

**The practice of massage : its physiological effects and therapeutic uses /
by A. Symons Eccles.**

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Eccles, A. Symons 1855-1900.
Royal College of Physicians of Edinburgh

Publication/Creation

London : Macmillan, 1895.

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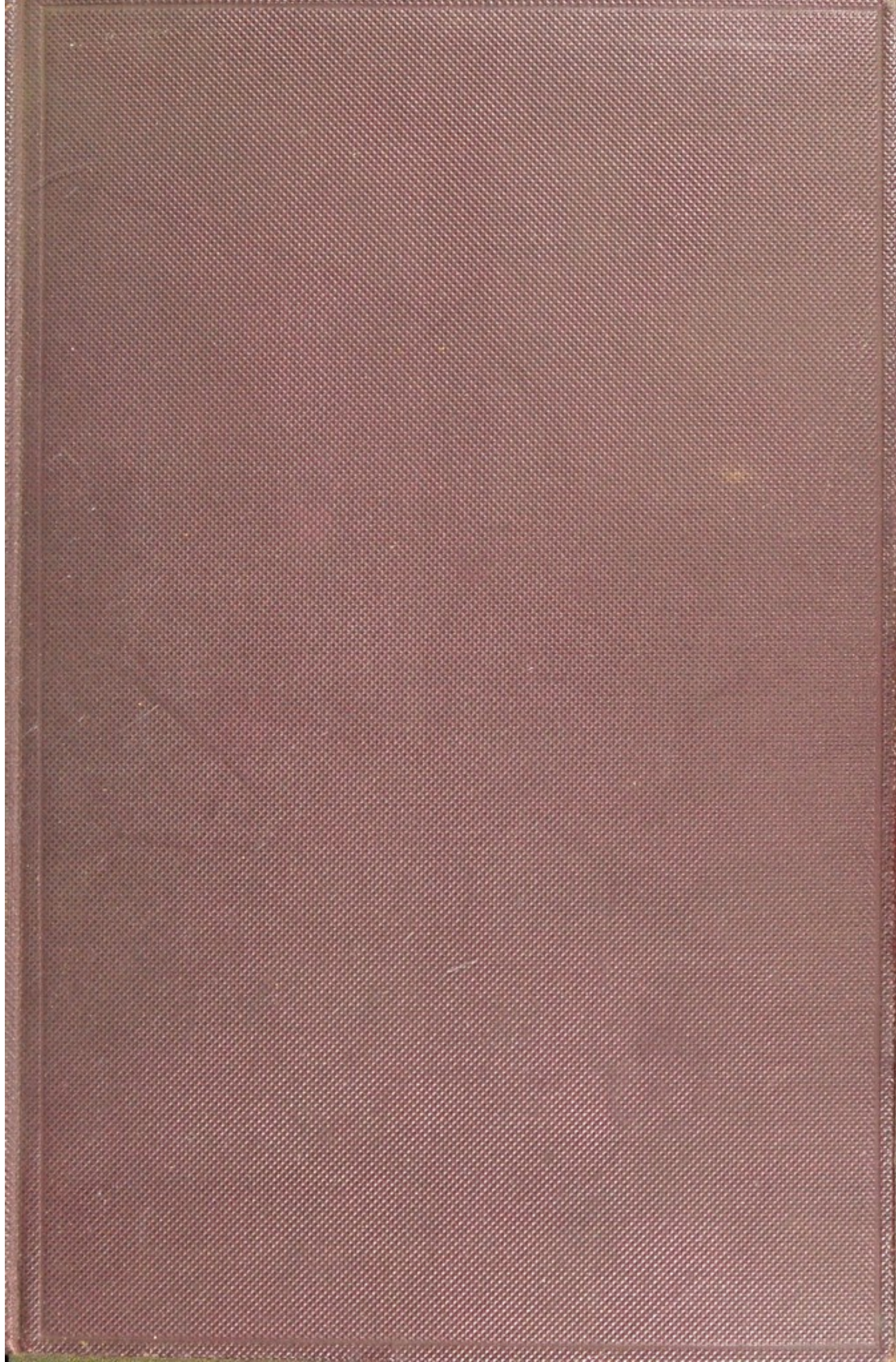
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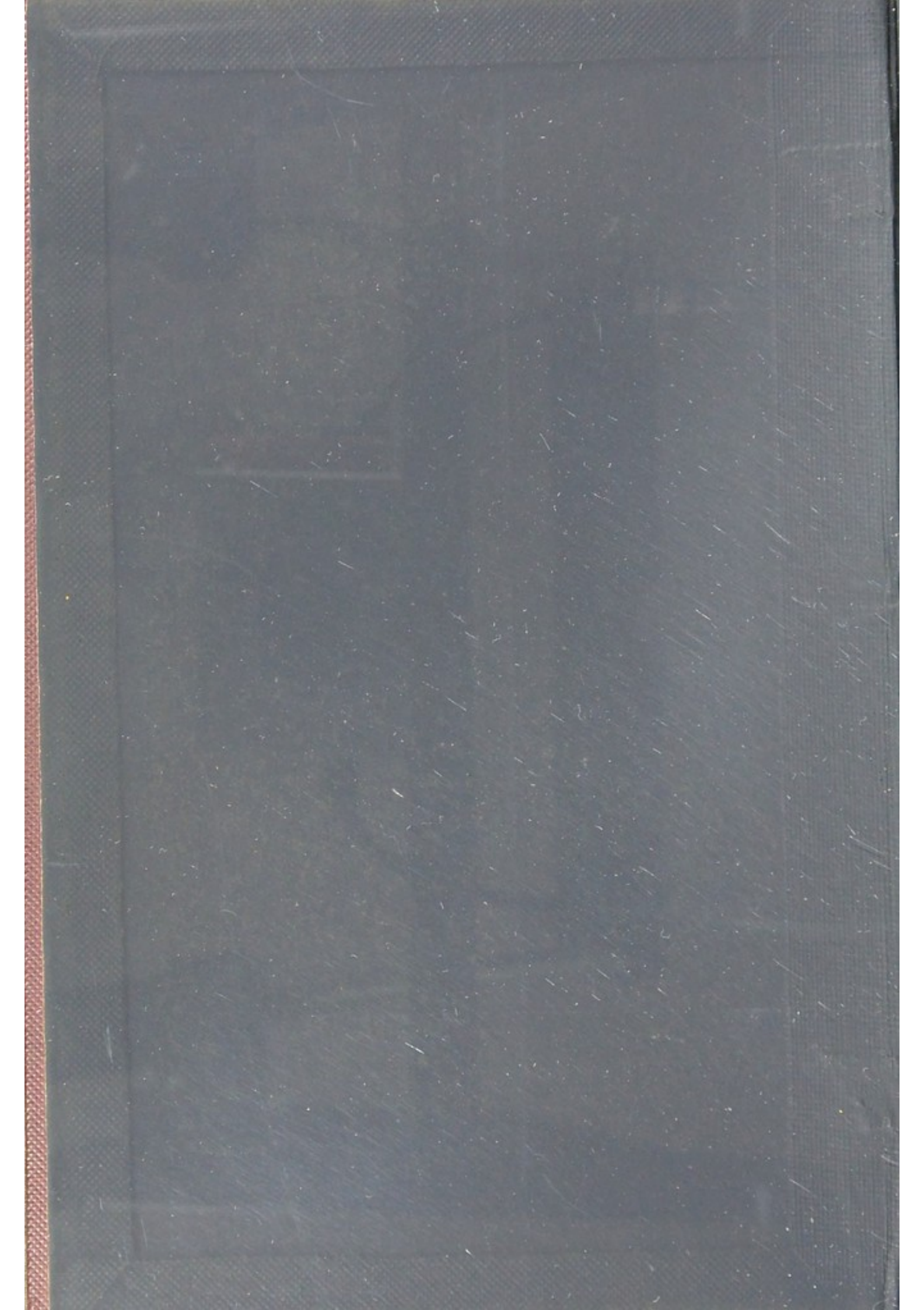
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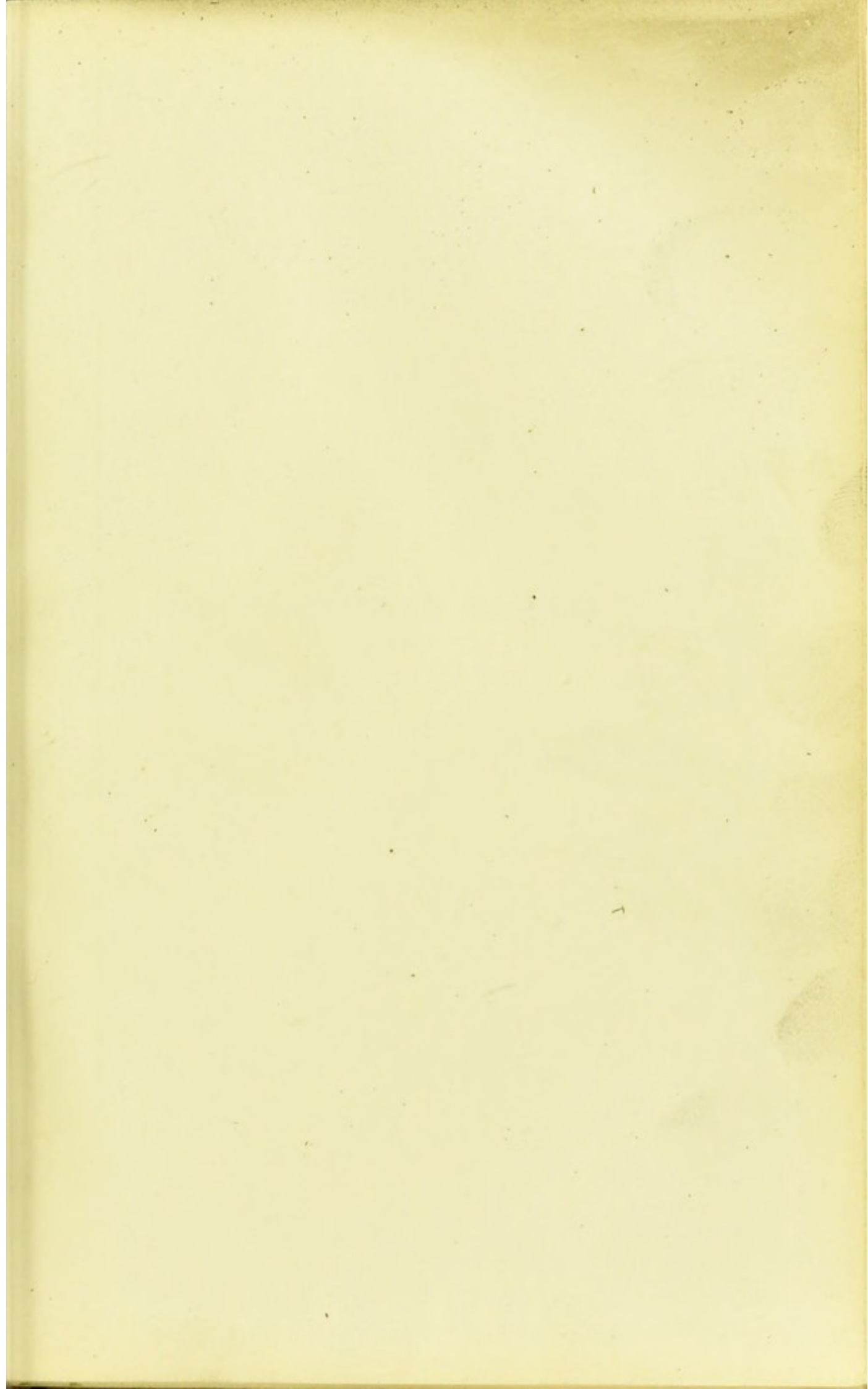






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THE PRACTICE OF MASSAGE



THE PRACTICE OF
MASSAGE

Its Physiological Effects
and Therapeutic Uses : by

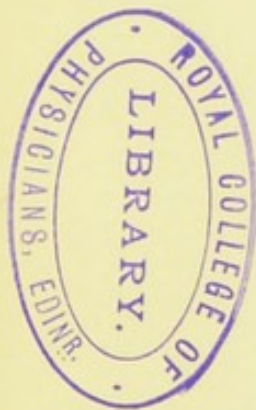
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LONDON
MACMILLAN AND CO.
AND NEW YORK

1895

THE HISTORY OF
MARRIAGE

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Edinburgh: T. and A. CONSTABLE, Printers to Her Majesty

TO

THOMAS LAUDER BRUNTON, F.R.S.

HIS HONOURED TEACHER AND FRIEND

THIS BOOK IS GRATEFULLY

AND AFFECTIONATELY DEDICATED BY

THE AUTHOR



P R E F A C E

THE following pages have been written at the instigation of some medical friends, to whom I owe a debt of gratitude for many opportunities of practising massage in cases confided by them to my care.

In spite of the existence of more complete treatises and works of reference, the rapidity with which new facts are ascertained, and wider scope is obtained in relation to the application of massage as a means of treatment, encourages me to believe that no apology is needed for the production of this book.

In some measure it is a record of personal observation and practice; and while I have not attempted to include many modes of employing massage in the treatment of disease with which I have no practical acquaintance, and on which I do not feel competent to hazard an opinion as to their value or feasibility, I have at the same time endeavoured to embody in this work the most

recent as well as the earlier contributions to our knowledge of the effects, uses, and limitations of massage, so far as they have appeared to be fairly established facts or incontrovertible opinions.

In so doing I trust that I have duly acknowledged the sources whence the information has been derived ; but if by inadvertence omissions have been made in regard to the work of others, I hope this expression of regret will be accepted for such unintentional want of recognition. A list of authors quoted and works referred to will be found at the end of the book ; but I am especially indebted to the works of Lauder Brunton and Douglas Graham for much valuable information.

In conclusion, I trust that this work, of one who is at the same time a practitioner of medicine and a practical masseur, may not be altogether without utility as a contribution to the literature of massage, in the practice of which I have proved the truth of Dr. Johnson's words : 'There is nothing, sir, too little for so little a creature as man. It is by studying little things that we attain the great art of having as little misery and as much happiness as possible.'

23 HERTFORD STREET,

MAYFAIR, *May* 1895.

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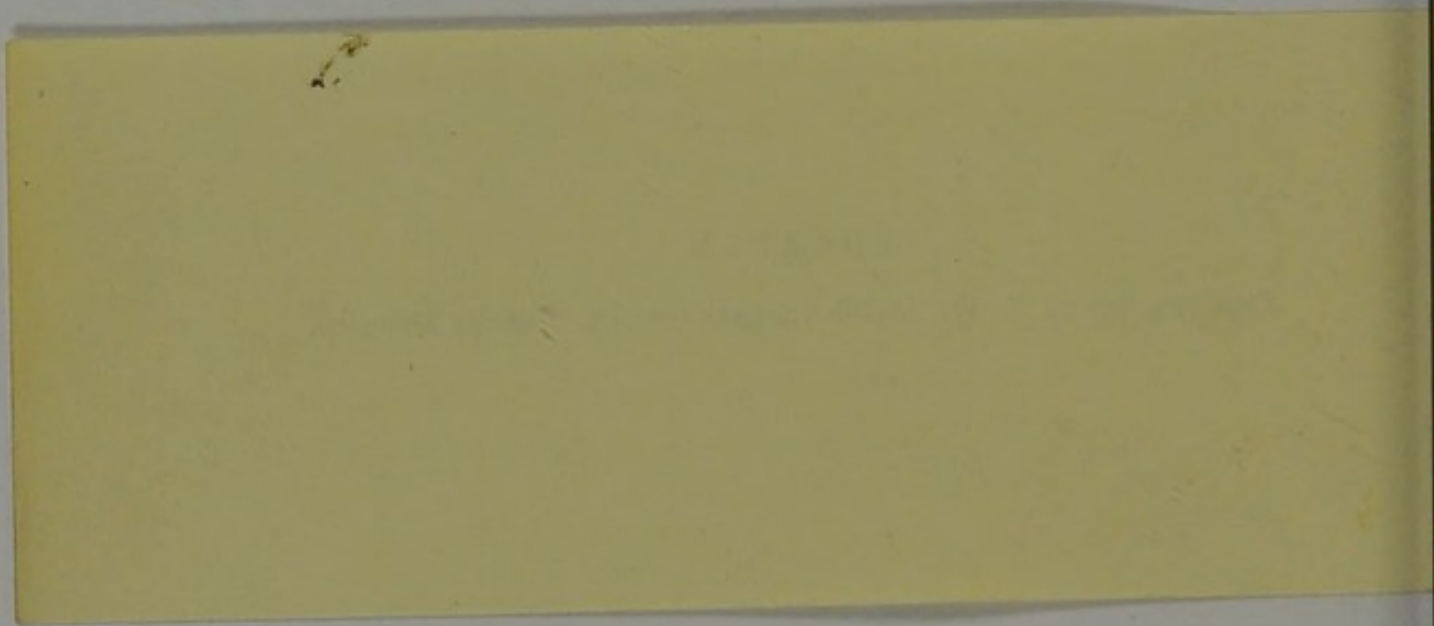
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ERRATUM

Page 173, line 21, *for* Dr. Sheridan Lepine *read* Dr. Sheridan Delepine.



CHAPTER I

Nomenclature and description of the manipulations—Mode of applying General Massage—Massage of the Abdomen, Chest, Back, Upper and Lower Extremities—Massage of the Head, Neck, Eyes, and Ears.

MASSAGE is the term generally employed by writers on the subject to signify a process which includes rubbing, kneading, and striking the body in a certain systematic fashion hereafter to be described.

For all practical purposes it is unnecessary to differentiate more than five manipulations, each of these, however, being modified in the duration, extent, and mode of application by the part of the body on which it is employed, and according to the effect it is desired to produce.

The nomenclature adopted in the description of the manipulations is that which is generally recognised both in Europe and America; and although the use of foreign words may be open to objection, still it seems preferable to retain them, as they constitute a kind of *volapük* among practitioners of the method throughout the world.

Effleurage, *petrissage*, *tapôtement*, *vibration*, and *massage à friction*, are the names given to these manipulations, the two first being employed in general massage, with the addition of the third and fourth in certain cases ; the use of the last being confined to local massage, and most frequently applied in the neighbourhood of the larger joints.

In performing general massage it is usual to combine with the rubbing and kneading of the skin and muscles passive movements of the joints. With these may be associated resistance by the patient to the movements performed by the operator ; or to the active movements of the patient the attendant may oppose resistance, this latter plan of action constituting what are commonly known as resisted exercises, to which more detailed reference will subsequently be made.

Effleurage (rubbing) consists in gentle stroking and rolling of the skin, gradually increasing in strength to moderately firm rubbing in a linear or curvilinear fashion, the firmer friction being always employed in the direction of the blood- and lymph-currents towards the heart. Over large muscular masses the whole palmar surface of one or both hands should be kept in close application to the patient's skin, while in the smaller areas of the feet and hands, and over bones unprotected by muscles, the palmar surface of the thumbs and the finger-tips will be most conveniently employed.

The centripetal or up-stroke of effleurage should always be firmer, commencing from the lowest or most distal point on the surface of an extremity, and should gradually be decreased in force as it is carried towards its proximal termination, the hand of the operator being closely applied to the surface of the skin throughout the manipulation, and not removed from it when the lighter, more gentle down-stroke is begun. A good rubber will not relinquish the apposition of the palm to the patient's skin until the whole series of centripetal and centrifugal strokes constituting the effleurage of the part is completed. The extent of the stroke in length will depend on the dexterity and reach of the operator as well as on the part of the body to which it is applied; but, speaking generally, the greater the extent the more grateful to the patient will the manipulation prove to be.

In regard to the rapidity of movement to be exercised in the performance of this hand-stroking or friction, one of the best authorities on the mode of applying massage has indicated the rhythm which may be advantageously used in effleurage when undertaken in connection with general massage,¹ and suggests that 'the rapidity of these double strokes may be from ninety to one hundred and eighty per minute'; but if silence gives consent it would appear that the majority of practical writers on the subject share the views of

¹ Douglas Graham : *A Practical Treatise on Massage*, p. 40.

the author, who is guided both as to the rhythm and duration of the manipulation by the condition of the patient, and by the effect it is desired to produce, these two factors influencing very greatly the mode and length of the application. If it is desired to exercise a soothing influence it will be found in most cases that long, moderately firm, even up-strokes, followed by light and steady down-strokes, prove most agreeable and sedative; but if a more stimulating effect is desired the manipulation must be performed more rapidly and briskly.

In practising this and all other manipulations included under the term massage, the truly skilful operator must have a good and sufficient reason for everything he does: as unless the local effects which should follow the successful application of each manipulation are produced, the benefit of general massage cannot be obtained.

To avoid the multiplication of confusing names for what are merely modifications of the same process, varied to fulfil identical indications under different circumstances, under the term *effleurage* are included other manipulations besides palmar friction. In almost all cases it is well to roll the skin between the fingers and thumb, combining this process with gentle sliding of the skin against and over the underlying tissues, and, without any alteration of the relationship between the apposed surfaces of the operator's hands and the patient's skin, to gently draw the skin with the subcutaneous

tissue to and fro in all directions to its utmost limits over the surface of the subjacent muscle sheaths.

The object of this manipulation being to produce the effects of effleurage on the whole thickness and under-surface of the skin as well as on its upper strata, it also enables the manipulator to detect any adhesion or any abnormal condition in the texture of the skin itself. Indeed the recognition of localised exudations is greatly aided by this process, and leads to the application of another form of effleurage which constitutes a sort of link between rubbing and kneading: *i.e.* the manipulation of exudations between the skin and the muscles by means of a vertical application of the thumb or finger-tips to the affected part, the pressure being always directed centripetally, and varying in force with the extent of the induration.

Petrissage (kneading) is the term applied to the kneading, squeezing, pressing, and rolling of the skin together with the underlying muscles by one or both hands in the second stage of massage.

If the primary object of this manipulation be steadily kept in view there can be no doubt or controversy as to the right mode of its performance. The rationale of muscle kneading is to mechanically assist the flow of the lymph- and blood-current towards the heart: *i.e.* from the periphery towards the centre, to squeeze out from the tissues, especi-

ally from the muscles, the waste products which may have accumulated within them. This being the most important use of massage, though there are many other valuable indications fulfilled by its practice, it follows that all pressure and manipulation must be exercised in a centripetal direction, beginning from the part of the limb or the attachment of the muscle most remote, and working always towards the central or proximal attachment of limb to trunk or of muscle to limb.

In the employment of centripetal pressure the technical detail of most practical value to be observed is the maintenance of contact between the balls of the operator's thumb and little finger, together forming the base of the palm, and the surface of the part under manipulation. None of the movements included under the term *petrissage*, save those employed on the muscles of the face, head, hands, and feet, can be correctly and effectually carried out, unless the rule of keeping the base of the palm of the hand in close apposition to the skin overlying the muscle is constantly observed and practised. The squeezing of the muscle must be exercised between the palmar surface of the adducted fingers and the base of the hand, not between the fingers and thumb (as in pinching). Pressure exercised at right angles to the course of the muscular fibres or to the surface of the muscle would be of little value in aiding

the propulsion of lymph and waste products from the sheath and substance of the muscle into the proximal lymph channels leading from the muscle to the main lymph trunks. Moreover, mere squeezing of the fleshy tissues between the fingers and thumb, or in the grasp of one or both hands, without consideration for the direction in which such pressure is exerted, will not only minimise the value of efforts thus misapplied, but will defeat the object in view ; for pressure in any other than a centripetal direction, so far from aiding the flow through the lymphatics and veins of the part manipulated, will obviously rather tend to the arrest of the venous and lymphatic currents in their passage through the vessels below or on the distal side of the point of pressure. Vertical pressure will frequently produce bruising of the part, oblique pressure will never do so.

In dealing with a limb or part of the body by muscle-kneading, pressure is not only exercised on the muscle or group of muscles actually under manipulation, but the blood-vessels and lymphatics surrounding or adjacent are also influenced, thus rendering it incumbent on the operator to observe the course of the veins and lymph channels, and to work always in the direction of the current through them from the periphery to the centre.

Tapôtément (or muscle-hacking) is the term applied to the delivery of a series of rapid blows

perpendicularly to the surface, either by the dorsal aspect of the semi-flexed fingers, when it is desired to administer slight mechanical stimuli to the superficial structures; or by the ulnar border of the extended palm, when more powerful and deeper-reaching effects are indicated.

In performing the milder form of *tapôtément* the four fingers of the hand must be in close apposition one to another, the blow being delivered by a movement of the wrist, the dorsal surface of the semi-flexed second and third phalanges alone being suffered to come in contact with the patient's skin, care being taken to avoid striking the part under manipulation with the knuckles. In raising the hand from the patient's skin it is equally necessary to prevent the nails and finger-tips from striking the surface at the conclusion of the blow, otherwise a smarting, stinging sensation is evoked which is undesirable: for the object of this manipulation is not to produce a painful impression, but to administer a slight mechanical stimulus. The more powerful manipulation carried out by means of the ulnar borders of both palms striking the surface alternately should only be practised by persons who by reason of long and constant performance of massage have so developed the hypo-thenar muscles of their palms that the ulnar border of the hand, instead of presenting a straight barely covered ridge of bone, affords a convex cushion of firm resilient muscle.

With such a pad as every good masseur must possess it is possible to give a series of blows on the larger muscular masses of the body without inflicting unnecessary pain or bruising the part so manipulated. This hacking is carried out by movements of the elbow joint, the wrist being fixed and the hand extended on the fore-arm; the same precautions being observed in performing this as in the slighter form of tapôtément, viz.: to deliver the blow at right angles to the surface, the ulnar border of the hand only, not of the finger, being permitted to impinge on the body surface of the patient.

Hacking is usually administered transversely to the course of the muscular fibres of the more fleshy parts of the body. The manipulation must never be practised over bony or ill-covered parts, and the slighter form alone over the abdomen, if indeed it is practised at all in this region.

Vibration includes a variety of movements, made by the hands of the operator, partaking in character both of kneading and striking, to these being added a vibratory or shaking action, the manipulation being specialised according to the part of the body to which it is applicable. Over the chest wall the whole palm of the hand is kept in contact with the skin while a series of rapid succussions or vibrations are imparted by the muscular action of the forearm to the part under manipulation.

Another form of vibration employed most usually over the præcordial region consists in striking the surface gently and alternately with the flat palm and the finger-tips.

Along the course of nerves, the trunks and branches may be subjected to pressure by the points of the fingers gathered up into a cone, to which a trembling movement is transmitted. Again, succussion of the abdominal wall may be practised either by means of the palm semi-flexed into a cup-like shape, or deeper pressure may be exercised by applying the finger-tips of both hands, joined palm to palm, perpendicularly to the surface, the points of the fingers being pressed deeply into the epigastric and right hypochondriac region to which a series of vibrations or succussions is thus transmitted.

Any of these manipulations, except the lightest and gentlest, may be fraught with possible danger if practised over the abdomen by persons without thorough anatomical and physiological training, coupled with such a knowledge of auscultation, percussion, and palpation as will enable the manipulator to map out the position of the viscera.

Massage à friction is perhaps the least appropriate of the terms used to denote the different manipulations in the systematic practice of massage ; but no better phrase has yet been found to convey some impression of this important

modification in the mode of handling tissues overlying and adjacent to the larger joints. The manipulation comprises circular or rotatory friction by the thumb or finger-tips of one hand alternating with powerful centripetal friction and kneading by the other hand. When practised over, or in the vicinity of a joint, the most effectual method is to use the fingers as a 'rest,' while the thumb kneads the tissues in a rotatory fashion, the circumference of the circles so described being increased gradually till the widest range is attained. When this limit is reached the thumb may be rested by substituting for the friction exercise centripetal kneading of the muscles on the proximal side of the joint.

It is difficult to describe this very useful manipulation, and it is by no means easy for an unpractised hand to acquire dexterity in its performance. With the right thumb the rotatory friction may be practised with comparative ease; but most persons experience difficulty in performing massage à friction with the left thumb until after long and constant training.

The success attending massage of sprains, strains, and rheumatic affections of joints and muscles cannot be achieved without the aid of this manipulation, which tests the dexterity and ability of the masseur perhaps more than any other form of massage.

Before proceeding to discuss the physiological

effects of massage it may be well to briefly describe the mode of applying general corporeal massage. In many cases friction and kneading only are necessary to obtain the desired effect, whilst in others, percussion (*tapôtement*) and vibration must be added, the duration and extent of each manipulation being modified by the state of the patient and the effects it is desired to produce.

It must be remembered that in regard to the length of time occupied by any one movement or by the administration of general massage to the whole body, this greatly depends on the dexterity and intelligence of the operator: for, while one will accomplish all that is necessary in a few minutes, another less skilful manipulator may fail to produce the same effect, even after expenditure of unnecessary time, trouble, and fatigue.

If the mere automatic rubbing and kneading were alone sufficient to produce the best and most desirable results obtainable from massage, some of the ingenious, but comparatively useless, machines which have been invented might be employed as substitutes for the human hand; but it is incontestable that in many cases wherein massage is said to have been employed without success, the failure was due to the inexperience and lack of manipulative skill on the part of the rubber, and not to the inefficiency of the process itself.

While much of the value of massage must depend upon the skill and intelligence of the

operator, not a little rests on the physical conformation and muscular development of the hands, which should be broad and fleshy: the skin being smooth, the muscles, both of the fingers and palm, firm and resilient, those of the little finger and thumb being especially well developed. A long gaunt hand is unsuitable for the purpose, and other things being equal, the choice of a rubber should depend upon the possession of smooth, pliant, muscular hands and forearms, in which the development of the thenar and hypo-thenar eminences in the one, and the flexor sublimis digitorum in the other, are the special features betraying long practice and efficiency in the art.

For the administration of general massage the patient should be in the recumbent position, preferably on a firm, well-padded couch 26 inches high, and so placed as to afford room for access on all sides; but an ordinary single bedstead will serve the purpose, and in cases in which massage forms part of the 'rest cure,' it is better that it should be given in the bed, rather than that the patient should be moved on to a couch or bench. The bed-clothing or rugs with which the patient should be warmly covered may be protected from being soiled by the lubricant (if any is used) by large Turkey towels, which are much better for this purpose than blankets, as they are equally warm, and no hairy particles are transferred to the skin, which may well prove a source of irritation

if the patient be enveloped in a fabric of woollen texture. The temperature of the room should be between 60° and 70° , and for ordinary purposes massage of the whole body should be given between meals, neither too soon before nor after the ingestion of food. No authoritative statement has yet been made by practical writers on massage as to which part of the body should first be manipulated, but, in consideration of the physiological effects hereafter referred to, it is well to commence with the abdomen; then, in the following order, the chest, back, flanks, upper and lower extremities, should be dealt with, manipulation of the head and face not entering as a rule into the scheme of general corporeal massage.

Massage of the Abdomen.—The patient reclining in an easy and unconstrained position on the back, with the head slightly raised, the shoulders and buttocks being on the same level, the whole back well supported, and the lower extremities semi-flexed, while the arms are slightly abducted, but lying quite flaccid on either side, the abdominal walls will be as much relaxed as possible. The patient should be instructed to breathe steadily and somewhat deeply during the manipulation, and not to move or raise the head; as holding the breath, or lifting the head from the pillow, or indeed making any other voluntary effort, will immediately excite contraction of the abdominal muscles,

and thus interfere with the efficacy of manipulations in this region.

In performing massage, no part of the body, save that actually under treatment, should be exposed, and in dealing with the abdomen, while the bed-clothes may be folded and drawn down over the hips, the chest and arms must be protected by a suitable wrap of sufficient weight and warmth.

Arrangements having thus been made to ensure the comfort of the patient during the operation, it is initiated by gentle friction gradually increasing in force and firmness over the hypochondriac and epigastric regions, the firmer strokes being from left to right, beginning over the lower left ribs in the nipple-line and passing obliquely to the right and downwards towards the pylorus; this manipulation skilfully applied will aid the evacuation of the gastric contents into the duodenum if the pyloric orifice is relaxed. Friction over the right hypochondrium, combined with alternate compression and relaxation of the ribs overlying the liver, and firm kneading with deep finger-thrusting just below and to the left of the right floating ribs will be found a useful auxiliary to Nature's massage of the liver as performed by the rise and fall of the diaphragm and chest walls. After having sufficiently rubbed and kneaded the hypochondria and epigastrium, the next manipulation should consist of circular rubbing with the

palm, and, using the thumb as a pivot over the navel, rotatory friction with the three finger-tips from above, downwards, and from left to right over the umbilical and hypogastric regions. The whole thickness of the abdominal walls being subsequently rolled and kneaded between the fingers and thumbs of both hands, care must be taken to avoid any unnecessary bruising either of the belly wall itself or of the delicate structures lying beneath it.

In cases of large and protuberant abdomens efficient manipulation is impossible save by the co-operation of two persons, who, standing one on either side of the patient, with the fingers of both right hands interlaced, practise circular friction both over the small intestines from left to right, and, as in the succeeding manipulation of the colon, from right to left.

The next manœuvre included in abdominal massage has for its object the compression of the colon to aid and accelerate the onward movement of its contents towards the sigmoid flexure; for this purpose, when the patient is thin, and the couch or bed sufficiently narrow, this manipulation may be performed, standing on the left of the patient and with the 'heel' or base of the right palm following the course of the colon from the right iliac fossa upwards along the right side towards the hepatic flexure, thence slightly downwards and in a curvilinear fashion across the

abdomen just above the navel to the left hypochondrium, and then downwards to the left iliac region, thus following the course of the ascending, transverse, and descending colon.

To this single-handed proceeding may well be added the following, especially in cases of obesity:— For the ascending colon, standing on the right of the patient, commencing in the right iliac region as before, the finger-tips of the right hand being placed and rather deeply pressed over the cœcum, the pressure upwards towards the right hypochondrium is reinforced by placing the left hand over the right and pressing firmly on the second phalanges of the right-hand fingers, the two hands thus forming a wedge-shaped instrument, the thin edge of which, represented by the right finger-tips, is pressed deeply into the abdominal wall; while the base, formed by the balls of the right little finger and thumb, rests lightly on the belly wall. The rubber, standing on the right-hand side of the couch, and facing the foot, firmly draws the hands upwards towards him over the ascending colon, then, passing to the left-hand side of the couch, the same manipulation is repeated across the abdomen over the transverse colon, and turning with his face to the head of the couch, the hands are drawn downwards over the descending colon. The sigmoid flexure is best kneaded standing on the right side of the patient, and transposing the hands, the left finger-tips are pressed deeply

into the left iliac fossa drawn obliquely upwards and inwards towards the navel, and then downwards to the left side of the hypogastrium. In following these directions it must of course be understood that in cases of gastroptosis, or where, as sometimes happens, the transverse colon describes an arc, the convexity of which may invade the umbilical region, or even exceed these limits, the operator having made out the situation of the viscera, modifies the course and direction of the kneading accordingly.

In many cases it is useful to subject the whole abdomen to succussion, either by placing the flat palm of one hand over the navel, and more or less vigorously shaking the anterior abdominal wall; or by semi-flexing the fingers, thus forming a cup-like instrument, alternately shaking and gently striking the belly. Another procedure of a vibratory character is carried out by forming the fingers and thumb of one hand into a cone and pressing the united finger-tips deeply into the abdomen, either in the pyloric region or just over the navel. In stout persons this vibration is best performed by bringing the fingers and palmar surfaces of both hands together, pressing the thin end of the wedge thus formed into the belly, and communicating to it a tremulous or vibratory movement. The concluding manipulation of abdominal massage should be thorough friction of the whole surface by the palms of both hands, and

in cases of obesity the flexor surface of the forearm may also be employed in friction.

Any brusque, jerky, or too vigorous handling of the belly is to be strongly deprecated, not only for the reason that serious injury may be inflicted on the delicate organs situated in this region, but because, unless the extent and force of the manipulation is most carefully, gently, and gradually increased, the patient will instinctively shrink from the application of abdominal massage, the reflexes will be excited, the muscles uncontrollably contracted, and thus any attempt to manipulate the deeper structures will be frustrated. It is quite easy by judicious and gentle handling to habituate the most nervous and irritable patient to comparatively deep and vigorous manœuvres; but knowledge, tact, and skill are indispensable to the performance of efficient abdominal massage.

Massage of the Chest follows most conveniently on that of the abdomen, and should be commenced by gentle friction over the pectoral, sternal, and præcordial regions; then the integuments should be raised between the fingers and thumbs of both hands from the subjacent tissues, and thoroughly kneaded; the pectoral muscles should then be subjected to firm pressure, friction, and kneading, commencing in the axillary region and following the course of the fibres in their fan-shaped expansion to their attachment along the collar and

breast-bones. By placing the fingers of one hand in the axilla, and those of the other over the upper surface of the muscle, it can be thoroughly squeezed and kneaded, the direction of the pressure being as before from the attachment to the bicipital groove inwards and downwards towards the middle line of the body, and upwards towards the collar-bone; finally, firm pressure should be exercised with the finger-tips from the axillary line inwards and downwards to the sternum along the intercostal spaces.

Massage of the Heart, as described by Oertel, is performed as follows:—

He states that during expiration pressure should be made by the hands upon the thorax in the axillary line, beginning at about the fifth or sixth rib, and, as expiration proceeds, moving gradually downward and forward to the xiphoid process, in the neighbourhood of the seventh or eighth rib. In this way a lateral pressure is applied to the chest walls, and at the same time the two thumbs placed on each side of the sternum tend to narrow the antero-posterior diameter of the thorax, or, at least, to prevent its increase during expiration.

Massage of the Back.—It is recommended by some writers that this should be given with the patient resting on either side alternately; but this involves more moving about for the patient than

is necessary, or in many cases desirable, and certainly, in the experience of the writer, massage can be much more efficiently performed when the patient adopts the prone position. In order to relax the tissues of the back as much as possible, and for the greater comfort of the patient, firm, well-filled pillows should be placed under the abdomen and chest. The rubber then, standing on the right side of the patient, commences to deal with the right side of the neck and back, applying from the roots of the hair, at first gentle, and afterwards gradually increasing firmer friction—the more vigorous rubbing being applied downwards and outwards in a curvilinear fashion, following the course of the upper fibres of the trapezius muscle from the occiput and spines of the vertebræ to their attachment along the spine of the shoulder-blade. The whole of the superficial structures of the back, from the sacrum to the occipital protuberance, should then be rubbed. Palmar friction with the right hand should be given by a series of up-and-down strokes the whole length of the backbone to the right of the spinous processes; then, commencing from the seventh cervical spine, a series of transverse strokes somewhat firm in character should be delivered outwards and gradually obliquely downwards; the upper ones terminating at the shoulder, the lower being prolonged downwards in the axillary line. The muscles of the back and shoulders

must now be thoroughly kneaded, the trapezius in its upper part from above downwards, and in its lower part from below upwards, and outwards. The muscles attached to the shoulder-blade must then be kneaded ; the supra-spinatus by a series of firm rotatory movements with the thumbs from without inwards along the course of its fibres. The infra-spinatus and teres are best kneaded with the base of the palm, the latter being also firmly squeezed and grasped between the fingers and thumb of the left hand upwards and outwards to their attachment to the arm-bone. Before proceeding to knead the muscles of the back the arms should be abducted to an acute angle with the trunk, so that the inner border of the shoulder-blade may be drawn away from the spine, in order to expose the muscles between the backbone and the shoulder-blade to the influence of the manipulation. The muscles lying between the spinous and transverse processes of the backbone may most effectually be kneaded by a series of semi-circular movements of the thumb downwards and outwards, the whole length of the back being thus dealt with. The left side of the back should then be treated in a similar fashion, the rubber standing on the left side of the couch. In very muscular subjects, when it is desired to apply vigorous massage to the muscles of the spine, *e.g.* the erector spinæ and its prolongations, the rubber may kneel upon the couch, bestriding the

patient, and work from the neck downwards with both hands, one on either side of the spinal column. In the same way, in this attitude he will be able most effectually to rub and knead the muscles of the lumbar and flank regions; but in using the firm pressure with the base of the palm he is thus able to apply, the hands must be employed alternately, or the tissues would be rendered tense, and an unpleasant dragging sensation replaces what would otherwise prove agreeable to the patient's feelings. This more vigorous form of back-massage should be terminated by a series of rapid frictions over the spine and on either side the whole length of the back. In rheumatic affections of the back-muscles, hacking with the ulnar border of the hand may be added to the foregoing movements; but these must of course be applied only over the more fleshy parts contiguous to the backbone.

The manipulation of the trunk having thus been completed, the patient should be turned over, and, assuming an easy recumbent position on the back, massage of the arms may next be administered.

The right arm being slipped out of its sleeve (which should be passed under the arm-pit and laid across the chest), care must be taken that the rest of the body is thoroughly wrapped up and warm.

Massage of the Upper Extremities.—The rubber,

standing on the right of the patient, grasps the right palm in his own while he commences manipulation with some half a dozen long rapid strokes given by the palm of his left hand from the finger-tips to the shoulder over the extensor surface of the semi-flexed limb lying midway between pronation and supination; then relinquishing the patient's hand from his right grasp, while the hand lies supine in his left palm, with his right he repeats the friction over the flexor surface of the hand, forearm, and upper arm to the axilla. After this preliminary rubbing of the whole limb the palmar surface of the fingers and hand to the wrist should be thoroughly rubbed. The firmer upward stroke is given by placing the finger-tips on those of the patient, and as they are pushed onwards their whole palmar surface and that of the hand also is brought into contact with the patient's skin till the stroke is finished at the wrist by the base of the rubber's palm, the lighter return stroke reversing this process without removal of the hand. In the succeeding friction the relative position of the operator's and patient's hands must be so varied that the manipulating fingers may cover the grooves formed between the adducted fingers of the patient's hand. Each finger must now be thoroughly rubbed and kneaded between the finger and thumb after the back of the fingers and hand have been treated in the same way as the palm; then with the ball of the thumb a

series of rotatory movements will serve to knead the palm, and massage of the hand will be completed by deep kneading between the dorsal surfaces of the metacarpal bones followed by squeezing of the muscles forming the ulnar border of the hand and the fleshy mass between the index-finger and thumb.

Massage of the forearm is best administered when the elbow-joint is flexed, the upper arm resting upon the couch, the hand and forearm held perpendicularly at right angles to it while being dealt with. In this way the force of gravity aids the efforts of the masseur in squeezing out from the tissues the lymph on its way to the proximal trunks. While the forearm is in this position the whole of the tissues on both surfaces may be subjected to thorough rubbing, the deeper friction being accomplished by the right hand for the flexor surface and the left for the extensor. Effleurage with the thumb may be employed between the tendons and muscle-bundles of the forearm, then petrissage between the tips of both thumbs may be practised in cases of exudations or thickenings in the hand and forearm. Kneading of the muscles however is best accomplished by taking them up separately between the fingers and thumb, and kneading them thoroughly always in an upward or centripetal direction. Where it is not possible to dissociate one muscle from the others, the whole muscle-group must be thoroughly rolled, squeezed, and kneaded. The slighter

form of muscle-hacking delivered by the semi-flexed fingers may be practised on the forearm. Massage of the upper arm consists in friction, at first light, gradually increasing in force, over the whole surface from the elbow to the shoulder-joint ; then, if it is desired to rub very deeply and forcibly over the shoulder, the following plan will be found most useful. The patient assumes the sitting attitude ; the operator seats himself facing the patient's side, and near enough to enable the elbow of the patient to rest upon the rubber's left shoulder ; the operator then interlaces the fingers of his hands over the patient's arm, and, commencing from the elbow, pushes his hands firmly over the surface of the arm and shoulder to the neck ; bringing his hands back lightly and gently, and without removing them, he repeats the manipulation, which may be further elaborated by adding a rolling, twisting movement to his clasped hands. Reibmayer pictures this manipulation with the patient resting his hand on the rubber's shoulder, but in the author's experience it is almost impossible to prevent the patient contracting the triceps muscle while assuming and maintaining this pose. The deltoid also is brought into action to support the weight of the limb, and as it is of no possible use to attempt massage of muscles in active contraction, the value of the proceeding appears to be enhanced by the plan adopted by the writer.

Petrissage of the muscle groups of the upper arm may be practised on each surface separately by the single hand, the brachialis anticus and biceps being kneaded by the right hand, the triceps and deltoid by the left, but more vigorous manipulation may be practised by grasping the muscles on both surfaces with the two hands and firmly rolling and squeezing them upwards from their insertions to their origins. Another form of petrissage particularly applicable to the deltoid and biceps in the arm, the quadriceps extensor in the thigh, and the muscle group forming the calf, is practised thus:—With the fingers and thumb of one hand the muscle is grasped towards its lower extremity, and raised, as it were, from the bone beneath; meanwhile the palmar surface of the thumb of the other hand is pressed deeply and longitudinally into the fibres of the muscle, the upward pressure of the thumb alternating with the grip of the hand, which is rhythmically contracted and relaxed along the whole length of the muscle from below upwards. The muscles on the whole upper extremity having thus been subjected to thorough kneading, palmar friction from the finger-tips to the elbow, and thence to the shoulder-joint, should conclude the manipulation of the right limb, which should then be reclothed and the same procedure practised upon its fellow of the opposite side. The rubber, standing on the left of the patient, grasps the left

palm in his own and performs massage of the left limb, using his right hand over the extensor surface, and his left over the flexor aspect of the extremity. After the final effleurage of each limb, all the joints of the fingers, the wrist, elbow, and shoulder, must be subjected to passive movement; and according to the state of the patient, either at the commencement of a course of massage, or at such a period as the physician may prescribe, to these passive movements may be added resistance on the part of the patient against the efforts of the masseur, which must at first be very moderate, and be followed, when desirable, by active movements on the part of the patient, moderate resistance being offered by the rubber, as in the exercises named by their designers 'Widerstandsgymnastik,' to which reference will subsequently be made. In the practice of the author general massage is brought to a close by the manipulation of the lower extremities, for reasons which will be apparent in the discussion of the physiological effects of massage.

Massage of the Lower Extremities.—The rubber, remaining on the left side of the couch, uncovers the left lower limb and with the right hand delivers a series of rapid frictions from the toes upwards over the dorsum of the foot, external surface of the leg, the knee and front and external surface of the thigh; then with the left hand, the knee being

semi-flexed and the thigh slightly abducted and rotated outwards, the sole of the foot, calf, inner side of the knee and thigh, are also lightly and briskly rubbed, then, re-covering the limb and exposing the foot and ankle only, the more detailed treatment of the foot is given. Supporting the sole of the foot in the palm of the left hand, the heel resting in the semi-flexed fingers, friction over the dorsum of the foot and the front and outer surface of the ankle is performed in much the same way as that of the back of the hand. The tips of the fingers and their whole palmar surface must be employed in the friction of the numerous depressions and irregularities of surface on the upper and outer aspects of the foot and ankle, then deeper pressure may be practised by means of the thumb, the foot being flexed, extended, abducted, and adducted so as to expose as great a range of surface as possible to the centripetal pressure of the thumb, fingers, and palm, which must all be brought into play. The upper and outer surface of the foot and ankle having thus been well rubbed and kneaded, the masseur, standing with his back to the patient and supporting the dorsum of the foot with the right hand, then proceeds to rub the sole of the foot, from the toes to the heel ; no gentle effleurage is permissible here lest the patient be irritated by any tickling sensation. When it is desired to practise very firm kneading of the sole of the foot, the operator

may stand with his back to the patient, and in the case of the right foot, grasping the inner side of the foot with his right hand and the outer side with his left, the fingers resting upon the dorsum, the thumbs, commencing from the ball of the toes, may be used for deep kneading and squeezing of the plantar tissues by a series of semicircular movements from toe to heel. The inner side of the foot and inner ankle may be well rubbed by the left hand of the operator while he faces the patient. Friction over the peroneal region from the outer malleolus to the head of the fibula should be administered by the right hand, using especially the base of the palm in the upward and stronger strokes. Petrissage of the outer surface of the leg, of the tibialis anticus, and other muscles of this region, is best performed by the thumbs of both hands pressing and squeezing upwards from the ankle to the knee. Friction of the posterior surface of the leg may be practised in two ways; for the lighter form, the knee should be flexed, the limb slightly abducted; then, while the right hand is placed over the upper part of the leg to steady the limb, and the foot is fixed by placing the dorsum against the left side of the rubber as he faces the patient, the tendo Achillis may be well rubbed and kneaded between the fingers and thumb of the left hand; then, flexing the hand so as to follow the contour of the calf with the ulnar border lowermost, a series of powerful upward

strokes can be administered by drawing the hand (thus placed transversely to the axis of the limb) upwards from the tendon over the belly of the calf muscles to the space behind the knee. The calf may further be kneaded by alternately grasping and relaxing the muscles in their whole length from below upwards. The patient's limb should then be extended—the extensors of the thigh being relaxed, by placing a small cushion behind the knee; the inner, outer, and front surfaces of the thigh should be rubbed with both hands, the left travelling from the inner side of the knee to the groin, the right from the outer side of the knee to the trochanter. The hands should not be suffered to leave the skin of the patient until the series of firm up and light down strokes, embracing the whole limb except its posterior surface, is completed.

Massage à Friction of the knee-joint may here be practised if necessary (*vide* p. 10). While the patient still remains lying on the back the extensors and adductors only can be well dealt with, and in muscular subjects both hands are necessary for the rolling, squeezing, and kneading movements required for efficient massage of the large muscle groups. In ordinary cases massage of the backs of the thighs and buttocks may be deferred until the other surfaces of both limbs have been dealt with, as this will obviate the twisting and turning

about of the patient which would otherwise be involved in treating the whole of each limb separately. The left leg and accessible structures of both thighs having been massaged, the patient must again assume the prone position. The muscles of both calves may then be more thoroughly manipulated if required, and the backs of the thighs first rubbed from the back of the knee to the crest of the ilium, then the hamstring muscles should be thoroughly kneaded in their whole extent, and if grasping and squeezing the whole length of these muscles with both hands is not sufficient, deeper pressure can be exercised over the fleshy masses in this region by firm upward friction with the closed fists.

Massage of the buttock can only be performed effectually with both hands, and the friction over the glutei should be rather outwards and downwards for the firmer strokes.

Massage of the sciatic nerve is practised while the patient is in this position; friction with the finger-tips or the knuckles must be associated with deep pressure along the whole course of the nerve trunk upwards from the popliteal space to the sciatic notch.

Deeper pressure over the nerve may be exercised by means of the two thumbs deeply thrust between the hamstring muscles, and made to traverse the length of the nerve. Hacking with the ulnar borders of both hands is most applicable

to both anterior and posterior surfaces of the thigh, the blows being delivered transversely to the direction of the muscular fibres. In muscular subjects the buttocks also may be subjected to this more vigorous form of tapôtment, and the vibrations as practised on the abdomen may be beneficially employed over the trunk of the sciatic nerve, and especially over the sciatic notch. Effleurage of the limb should conclude the manipulations.

The foregoing description of the different manipulations ordinarily included under the collective term 'massage,' and the sketch of general corporeal massage just concluded, must not be taken to embrace all the movements which an accomplished masseur may employ in the mechanical treatment of the various conditions to which it is applicable; neither will the mere automatic practice of these manipulations prove so valuable, even at the hands of one well instructed, so far as the mere mechanical details are concerned, as the same procedure carried out by one whose knowledge of disease, and of the effect it is desired to produce, enables him to adopt methods which may perhaps be peculiar to himself. While in many cases massage may be intrusted to intelligent laymen possessing the necessary manual dexterity, in others success will depend very greatly upon its performance by the physician himself; for it is almost impossible to convey correctly to another the duration, force, and extent of manipulation desirable in a given

case for the production of a particular effect. Neither is it possible to gauge the effect produced by observation at the close of a sitting, as well as one can when conducting the operation oneself. The objection may be raised that these are the views of an enthusiast ; but while no one is more sensible of the proper limitations for the use of massage, few perhaps have had greater experience of the remarkably different results obtainable in the same case when massage has been administered by an expert, well-instructed, conscientious rubber at one time, and the physician conducting the case at another. Both equally endowed with mechanical dexterity, the one tries to carry out intelligently his instructions, while the other does himself what he knows to be required. Before discussing the physiological effects of massage it may be well to allude briefly to the manipulation of the head, face, and neck. Massage of the head and face has been found useful in neuralgias, rheumatic affections of the scalp, facial paralysis of peripheral origin, and for the dispersal of thickenings or exudations and improvement of nutrition in these regions.

Manipulations of the head and face require no detailed description ; the skin and muscles of the face can be thoroughly rubbed, pressed, and rolled either by the palmar surfaces of the thumb against the subjacent bones, or the soft parts may be pinched up, and as it were drawn away from the bones between the fingers and thumb. The fore-

head is best manipulated by the thumbs of both hands, not only the surface being rubbed, but the structures covering the frontal bone should be moved to and fro in every direction over the bone. With the palmar surface of the hand, the fingertips, and the thumb, the same pressure and movement of the scalp over the bones of the head may be employed, and if the hair is cut short, or the head is shaved, rotary friction by the thumbs may usefully be practised ; in other words, dry shampooing is a more appropriate term than massage of the scalp. In cases of exudation the direction of the friction and pressure should be from the vertex towards the postauricular and occipital regions, and should be followed by the practice of Gerst's method of neck-massage, which is thus accomplished :—The patient sitting upon a low-backed chair, with the neck and shoulders exposed, the operator stands behind, and placing the ulnar border of each hand behind the ears, and transversely to the direction of the sterno-mastoid muscular fibres, he draws the hands firmly downwards and outwards over the neck to the shoulder, half rotating the hand and forearm as the stroke is made, so that the whole palm comes in contact with the posterior triangle of the neck. The trapezius muscles may then be firmly rubbed and kneaded downwards from the occiput to the spine of the shoulder-blade. The anterior surface of the neck can be subjected to firm friction by the rubber

standing opposite the patient, and with the head slightly thrown back, the same manœuvre with the hands (commencing just below the jaw) may be practised over the anterior triangle of the neck as was performed upon the posterior cervical region.

During the application of neck-massage the patient should be instructed to breathe very deeply, as deep inspirations will increase the negative pressure, and thus favour the rapidity of the blood-current through the veins. If the stethoscope is applied to the furrow between the two heads of the sterno-mastoid while massage of the neck is being performed, the 'bruit de diable' will be heard quite distinctly, even in cases in which it is inaudible at other times: thus showing that the velocity of the current through the jugular vein is greatly increased. In this way neck-massage may prove useful in alleviating congestive headache.

Massage of the Eyes.—Donders was the first to suggest massage as a means of treatment in certain affections of the eye, and introduced it to the notice of the profession in this country at the meeting of the International Congress of 72; but Pagenstecher of Wiesbaden first described a systematised method of manipulation. The masseur, standing on the same side as the eye affected, places the bulb of his middle finger on the centre of the closed upper lid, and without altering the relationship of the finger to the skin beneath it, he rubs the lid

up and down over the eyeball as far as possible ; then, having completed the series of vertical strokes, he places the bulb of the middle finger on the extreme outer edge of the closed upper lid, and pushes it firmly inwards, rubbing the surface horizontally till he reaches the inner canthus ; then the stroke is reversed by drawing the finger back to its original position. The lower lid is then similarly treated, and thus the whole cornea and greater part of the sclerotic are subjected to friction. This method may be practised with or without medicated ointments ; but for further details on the application of these methods the reader is referred to the works on ophthalmic massage quoted in the bibliography.

Massage of the Ear has been described by Douglas Graham, who refers to Hommel's method of 'Tragus Press' thus :—

'Acting upon the supposition that pressure of the tragus upon the meatus renders the canal air-tight, and condenses the air therein sufficiently to act directly upon the membrana tympani, he releases the pressure upon the tragus, that the sudden escape of the compressed air may produce a vacuum and traction upon the membrane ; compression and attraction of the membrane being thus rapidly produced by exerting and relaxing pressure upon the tragus. But a much more agreeable and efficacious method than that of Hommel is to apply the hand so that the muscles in front of the metacarpal bone of the thumb will fit accurately into and over the auricle, the

right hand for the left ear, and left for the right, and by making moderately strong, circular kneading in a direction backwards, upwards, and outwards, powerful but pleasant compression and suction are created, sensible to the hand of the operator as well as to the ear of the patient. This has none of the disagreeable feeling of "plop, plop, plop," like shooting peas into the ear, which the "tragus press" of Hommel has. Indeed, Hommel's method makes no suction at all (except in theory), for the compression of air which it causes is so slight that its sudden liberation cannot produce any appreciable vacuum, as claimed by its advocates. That benefit has resulted from it, there is no doubt, but we must look for a reason other than that given, and it is undoubtedly this : that the vessels of the cavity of the tympanum and the drum membrane anastomosing at the tragus, alternate compression and relaxation of the tragus produces a pump-like action on these vessels, which draws the blood outwards, thus making the circulation go on more lively, bringing more nutritive material, and removing more waste products, as massage does in any other part of the body.¹

¹ *Recent Developments in Massage*, by Douglas Graham, M.D.; 1893.

CHAPTER II

Physiological effects of Massage—Effects produced by each manipulation—By Massage as a whole—Effects of Abdominal Manipulation—Rules for administration.

IN describing the physiological effects of massage on healthy subjects, those resulting immediately from each manipulation will first be noted, then those of general massage, both immediate and remote, so far as they have been observed either by writers on the subject whose works have been consulted, or by the author himself in the course of a series of experiments undertaken with a view to inquire into the value of massage, *per se*, as a remedial agent.

Effleurage (light stroking with the finger-tips and hand, firmer friction with the palm).—One of the first effects of the gentler forms of this manipulation is the stimulation of the pilo-motor nerves, the contraction of the *arrectores-pili* muscles compressing the contents of the sebaceous follicles, and with the friction exercised by the operator's hand, aiding in removing the secretion.

The immediate supervention of the phenomenon

commonly known as 'goose-skin' might be attributed to the cold impression consequent on the uncovering of the part or to the contact of the cold hand of the rubber; but even when the hand is warm and the part is stroked and lightly rubbed without exposure to the influence of cold, the same effect is produced.¹ Since the earlier observations made by the writer on the occurrence of the pilo-motor reflex, Mackenzie has pointed out that this phenomenon occurs beyond the immediate neighbourhood of the part stimulated, and after reading his interesting article on this subject, in many cases the spread of 'goose-skin' over a large surface beyond the part directly under treatment has been observed.² This ceases however on the employment of firmer friction, which causes dilatation of the superficial cutaneous blood-vessels with accompanying redness of the skin. Insensible, and sometimes sensible, perspiration is produced, and in some cases the latter precedes the visible dilatation of the vessels; the subject not only perspiring on the surface under manipulation, but also on the opposite side of the limb over the area corresponding to that undergoing friction. The practical bearing of such conditions as sensible and bilateral sweating is the necessity thus proved

¹ 'Physiological Effects of Massage'; A. Symons Eccles.—*Practitioner*, vol. xxxviii. p. 401; June 1887.

² 'The "Pilo-motor" Reflex,' by James Mackenzie, M.D.—*Brain*, Part lxiv.; 1893.

for the use of a lubricant when performing massage in such cases, in order to avoid the unequal and dragging character which will otherwise be imparted to the rubbing, when exercised on a perspiring surface.

The subjective sensations produced by effleurage vary very greatly; the occurrence of goose-skin with its attendant sense of shivering speedily gives place to a glowing, tingling sensation. 'Tickling' can always be avoided by care in applying the whole flat palm of the hand to the skin of the subject. The skin reflexes are elicited almost directly, and if at first feeble or retarded, are more easily excited after two or three daily rubbings. The soothing effect on the sensorium of gentle skin-stroking, especially when slowly and regularly practised, is almost always obtained in healthy individuals; but the most remarkable effect of light friction, acting on the cutaneous nerve-endings, appears to be identical with that which Naumann has shown follows weak electrical stimulation of the frog's skin, viz., acceleration of the heart's beat. If the lighter friction is followed by harder rubbing, rolling, and squeezing of the skin, the effect is reversed, slowing of the pulse-rate occurring just as it does when the deeper movements, known as 'petrissage,' are practised.

By the initially light and gradually firmer friction of the surface the venous blood and the

lymph are mechanically forced on through their respective superficial vessels, and in this way the rapidity of the cutaneous capillary and arterial circulation is increased, as also that of the venous and lymphatic trunks lying on a deeper plane; then in rolling the skin over the superficial fasciæ the vessels of these tissues are similarly acted on.

Petrissage (kneading, rolling, and squeezing of the skin and underlying muscles).—Pursuing the process to the deeper movements, in which the fasciæ are thoroughly kneaded, a series of events occurs similar to those described by physiologists as the result of muscular action; indeed, it is the duty of the masseur to apply intermittent and rhythmical kneading to each muscle or group of muscles so as to simulate as far as possible nature's own provision for the maintenance of the circulation through the tissues.

Kneading mechanically forces the lymph from the spaces into the vessels, whence it is prevented flowing back by the valves; at the same time the circulation of the blood through the arteries and capillaries of the muscles is accelerated so that absorption of waste products is increased, the nutrition of the parts is improved, and as the pressure is exercised on the deep veins they are alternately emptied and filled by rhythmical massage, while the circulation through the arteries being intermittently checked, the vessels above the

point of pressure become dilated ; and when this temporary compression is relieved, blood flows into the parts with greater force and rapidity, thus increasing the velocity of the circulation through the part under treatment.¹ Temporary decrease in the circumference of a limb has been pointed out as a result of kneading by Douglas Graham, and similar results have been obtained by the writer, who in one case found three-quarter inch decrease in the circumference of the thigh after ten minutes' deep kneading of the limb, the same result following in another case after fifteen minutes' manipulation. This temporary reduction in size points to an unloading of the efferent vessels of the part, while the subsequent resumption by the limb of its former measurement may probably be referred to the afflux of arterial blood promoted in the muscles acted upon. Lauder Brunton and Tunnicliffe, in experiments carried out on cats, observed that during massage the flow of blood is increased through the muscles, and immediately afterwards an accumulation of blood occurs in the massaged muscles, which is followed by an increased flow through them.

Muscle-kneading has long been recognised as a substitute for muscular exercise, but it also relieves the aching and weariness produced by exercise, whether in a feeble or vigorous muscle ; moreover,

¹ 'Physiological Effects of Massage' ; Eccles.—*Practitioner*, vol. xxxviii. p. 401 ; 1887.

massage will not only restore to the fatigued muscle its original power, but will sometimes increase its energy.

The experiments of Zabludowski on the muscles of an uninjured frog and on the forearms of human beings, showing the restorative effects of massage on fatigued muscle, have been confirmed by the writer in a series of experiments on able-bodied men, in which the muscles of the forearm were rendered powerless both by the exhaustion following rhythmical contractions stimulated by the induction current, and by the fatigue of squeezing a dynamometer until the pressure became so feeble that the indicator could not be made to travel beyond five pounds. In every case the limb was subjected to ten minutes' massage, with the result that whereas ten minutes' rest alone produced little or no effect on the pressure, after massage the indicator pointed to a rise of from forty to fifty pounds. The measurement of the limbs before and after massage was taken, with the result that at the period of greatest exhaustion the circumference of the forearms had increased in some cases three-eighth inch ; at the conclusion of ten minutes' rest without massage no diminution nor increase had occurred, while after massage, three-fourth inch decrease has been noted.

The elaborate experiments of Professor Maggiora of the Turin University confirm these observations and prove the invigorating effects of massage upon

muscles previously fatigued by over-exercise, exhaustion following intellectual work, and electrical stimulation. The detailed record of his investigations will be found in the *Archives Italiennes de Biologie*, tome xvi., and are also quoted at length by Graham in his more recent work on massage.¹ Kneading has a more marked effect in restoring muscular power than any other of the manipulations; but a combination of rubbing and kneading produces a more decidedly reinvigorating effect than any other procedure. Massage therefore may be said to have certain advantages over exercise for enfeebled persons, in that it demands no voluntary effort, no muscular fatigue is induced, but rather removed, the blood is attracted from the internal organs to the external tissues when the muscles of the limbs are kneaded, while the recumbent position of the body usually adopted during the operation tends to the conservation of force rather than to its expenditure. There can be little doubt that kneading produces dilatation of the vessels of the part manipulated, and that this is maintained by tapôtment; so when a large area, such as the muscles of the limbs and trunk, is subjected to kneading, the tension of the vessels in other parts is reduced and the rapidity of the heart's action is diminished.

The effect of muscle-kneading on the pulse-rate is not constant, so far as the author's own observa-

¹ *Modern Developments of Massage*; Douglas Graham, p. 7.

tions prove. Sometimes the action of the heart after manipulation of the muscles of the trunk and limbs is accelerated, possibly due to the stimulation of the muscular nerves, but as a general rule slowing of the heart's beat follows firm kneading of the muscles. In regard to the effects on blood-pressure, the recent experiments of Brunton and Tunnicliffe¹ show that massage of a large muscular area is followed by a fall in pressure. Kneading the hind limbs of cats for 100 seconds, they found in one case that before massage the manometric reading in the carotid stood at 68 m.m. mercury; during massage, *i.e.* four seconds after its commencement, the maximum of 70 was reached; at the end the mercury had fallen to 61 m.m.; after its conclusion to 53 m.m.; and three minutes after had risen again to 67 m.m. In the second experiment, before massage the mercury stood at 86 m.m.; reached the maximum, during the massage, of 88 m.m.; towards the end, fell to 80 m.m., at the end a further drop of 11 m.m. occurred, whilst 3½ minutes afterwards the pressure was 84 m.m.

The sphygmo-manometric readings of the radial pulse after general massage, excluding the abdomen, as observed in a series of experiments on healthy men, were recorded by the author in 1888²

¹ *Journal of Physiology*, Dec. 1894.

² 'The Internal and External Temperature of the Human Body as modified by Muscle-kneading, with Sphygmographic and Sphygmo-manometric records.'—*Brit. Med. Jour.*, vol. ii. p. 1211; Dec. 1888

at the Glasgow Meeting of the British Medical Association, and at first sight they would appear to be contradictory to the later observations of Brunton and Tunnicliffe; but while care was taken to insure accuracy, the instrument used, viz., Von Basch's pocket sphygmo-manometer, may easily be mis-read, and cannot in any case replace the use of a manometer placed in the carotid; moreover, the readings were not taken so promptly as those of Brunton and Tunnicliffe, whose observations, based on experiment with all the apparatus of a physiological laboratory at their command, must needs be more reliable than those of the author, armed only with the ordinary instruments for clinical examination. But repeated observations with the sphygmo-manometer before, during, and after abdominal kneading, point to a fall of blood-pressure in the radial artery, with corresponding diminution in the rapidity of the heart's action.

The apparent rise of blood-pressure in the radial artery after general body-massage may be accounted for in the cases recorded by the author in 1888, by the fact that the upper extremities came last in the order of manipulation; the radial artery would therefore be full of blood, and thus the reading, though possibly accurate, would be misleading.

In any case, the dilatation of the vessels of the skin, subcutaneous tissue, and muscles produced by the deeper movements of massage, must reduce

peripheral resistance, and consequently decrease blood-pressure in the arterial system, and favour the contraction of the left ventricle and the easy expulsion of its contents.

Abdominal kneading appears to produce dilatation of the intestinal vessels, and acts also in the direction of reduction in rapidity of the heart's beat, at the same time causing a diminution in the volume of the systemic arterial circulation.

Observations on the effects of muscle-kneading on the internal and external temperature of the human body in health, show that the immediate result of kneading the muscles of the trunk and limbs is to raise the external temperature and at the same time to approximate the external and internal temperatures, the rectum apparently losing heat, while the surface of the body gains it. Moreover, it is found that under a course of muscle-kneading extending from three weeks to two months, the temperature topography, which in feeble persons, and notably in dyspeptics and persons suffering from mal-assimilation, assumes much greater disproportions as between axillary, surface, and rectal temperatures than in health, will be modified very considerably, internal and external temperatures being more nearly approximated and less easily influenced than before the treatment, which of course consists also in careful dieting and rest.

It should be borne in mind by all who desire to

practise massage successfully, that the surface-temperature is usually reduced by abdominal kneading, the extremities speedily becoming quite cold and comparatively bloodless, while the rectal temperature rises, and the abdominal vessels are engorged.¹ For this reason general massage of the body should not be practised soon after a meal, and when abdominal kneading is included therein, this should precede the manipulation of the extremities.

Tapôttement.—The physiological effects of this manipulation vary in degree with the force and character of the methods employed. The lighter and more superficial series of blows delivered by the dorsal surface of the semi-flexed fingers serves to increase the vascularisation of the skin and subcutaneous tissue, the dilatation of the cutaneous vessels causing a corresponding rise of local temperature, while at the same time there is a moderate stimulation of the superficial nerves. The deeper structures, however, are much more thoroughly dealt with by the application of the more powerful manipulation known as ‘muscle-hacking.’ The effect of this procedure is the production of strong vibration in the nerves lying on a deeper plane; the deeper vessels of the part

¹ ‘The Internal and External Temperature of the Human Body as modified by Muscle-kneading, with Sphygmographic and Sphygmo-manometric records.’—*Brit. Med. Jour.*, vol. ii. p. 1211; Dec. 1888.

will also be affected by the direct stimulation, and, where a series of rapid blows is delivered transversely to the direction of the fibres of the larger muscles, localised muscular contractions will be induced and will continue for one or two minutes after the cessation of the manipulation; sometimes the whole muscle thus dealt with will contract. Hacking, when applied over the course of a motor nerve, will often produce sufficient stimulation to cause contraction of the muscles supplied by the periphery of the nerve.

The effect is not confined to the locality under manipulation; but, as is also the case with petrissage, stimulation of the sensory nerves by 'hacking,' while producing increased temperature and vascularisation of the part so treated, will also produce symmetrical reflex secretion. Thus, if the muscles of one extremity be subjected to 'tapôtment,' while the results in the limb immediately under treatment will be increased local heat, idio-muscular contractions, and dilatation of vessels with stimulation of the sensory nerves of the part, it will be found that a synchronous secretion of sweat occurs on the corresponding limb of the opposite side, though without any appreciable increase of temperature or vascularisation.

One unpleasant result of hacking frequently observed by the writer may be alluded to rather as a warning, for it cannot be regarded as a desirable physiological effect, viz., that in many cases

it is difficult to avoid the supervention of tonic spasm in a muscle or group of muscles under manipulation. The readiest way, in the writer's experience, for arresting this painful cramp is to knead vigorously the opposing muscular group.

The Physiological Effects of Vibration.—'Mechanical stimuli act upon nerves when they are applied with sufficient rapidity to produce a change in the form of the nerve particles, e.g. a blow, pressure, pinching, etc.' (Landois and Stirling).

Nothing is known as to the nature of a nerve impulse, but it appears to be thought probable by most physiologists that it partakes of the character of molecular vibration. Dr. Mortimer Granville was the first to suggest the application of the laws of mechanical vibration to the treatment of nerves, by a series of mechanical shocks to the course and termination of nerve fibres, and invented an instrument, known as his 'percuteur,' which, with its various modifications, may be employed for the purposes of 'nerve-vibration'; but mechanical stimulation of nerves may be practised by the hand without the employment of instruments, as has already been pointed out, and all the movements included under the term massage must necessarily act mechanically on the nerves of the part undergoing local manipulation. The sensory impulses therefrom reach the centre, and may set up reflex effects in distant organs. But in discuss-

ing the effects of vibration, the term is here confined to the purposive application of manual stimulation of particular nerves or nerve plexuses.

It has already been shown that the more vigorous form of tapôtément applied over a motor nerve will excite contractions in the muscles to which it is distributed, and the same effect may be produced by energetic pressure over a motor nerve-trunk.

When, however, to this pressure is added a vibratory movement over sensory nerves, sedative effects may be produced akin to those which follow gentle friction of the whole surface of the body. In the latter case, the monotonous sensorial impression acting on the nerve centres will produce a general calmative result; but the effect of vibration over a nerve excited by pain is to replace the painful impression by setting up a series of vibrations altering the rhythm of molecular excitation.

It is not easy to recognise any very palpable effects produced by mechanical stimulation of healthy nerves save that the subject of course perceives the numbing influence of firm vibratory pressure over a sensory nerve, and the sensation of the limb having 'gone to sleep' when pressure over a mixed nerve is practised, a condition affecting both motor and sensory functions. The stimulation of vibrations over healthy nerves may indeed produce painful impressions, whereas the same manipulation over a nerve in a state of pain will substitute for the morbid sensation a pleasant

and soothing sense of relief therefrom. The author has so frequently found relief following nerve-vibration in non-inflammatory abdominal pain, that no question can arise as to its utility; but with a view to testing its effects in conditions arising in healthy individuals which may best be described by the term 'conscious digestion' (*i.e.* a certain sense of repletion following on a large meal), deep vibration over the epigastric region has been practised for one or two minutes in three men, with the result common to all, that the sense of heaviness and local distension has given place to a sensation of lightness and freedom from oppression.

This may possibly be referable to direct stimulation of the sympathetic or to the reflex action through the sensory nerves of the abdominal wall. In the light of Dr. Head's observations on the relationship between disturbances of sensation on the surface of the body and the pain of visceral disease, it is possible that pain occurring in the deeper organs may be modified by manipulation over the superficial areas corresponding to the distribution of the cutaneous sensory nerves derived from the same segment of the spinal cord as that from which the sensory nerves of the disturbed viscus are given off. In this way the practice of vibration over the skin areas mapped out by him as corresponding to the different segments, may affect the organs to which they are allied through their sensory nerves, and such appears to be the

explanation of the value of so-called 'heart massage,' 'lung vibration,' etc. Certainly in some few cases palpitation and other disturbances of the cardiac function, asthma, and dysperistalsis have been temporarily relieved by the author on applying vibration over the skin areas corresponding to the organs affected.¹

Massage à friction is especially adapted to the manipulation of joints, and is indeed a combination of rubbing and kneading, having for its purpose the distribution and squeezing out of waste products from the tissues in which they have formed.

Von Mosengeil has shown in a series of experiments on rabbits that lymph and waste products in a joint can be forced out into the ascending lymphatics of a limb by the employment of this form of massage.

He injected the right and left knee-joints of rabbits with thick black Indian ink, and in the case of each animal he massaged the right limb, leaving the left untouched. On killing the animals some hours after, it was found that the right knees (from which the swelling caused by the injection had disappeared under manipulation) were almost entirely free from ink, some staining of the synovial membrane alone remaining, the greater part of the

¹ 'On Disturbances of Sensation, with especial reference to the Pain of Visceral Diseases,' by Henry Head, M.D.—*Brain*, lxi., lxii., and lxvii. ; 1893.

ink having passed into the ascending lymphatics, whose course could be distinctly traced by the discoloration of their contents, the lymphatic glands to which they led being also stained with ink. The crureus and subcrureus muscles were very black on the side which had been massaged; on the other side, however, they were red and injected with blood, while on examination the injection was found *in situ*, and no part of it had escaped from the cavities of the left joints. These experiments are among the most valuable which have been made in reference to the physiological effects of massage, and conclusively prove its value in certain affections of the joints.

A striking confirmation of the facts deduced by von Mosengeil from his experiments on rabbits has recently occurred in the practice of the writer in a case of sprained ankle wherein there was very considerable bruising and pigmentation due to the rupture of capillaries around and above the joint. On the day following manipulation of the joint, and the limb above it, the patient complained that, though the swelling and pain in the joint itself were much modified, the whole of the leg up to the knee was discoloured. On continuing the massage on the second day, the discoloration of the ankle and immediate vicinity of the joint was much less, but there was certainly an apparent increase upwards of the bruised area. On the following day the discoloration had almost completely disappeared,

save over the upper part of the calf and in the popliteal space. On the next day the discoloration had entirely passed away.

Having noticed the distinct features of the different manipulations included under the general term *massage*, it now remains to consider the results of the whole process.

Effects of General Massage.—As observed after a month of daily manipulation, the effects on healthy persons may briefly be summed up thus: the skin becomes softer, more glossy and pliable, fitting the subjacent tissues more accurately than before. The veins are more distinct, and the general colour of the integument, especially where there has been previous pallor, is increased. Tactile sense is improved, but the immediate effect of massage is rather to deaden sensation, as observed by Douglas Graham, who noticed that kneading the skin produced temporary anæsthesia, ‘even to the extent of inserting a hypodermic needle without the prick being felt.’ The after effects point to better nutrition of the skin and nervous system, as observations on the sense of locality by æsthesiometry made by the writer before and after massage, in many cases of both healthy and ailing persons, go to show. In all cases in which massage has been attended by improved bodily health improvement in local sense has been observed. Cutaneous

sensibility to electrical currents is greatly increased by massage, while the skin-resistance is considerably reduced. It has been frequently observed by the writer that, whereas before massage it has been necessary to employ from fourteen to twenty cells in order to obtain a current of ten milliampères, after somewhat vigorous kneading of a part ten or twelve cells have sufficed to obtain the same deflection of the needle. Moreover, as days have passed, resistances have been so reduced that great economy of battery power has been effected. The observations of Weir Mitchell on the temperature of persons suffering from anæmia, neurasthenia, and other diseases, before and after massage, induced the writer to note the temperature of healthy individuals subjected to experimental massage. The results in over a hundred observations, on twenty healthy adults, showed that massage temporarily increases the general body-temperature; but in all cases it fell after two hours to a degree below that which had been noted immediately on ceasing manipulation. The temperature of a limb after ten minutes' massage is higher than that of its fellow of the opposite side, sometimes to the extent of 4° F.

The increase in the free surface-temperature of a part directly after massage varies with the situation and with the difference between the temperature, taken before massage, of the axilla and that of the free cutaneous surface of the part; *e.g.* in the case of a healthy adult before massage the

axillary temperature was 98·8 F., the free surface-temperature of the left palm was 90° F. Directly after massage of the left upper extremity the palmar temperature was 97° F., the axillary temperature rising on the same side to 99° F., and remaining normal on the opposite side. This is typical of the results obtained both in health and disease, and certain deductions may be made from this fact of greater heat-production in a part manipulated :—The rapidity of the local circulation is increased, the volume of blood in the part is augmented, and the metabolism of tissue is improved, for in view of the results in cases of anæmia, neurasthenia, and muscular atrophy, it can hardly be doubted that all these three conditions take part in the production of heat-increase which follows massage. Exercise of a limb till exhausted produces a rise in the temperature in the same degree as massage ; but with the difference that the circumference of the limb is temporarily increased, while by massage it is decreased ; aching and fatigue follow exercise, even to the extent of powerlessness whereas massage produces neither pain nor exhaustion, but relieves both.

The effect of massage on the respirations is almost invariably the same in all cases : they are increased in depth and frequency when the attention of the patient to the process he is undergoing has not caused him to breathe slightly and irregularly.

Observations made by Dr. Gopadze, and subse-

quently by the author, on the bodily weight of healthy persons taken before, during, and after some days' general corporeal massage, have in each case shown that an increase in weight occurs without interference with the diet, habits, or occupation of the subjects, save in the case of one very stout individual, otherwise quite healthy, who lost ten pounds in twenty-eight days while being massaged once daily by the writer. The results appear to justify a fairer appreciation of the value of systematic massage alone than has been shown by some who have obtained startling results by the prosecution of the Weir Mitchell treatment, in which it plays an important part.

The effects of massage in cases of anæmia have been well known to be most beneficial, and the number of red corpuscles, after a course of massage, has been ascertained to be greatly increased, not only in anæmic patients, but in healthy persons subjected to massage for experimental purposes; it is, however, only very recently that John Mitchell has found a considerable increase in the number of red blood corpuscles immediately after an hour's massage, without any corresponding increase in the amount of hæmoglobin.

Mitchell suggests that the massage may have the effect of bringing a number of red blood corpuscles into the circulation, which, before massage, had been resting in various parts of the body, that these may be poorer in hæmoglobin than the

others ; thus explaining why the hæmoglobin is not usually increased to an extent corresponding with the increase in the number of red corpuscles. The effects of massage, therefore, on the circulation are not confined to the alterations produced in the calibre of the vessels, the rapidity of the local blood stream in the part manipulated, and the greater vascularisation of the organs immediately affected by the manipulations ; but from these recent observations we learn that the quality of the vascular contents is also modified directly after general corporeal massage.

The effect of massage on the elimination of uric acid has recently been observed by the writer, who has found that with an increase in the total quantity of urine passed in the twenty-four hours by persons undergoing daily massage for about an hour, the quantity of uric acid has also been augmented appreciably over and above the proportion eliminated under the same circumstances without massage ; but a still more noticeable effect of massage, in cases of neurasthenic patients, has been observed in the result of over one hundred experiments made in testing the urine for leucomaines by the process described by von Poehl. It has been found almost invariably that the amount of leucomaines, in the form of phospho-tungstates precipitated from the urine of neurasthenics by the method of von Poehl, has been increased while they were undergoing daily massage, and that an

excess of leucomaines appeared in the urine voided after abdominal massage over and above the amount found in the urine passed in the morning before manipulation; whereas when massage was omitted for a few days the quantity of the precipitate fell below the average daily proportion eliminated, rising again on the resumption of the manipulations; though the appearance of leucomaines in the urine gradually decreased as the patients improved in health and strength. It would thus appear that massage, and especially massage of the abdomen, aids the elimination of these toxic substances through the kidneys.¹ Polubinski also observes increase in the volume of the urine and in the quantity of its solids after abdominal massage. The effects of abdominal massage alone are sufficiently remarkable to demand separate consideration, though, as within the limits of this work it is only possible briefly to state the results observed, the reader desiring more detailed information is referred to the bibliography at the end of the book.

Massage of the abdomen when practised for periods varying from ten to thirty minutes produces effects which may thus be summed up:—

The generation of gas within the stomach and intestines is diminished, and its expulsion effected.

The onward movement of the gastro-intestinal contents is favoured; and Boas of Berlin, by knead-

¹ Wratsch: St. Petersburg, Nov. 22, 1891.

ing and rubbing the abdomen from the right hypochondrium towards the median line, has been able to induce relaxation of the pyloric sphincter, and after a time the intestinal juices have entered the stomach, whence they have been withdrawn by the stomach-pump; so that it appears possible to push the contents of the small intestine in either direction.

The rapidity of circulation through the visceral lymph and blood-vessels is apparently increased, the abdominal vascular area being dilated.

The circulation through the liver is improved, and thus the destruction of alkaloids by this organ is promoted. In this connection, not the least valuable effect of abdominal massage is the stimulation to more vigorous action of the diaphragm, and the consequent auto-massage produced by the deeper inspirations and abdominal reflexes excited by the earlier manipulations of the abdominal walls. The rate of absorption from the stomach is increased. The secretion of the gastric juice is augmented. The rate of absorption from the intestines is increased.

Under these circumstances the employment of abdominal manipulation fairly assumes a high therapeutic value, and on its frequent administration, with daily general massage, the successful treatment of a certain class of cases largely depends.

Rules for the Administration.—There are, however, a few rules in the administration of local

and general massage, the observance of which has a practical bearing on the efficacy of the manipulations. In employing local massage the part to be handled must be placed in an attitude of complete repose, with the muscles relaxed and kept in a flaccid state while they are undergoing manipulation, as it is useless to attempt massage of muscles in a state of active contraction.

In the case of a limb, the distal extremity should be on the same plane as its proximal junction with the trunk, or slightly raised above it, and the massage should be commenced at the point furthest from the trunk, the firmer manipulations always being practised in a centripetal direction from joint to joint, passive movements of each joint being performed by the operator as he reaches them in the course of kneading the limb. Moderately firm friction of the whole extremity should terminate the manipulations.

In dealing with an injured or diseased joint the muscles on the proximal side of the articulation should first be thoroughly kneaded, then those on the distal side, and, finally, the joint itself should be at first gently, and subsequently more firmly, manipulated to such an extent as its condition will permit.

Only the part immediately under manipulation should be exposed.

When it is desired to administer general massage,

the body must rest in the recumbent position on a couch or bed of convenient height (2 ft. 3 in.), the whole trunk and limbs, save only the part actually being massaged, well and warmly wrapped up.

Abdominal massage should be administered with the patient lying in the dorsi-recumbent position with the head slightly raised, and the lower extremities semi-flexed.

The abdominal walls should first be rubbed and lightly kneaded, friction first being employed from left to right over the hypochondriac and epigastric regions; then after the whole of the surface has been rubbed and kneaded, if the operator has sufficient knowledge of visceral topography, and can be trusted to employ the manipulations with care and discretion, both hands may be employed in deeper kneading over the liver and the small intestines; and from the right iliac fossa along the course of the colon upwards, across and downwards to the left iliac region, the large intestine may be subjected to firm pressure, the manipulation of the abdomen terminating with friction by both hands round and round the whole belly.

As soon as the massage of the abdomen is concluded, it should be warmly and closely wrapped. From three-quarters of an hour to one hour and a quarter is the time usually required to thoroughly manipulate every part of the body in general corporeal massage; but this will not suffice if vibrations and active movements are to be included.

The author usually prescribes general massage in the following order:—

(1) Abdomen, (2) Chest, (3) Upper extremities, (4) Back and loins, (5) Lower extremities.

Nos. 3 and 4 may be reversed in sequence, but in the above order the patient is not so frequently required to change his position.

CHAPTER III

The Therapeutic Uses of Massage—In Affections of the Skin.

IN endeavouring to estimate the therapeutic value of massage, either alone or as an adjunct to other means of treatment, it must be borne in mind that the success attending its employment will be modified not only by the manual dexterity of the operator, but also by the practical knowledge of the effects it may produce and the limitations of its utility. The skill brought to bear upon its employment, both in the selection of cases and in reference to the frequency, duration, and mode of administration appropriate to the various morbid states in which its use may prove valuable, must necessarily influence our judgment as to its efficacy.

Briefly, the indications fulfilled by massage may be epitomised as follows:—

- (1) Mechanically and directly, elimination of waste products from the tissues under manipulation is increased, the absorption of infiltrations and exudations is greatly favoured, adhesions are attenuated, sometimes broken down, and even organised thickenings may be reduced.

- (2) Nutrition of the part is improved, vascularisation is increased, and metabolism is augmented.
- (3) Indirectly, massage acts as a derivative, relieving congestion of the internal organs by attracting the flow of blood to the surface and muscles. Molecular vibrations are set up, stimulating the nervous system, acting through it reflexly, thus exciting secretion; while, on the other hand, its sedative influence relieves pain and reduces over-activity.

Massage in Affections of the Skin.—Although the employment of massage in cutaneous diseases must necessarily be somewhat limited, it may not be superfluous to repeat here some of the observations which have already been published by the author on this subject,¹ especially as little reference has been found either in text-books on dermatology or in treatises on massage to the employment of mechano-therapy in skin diseases.

At the risk of recapitulation, it is necessary to consider the direct and indirect effects which can be produced on the healthy skin by skilful manipulation, and these will be best realised in observing the local effects of different manipulations on the skin only, by noting how far these may be modified by deeper movements acting on the

¹ 'Massage in Diseases of the Skin.'—*Lancet*, Oct. 14th, 1893; vol. ii. p. 924.

subcutaneous tissues also, and lastly by observing the phenomena produced by massage of one part of the body on other areas of the skin : for these indirect effects on tissues remote from the actual site of operations are both remarkable and interesting. The general effects of massage on nutrition as a whole having been already more or less fully considered in a previous chapter, it will not be necessary to do more than refer to the fact that the skin participates in the beneficial effects which may be produced on the general nutrition of the body by systematic skilled massage.

The local effects of massage on the skin vary with the character of the manipulation. Light friction produces precisely the same apparent effects as the application of cold impression to the surface, with this difference : that, whereas the initial effects of cold stimulation and of mechanical friction are identical, viz., contraction of the muscular fibres of the arrectores-pili and of the cutaneous vessels, producing the condition known as 'goose-skin,' we find that if the application of cold is continued the circulation through the cutaneous area so treated is checked, there is venous congestion, over-filling of the lymphatics, and consequent tumefaction of the part ; while with the continued application of friction the contraction of the skin musculature and vessels is replaced by relaxation ; pallor is succeeded by the warm redness characteristic of more rapid circula-

tion and arterial hyperæmia, and if the vigour of the manipulation is increased to firm rubbing, the loose epithelium is removed, the contents of the sebaceous follicles previously compressed during the stage of 'goose-skin' are expelled, dilatation of the superficial arterioles occurs; while at the same time, the friction being always exercised centripetally, the lymphatic vessels are unloaded, and venous circulation is stimulated. If to this, firm friction, rolling, and squeezing be added, the superficial tissues being lifted, as it were, from the subjacent fascia, and the whole thickness of the cutis and subcutaneous tissue thoroughly kneaded, vascularisation will be greatly increased. At the same time the lymphatic spaces are drained, and thus absorption by lymphatics and blood-vessels is accelerated. Some years ago the results of certain observations on the free surface temperature of parts, before and after massage, were recorded; but at that time the writer had not observed the effects produced by dealing with the skin only as opposed to those resulting after thorough kneading of the deeper-lying tissues also; latterly, however, certain experimental observations have been made on the different effects produced respectively by shampooing the skin and subcutaneous tissue only, and massage in which the deep tissues of the part have also been kneaded.

The results of these observations are very meagre in comparison with the work they en-

tailed. Light friction of a part reduces surface-temperature so long as no effect is produced other than cutis-anserina.

In ten experiments on healthy adults, whose axillary temperature on both sides was equal, and whose free surface temperature on the extensor surface of both forearms was before massage 88° F. or more, and which, as taken by Immisch's surface thermometer after ten minutes' exposure to the surrounding air, showed no signs of falling, it was found, on subjecting the left forearm to gentle upward friction, that while the temperature in both axillæ and in the untouched free surface of the opposite limb remained constant, the temperature of the left forearm, extensor surface, fell in all cases more than two degrees; in three cases nearly four degrees.

After firm friction, rolling, squeezing, and kneading of the skin of the limb, in all cases the free cutaneous temperature rose to 95° F.; but the axillary temperature remained the same on both sides, while in seven cases an interesting phenomenon was noticed on the opposite side; the right limb sensibly perspired, and the free surface temperature of the untouched forearm fell to 84° F. during the time that the firm friction of the left limb was in progress.

In three of these cases massage of the whole limb was superadded to the shampooing of the skin, the muscles were thoroughly kneaded and

rolled, and subsequently hacked, after which centripetal, *i.e.* upward, friction of the whole surface of the limb was practised, at the close of massage. After ten minutes of such a series of manipulations, in each case the left axillary temperature had risen more than one degree, and the free surface temperature had risen to 98° F., *i.e.* to within four or five decimal points of the initial axillary temperature on the same side. Meanwhile the free surface temperature of the opposite limb in all three cases ceased to fall, and in one case it certainly rose from 84° F. to 86° F. during the thorough massage of the whole limb.

In testing the effects of massage on the cutaneous nerves it is necessary to distinguish between the immediate effects produced by each form of manipulation and the results produced on cutaneous sensation by massage of a part repeated daily.

In regard to light friction, it has been impossible to detect any effect on the sense of locality or on the temperature sense. After firm friction of a part for five minutes, æsthesiometry reveals decided increase of tactile sensibility, and in the case of the limbs in their transverse axis the sense of locality has in most instances been apparently improved. Thus in the thigh, on the inner surface before massage, the æsthesiometer revealed 36 m.m. as the nearest distinguishable points in the transverse axis of the limb, while after firm upward friction the two points were distinguished at 31 m.m.

distance apart. After kneading and rolling the skin the points were actually not felt as two under four centimetres apart ; while, after kneading and hacking of the muscles, the cutaneous sensation was so benumbed that the subject failed to recognise the contact of the instrument at all. Similarly, the temperature sense for heat was almost entirely lost, and barely distinguishable for cold ; indeed, the subject merely felt the contact of the ice tube, and could not tell whether it was hot or cold after thorough massage, though after mere skin friction the ice tube was immediately and painfully recognisable, while the hot-water tube was distinguished as hot ; but there was no flinching from the heat, as on the opposite untouched limb. The results of thorough daily massage of the same limb for a week were more particularly remarkable in regard to local sense and tactile sense. The two points were distinguishable on the sixth day before massage at 34 m.m. apart in the transverse axis of the limb over the whole of the adductor region. Cremasteric reflex was very readily produced on slight pressure with the points, and sharply succeeded the application of the cold test-tube. On the eighth day, æsthesiometry showed the points easily distinguishable on the inner surface of the thigh at 32 m.m., on the outer surface of the leg at 30 m.m. instead of 35 m.m., as noted on the first day. The temperature sense for both heat and cold was acuter

than on the limb of the opposite side, in so far that the patient more readily distinguished iced, cold, warm, and hot-water tubes.

Perhaps one of the most interesting effects of massage to dermatologists will be the influence which it has been repeatedly observed to exercise on galvanic conduction.

This has been already noted, but in view of the possible value which may arise out of the employment of the cataphoric action of the constant current in skin medication, it may not be amiss to refer again briefly to the indisputable fact that massage greatly decreases the resistance of the uninjured skin to the passage of electrical currents. The writer has repeatedly observed that previous massage of a part will economise the number of cells necessary in order to pass a given number of milli-ampères of current through the skin, and that while the same current may be maintained during the application, the number of cells in action may be more rapidly reduced than is possible when massage has not previously been employed.

If it is desired to use the alternating constant current for the purpose of percutaneous medication, by saturating the electrodes with a watery solution of the substance selected for use, the preliminary application of massage may most probably be found to increase the rapidity with which the drug will be absorbed, just as it undoubtedly reduces the

resistance of the tissues to the passage of the electric current.

Absorption through the uninjured skin appears to remain a vexed question, so far as solids and watery solutions or fatty medications are concerned; but in regard to watery solutions, the presence of the fatty matters normally present on the epidermis derived from the sebaceous glands seems to afford the greatest protection against the penetration of such aqueous medications as might perhaps otherwise be utilised. It is interesting to note, that for a short time after dry massage the oiliness of the epidermis is decreased; while the contents of the glands have been mechanically squeezed out. The application of finely divided powders to the skin after massage will be found to be more efficacious than the inunction of ointments without massage in such cases as the dermatologist may wish his medication to reach the deeper layers of the skin.

Clinically, the author believes that he has been able to satisfy himself on this point; but experimentally it still remains a subject of controversy as to whether percutaneous absorption of the large majority of local medicaments takes place or not. It is an investigation which seems worthy of unprejudiced observers, and it is to be hoped that evidence on this subject will shortly be sought and found. The results of personal observations of the effects of massage on the skin have been

here set down in the hope that they may not be entirely without use as an indication of the possible therapeutic value of massage in cases more particularly coming under the province of dermatology; and though its use can perhaps be more profitably discussed by others who are specially engaged in the study and treatment of cutaneous disease, the writer thinks it may be permitted to notice briefly the class of cases in which undoubtedly good results have followed the administration of massage by him, either at the instigation or with the sanction of well-known authorities on pathological conditions of the skin. The best results following the use of massage in skin diseases have been those obtained in cases which may more correctly be regarded as belonging to a wider field than that which is strictly speaking occupied by dermatology, though, the manifestations being largely marked by interference with cutaneous nutrition, they fall most naturally within the limits of skin troubles. Enfeebled and sluggish circulation resulting in impaired vascularisation of the skin, with the consequent peripheral ischæmia, cyanosis, or chilblains arising therefrom, and conditions apparently closely allied to Raynaud's disease, are unquestionably greatly modified by a systematic course of massage; which not only proves a valuable adjunct to the general hygienic measures appropriate to such cases, but also acts as a prophylactic against the

recurrence of the more painful sequelæ of defective peripheral circulation. It is not requisite to refer again to the precautions necessary to ensure the success of the mechanical stimulation of cutaneous circulation; but unless the phenomena of skin radiation, heat abstraction, and surface temperature generally, are borne in mind, massage in such cases as result from the constriction or emptiness of the cutaneous vessels will not prove by any means beneficial. The careful administration of massage will prove far more valuable than the application of electricity in what has been termed 'chilblain circulation,' because no evaporation, and thus no heat abstraction, will follow its properly regulated use, as must be the case when moistened electrodes are applied to the cold, blue, or mottled surface of the skin in this condition.

Massage is not only useful when applied directly to the part affected, for it may be employed as a mechanical stimulant over the vasomotor centres, controlling the vascular conditions of the part affected. Friction and kneading over the cervical and dorso-lumbar regions of the spine, with firm kneading especially directed along the erector spinæ, appear to affect inflammatory lesions of the skin of the upper and lower extremities respectively; while abdominal kneading certainly reduces the tension in the blood-vessels of the extremities, as described in a previous

paper.¹ The value of massage in altered cutaneous sensation without any visible lesion has proved uncertain. In some cases of pruritus it has proved apparently curative, while in others no good result has been obtained; but in cutaneous conditions depending on neuritis or perineuritis the effects have been very satisfactory: herpes zoster has been aborted in a large number of cases of sciatica; anæsthesia and hyperæsthesia of the skin due to this malady yielding also to local massage.

It is, however, in the lesions of the skin characterised by the accumulation of inflammatory products, by the overloading of lymphatic spaces, the clogging of the lymph channels and blocking of lymph glands, that massage may certainly be regarded as unquestionably useful; and provided that the same precautions are adopted in the employment of this form of local treatment as are carried out by most, if not all, dermatologists, in testing remedies over a small area at first, the results even in severe cases of chronic dermatitis will prove satisfactory. One very inveterate case, in which the pustular dermatitis was universal, and the lymphatic glands, especially the femoral, were greatly enlarged, indurated, and matted together, has certainly improved, at any rate temporarily, after each course of massage. The scleroderma

¹ 'The Internal and External Temperature of the Human Body as modified by Muscle-kneading.'—*Brit. Med. Jour.*, vol. ii. p. 1211; Dec. 1st, 1888.

was diminished, the lymphatic glands became smaller and discrete, and the author believes, at the risk of posing as an enthusiast for massage, that if the patient could have persevered with the mechanical treatment under conditions of equable surface temperature, permanent benefit might have been derived from the other remedies which Mr. Morris was employing at the time. In psoriasis the distinct beneficial effects of a prolonged course of massage have been seen, and the value of the local treatment has been tested in chronic cases of psoriasis universalis when no other treatment, external or internal, has been employed. In order to recognise whether or not the mechanotherapy could be accredited with the involution of the disease in different cases, some portion of the body has been selected—a limb, or one side of the back, or the abdomen—on which to test the effect of local massage in psoriasis universalis, and it has invariably been found that while on the untouched parts of the body the disease might be spreading, both by the enlargement and coalescence of existing patches as well as by the appearance of fresh spots, on the area of skin subjected to massage the centre of the patches commenced to fade, the rings became narrower and less marked by redness and scaliness, until finally they broke and disappeared. Moreover, in those cases wherein the patient was distressed by the painful irritation and burning itching which is a frequent subjective

symptom of psoriasis, the effect of massage has been to reduce the irritation and to allay the discomfort, which in some cases produces serious insomnia.

It must be conceded, in advocating the more extended use of massage as an adjunct to the treatment of skin diseases, that in the majority of cases massage has been combined with rest and careful dieting, the patients having been under care for other concomitant conditions of ill-health; some of them, if not all, suffering from disorders of digestion, so that one has been disposed to associate the skin affection with the dyspepsia; but whereas the latter has been permanently cured, the former has recurred, though in only one case as yet with its pristine force and severity.

The cases in which the author has administered massage in skin affections comprise examples of various forms of vaso-motor enfeeblement, tropho-neuroses, *e.g.* anhydrosis, pruritus, and alopecia universalis (in one case followed by the growth of lanugo over the whole body and on certain portions of the scalp previously denuded), psoriasis, dermatitis with scleroderma,¹ acne, and comedones.

In the cases of alopecia, sluggish circulation, acne, and comedones, dry massage has been employed.

In dermatitis and psoriasis the lubricant which

¹ See also *Recent Developments in Massage*, by Douglas Graham; 1893.

was found preferable to any other is clarified neat's-foot oil. The advantages it possesses over other fatty or oleaginous applications are briefly these:— a little goes a long way, a few drops poured into the palm of the hand serve to remove the scales, to prevent dragging or irritation of the patient's skin; the oil thoroughly disappears from the surface both of the rubber's hands and the patient's body, so that in the latter case no unpleasant stickiness and no heat abstraction from the surface remains to add to the discomfort of the sufferer; while at the same time the skin is sufficiently impregnated with oil to render it tenacious of any dusting-powder which may be applied after the massage.

Ignorance of the methods in vogue among modern dermatologists must be the excuse for suggesting a therapeutic plan which may be already familiar to all; but, as the result of personal experience, it appears that carefully regulated and skilful massage, followed by appropriate remedies in the form of a dusting-powder dredged from a perforated vessel on to the skin, would be an improvement on the inunction of ointments in many cases. In one of the latest works on skin diseases, its author declares that 'half the battle depends on the thoroughness with which the preliminary and curative agents are rubbed in.' May it be said that the other half of the battle would be in favour of the therapist if he

would adopt preliminary measures to promote absorption, not only by, but from the skin, before applying the special local medication? The value of all the much-vaunted ointments, embrocations, etc., daily advertised for the depletion of the public pocket, depends almost entirely on the inducement they offer to practise rubbing in cases of non-parasitic skin diseases. In the same text-book on diseases of the skin, massage is referred to in five lines, two of which are devoted to the statement that 'it has been quacked as usual, having been put forward as a preventive of wrinkles of the face.'

It does not appear that reference has been made to the quacking of other remedies, *e.g.* arsenic in skin diseases, though probably its abuse by ignorant persons amounts to quackery. Of course every remedy rendered fashionable by its successful application at the hands of scientific practitioners will be quacked by persons unqualified to administer it; but in the matter of wrinkles and massage, the obliteration of facial lines or wrinkles has been observed, not indeed as the result of facial massage in aid of senile vanity, but following on the re-deposition of fat, and the better nutrition of the skin after a course of general massage in many cases of mal-nutrition, in which the skin of the face has participated in the general aggrandisement of the tissues. Face-massage alone is quackery in regard to wrinkles. General massage

is useful for their obliteration, always providing that the processes of senile decay are not prohibitive of any improvement in general nutrition.

Massage certainly promotes the growth of the hair, as may be seen in cases of sciatica, when the effect of frequent manipulation of the limb is plainly seen in the greater luxuriance of hair on the leg which has undergone massage. Massage of the head appears also to strengthen the hair and induce the growth, while falling out of the hairs is arrested. After fevers, the writer has seen good effects produced by scalp-massage in improving nutrition, and thus fostering the growth and thickness of the hair.

CHAPTER IV

Massage in Diseases and Injuries of the Muscles, Joints, and Bones—Myalgia—Muscular Rheumatism—Traumatism—Atrophy—Contractions—Synovitis—Articular Rheumatism—Arthritis—Lawn Tennis Elbow—Tendo Vaginitis—Relaxation of Ligaments—Sprains—Dislocations—Fractures.

Myalgia and Muscular Rheumatism.—It has already been seen from the experiments of Zabudowski, Symons Eccles, and Maggiora, that massage restores power to muscles previously fatigued by natural and artificial means. Now, so far as the sensations and the appearance of muscles affected by myalgia and muscular rheumatism are concerned, there is practically no difference between excessive fatigue and myalgia, while in muscular rheumatism the stiffness and swelling so frequently met with after prolonged fatigue are found in the earlier stages; followed later on by adhesions between the muscle-bundles, induration of the connective tissue, and, if the nutrition and activity of the muscle is not soon restored, these conditions may be attended by atrophy of the fibrils. This state of atrophy may be common to

the whole muscle, in which case the consistence of the organ is flabby and pulpy to the touch ; or, associated with wasting, there may be localised indurations, sometimes contractions—and thus what would be represented in the healthy muscle by a smooth, firm, resilient surface, is replaced by an irregular, nodulated mass, here soft and pulpy, there hard and rigid.

In the milder forms of myalgia and muscular rheumatism it is often difficult to assign their cause, and any attempt to specify the pathological conditions on which they depend must be speculative ; but the fact that the histories frequently given point to the initiation of pain after alcoholic or dietetic excesses, goes far to establish the probability that these conditions depend upon the chemical state of the organ and the retention of waste material within its sheath.

In the more severe forms of muscular rheumatism, whether associated with arthritic trouble or not, localised thickenings or tumefaction, and sometimes atrophy of the muscle, have been almost always observed ; and in cases where the thickening has occupied a superficial area of sufficient size to permit the application of an electrode to the overlying skin, without encroaching on the surface of the muscle outside the zone of infiltration, it has been found that there was in these situations, not only loss of contractility, as in the rest of the muscle, when atrophied, but total loss of electrical

irritability on the passage of a mild faradaic current. In such cases there has frequently been a history of fatiguing exercise followed by prolonged exposure of the limb to cold or damp. Examples of fatigue followed by exposure to direct cold impressions, as afforded by the notes of cases which have come under the writer's care, are so numerous that the whole of this chapter might easily be occupied in citing them. The same experience in cases of arthritis, whether preceded by acute rheumatism, traumatism, or gonorrhœa, tends to strengthen the importance of fatigue and exposure as factors in the causation of rheumatism. For some hours daily, at all seasons throughout the year, the author is engaged in very vigorous exercise of the arms, at the same time almost always standing while so employed. In summer, and when the aerial temperature is comparatively high, there is rarely any painful sense of fatigue in the upper extremities, save towards the end of a heavy day ; but in winter, and especially when there is a strong north-easterly wind, an aching in the arms is experienced, increased to actual pain, if two or three hours spent in the administration of massage are followed immediately by exposure to the outer air. The fingers become much swollen, the wrist-joints sometimes puffy, and the muscles of the forearm ache. More especially this condition is noticeable if, in addition, any gastronomic indulgence has been permitted. In wet weather, the tendo achillis, just

at and above its insertion, becomes painful and stiff. Now these personal observations, taken together with those made on persons suffering from one or other form of chronic rheumatic disease, induce the strong belief in the opinions held by Dr. Alexander Haig on the *rôle* of uric acid in the etiology of rheumatism.

Sir A. Garrod has pointed out that the joints are more acid than other tissues under ordinary circumstances, and it may well be believed that after vigorous use of the joint, *e.g.* the knee in riding, etc., the 'fatigue stuffs' are increased therein, and more acid is generated.

Du Bois Reymond has pointed out that active muscle 'passes into an acid reaction,' which he attributes to the formation of para-lactic acid; while others attribute the acidity to phosphoric acid, or to acid potassium phosphate.

Now if the active circulation through a limb be interfered with, as it certainly is by prolonged exposure to cold and damp, it follows that the removal of these acid fatigue-products will be retarded, and Dr. Haig¹ has pointed out that excess of acidity in the tissues will favour deposition of uric acid in them; and it is to the irritation set up by uric acid, thus rendered insoluble in the acid media within the muscle sheaths, that rheumatic myositis is due.

Given a case of chronic muscular rheumatism,

¹ *St. Bartholomew's Hospital Reports*, vol. xxvi.

the question arises as to what is the best method of treatment to be adopted. The indications undoubtedly are:—to relieve pain, to hasten the removal of inflammatory or waste products, to induce a greater flow of blood to and through the affected part, and thus to aid the solution of uric acid, and restore the muscle to painless activity; while at the same time muscular atrophy is to be arrested, and the infiltrations of the muscular and fibrous tissues so frequently met with should be removed. All these requirements are met by local massage, and the rapidity with which the morbid conditions are overcome by skilful manipulation is much greater than when constitutional remedies alone are employed. This is now so well established by the wide experience both of patients and practitioners, that massage no longer needs any advocacy as a means of treatment in myalgia and muscular rheumatism. Unfortunately, comparatively few cases of the milder forms present themselves for treatment by massage, which is too often postponed until more easily available means have been adopted and failed.

It is such a well-known fact that muscular rheumatism often yields to other treatment—sometimes without any treatment at all,—that it may be justly contended we have no right to attribute success in such cases to mechano-therapy; however, as in strains, sprains, sciatica, and rupture of muscular fibres, massage certainly reduces the

duration and severity of pain, it is to be regretted that so many cases drift into a chronic and serious condition before local manipulation is employed. Perhaps the commonest and most disabling form of rheumatism met with in this country is acute lumbago, and without the aid of local manipulation the patient is frequently *hors de combat* for many days, in spite of internal and external medication. Estradere,¹ Schreiber,² and many other authors, have cited a considerable number of cases of lumbago rapidly cured by one or two sittings of massage. In a large number of cases the author has been able in this, and other forms of muscular rheumatism, to relieve the patient from acute suffering after administering massage once or twice, in twenty-four hours. So long as the diagnosis of painful affections, apparently muscular, is assured, the local application of the remedy may safely be left to laymen skilful in manipulation; but it is not always easy to make a differential diagnosis between the severer forms of muscular pain and acute neuritis or other more serious conditions, in which the pain referred to the muscle by the patient may be due to deeper-seated mischief.

While some practitioners of medicine, who ought to know better, still maintain an attitude of supercilious disparagement or unconcealed hostility to-

¹ *Du Massage Estradere*; Paris, 1863.

² *Manual of Treatment by Massage*. Translated by Mendelson. Edinburgh, 1887.

wards massage and those legitimately employing it, the public, to whom popular experience has proved its value, will seek the services of half-educated and unskilful rubbers, whose ignorance of disease will lead them to abuse the little manipulative skill they may possess in professing to cure all the ills to which flesh is heir.

It is not surprising that massage should fall into disrepute in this country, if persons who are aware of a hostile opinion against its use being held by their medical advisers should place themselves in the hands of unqualified rubbers for the treatment of what both, in their ignorance, may believe to be muscular rheumatism, without previously seeking the advice of their usual medical attendant.

When massage is thus employed in cases of advanced renal disease, the earlier stages of spinal caries, or other complaints, in which the pain may be referred to the lumbar region, under the misapprehension, both by rubber and patient, that they are dealing with lumbago, the consequences must be disastrous ; the method of treatment is blamed, whereas the blame should fall on the individual responsible for its misapplication.

That the responsibility in such cases should sometimes fall on the medical practitioner who is known to sneer at massage as a means of treatment, is well illustrated by the following incident which occurred in the practice of the writer :—

A gentleman of middle age entered his consulting-room, stooping very much, complaining of pain in the lumbar region. When asked for the name of his medical adviser, with a view to consultation, he replied that he had been to see his doctor, who told him he had probably caught a chill, and that he had better go to bed and keep warm. A prescription was given; but before leaving the room, the patient, under the impression that the doctor shared his views as to his complaint being rheumatism, inquired whether massage would hasten his restoration to painless activity. The doctor replied that massage was all humbug, and those who believed in it were humbugs also. From a friend who had been successfully treated by massage for what was described as a similar attack of sudden acute pain, the patient learned the author's name and address. On examining the urine, pus was found, and, on inspection, a swelling on the left side of the lumbar region disclosed what was probably a renal abscess. There was no history of previous acute pain or other symptoms of kidney mischief. If this patient, instead of consulting the writer, had availed himself of the services of a masseur, who would have been to blame for the harm which must have resulted from manipulation of the back and loins? The patient himself believed he was suffering from lumbago. He was dismissed with the information that massage was not

all humbug; but that it would be worse than humbug to employ it in his case.

Muscular Traumatism.—In cases of muscular strain the result of sudden effort, as also in overstrain occurring after repeated violent exertion, the prompt administration of massage will sometimes be followed by immediate relief, and almost always by rapid recovery from pain and restoration of the muscle to its normal power and activity. Many examples of successful treatment of these conditions have been recorded by Douglas Graham and other writers on massage. Several cases have come under the personal observation of the author, through the courtesy of surgical friends who have intrusted the manipulative treatment to his hands.

It is probable that in all cases of sudden muscular strain some slight rupture of the fibrils must occur, and the localised tumefaction so often met with in that part of the muscle which has been subjected to the greatest strain, points to the extravasation of blood, as well as to exudation of lymph for reparative purposes. It is therefore necessary, in applying massage under such circumstances, to carefully avoid any risk of widening the breach between the ruptured ends of the fibres of the muscle or its sheath.

The manipulations must at first be confined to the structures surrounding and on the proximal side of the part injured; gradually the swollen part

may be approached and handled ; but no kneading with the thumbs or finger-tips should be practised over the site of injury in cases of muscular strain or over-strain, lest further rupture of the possibly torn fibres should result. The author was the first to describe the accident which he has named 'Golf-hip,'¹ a condition of gluteal strain occurring as the result of over-vigorous employment of the 'driving stroke,' and perhaps associated with a lack of skill in neophytes.

One of the cases, the second, occurred in the person of a member of the medical profession, who consulted Mr. C. B. Keetley, to whom the author is indebted for the opportunity of seeing and treating this patient. There had been a lapse of ten days between the commencement of the pain and stiffness (about the upper part of the right buttock and lumbar region) and the date on which the patient first consulted Mr. Keetley. After two or three days' massage the severe pain subsided, though it was not until some days after this that the patient was able to assume and maintain the erect posture without painful effort. In the first case, on inquiry as to the cause and duration of the severe pain extending over the greater part of the right buttock, the patient said that he had within the previous ten days commenced to learn the game of golf, and though during the

¹ *Lancet*, vol. i. p. 328, February 10, 1894, in which full details of this injury are given.

first few days, going round the links once daily, he had experienced some general stiffness at night, and in the morning on rising, no localised or severe pain had been felt until two days previously, when, having devoted the greater part of the afternoon to the practice of a stroke involving an attitude and a rapid muscular effort, doubtless familiar to those who play golf, the patient, desiring to pose while driving a 'tee'd ball' in the most finished style, felt a violent pain in the upper and outer part of the buttock and over the right lumbar region, so that on leaving the ground he was unable to walk without much suffering, and could not adopt the erect posture, and at night the pain involved insomnia, little rest being obtained. Hot fomentations and rubbing with embrocations had completely failed to afford relief. After the first administration of somewhat vigorous massage, the patient, who had previously maintained the attitude and mode of progression most commonly acquired by persons afflicted with long-standing sciatica, was able to assume an almost erect position, and could dispense with the sticks on which he had hobbled into the room. Daily massage of the affected tissues in four days completely restored painless activity to the injured muscles and fasciæ. Since then three other examples of gluteal strain from the same cause have been successfully treated by massage under the observation of the writer.

In sudden muscular strain involving palpably extensive rupture, massage will be found a most useful adjunct to treatment in the later stages, when its employment will greatly hasten the restoration of healthy function, and will rapidly reduce the induration at the site of injury, and the œdema so frequently met with on the distal side of the ruptured muscle. Perhaps no more remarkable evidence of the lymph-heart function of muscles is afforded than that which is noticeable when rupture of a large muscle, *e.g.* the rectus femoris or the soleus, occurs. Rapid and extensive œdema of the limb below the injury supervenes, and remains until massage and passive movements restore to the muscle its lost function.

Atrophy of Muscles.—For the restoration of nutrition to muscles wasted by disease, injury, or disuse, no method of treatment excels that of massage. Even when atrophy results from lead-poisoning or from paralysis, as in facial palsy, the early use of massage will be found to be of much greater service in preventing contraction and maintaining nutrition than the application of either form of electricity. In cases of infantile paralysis, the worst effects following this disorder may be avoided or greatly reduced by early and assiduous massage of the affected limbs. An intelligent nurse may easily be taught to apply the

remedy, but unfortunately the duties which a nursery entails leave little leisure for the regular practice of the necessary manipulations, so that unless the nurse can be persuaded to employ her hands as conscientiously and regularly as she feeds the infant, it is perhaps better to intrust the massage to an independent rubber.

Muscular Contractions.—Rollet¹ describes a deformity of the hand peculiar to glass-blowers, called by Poucet *main en crochet*, or by the glass-blowers *main fermée*, which is characterised by permanent contraction of the fingers, due to flexion of the second upon the first phalanx. This is first manifested in the left hand; the little finger is first affected, then the ring, and next the middle finger. The inter-osseous muscles atrophy slightly. Taken in its early stages, good results are obtained by the use of massage, with a change of work.

Temporary contraction of the hand, due to long-continued immobility in one position, yields more rapidly to centripetal friction and kneading than to the application of warmth. After long forced marches in the Russo-Turkish Campaign, 1877-79, the author had frequent opportunities of witnessing the effects produced on men who, in a semi-somnolent condition, dragged themselves along towards the close of the day with insufficient energy to 'change arms,' and though few reported

¹ *Revue de Chirurgie*, May 1890.

themselves sick for such conditions, he has often seen the men busily engaged chafing and kneading their comrades' hands, swollen or cramped from carrying the musket for many hours under circumstances of great cold and privation. In his own case, after a long ride under similar conditions, he has been thankful to find among his comrades one who has fulfilled the *rôle* of masseur in civil life, and grateful for the ease and comfort which have followed the skilful administration of massage.

In acute torticollis, following a sudden movement of the head, or due to muscular rheumatism, the muscle involved appears to be usually the trapezius. In such cases massage of the contracted muscle not only gives immediate and permanent relief, but if this does not follow the first operation, a very few daily applications suffice to remove pain and spasm. Schreiber¹ advocates, after the massage, movements of the head, backward, forward, and to either side (each ten times), and, finally, rotation—first passive, and then assisted. Both massage and movements cause temporary suffering during their application, but the patient usually loses his trouble after a single sitting.

In the more common variety of true spasmodic wry-neck, Keetley² of London and Schmitz³ of

¹ *Manual of Treatment by Massage*, p. 170.

² *Annals of Surgery*, April 1889.

³ *St. Petersburgher Medicinische Wochenschrift*, February 18, 1889.

St. Petersburg, advocate the use of manipulations after their operative and mechanical methods of first dealing with this complaint have served their purpose.

Diseases of Joints.—In all chronic affections of the joints, so long as structural changes of a permanent character have not destroyed the articulation, whether by true ankylosis, by the formation of cicatricial tissue, pulpy degeneration of the synovial membrane, or as the result of traumatism, it will generally be found that there is a greater apparent loss of mobility than that which really exists. In such cases some of the immobility of the joint is due to the contraction, tonic spasm, and wasting of the muscles which act upon the joint; and even after all local mischief in the articulation has ceased to exist, the sense of weakness, combined with the fear of exciting pain, induces the patient to keep the muscles in a state of tension, which is voluntary at first, but subsequently becomes involuntary. In many cases no sort of persuasion will induce any exercise of the will to overcome the defensive action of the muscles for the maintenance of immobility of the joint. If these conditions have lasted long enough, actual contracture of muscles may have occurred, and under these circumstances it may be at first difficult to detect what proportion of the muscular rigidity is due to actual contracture and to tonic

spasm respectively. Examination under an anæsthetic will of course reveal the extent of mobility possible, without breaking down adhesions, or operative interference with the tendons. Where the apparent rigidity is in the main due to muscular spasm, massage of the affected tissues, with passive movements of the joint, will prove most successful. Some difference of opinion appears to exist among writers upon massage in these affections, as to the character of the manipulations preferable in such cases ; but the views of Schreiber and Graham, who advocate very gentle and careful massage, are shared by the author. Any attempt at vigorous measures may be followed by pain in the joint and increased irritability of the muscles. Generally speaking, it may be said that all manipulations for the relief of joint affections should be at first confined to the proximal muscles of the limb ; and after the patient has become accustomed to the handling, the whole limb may be subjected to massage, and finally the joint itself should be approached with due precaution. Where no firm adhesions require to be broken down, *massage à friction*, with passive movements, may be employed early in the treatment. The classic experiment of von Mosengeil proves conclusively the value of massage in promoting absorption from the interior of joints.

∴ Intra-articular and peri-articular effusions and exudations rapidly disappear ; pain is thus relieved

by decreasing the pressure upon the sensory nerve-endings, circulation through the muscles and tissues of the joint is accelerated, while the stagnation in the lymph spaces is overcome. In cases of synovitis, especially when the inflammation has been severe, the formation of firm adhesions may be prevented by the early use of massage and passive movements, the increased area over which the products of inflammation are spread, and the restoration to the disused muscles of their lymph-heart action, tending to the dispersal of material which would otherwise become organised. It is, however, necessary to avoid the use of massage in any case of joint inflammation, in which suppuration has occurred, at all events until any danger of driving infective material through the lymphatic glands has passed away. By far the largest number of cases of joint affections which have come under the notice of the writer have been examples of chronic rheumatic arthritis, in which both muscles and joints have been attacked. The successful treatment of such conditions has proved difficult, and in too many cases impossible, by any means with which we are yet acquainted, and this very difficulty accounts for the many different methods of treatment which have been devised for the relief of sufferers from chronic rheumatism. The age of the patient, the duration of the malady, and the number of joints affected, will modify the length of time necessary for treatment and the prognosis of the disease.

It is not possible in any case of rheumatic polyarthritis to promise any better results from massage than from other forms of treatment, but it may be safely alleged that much more satisfactory results may follow the employment of skilful manipulation than from any form of treatment in which they are not included. The popularity of Aix-les-Bains as a resort for sufferers from rheumatism doubtless depends very largely on the scientific application of massage under careful supervision. Chronic rheumatic arthritis yields so slowly to any kind of treatment that all means at our disposal for the reduction of its duration and the limitation of its sway must surely engage the attention of every thoughtful practitioner.

It is not unreasonable to believe that the inaction of muscles associated with a rheumatic joint induces the accumulation of waste products in the articulation itself and in its surroundings. The lymph-pumping function of the muscles normally acting on the joint is thrown into abeyance, and the influence of muscular contractions in aiding the onflow of the venous current is lost. The intramuscular arterioles, as also those of the skin, are contracted; and thus the blood-supply to these structures is seriously interfered with, so that the washing-out from the joint and other structures of the morbid products accumulated therein is retarded, thus further increasing stasis in the inflamed foci. Inasmuch as most cases of chronic

arthritis afford evidence of inflammatory deposits in the fibrous and muscular tissues connected with the joint, the lymph spaces of the connective tissue being clogged and matted together so that the movements of tendons and muscles are mechanically impeded, it is not surprising that after one attack of rheumatism the fibro-serous tissues are peculiarly liable to a recurrence of inflammation, especially if they are exposed to a repetition of the predisposing or exciting causes. The treatment of chronic articular rheumatism by a combination of massage, galvanism, and exercises both passive and active, was first described by the author in a paper¹ read before the West London Medico-Chirurgical Society, and the best results have followed its employment in the majority of cases so treated.

When there is much pain and thickening in and around the rheumatic joint, with atrophy of muscles and intra-fascial tumefaction, massage is best employed for a few minutes several times daily. In severe cases, with many joints affected, the manipulation of one only at first should be attempted; centripetal friction, gradually increasing in firmness, and subsequently combined with kneading of the proximal muscles connected with the joint, should be practised at first as far from the focus of mischief as possible. Cautiously the firmness and nearer approach of manipulation to the joint may be increased, till in the course of a few days, if all

¹ *Practitioner*, August 1891, vol. xlvii. p. 112.

goes well, the articulation itself is subjected to *massage à friction*. At the same time passive exercise of the joint may be gently practised, care being taken that too much pain is not produced. One or two movements at each visit (the range of attempted motion being gradually increased) will suffice, till at last the patient is bidden to aid and independently to perform the exercises most appropriate to the particular condition of the joint. Then, when some appreciable power has been gained in the use of the joint, resisted movements may be added to the passive and active manipulations; and finally, after a period varying with the constitutional and local severity of the case, the resumption of power to use the limb without pain will reward the prosecution of a somewhat laborious method of treatment. In long-standing and severe cases the patience of the sufferer and the physician may be sorely taxed, but in the majority of instances recovery will be the reward. It is most important that the improvement in the circulation following the local use of massage in chronic rheumatic arthritis should be maintained in the intervals between the applications of manipulation, by all manner of means. The limbs should be wrapped in cotton-wool and flannel bandages, night-socks should be worn on the feet, and warm woollen mittens on the hands; the head, if affected, as is often the case, should be protected with a woollen cap; and the neck, frequently left out in the cold,

must be swathed in the folds of a Shetland shawl. Hot-water bags must be placed round the limb after manipulation, and, wherever possible, they should be used as substitutes for pillows for the support of the affected limbs or joints. Indeed, no precautionary detail is too trivial to be omitted in the care and treatment of this malady, so often terminating in a crippled condition for life. The results sometimes obtained by assiduous perseverance with mechano-therapy in these frequently hopeless cases are worth working for, and will repay the time and trouble expended on them.

The following cases may be cited as illustrating the value of prolonged assiduity in treatment, in conditions where the youth of the patient appears to be an important factor in determining a favourable result:—

A. C., æt. 29, was sent to the author by Dr. Lauder Brunton in September 1888. There was no history of illness previous to April 1883, when the patient went to India, and on landing suffered from pain and swelling of both big-toe joints and in the lumbar region, which lasted for a month; he then marched five hundred miles, and lost two stone in two months. Both knees, the right ankle, the left sterno-clavicular joints, and the inter-phalangeal joints of the left little finger, became affected. For two years he suffered, off and on, from pain in these localities and increasing stiffness. The hip-joints and those of the lumbar

region then became the seat of intense pain and stiffness, and he began to become crooked. The patient returned home to England in August 1885, and had suffered much ever since. Droitwich, Aix-les-Bains, and other thermal resorts had been visited more than once.

The patient was admitted for treatment on September 5th. His condition then was that all the joints previously named were swollen and stiff, he could not walk upright, the trunk being flexed at an obtuse angle on the pelvis, with a decided list towards the right side. There was complete immobility of the lumbar region, all the muscles being much thickened and brawny; stiffness of both hip-joints was so marked that the patient could not raise himself from the stooping posture. There was marked atrophy of all the muscles of the right leg. Shortly before consulting Dr. Brunton he had suffered iritis of the left eye. The unclothed weight was 10 st. 1 lb., height 5 ft. 10 in. His top weight in 'ducks' had been 12 st. 7 lbs. As there was no acute suffering in this case, general massage was given, with special attention to the joints most seriously affected, twice, and sometimes thrice, daily. Passive movements were included in the treatment until September 28th, when rheumatic iritis of the left eye recurred. This involved rest, so massage alone was practised until October 8th, when the iritis, treated by Mr. W. H. Jessop, subsided.

Weight 10 st. 6 lbs. On 22nd, the passive and active movements having been continued since the 8th, the spinal curvature was almost unnoticeable, and there was much less stiffness in the hip-joints. The right eye became slightly affected until 29th, when both eyes were quite well. Except the slight lateral bend to the right, the spinal curvature was quite gone, and meanwhile the other joints had regained considerable power of mobility. On November 12th, in view of the tendency to recurrent iritis, it was thought well that the patient should avoid the inclemency of the English winter, and on the advice of Dr. Brunton he went to Meran to continue treatment under the care of Dr. Schreiber. Weight 10 st. 10 lbs. unclothed.

On May 11th, 1889, the patient was again seen by the writer. He had been since November in Meran under Schreiber's care, but a prolonged attack of iritis prevented treatment for nine weeks. After spending the summer in active exercise, the patient again presented himself in good health, and with only some slight stiffness in the lumbar region remaining, and was able to resume his ordinary duties, which he still continued to perform up to the time when he last communicated with the writer in 1891.

A. W., æt. 25, consulted the author at the end of 1892. Six months previously he first noticed stiffness and pain in the left buttock and right

shoulder-joint ; subsequently both ankles and the right toe became swollen and painful. After a week in bed the left knee and shoulder-joints were similarly attacked. On examination, pain, swelling, and stiffness were found in the left shoulder, knee, and ankle, in the right shoulder, ankle, and great-toe joints, and in the left hip there was much pain, and almost total loss of power to flex the thigh on the abdomen ; there was pain over the right parietal prominence, with pain, stiffness, and nodular induration over the right trapezius. The seventh cervical, third, sixth, seventh dorsal, and second, third, and fourth lumbar vertebral spines were tender, and the inter-spinous ligament thickened. There was much matting of the fibres of the erector spinæ and latissimus dorsi muscles, and generally over the lumbar aponeurosis. The right sterno-clavicular joint was also swollen and tender, and there was marked atrophy of all the muscles of the left buttock and lower extremity, the tendo achillis being the seat of severe tendo vaginitis. The patient was admitted on January 10th, 1893, when his weight, unclothed, was 8 st. 9½ lbs. ; he had suffered from iritis three times, the right eye being the worst ; this, however, did not recur, and the treatment by rest, massage, and passive movements at first, followed by active and resisted movements, and finally open-air exercise, was unintermittingly pursued until April 6th, when the unclothed weight was

10 st. 3 lbs. Effusion without pain, heat, or redness appeared in the left knee-joint, but speedily yielded to rest. On May 9th, the patient, having recovered the painless use of all his joints, weighed 10 st. 5½ lbs., and the long course of treatment was brought to a close. The following measurements, taken at the commencement of treatment and again at its termination, may not be altogether uninteresting :—

	Jan. 10, 1893.	May 9th.
Right Thigh	44 c.m. . .	46 c.m.
Left „	34 „ . .	39½ „
Right Knee	33½ „ . .	31½ „
Left „	34 „ . .	32 „
Just above the		
Right Knee	31½ „ . .	37 „
Left „	30 „ . .	33 „
Just below		
Right Knee	31½ „ . .	30 „
Left „	31 „ . .	31 „
Right Ankle	27 „ . .	23½ „
Left „	26 „ . .	24 „

This patient was seen from time to time for over twelve months, during which period he had remained free from the complaint.

These two cases are typical of what may be done to relieve suffering and restore function in chronic rheumatism when age is in favour of the patient.

The two following cases illustrate how little improvement can be effected when the disease is in an advanced stage, and the age of the patient militates against nutritive rehabilitation:—

Mr. O., æt. 70, had been the victim of rheumatic poly-arthritis for many years; he weighed 18 stones, and was unable to walk or change his posture without the aid of other persons. He could not even turn in bed, rise up, or sit down, feed himself, or perform his own toilet. The shoulders, elbows, wrists, and finger-joints of both upper extremities were affected, the knees and ankle-joints of both lower extremities, and there was much atrophy of the muscles, which was masked by the general obesity, save in the left thigh, which was appreciably smaller than the right. The patient was sent to the author by Dr. Lauder Brunton in 1886. When first seen he was practically helpless, and was pushed about in a wheel-chair. His great weight necessarily restricted his movements, as it required two persons to take him from the bed to the chair, and *vice versa*. The treatment pursued was by massage twice daily of the affected joints and limbs, galvanism through the joints, which relieved pain, and passive exercises for three weeks, followed by active exercises; so that at the end of seven weeks he was able to feed himself, to brush his own hair, and with the aid of a stick to walk a hundred yards, but a relapse followed shortly after the

conclusion of treatment, and the patient derived little or no permanent benefit from its prosecution.

Mrs. —, æt. 71, was first seen in consultation with Dr. Charles Hartley in the latter part of 1892.

History.—At the age of twelve years had rheumatic fever, and never felt any effect for twenty-two years, during which time she led a most active life, residing in a house on a clay soil, with a river running close to its walls. Five and a half years before her admission for treatment she had first noticed a swelling, pain, and stiffness in the right knee, and since the other joints had become affected, first the right hand and both wrists, then the shoulders, the other knee, the elbows, and finally the left hand; and, in July 1892, the hips and back were attacked. Everything had been tried—drugs, diet, the waters of Aix-les-Bains, Bath, and other places. From February to July she had been through the ‘Salisbury treatment,’ and believed she had certainly gained power to get about, but had lost 19 lbs. weight. Arthritis deformans existed in all the phalangeal, metacarpal, and carpal joints of both hands, in the joints of the tarsus and ankles of both feet, in the hips, knees, shoulders, elbows, and jaw. The patient was admitted for treatment on December 1st, 1892; weight, unclothed, 5 st. 10 lbs.; sleeplessness and constipation, with marked anorexia and a sub-

normal temperature, were present in this case. The treatment was continued until January 18th, when the exhaustion, which had been present after any effort, had been relieved; the patient was able to walk over ten of Schreiber's blocks four times to and fro without aid, the arm-exercises were fairly well performed, but only 7 lbs. had been gained in weight.

Dr. Charles Hartley, in reply to inquiries as to the condition of this patient, reports that two years after treatment she was well enough to travel thirty miles out of London, walk a distance of ten yards, attend a public ceremony, and return to town the same evening without suffering, so that the progress of the malady in this case does not appear to have been so rapid as it had been before treatment.

Judging from the excellent results following the early treatment of poly-arthritic rheumatism in several cases, and the marked benefit derived from massage, where only one or two joints and their corresponding muscles are affected, it seems more than probable that patient perseverance in a long course of massage and exercises at the very outset of a case threatening to develop into arthritis deformans, would materially modify the prognosis, and at any rate would help to postpone the crippled condition into which so many sufferers eventually fall. In severe cases of gonorrhœal rheumatism no form of treatment is attended with better results

than those which follow rest and massage ; but so long as the gono-coccus is found in the urine there is danger of the disease spreading to other muscles and joints than those first attacked ; it is therefore necessary to adopt local and constitutional treatment until complete freedom from the cause of the disease has been insured.

There is one injury, the prevalence and nature of which demand separate attention before considering the use of massage in injuries of joints.

' *Lawn-Tennis Elbow* ' is a condition which appears to be associated only with a particular stroke used by expert players, and may be the result either of sudden strain or of long-continued and unrelieved practice of the movement causing overstrain. Moullin describes ' *Lawn-Tennis Arm* ' ¹ as follows :—

' There is a tender spot about the middle of the forearm, on the outer side of the bone, corresponding to the attachment of one of the muscles that is used especially in back-handed strokes.'

This would appear from the description quoted to be a different injury from that which, in the experience of the author, results from the use of the same back-handed stroke. The movement for the delivery of the stroke consists essentially in the sudden extension of the whole arm, accompanied by rapid and forcible pronation of the forearm.

¹ *Sprains*, C. W. Mansell Moullin, p. 119.

The usual site of the pain and tenderness complained of by the majority of sufferers who have come under observation, has been at a spot just below the external condyle of the humerus, and the swelling extends thence downwards over the upper third of the extensor surface of the forearm. When the injury is severe it renders the limb powerless, and any attempt to extend and at the same time pronate the forearm is attended by exquisite pain. The injury appears to involve both sprain of joint and strain of muscle, for very frequently the outer aspect of the elbow-joint is greatly altered and swollen. The anconeus is probably the muscle affected, and the orbicular ligament of the radio-ulnar joint of the elbow is strained. The importance of recognising the tissues implicated is not perhaps very great, save from the point of view of massage, when it makes all the difference; as, if the tender spot and greatest swelling is about the middle of the forearm, the procedure for the dispersal of the exudation must differ from that which would be employed when the focus is situated just below the outer condyle of the arm-bone. The sheath of the anconeus is swollen and tense, and the manipulation found most useful for reducing swelling and relieving pain in 'Lawn-Tennis Elbow' is first to rub and knead centripetally the triceps muscle, then gradually to approach the swollen joint and muscle, and by gentle *massage*

*à friction*¹ to reduce the amount of exudation poured out into and beneath the sheath. After massage the limb should be placed in a sling with the forearm midway between pronation and supination. When the injury is recent, a few days will suffice to restore freedom from pain and swelling; but abstention from play must be enjoined until all soreness and sense of powerlessness have ceased.

In the more chronic form of this condition, due rather to over-use and consequent lymph-logging of the tissues, a longer course of massage and rest of the parts is necessary; and the use of the back-handed stroke must be discontinued for some time, and immediately abandoned if pain and stiffness follow its resumption.

Tendo Vaginitis is a condition closely allied to sprain which follows over-use of joints to which the tendons affected are attached. It is a frequent trouble in pianists, and appears to be the initiative of 'rider's sprain' and oarsman's cramp. When recent, it yields readily to treatment by massage; but in the more chronic cases long-continued and persevering manipulations are often unattended by success. The massage appropriate to these affections should not be practised for more than five or ten minutes at a time, and has for its object the removal of the surplus fluid collected within

¹ For description of this manipulation, *vide* p. 10.

the tendon sheath, and the improvement in nutrition of the over-fatigued muscles.

Tendo vaginitis is not an infrequent complication in the initial stages of some occupation-cramps, to which further reference will be found in a subsequent chapter.

Relaxation of Ligaments is sometimes met with in infants and young children, in whom no evidence of muscular paralysis or deformity of the bones can be detected. Most commonly the condition is recognised when the child first begins to walk. The attention of the medical adviser is drawn to the fact that 'the ankle and knee-joints are weak,' and when walking it is found that either one or both legs present the appearance of genu valgum, the child walking on the inner edge of the foot, and bending the knee towards its fellow of the opposite side. No true talipes exists, nor is there any alteration in the shape of the bones forming the knee-joint; but the internal lateral ligaments of both ankle and knee-joints are found to be relaxed, and the muscles of the leg are flabby and ill-developed. This state of affairs appears to be engendered by the difficulty to maintain equilibrium on the part of delicate children with ill-nourished muscles. The little one in his early efforts to stand and walk is obliged to widen his base of support; and, to prevent falling, places his feet far apart, thus straining the internal lateral

structures of his joints, which become relaxed in consequence of the too great traction made upon the ligaments. Massage twice daily of the affected limbs must be practised for some months, until the nutrition of the muscles and ligaments has been restored. The manipulation can be easily carried out by the nurse in whose charge the infant may be.

Either as the result of neglect in childhood, or following arthritis, some adults are very prone to sprains, constantly recurring in one or more joints, as the result of atrophy, or relaxation of ligaments. The author has seen three instances of partial dislocation of the patella in members of the same family, who also suffered from a tendency to twist the ankles. Accidents involving subsequent synovitis were frequently occurring, until the prolonged use of massage in all three cases appeared to effect improvement, inasmuch as three years elapsed without any mishap, whereas, before treatment, each of the patients had been laid up once or twice every season when playing lawn-tennis. Douglas Graham also refers to a similar accident, in which massage, movements, and faradisation restored the limb to its normal utility. He also cites two cases arising from synovitis. Laxity of the plantar fascia and ligaments, leading to flat-foot, may be successfully treated by massage of the foot and leg, with exercises designed to improve muscular power and to strengthen the enfeebled ligaments.

The tiptoe exercise is most useful in such cases ; but œdema of the ankle and sole sometimes follows its use, when massage will remove the exudation and help to prevent its reappearance.

Injuries of Joints.—The only traumatic conditions of joints in which massage is generally useful are those characterised by temporary partial displacements, commonly known as sprains, in the slighter forms of which massage may be immediately used with advantage, and in the more serious forms of displacement, which must remain permanent unless replaced by surgical skill, known as dislocations, in which massage is extremely valuable when employed after all inflammation has subsided. The widest difference of opinion exists among authorities of the present day in regard to the immediate treatment of sprained joints—one party insisting on the necessity of securing and maintaining immobility of the joint until all acute conditions have passed away, while the other advocates the immediate application of massage and early movement in all cases. Since the days of Phellipeaux and Estradère the battle has been carried on without decisive victory of one method over the other ; but on the Continent the advocates for the more rapid treatment of sprains by massage, bandaging, and movements are in greater proportionate numbers than in this country. It is agreed, apparently, on both sides that the treatment by

rest and immobility certainly entails longer convalescence than by the more venturesome plan; but as in these days of hurry and competition, time and its loss have become a more serious consideration to sufferers from this local injury, it is not astonishing that they seek the advice of those whose methods promise the most rapid restitution to activity. While it is conceded that much unnecessary time may be lost, and suffering be prolonged, by relegating sufferers from sprains to the irksome inactivity entailed by rest on a sofa and the application of local antiphlogistics, it is no less true that massage may do much harm when the injury is complicated by rupture of ligaments, or fracture of bones to which they are attached, and the danger of employing manipulations which would be contra-indicated under such circumstances cannot be gainsaid. When it is possible to diagnose the injury as a simple temporary distortion unaccompanied by actual solution of continuity, either of the soft parts or the bone, there is no doubt that repeated massage of the joints, which should be well strapped in the intervals between the manipulations, will greatly reduce the severity and duration of the acute suffering which follows the comparatively slight injury. The employment of massage in both cases is admissible; but while in the slighter forms of sprains occurring in the wrist, ankle, elbow, and knee-joints massage may be administered as early as possible, and

employed at frequent intervals, not only in the neighbourhood, but over the joint itself, in the more severe conditions complicated by extravasation, rupture, or fracture, massage can only be used in the vicinity of the joint, which must be protected in an immobile position by suitable apparatus until all inflammation has ceased. Then massage and movements may be advantageously practised for the reduction of swelling, the removal of exudation, and the restoration of function to the joint and the muscles acting thereon. The plan of treatment of the slighter forms of sprain, which has proved successful in thirty-six cases of the ankle-joint and seven of the wrist, in the practice of the author, is as follows:—

The parts have been restored as far as possible to their normal relationship; *massage à friction* has been employed centripetally, at first very gently, and at intervals varying from two to twelve hours, with increasing vigour. At the close of each sitting the joint has been strapped firmly, but not too tightly, with adhesive plaster, and the patient has been permitted to use the limb in the intervals between the repeated administration of massage. Seven days has been the longest period during which pain, stiffness, and weakness have remained, and in six cases of sprained ankle the joint has recovered its painless function on the second day after the accident, with frequent manipulations. The statistics of other practitioners, with wider

experience, prove the value of massage in reducing the duration of suffering in these injuries. Douglas Graham, in an article in the *New York Medical Record*, gives the average length of time for recovery in the treatment by massage of 308 cases of sprains and joint-injuries, apparently of all degrees of severity, as nine days.¹ In fifty-five cases treated by the ordinary method the average time exceeded twenty-six days.

In dislocations the employment of massage as an after-treatment promotes the earlier and more vigorous activity of the muscles frequently injured at the time of the accident, and always flabby and lax after the long disuse entailed thereby. In contusions of joints, as also in muscular bruises, the extravasation of blood and exudation of lymph may be rapidly removed by gentle centripetal rubbing and kneading; but it is well, in cases in which the distal extremity of a limb has been the seat of injury, to warn the patient that the discoloration noticeable on the skin of the part affected may spread upwards under the influence of the manipulations.

Mansell Moullin in a recent work on Sprains approves the immediate use of massage in slight cases; but deprecates any bruising due to manipulation. No such bruising should be caused by skilful massage; but more *extensive* discoloration must always follow massage of a sprain than would

¹ Graham, *loc. cit.*, p. 212.

occur if the extravasation were left *in situ* without any attempt to spread it over a larger absorbent area.

Fractures.—The value of massage in the after-treatment of fractures, in order to restore the utility of the limb as early as possible, and to counteract the effects of prolonged immobilisation, has long been recognised, and it must be regretted that, in view of the uncontroverted fact that the early application of massage curtails the length of time during which the fractured limb remains powerless, or at any rate unequal to the demands of active or laborious use, the accident wards of the hospitals in this country still remain without a staff, whether of students or nurses, who are capable of applying massage as an aid to the early resumption of the wage-earning capacity of the labouring class, to whom the majority of sufferers from these injuries belong.

The absence of an efficiently constituted massage department in the great hospitals of England appears more remarkable in this connection when it is remembered that massage in recent fractures was recommended by Lucas-Championnière in 1886, and a number of cases were reported in the French Medical Journals in which unusually rapid recovery followed its employment, especially in cases of Colles's and Pott's fractures.

In 1887 Lucas-Championnière again drew the

attention of the Société de Chirurgie to the value of the treatment, and advocated more prolonged sittings, which in his previous communication he had limited to ten or fifteen minutes. Subsequently Rafin of Paris recorded cases of fractured fibula in which recovery occurred in from thirteen to twenty days; of the external condyle of the humerus in a child in nine days; and in a fracture of both malleoli, with dislocation outward and backward, in an adult, in forty days.

In transverse fractures of the patella, Tilanus of Amsterdam extols the use of massage and movements for the prevention of stiffness and muscular atrophy and the rapid dispersal of effusion. Six patients so treated walked well in fourteen days. Wagner of the Austrian army reports five successful cases, and more recently Lucas-Championnière¹ adds fractures of the upper end of the humerus to those in which he had previously advocated the immediate use of massage and the early employment of movements. He applies no restraining apparatus beyond a sling, massage and passive movements being practised from the first. Even in fractures of the surgical neck the first application of massage is made while the patient is under chloroform for the reduction of deformity, and daily massage is used after the fourth or fifth day,

¹ 'Traitement des Fractures de l'extrémité supérieure de l'Humérus par le Massage.'—*Journ. de Méd. et de Chirurg. Pratiques*, Sept. 25th, 1894.

the axillary pad and sling being discarded after about a fortnight. This surgeon alleges that whereas these injuries were regarded by him as of comparative gravity, since he has employed massage and movements from the commencement he no longer regards such fractures as serious, and confidently looks forward to good and early recovery.

Landerer,¹ in an interesting paper on new methods of treatment in fractures, employs massage and passive movements in simple fractures with little or no displacement after a few days' rest and immobility.

In fractures with displacement of the upper extremity, and in almost all cases in the lower extremity, the limb is kept in splints for a few weeks, being removed for the purposes of manipulation only, after three or four days' rest.

In every case friction and kneading in a centripetal direction, with tapôtment of the muscles, is employed. Excellent results have been obtained without muscular atrophy in fractures of the patella and leg-bones, locomotion without support, save from a stick, being acquired in a fortnight.

¹ *München med. Wochenschrift*, Dec. 11th, 1894.

CHAPTER V

Massage in Disorders of Digestion—In Diseases of the Stomach—Constipation—Diseases of the Liver and Gall-Bladder—Chronic Diarrhœa, etc.

IN no class of cases has massage proved so uniformly valuable as it has done in functional derangement of the chylopoietic viscera; and constantly increasing experience of its employment, both alone and in combination with rest and appropriate diet, in a very large number of cases, has convinced the author of its superiority over any other plan of treatment in many very serious conditions of mal-assimilation, whose origin could be traced to primary dyspepsia in one or other of its many forms. The indirect action of massage as a substitute for exercise, when practised upon the muscles, although exceedingly valuable in promoting tissue-change, oxidation, and excretion of waste products, is not the only way in which it proves useful; for while, by general corporeal massage, the congestion of internal organs may be relieved, appetite improved, and

the powers of ingestion increased, the direct effects of massage of the abdomen are more remarkable and far-reaching, and when practised purposively either alone or in combination with general massage, the results are most remarkable and satisfactory. The knowledge that abdominal massage is useful in derangements of the digestive functions is by no means of recent date; but its scientific application, based on experimental acquaintance with the effects produced on absorption, secretion, innervation, and nutrition, is comparatively recent; and while abdominal massage may have been employed from time immemorial, the reasons why its use should prove beneficial have only been investigated within the last few years, and afford a striking example of scientific experiment confirming popular experience. It may fairly be said that local massage of the abdomen acts mechanically, physiologically, and chemically. Mechanically and directly by removing the contents of one part of the gastro-intestinal tract into another, as when matters are forced from the stomach into the small intestine, and *vice versa*; or as when the passage of fæcal matter is mechanically hastened by actual kneading along the course of the intestine. By the extrusion of the contents of the gall-bladder, as in digital manipulation for the removal of gall-stones, or by the relief of intussusception by careful kneading, with or without injections, which last proceeding has been successfully practised and

reported by Buch,¹ Putnam,² and others. Physiologically, by improving the nutrition of the muscles of the abdominal walls and of the intestines themselves, promoting peristalsis and increasing the rapidity of the portal circulation through the liver and of absorption from the stomach and intestines. Chemically, by improving the blood-supply of the viscera, thus influencing the quality and quantity of the secretions containing the enzymes necessary to digestion.

Diseases of the Stomach.—The maladies of the stomach in which massage combined with appropriate dietetic treatment has been proved to be distinctly valuable, are chronic gastritis, both simple and mucous, gastric atrophy, dilatation, and those cases which Ewald³ describes as true neuroses under the name neurasthenia gastrica.

The majority of persons suffering from gastrointestinal disorders who seek relief from suffering by mechano-therapy postpone the use of these means until hygienic, dietetic, and drug treatments have been found insufficient; consequently the experience of the author in the employment of massage in such cases has been for the most part confined to those in which the more serious results

¹ *Berlin Klin Woch.*, October 11th, 1880.

² *Boston Med. and Surg. Journ.*, April 21st, 1881.

³ *Verhandlungen des III. Congresses für Innere Medicin*, 1884, and *Klinik der Verdauungskrankheiten*, S. 232.

of long-continued derangement of the digestive functions have been observed. In one hundred cases in which disorders of digestion initiated the conditions of ill-health from which the patients sought relief, sixty-five had developed neurasthenia, and in many of these the symptoms referable to the gastro-intestinal tract were overshadowed by the more distressing nervous phenomena to which the primary defect in the digestive organs had given rise.

In this connection it may be well to point out that the disorder of digestion preceded the nervous breakdown, and in most cases afforded clinical evidence that the gastro-intestinal derangement was not of a neurotic character; but was associated with chemical alteration of the secretions, in some cases followed by or concomitant with muscular and mucous atrophy.

It may be argued by some who are sceptical of the value of mechano-therapy in disorders of digestion, that the means employed synchronously with massage would have sufficed to restore the patient to painless functional activity without it; but the rapid freedom from discomfort, so often experienced by dyspeptics, temporarily after massage of the abdomen, and permanently after a course of local and general massage, precludes the possibility of denying to mechano-therapy its fair share of utility and influence in restoring the powers of digestion.

The employment of Penzoldt's test, the Salol

test, and Günzberg's¹ capsules, will satisfactorily show the rate of absorption, the motility and secretory conditions in gastric cases before and after the use of abdominal massage, and indeed will serve as an indication as to whether the manipulations are producing the desired effect. In a few cases the author has had opportunities of testing the hydrochloracidity after the test breakfast by evacuating the contents of the stomach, and employing the phoro-glucin-vanillin re-agent of Günzberg as recommended by Ewald,² further testing the motility of the stomach by Huber's test. The results in these cases obtained before and after abdominal massage prove conclusively the value apparently attributable to manipulations of the abdomen as shown by employing the other tests.

The plan adopted in the administration of massage in the more severe cases of chronic gastritis, gastrectasia, and gastric neuroses, has been to include in the first application of general massage for the day thorough systematic massage of the abdomen; then, from half to three-quarters of an hour after the two principal meals, to rub and knead the hypochondriac and epigastric regions after the manner already described, concluding with mas-

¹ 'Günzberg's Test in the Diagnosis and Treatment of Chronic Dyspepsia,' by A. Symons Eccles.—*Pract.*, April, May, and June 1892, vol. xlviii. pp. 257-348, 417.

² Ewald, *loc. cit.* p. 30.

sage of the intestines, and vibrations when deemed necessary. The effect of vibrations when practised in cases in which the patient complains bitterly of the sense of weight and oppression, and it may be pain, shortly after taking food, is very remarkable. The local discomfort gives place to a sense of buoyancy and activity, while the dulness and depression so often complained of by dyspeptics after a meal is got rid of. As to the time occupied by these proceedings, it will vary very greatly according to the conditions, both objective and subjective—sometimes ten minutes will suffice to render digestion (previously painful) unconscious, the flatulent distension is removed, and the patient feels comfortable and happy. In others it may be necessary to persevere for nearly an hour before the object in view is obtained. In many cases it is useless to hope for the best effects of local massage unless it is applied intelligently, being modified according to the indications and varied with the needs of the individual; for this reason, in some instances it is much more satisfactory to administer the massage one's self, at all events for the first few days, than to delegate it to the most skilful manipulator, who cannot tell whether the stomach has resumed its normal size and shape, or if success has followed the endeavour to remove its contents into the duodenum.

The following cases will serve to illustrate the use of massage in chronic gastritis:—

Miss J. B., æt. 56, consulted the author towards the latter end of January 1889.

History.—No previous illnesses except frequent attacks of dyspepsia during the last nine years, and occasional discomfort from hæmorrhoids. The present illness commenced three months before, in Paris, whence the patient had just returned. Pyrosis, pain in the pit of the stomach and between the shoulders, were the earliest symptoms; these still continued, with vomiting almost every day, either immediately after a meal or two or three hours afterwards. The patient was very stout, and appeared to be suffering from anæmic obesity as well as from the gastric disturbance. The tongue was large, pale, and flabby, marked with the teeth, and thickly furred towards the base, the papillæ of which were swollen and congested. On examination the abdomen was found to be protuberant, and distended with flatulence. There was no dilatation, but distension of the stomach. Eructations, acid regurgitations, and vomiting, sometimes relieved the pain at the pit of the stomach, over which tenderness was elicited on deep pressure. The most careful diet and treatment by drugs during the past three months had failed to overcome the conditions of gastric irritability, complicated with alternating constipation and diarrhœa. Examination per rectum revealed the presence of one or two small piles only. As it was important that the patient should return to the Continent early

in March, she was recommended to remain in bed and undergo a course of massage. On the first day Penzoldt's test showed a delay of an hour and a quarter, the salol test reacted half an hour after the ingestion of the capsule. Günzberg's capsule was employed on the third day, but the characteristic reaction was not obtained on the starch filter-paper until after two hours. The patient was put upon peptonised milk, and general massage was administered once daily, abdominal massage twice daily. At the commencement of the treatment the weight was 11 st. 3 lb. The vomiting ceased on the fifth day after treatment; the sleep, which had been heavy, unrefreshing, and often disturbed by nightmare, became lighter, more tranquil, and was followed by a sense of refreshment towards the end of the first week. February 12th, 1890, weight 11 st. The pain between the shoulders was gone, bowels open once daily for the last three days, motions pale (milk stools), the pain after food was relieved for a short time after massage. February 19th, weight 10 st. 9 lb. The diet consisted of milk, 4 oz. every two hours, rusks and milk, half pint, for breakfast, purée of meat and a custard pudding for lunch, fish and toast for dinner. February 26th, weight 10 st. 9 lb. A cut off joint, sieved potatoes and toast with milk-pudding for lunch; no longer any pain, tongue less furred.

March 3rd, weight as before. Has taken outdoor

exercise during last week ; tongue still slightly furred at base, flatulence occasionally after principal meals, easily dispersed ; Penzoldt's test 20 minutes, salol 45 minutes, Günzberg 70 minutes. Patient left for Paris. The only drugs used were the acid glycerine of pepsin, ℥j three times a day after meals, and 2 gr. capsules of cascara every night. For more than a twelvemonth the patient had been able to keep free from indigestion by practising the active exercises recommended, and had taken no drugs since her return to Paris.

The next case to which reference may briefly be made, as illustrating the effects of massage combined with rest, has already been reported in the *British Medical Journal* of Sept. 3rd, 1887.¹

This patient was a gentleman, aged 47, who for more than two years had suffered from anorexia, frequent 'bilious attacks,' nausea, and vomiting of ropy mucus, resulting in general weakness, incapacity for work, depression, and insomnia, culminating in a complete breakdown, which Dr. A. Gamgee, who sent the patient from Hastings, found unamenable to treatment.

On admission the weight was 10 st., height 5 ft. 7 in. The patient was fairly nourished, though flabby, the skin clammy, complexion sallow, with

¹ 'Massage as a means of Treatment in Chronic Dyspepsia and in Sleeplessness.'—*British Medical Journal*, vol. ii. p. 502 ; Sept. 3rd, 1887.

dark rings under the eyes, and the pupils widely dilated. The tongue was large, marked with the teeth, and thickly furred. Breath very offensive; pulse small and hurried. Thoracic organs normal. Abdomen full, distended with flatulence, frequently expelled as ill-smelling eructations, but without relieving the constant palpitation which alarmed the patient. Until the twenty-fourth day of treatment little progress had been made, although the vomiting of ropy mucus mingled with semi-digested food had gradually become less frequent. On the thirty-third day the patient had slept for nine hours, complained little of headache, the tongue was only slightly furred, and no discomfort had been felt after food, though the diet had been greatly increased. From this date improvement was steady, and in a letter written some time after the patient described himself as a different man, taking long walks and enjoying them.

The conditions of gastric atrophy consequent on long-continued gastritis, or associated with anæmia, chlorosis, and general marasmus, are not so readily or invariably amenable to treatment by mechano-therapy as the cases of gastric atony, in which, despite the implication of the mucous membrane, the muscular wall of the stomach appears to have suffered most. Where there is fibroid degeneration of the mucous coat there is little hope of benefit from massage, and failure following its use may in these cases be fairly

attributable to the almost complete destruction of the glandular tissues. The difficulty in diagnosing the condition of the mucous membrane until the patient has been under observation for a period sufficient to test the extent to which the functions of absorption and secretion have been diminished, affords an opportunity for testing the therapeutic value of massage. By its use, coupled with the employment of the tests already referred to, the prospects of amelioration may be gauged; and it may be taken for granted that, if no variation in the behaviour of the tests occurs before and after abdominal massage carefully administered for three weeks, the case is one in which no good may be expected from the treatment.¹ In some few cases, however, wherein very slight variations of reaction-time before and after massage were noticeable in the earlier weeks of treatment, perseverance has led to the best results.

The two following cases were published in 1892, but are here recorded, as sufficient time has now elapsed to prove the lasting effect of the treatment:—

A lady, aged 37, married, no previous illness, first noticed flatulent distension and epigastric weight after meals five years previously; for twelve months the discomfort after taking food had greatly increased, producing anorexia

¹ 'Günzberg's Test,' etc.—*Pract.*, April, May, and June 1892, vol. xlviii. pp. 257, 348, 417.

and sleeplessness. There had been much domestic anxiety for some years. The patient first came under observation twelve months ago, when she was placed under a course of rest and massage without seclusion, and with the dietary which, in my opinion, the result of physical examination and the clinical tests indicated. At the commencement of treatment the patient's nett weight was 6 st. 12 lb., height 5 ft. 6 in. Pale, pinched face, and general bloodless appearance of the whole surface, the nails, lips, and gums being colourless. The tongue was large, flabby, and marked by the teeth, with two symmetrical frothy streaks on the dorsum, which was slightly furred towards the back. The chest-sounds were normal, save that the stomach resonance extended upwards to the fourth intercostal space in the left mammary line, inspection of the abdomen revealing a stomach note with succussion-sound downwards in the same line to a point on a level with the umbilicus, thence downwards transversely two fingers'-breadths below the navel, whence it curved upwards to the edge of the ninth costal cartilage about a finger's-breadth internal to the right nipple line.

After a test-breakfast on the following morning Günzberg's test showed no reaction till after the lapse of two hours and a half, and on the same day the salol capsule, taken one hour after the midday meal, gave a slight trace in the urine after the lapse of three and a half hours. The patient

was placed upon a dietary from which all starchy foods and saccharine matters were excluded, and no fats save those contained in milk and in the interstices of finely divided meat were permitted. No liquids were allowed, except four ounces of hot water after three meals *per diem*. The milk was given with Benger's food, or thickened with unsweetened rusks thrice baked.

At the end of a fortnight the patient weighed 7 st. $0\frac{3}{4}$ lb. The Günzberg reaction did not occur till two and a half hours after the administration of the capsule. Salol reaction two hours and a quarter, *i.e.* one hour and a quarter earlier than on the previous occasion. There was less flatulent distension of the stomach and bowels, the tongue was cleaner, and sleep had been obtained to the average extent of seven hours per night. The succussion sound could not be elicited below the umbilical level. The same dietary was continued, abdominal massage was practised thrice daily, general massage once daily. At the end of a week the patient's weight was 7 st. $3\frac{1}{2}$ lb.

Günzberg, reaction-time	.	.	120	minutes.
Salol,	„	.	80	„

showing a gain of thirty minutes with 'Günzberg' and of fifty-five minutes with salol.

The amount of food was increased, but the quality remained unvaried. A week later, in spite of the intervention of the catamenial period, the

physical signs were improved, and the reactions were—

Günzberg, reaction-time . . .	80 minutes.
Dense salol, „ . . .	60 „

The patient was given green vegetables, unminced meat, and once daily a farinaceous milk pudding, and at the end of the week there was no increase of flatulence, which was only felt for a short time, an hour after the three principal meals of the day had been finished. The weight was 7 st. 6 lb. After five weeks' treatment the stomach level was two and a half fingers'-breadths above the navel. The tongue was clean, there was no complaint of oppression after meals, with a diet consisting of cocoa, toast, fish or eggs, and fried bacon for breakfast. Half a pint of milk with biscuits at 11 A.M.; a luncheon of roast meat, green vegetables, toast, stewed fruit, and farinaceous pudding. Cocoa and bread and butter or toast at 'afternoon tea,' and a dinner of a similar character to the luncheon, with a glass of burgundy. The weight was 7 st. 8 lb. at the end of the fifth and last week of treatment.

Günzberg, reaction-time . . .	80 minutes.
Salol, „ . . .	60 „

This patient, who was under treatment in the earlier months of 1891, was seen again in March 1892, when there was a further gain in weight.

The stomach limits were normal, and there had been no dyspepsia. In answer to inquiries made in the autumn of 1894, the patient wrote that she was quite free from her old digestive troubles.

In the following case, which had been diagnosed as one of gastric atrophy some time before it came under the notice of the author, the test for absorption employed, which has since been frequently adopted, was suggested by Dr. Lauder Brunton, viz., the ingestion of a dose of five centigrammes of powdered rhubarb, subsequently tested for in the urine alkalinised with liquor potassæ.

The patient, a gentleman, æt. 43, had suffered from dyspepsia, aching pain and weight in the epigastrium, constipation and acidity, for years, off and on since boyhood. He had suffered from 'four acute attacks and one subacute attack of rheumatism.' There was a systolic murmur at the apex, with increased impulse and cardiac dulness, the apex being just outside the left nipple.

The stomach was enlarged, and succussion was elicited below the navel. Weight, 7 st. 8 lb.

Rhubarb, reaction-time	.	.	30	minutes.
Günzberg, „	.	.	135	„
Salol, „	.	.	200	„

After the first week of restricted proteid diet—

Günzberg, reaction-time	.	.	120	minutes.
Salol, „	.	.	180	„

At the end of the third week the weight was 7 st. 12½ lb.

Günzberg, reaction-time	.	.	120	minutes.
Salol,	„	.	90	„

At the end of the fourth week, farinaceous matters having been given in addition to the diet already taken, much troublesome flatulence and nausea followed.

Günzberg, reaction-time	.	.	135	minutes.
Salol,	„	.	180	„
Weight, 7 st. 10 lb.				

Rigid adherence to a proteid dietary was followed at the end of the fifth week by a cessation of unpleasant symptoms.

Günzberg, reaction-time	.	.	120	minutes.
Salol,	„	.	60	„
Weight, 7 st. 10 lb.				

After eight weeks the weight was 8 st. 6 lb.

Günzberg, reaction-time	.	.	100	minutes.
Salol,	„	.	60	„
Rhubarb,	„	.	20	„

This patient took a restricted dietary, with no vegetables or farinaceous food save a few rusks and thin toasted bread, but with plenty of milk, for three months, at the end of which time the *clothed* weight was 10 st. 4 lb. The stomach limit

was two fingers'-breadths above the level of the navel, and there was seldom any discomfort after meals.

Three years had elapsed since the treatment when this patient was last seen, during which time the weight (clothed) had risen to 10 st. 10 lb., and, with the exception of occasional attacks of flatulence, with epigastric oppression, which yielded promptly to restricted diet, the patient had suffered no discomfort.

One of the most serious evils consequent on long-continued gastritis is the muscular atony of the stomach so often met with in old-standing cases, leading to dilatation.

In no class of cases are the good effects of abdominal massage so readily recognisable as in those wherein distinct and incontestable evidence of gastric ectasia exist. In almost all the more chronic cases of dyspepsia muscular inefficiency of the gastro-intestinal tract has been a prominent feature, and in none has this condition been more marked elsewhere than in the stomach; though frequently the megastria has been accompanied by local dilatations of the intestine, and especially of the colon, sigmoid flexure, and rectum.

The following cases have been selected from among very many, because they have been under observation at fairly frequent intervals, and are illustrative of the lasting benefit derived from the practice of mechano-therapy, after other methods of

treatment have been tried and found wanting. It is not sought to claim for massage that in all cases it has proved useful; but, excluding conditions in which it is absolutely contra-indicated—as for instance when dilatation depends on obstruction, carcinoma, adhesions, or fibroid degeneration,—out of twenty-five cases in which physical signs and clinical tests confirmed the existence of atonic dilatation of the stomach, in three only has a course of massage in which abdominal manipulation has played an important part failed to produce lasting beneficial results. In one of these three, the patient, who was sent to the writer by Dr. Bright of Cannes, weighed 7 st. 3 lb. on admission; two years previously the clothed weight was 11 st. 4 lb.; in the seven weeks of treatment the patient reached the unclothed weight of 9 st. 5½ lb., and left apparently quite well, but relapsed very soon after, and twelve months later had lost over 20 lb. On what this unfavourable condition depends no opportunity has occurred to show. The stomach-limits were normal at the close of treatment, while at the commencement the organ reached from the fourth interspace backwards to the axillary line, thence downwards to the left lumbar region one finger's-breadth below the navel, across to the right lumbar region, and thence upwards to the margin of the ninth rib in the mammary line. In the other two cases no untoward symptoms have arisen in three years and one year respectively; but examination of the

abdomen once or twice in each case has revealed the existence of some remaining ectasia.

The following case has been under observation for four years, and may therefore be regarded as a fitting example of the successful employment of mechano-therapy.

The patient, a gentleman aged 35, was sent to the author by Dr. Bright early in 1891. He had suffered from 'indigestion' for eleven years, since sheep-farming in Australia, when the diet had consisted almost entirely of meat, no farinaceous foods being obtainable. On admission the clothed weight was 8 st. 6 lb., naked 7 st. 9 $\frac{3}{4}$ lb. Height 5 ft. 10 $\frac{1}{2}$ in. The skin was cold and dry, the nose, ears, and fingers being dusky red, the nails and lips very pale. P. 59. There was great loss of subcutaneous fat, and the muscles were shrunken and flabby. Acid eructations and a sense of weight, sometimes amounting to pain, came on two hours after any food; the tongue, red at the tip and edges, was somewhat thickly furred. Thirst and hunger, with occasional gnawing sensations in the pit of the stomach, were prominent symptoms. The patient had undergone various forms of treatment, including lavage, without any relief, and had lost nearly 2 st. in four months. On examination, the stomach limits, when undistended, reached from the level of the fourth cartilage backwards to an inch beyond the left mammary line, thence downwards to the umbilicus, and upwards to the junction of the

eighth and ninth right costal cartilages. A capsule containing 15 grs. of salol was given at 2.30 P.M.; no trace of salol was found in the urine till 6 P.M., when a slight reaction was visible with ether. On blowing up the stomach the limits extended from the level of the fourth rib backward to the axillary line, thence downwards obliquely to a point four inches to the left of the navel on a level with a line drawn between the anterior superior iliac spines; thence midway between the navel and the pubis to the right lumbar region and upwards to the right tenth rib.

Constipation alternated with diarrhœa for a fortnight. Abdominal massage was practised three times daily, special attention being paid to the evacuation of the stomach-contents into the duodenum, and after each sitting a pad and bandage was applied over the hypogastric region. The unclothed weight, taken weekly, was as follows:—

7 st. 9 $\frac{3}{4}$ lb.	8 st. 1 $\frac{1}{2}$ lb.
7 st. 12 lb.	8 st. 3 lb.
7 st. 11 $\frac{1}{2}$ lb.	8 st. 5 lb.
8 st.	8 st. 5 $\frac{3}{4}$ lb.

Steady improvement in both subjective and objective symptoms was noticed at the end of the third week, and continued to the close of the seven weeks' treatment, the salol reaction on the last day being marked 1 $\frac{1}{2}$ hours after the capsule was taken.

The lowest limit of the stomach was two fingers'—

breadths above the navel. The tongue was slightly furred, somewhat pale, with two streaks of froth. One month later, the patient, who had been to Broadstairs, had gained $3\frac{1}{2}$ lb. The stomach was of the same dimensions as when he left; there had been no dyspepsia, save slight epigastric oppression directly after food, lasting for an hour. Three months later the limit of the stomach was three fingers'-breadths above the navel, an hour after a mutton-chop with toast and butter had been taken.

There was still a 'dull sensation' over the epigastrium, lasting for less than an hour after food. No eructations nor flatulent distension; bowels regular. The urine, which during treatment had been scanty and loaded with urates and phosphates, was now clear and abundant. Sp. gr. 1020; no phosphates. The patient no longer looks pinched and starved; tongue clean, appetite normal, hands and feet still somewhat cold. P. 70. Two months later the conditions were still further improved; the stomach limits the same. Five months afterwards the patient, having caught a chill while staying in Cannes, had lost 7 lb., the stomach lower limit was on a level with the navel; but a week later, after daily abdominal massage, while still pursuing his usual avocation, the weight rose to 9 st. 2 lb., and the lower limit of the stomach was two fingers'-breadths above the navel, and a month later, without any treatment in the interval, the weight was 9 st. 4 lb. During the summer of

1894 the weight rose to 9 st. 6 lb. In December 1894 the weight was 9 st. 3 lb., the stomach limits being normal, though there still remained a slight sense of distension for a short time after luncheon and dinner.

The next case came under observation in July 1891. The patient, a lady *æt.* 37, eleven years married, with four children, had first noticed flatulent distension and pain after food five years before. Various drugs and diets had been ordered from time to time, and for four years all starchy matters had been excluded from the diet. For twelve months the flatulence and pain, with frequent pyrosis, lasting for two hours or more after meals, had rendered her existence 'wellnigh insupportable.' Naturally of a cheery and active disposition, the patient found herself less and less able to carry out her duties, and complained of the increasing depression induced by the state of her digestion. There was marked *ectasia ventriculi*, the tongue was large, pale, flabby, marked with the teeth, slightly furred, more on one side than the other, and thickly towards the base. P. 68, small and easily compressible. The stomach limits extended vertically from the left fourth intercostal space to an inch below the navel, and laterally from the left mammary line to three inches to the right of the navel, and thence upwards to the junction of the eighth and ninth right cartilages.

The salol capsule taken at 2.30 P.M. on the first day of treatment gave no trace with ether till 6 P.M. A fortnight after rest in bed with general massage once daily, and abdominal massage thrice daily, the diet consisting of milk, eggs, purées of meat, and rusks, the patient still remained as at first, 7 st. in weight unclothed; but the salol reaction was obtained without ether two hours after ingestion of the capsule. At the close of treatment for five weeks 8 lb. had been gained, there was much less flatulence, the tongue was clean, and the patient had regained her usual spirits, the stomach limits being normal. Seven months later the patient had gained flesh, the clothed weight being 8 st. 12 lb.; the stomach limits were normal, and she was able to take the following dietary without the slightest discomfort:—

Breakfast—Toast, cocoa, eggs, bacon and fish;
11 A.M. half-pint milk.

Lunch—Roast meat, toast, stewed fruit, and custard.

Afternoon Tea—Cocoa, toast and butter.

Dinner—As at lunch; occasionally game or poultry and a glass of burgundy.

Twelve months later she was still enjoying good health—slight flatulent distension sometimes occurring at the period.

In June 1894 she was complaining of slight stiffness in the shoulders, arms, and knee-joints; the weight was 9 st. 4 lb.; there were no symptoms

referable to the stomach or digestion, which were normal, and painless in their functions.

The comparatively small gain in weight during the treatment of dilatation of the stomach by rest, massage, and diet, or by massage and diet alone, is doubtless due to the restriction in the use of fluid, starchy foods, sugar, and fat; for in those cases in which it has been attempted to increase the quality of the foods and the quantity of the liquids before the powers of absorption and motility are in a measure restored, convalescence has always been retarded. So also in cases of chronic gastro-intestinal catarrh, in which again it is necessary to eliminate from the dietary all easily fermenting food, which would set up gastric irritation if permitted to remain in the stomach, and diarrhœa when evacuated into the intestine; but with the aid of general and abdominal massage the demand for nourishment is excited in the previously pale and flabby muscular system, and the powers of digestion and absorption by the gastro-intestinal organs are increased. The following cases illustrate the use of massage in gastro-intestinal catarrh:—

Mr. H. M., æt. 33, came under observation in May 1890. Height 5 ft. 9 in. Weight, unclothed, 9 st. He had always suffered more or less from weak digestion; eighteen months ago had shivering fits followed by diarrhœa. For the last five months had suffered from frontal headache, epigastric pain, acid eructations, intestinal colic,

gurglings, and diarrhœa, lienteric in character, with some mucus. The dyspeptic conditions were followed during the last three months by so much 'weakness and nervousness' that he could no longer attend to his business. On admission the chest-sounds were normal, save over the right apex, where there was slight dulness and increased vocal resonance. P. 98; temp. 97·8. The abdominal walls were very thin, there was marked tenderness over the epigastrium, the stomach and ascending colon were much distended and bulging, the tongue was dry, furred towards the base, pale, and marked with the teeth. The rhubarb and salol tests were greatly delayed, and there was tympanitis with succussion sounds over the dilated stomach and colon. The former organ apparently reached from the fifth rib downwards to within two fingers'-breadths of the pubis, and it was most difficult to make out the limits between the stomach and colon respectively. The patient made no progress worth recording in the first month of treatment,—improvement taking place in one week, while in the next, pain, acidity, nausea, and diarrhœa would reduce the weight previously gained. In doubt as to whether the treatment should be continued, and also as to the limits of the stomach and distended colon, Dr. Lauder Brunton was called in, and at his suggestion the stomach was blown up, when he was able immediately to correctly map out the limits of

that organ. On Dr. Brunton's advice meat purée was added to the strictly milk diet previously given, and the massage was continued. From this time the patient made good progress, and in the remaining five weeks of treatment gained 8 lb. At the close of a few weeks' sojourn in Switzerland his weight was 9 st. 11 lb. In the following October, after a walk, he felt chilled, and for the first time since treatment, suffered three days from slight diarrhœa. At the end of December, in very cold weather, with snow, he felt sick, with frontal headache and loss of appetite, which passed off on the administration of a small dose of calomel. In the following May the unclothed weight was 9 st. 12 lb., and the patient was quite well, save for a slight headache, with nausea, which yielded to a grain of calomel with 3 grains of pil. Rhei. Co. taken that night. In March 1893, the patient, who had married a few months after being under treatment, called on the author to say how 'absolutely well' he felt. Since that date occasional assurances of the same character have been made, and on the last opportunity for examination of the abdomen, in March 1895, no trace was recognisable of the previous conditions observed in 1890.

Mrs. G., æt. 45, was admitted for treatment in November 1889, complaining of flatulent dyspepsia, with severe præcordial pain, coming on one hour after meals, followed by diarrhœa alternating with constipation. The first attack occurred in Rome

four years previously, when she suffered from nausea, vomiting of copious acid fluid, and lenteric diarrhœa. Later on the vomiting became less copious and the diarrhœa altered in character, the motions consisting occasionally of mucus only. She had been getting much thinner for nearly four years. The catamenia had ceased since July. On examination the abdominal walls were found to be flabby, the stomach was enlarged, the colon distended, there was slight tenderness over the cæcum, the liver was not enlarged or tender, the spleen could not be felt, the rectum normal. P. 96; temp. 98; urine 1.027, phosphates. Unclothed weight 6 st. 9 lb. Salol reaction three hours after ingestion. The treatment adopted was rest in bed, general and abdominal massage, and a dietary consisting of milk, finely divided meat, eggs, and rusks, and in the last fortnight unrestricted plain food. The period came on a week after the commencement of treatment. Three weeks after, the weight was 7 st. 2 lb.; there was occasional heartburn $2\frac{1}{2}$ hours after meals. A week afterwards all discomfort had ceased, and the weight was 7 st. 4 lb. In the concluding three weeks of treatment the patient put on weight very rapidly, and weighed 8 st. 4 lb. at the end of the eight weeks. There has been no return of dyspeptic symptoms, and the weight has been maintained during the last five years.

A large proportion of the gastro-intestinal cases

successfully treated by the 'rest cure' have been associated with neurasthenia; but of these the majority could not be regarded as examples of nervous dyspepsia in which the gastric or intestinal symptoms were merely local manifestations of a general neurasthenic condition. In a paper recently read before the Royal Medical and Chirurgical Society, the author pointed out the relationship between disorders of digestion and neurasthenia in nineteen cases of gastric ectasia and seventeen of constipation, in all of which the nervous symptoms, comparatively recent, had been preceded by months, and sometimes many years, of gastric or intestinal derangements, not in any sense of a neurotic character.¹ In thirteen cases of diarrhœa, and sixteen of other disorders of digestion, the same conditions have been found, and as the dietetic treatment of such cases should differ very widely from that which is appropriate in true gastro-intestinal neuroses, it appears important that all sufferers from neurasthenia, in whom the dyspeptic symptoms are prominent, should not be treated by over-feeding and seclusion, which are both unnecessary and harmful, save in hysteria and true neurasthenia gastrica. The diagnosis between neurotic and organic diseases of the gastro-intestinal

¹ 'The Relationship between Disorders of Digestion and Neurasthenia (Dilatation of the Stomach and Constipation),' by A. Symons Eccles.—*Proc. Roy. Med. Chir. Soc.*, February 27th, 1894.

tract is not always easy, especially when more or less serious disorders of digestion may be overshadowed by general nervous debility. The chemical tests, and the severity of symptoms, are the best guides to differential diagnosis, and close observation will prevent frequent error. Massage may prove equally useful in chronic disorders of digestion, whether neurotic in their origin or not; but the results of mechano-therapy are more certain in other curable derangements of the digestive function than in true neuroses, for in these latter, in the experience of the author, relapses more frequently occur than in those cases in which genuine disturbance of digestion has not been of a purely nervous origin. In two out of five cases of anorexia nervosa the patients relapsed shortly after their return home; in the other three, however, the best results were obtained. In gastralgia, flatulent dyspepsia, and diarrhœa of a purely nervous character, none of the symptoms of which the patient complains are aggravated by over-feeding, and bear no relation to the time or quality of the meals, but are generally associated with some emotional accident, and the same source of nervous irritability may cause excessive flatulence at one time, pain in the back, diarrhœa, or diuresis at another. In these cases the strict Weir Mitchell method is indicated, and the moral effect of seclusion is as valuable as the physiological effect of massage. The part played by massage in com-

bination with rest, over-feeding, seclusion, and electricity has become so well known through the writings of Weir Mitchell, himself the originator of the systematic treatment which bears his name, that no further reference need here be made to its use in cases of purely nervous stomach troubles; but many persons fail to dissociate the employment of massage from its use as a factor in the Weir Mitchell treatment, and some of those who admit its utility when combined with a psychical influence affect to discount its value *per se*. In cases of mal-assimilation due primarily to disease of the intestinal tract, massage alone, or combined with rest without seclusion, is unquestionably useful.

In many cases of diarrhœa and of constipation not accompanied by any nervous phenomena, the nutrition and healthy function of the intestine has been completely restored, and in a large number of cases in which nervous conditions have masked the intestinal defect, the restoration of healthy activity to the bowel by abdominal massage has resulted in the recovery of nervous tone.

Constipation.—The treatment of habitual constipation by massage has been successfully practised, and the results recorded by several authorities since Napoleon Laisne¹ described the systematic manipulations he practised for the relief of this condition;

¹ *Du Massage, etc., Appliqués à la Guérison de quelques Maladies*; Paris, 1868.

but the statistics and details of the treatment are somewhat meagre. Under these circumstances, and bearing in mind the prevalence of habitual constipation in this country, it may not be out of place to record here the mode, duration, and results of dealing with this condition by mechanotherapy.

The majority of the cases in which massage has proved successful fall under one or other of the following groups, each of which affords sufficiently distinct clinical features to demand recognition and consequent modification in the plan of action adopted. The first and larger group comprises those sufferers from constipation in whom the evil consequences of copro-stasis have not compelled them to abandon their usual occupations. In these, habitual irregularity, or disregard of the calls of nature, may have been the sole causes of the sluggishness in function for which they seek relief. On the other hand, it may be found that disease of the liver, or heart, causing portal congestion, or perhaps some previous painful affection of the abdominal or pelvic organs, may have originated the constipation which has since become habitual, without entailing serious interference with general nutrition. At the most, the patient may complain of decreased appetite, frontal headache, and mental dulness. Under such circumstances it is not infrequently found that a drug-habit is concomitant with the intestinal torpidity, and, in many cases,

relief is sought by the use of massage after increasing doses of various aperients have proved insufficient to ensure a regular action of the bowel. Cases of habitual constipation are often met with in men whose occupations are not sedentary, in the sense that they do not take much walking exercise, for many will say that they 'are running about the city all day,' or that they make a point of walking part, if not all, the way to and fro between their residences and offices or chambers. Again, many women, who suffer from constipation, truthfully declare that they are always taking long walks; yet, even though there may be no doubt as to the amount of walking done, these patients appear to suffer from want of exercise, as shown by flabby muscles, cold extremities, and pallid surface. The reason why walking is, comparatively speaking, of little use as an exercise in overcoming the tendency to constipation, is probably because the act is performed without any effort, and so slight are the kinæsthetic impressions produced by walking, that although there may be passive consciousness of the act, no sensation of effort results therefrom. Moreover, in many persons no apparent increase of vascularity, nor any rise of temperature in the lower extremities, follows a moderate amount of walking, when the pace and distance are no greater than customary. Abdominal massage alone at first, and afterwards accompanied or followed by active exercises, will often suffice to improve the

tone and overcome the inactivity of the organs concerned in the act of defæcation. By its use the abdominal reflexes are excited, the muscles of the belly contract, and the temporary fixation of the diaphragm induced by the firmer manipulations is followed by deep inspirations. The nutrition of the abdominal walls is improved, and peristalsis is stimulated. Possibly, vibration may stimulate Auerbach's plexus by the pressure to which the nerves are subjected between the hands of the operator externally, and the contents of the gut internally. The solid and gaseous contents of the intestine are compressed and moved onwards, especially in the colon. The abdominal vascular area is dilated, and thus nutrition is improved. The vagus is reflexly stimulated, as shown by the diminished rapidity of the heart-beats: and so, according to van Braam-Houckgeest,¹ the movements of the small intestine are consequently increased. Two or three weeks of thorough daily abdominal manipulation will usually be followed by the restoration of activity to the enfeebled bowel, and the patient may himself supplement the massage at the hands of another by kneading and rubbing his abdomen himself, or by the use of a small 'cannon-ball' covered with chamois leather, which may be rolled round and round over the belly in the recumbent position. To these passive movements must be added active

¹ Landois and Sterling, *Physiology*, p. 319.

exercises, which will not only alter the conditions of the abdominal circulation by the determination of blood to the actively contracted muscles of the limbs, but will also induce deep respirations and alternate contraction and relaxation of the abdominal muscular walls, thus varying intra-abdominal pressure, and reflexly stimulating the activity of intestinal movements. In order to attain these ends, it is best to prescribe the performance of unfamiliar voluntary acts, and frequently to change and increase the force and character of the exercises, discarding those which by reason of familiarity have become easy of accomplishment, and replacing them by others which require renewed effort. The second group consists of persons of both sexes, in whom there appears to be unquestionable evidence of mal-nutrition, shown by their inability to sustain any effort of mind or body without undue exhaustion, and in many of whom anxiety to fight against the increasing debility has led to the postponement of effectual treatment until marked anæmia and wasting have supervened, reducing them to a condition of deficient vitality, not confined to any particular bodily function, but affecting the nervous, muscular, and digestive organs alike, each and all affording ample signs of impaired nutrition. It is difficult to arrive at a just appreciation of the significance of habitual constipation in such cases. In some, one has been disposed to attribute the general impair-

ment of health to the disturbance of the digestive functions, for many patients date the commencement of their troubles from an attack of acute dyspepsia, or from the period of convalescence after one or other of the zymotic diseases, when 'indigestion' and 'constipation' first were noticed. On the other hand, many patients refer their nervous prostration and habitual constipation to mental worry or overwork, by which they have been so much harassed that the bodily functions have been neglected until their derangement has produced such serious results that diets and drugs no longer suffice to remedy the evil.

Whether it be that the constipation leads to the anæmia and marasmus, which when occurring in patients of a neurotic temperament we designate neurasthenia, or that the mal-nutrition of the nervous centres gives rise to the disturbance of the intestinal in common with other bodily functions, in these cases it would appear that at any rate when they come under observation we have to deal with a state of impaired innervation of the intestines, giving rise to atony and atrophy of the muscular walls and deficiency of the secretions.

The views expressed by the author some years ago, in a paper on the Treatment of Habitual Constipation by Massage¹ were confirmed by Dr. Lauder Brunton in his Cavendish Lecture of 1891 in the following words :—

¹ *Practitioner*, April 1889, vol. xlii. p. 260.

‘Not infrequently adults suffer from nervous irritability, depression, weakness, and inability to do anything; and this is put down on the part of their friends, and frequently of their doctors, to neurasthenia and hypochondriasis. They are treated with nervine tonics, nervine sedatives, change of scene, change of air, baths, waters, advice or scolding, and all to no good. Nervous and depressed they still remain. In some of these cases one may notice a large amount of mucus in the motions, and sometimes there appear to be actual casts of the intestines, long membranous-looking shreds apparently tubular in their nature. This condition has been described by the late Sir James Simpson under the name of membranous enteritis, and it is not only usually said to be associated with hypochondriasis, but often it is looked upon as the consequence rather than the cause of the nervous condition, which is certainly its usual concomitant. But it is of no use here to treat the nerves. If you wish for any good result, you must treat the bowels. In some, probably in many cases it depends upon the partial constriction of the intestine, near the junction of the sigmoid flexure with the rectum. The motions, lodging here, tend to cause an inflammatory condition of mucous membrane, and profuse secretion of mucus, which either simply coats the fæcal masses or forms a kind of false membrane. This condition may be due to actual constriction of the lumen of the gut, or to a diminution in its calibre from pressure. In children, prolapse of the rectum is a very common thing. In adults it is comparatively rare, but in them a tendency remains, not to prolapse of the rectum externally, but of the sigmoid flexure into the rectum; and this condition may give rise to great nervous disturbance, lasting for years, and perhaps indefinitely, unless its existence be

suspected and the proper treatment adopted. . . . I once saw a case of this sort, at intervals, for two or three years, without ever suspecting its nature. It occurred in a man from New Zealand, who had been accustomed to a great deal of horse-exercise, frequently riding forty miles a day. He began to suffer from neurasthenia, hypochondriasis, loss of appetite, failing strength, and emaciation. In fact, he presented almost the typical aspect of the hysterical girls who are so well treated by the Weir Mitchell plan, and, in consequence of this, I advised him to undergo a course of massage. This he did two or three times with very little good, until by my advice he went to Dr. Eccles.¹

The history, treatment, and recovery of this patient, taken from the case-book, are as follows:—

He was admitted for treatment on November 2nd, 1889. Height 5 ft. 9½ in., unclothed weight 7 st. 10 lb., æt. 33. A very thin, sallow, dark-complexioned man, with a dry, rough skin, blanched lips and nails; the tongue furred, flabby, and marked with the teeth. Heart-sounds were feeble, and the first short and sharp. P. small, dicrotic, 82; resp. normal, 18; temp. 98; appetite bad, slight nausea, and drowsiness for one or two hours after food. He complained of great weakness, especially in the legs, inability to obtain relief from the bowels without physic and enema. Sleep was disturbed by dreams, and unrefreshing.

¹ 'Elimination, and its uses in Preventing and Curing Disease,' by T. Lauder Brunton, F.R.S., etc.—*Trans. West Lond. Med. Chir. Soc.*, vol. v.

The urine was scanty, sp. gr. 1.028, very acid, urates, no albumen, no sugar. The abdomen presented no noticeable feature save loss of subcutaneous fat and thinness of muscular walls. Examination per rectum, dry, empty, and ballooned; there was no faecal matter within reach of the finger, but high up the sigmoid flexure could be felt protruding into the rectum.

Personal History.—He remembers that as a boy he always suffered much from constipation, and passed large motions with difficulty. In the year 1882 he first noticed inability to digest food, with a sense of fulness in the stomach, regurgitations, and a very foul tongue. These conditions he attributed to irregularity of meals, and overwork as a cattle and sheep farmer in New Zealand, when he often had to rise at 2 A.M. and kept late hours, often coming in exhausted, and late for meals. For twelve years the constipation had been increasing. After two or three hours' walking, there was so much fatigue that he was compelled to rest for three days, the legs being too weak to permit of locomotion. In 1883 he could hardly walk at all, dragging, heaviness, and tingling being especially felt in the left leg. He had suffered from left sciatica, which was cured by the hot sulphur springs of Rotorua.

On November 5th, examination per rectum revealed a large scybalous mass in the sigmoid flexure, which could be felt bulging into

the rectum; evacuation was effected by massage and irrigation with a long tube. On November 8th a similar condition was found, the scybala in faceted masses weighing together 2 lb. On November 11th there was good relief from the bowels, and the clothed weight was 8 st. $3\frac{1}{4}$ lb. November 18th, weight 8 st. $9\frac{1}{2}$ lb.; December 9th, 9 st. 4 lb.; December 16th, 9 st. 7 lb. The milk in the diet had been omitted for fourteen days, as the patient complained of nausea and biliousness. December 23rd, no gain in weight since the 16th inst., comfortable relief from the bowels daily since the 9th inst. Had been out walking during the last week, and felt no pain nor fatigue. The treatment was concluded on the following day. The patient was seen again on December 30th, when he reported that there had been comfortable relief from the bowels daily. He had walked for more than an hour each day without any pain in the legs or sense of exhaustion. On January 6th, 1890, examination per rectum showed that the redundancy of mucous membrane, which, in the earlier days of treatment, had formed pouch-like folds in the rectum, was much less, there were no scybala, the rectum was no longer distended, nor dry. On January 22nd, before leaving for New Zealand, the patient again presented himself, when no abnormality could be felt in the rectum; the bowels had acted regularly without difficulty daily.

The unclothed weight was 9 st. 8 lb. Since that date the patient has written at intervals describing his health as completely re-established. He had married in September 1890, and when last heard of, in 1894, was leading a healthy, active life, without any return of his old troubles. Examples of similar conditions have since frequently come under observation, in which the symptoms of neurasthenia evidently resulted from chronic coprostasis, under which circumstances the author is satisfied that it is useless to attempt treatment of the nervous condition unless the local cause can be successfully relieved.

The following case, sent by Dr. Napier of Glasgow, illustrates the value of abdominal massage for the relief of constipation in a patient suffering from a crowd of neurasthenic symptoms, which gradually passed away as the local condition improved.

Mrs. ———, æt. 37. History: eight years previously, after child-bed, the patient had suffered from membranous enteritis, ever since which there had been constipation. Acute peritonitis had followed a chill fifteen months before admission, and since that time obstinate constipation, pain in the right and left iliac, and in the sacral regions, had remained unrelieved. There had been pains in the head, especially about the right eyebrow, in the right eye, and in the occipital region. No action of the bowels had been obtained

without the use of a large enema of soap and water for twelve months. The patient was admitted on June 6th, 1889. Unclothed weight 9 st. 6 lb. She felt very weak, and could not endure any fatigue. Pain over the left iliac region usually came on directly after taking food, and continued for some hours after. There was tenderness and increased resistance over the ascending and descending colon. The muscles of the abdomen were flabby, and the distension of the whole colon was very marked. The tongue was fairly clean, but pale and flabby. Sleeplessness, with absolute wakefulness for several hours during the night, had existed for some weeks. On examination, the sigmoid-flexure was found to be prolapsed into the rectum, the mucous membrane of which was much relaxed, and, before the removal of a large scybalous mass, was wrapped round it and forced in front of it. No relief having been obtained from the bowels since May 31st, the scybalous mass removed was very hard and rough, causing the hæmorrhoids, which existed in the lower parts of the rectum, to bleed somewhat freely. On June 7th relief from the bowels was obtained without difficulty after abdominal massage, the motion being firm and cylindrical. The pulse was small and rapid, 96. Frontal headache was complained of every morning. On June 9th examination per rectum showed that it was much dilated, as on the 6th, but quite empty. High

up, just within reach of the index finger, could be felt the invaginated sigmoid-flexure from which three small fæcal masses were dislodged and dropped into the rectum. Up to the 13th no relief had been obtained from the bowels without active interference, but every day the scybala had been removed, either by the hand or by an oil enema with abdominal massage. On that day relief was obtained without aid, save the ordinary abdominal massage, for the first time for twelve months. Up to June 28th relief occurred daily without help; then, the bowels not having acted, a 3 oz. injection of oil was administered, which was followed by the passage of hard fæces small in size and quantity. On July 31st rectal examination showed the bowel to be absolutely normal and contracting vigorously, the bowels having been opened easily without any drugs since the 28th. On August 1st, the date of discharge, the unclothed weight was 10 st. 2 lb., and the patient, who had complained of great weakness, and had suffered from asthenopia, agoraphobia, and other morbid fears, insomnia, and many characteristic symptoms of nervous debility, was seen again in May 1890, when she reported herself quite well since treatment. In 1893 she was again reported as being in good health and spirits, and free from constipation.

The following case is so much like that of the man referred to by Dr. Brunton in his Cavendish

Lecture, that it may be interesting to note the apparent connection between diet and occupation as a cause, and constipation with sigmoid prolapse as a result. The patient, æt. 30, was sent to the author by Dr. Lauder Brunton on October 15th, 1894, so that as yet there has been too short an interval between the conclusion of the treatment and the present time of writing to see whether permanent success has been obtained. On admission he complained of rapid loss of weight, great coldness of the extremities, and premature fatigue, with obstinate constipation for the past twelve months, which had been spent in New South Wales, where he had always taken castor-oil on every third day. He attributed the derangement of function to the excess of meat and lack of other food-stuffs in his diet, together with the irregularity of meals during a short experience of sheep-farming. While in Australia the motions were black and hard, since returning to England there had been 'pieces of meat passing through, whole, without any digestion'; now the fæces were in clay-like lumps, with mucus in great quantity. He had passed all sorts of things in his motions, among others the legs of a 'daddy-long-legs,' bits of sewing thread with knots on the ends, seeds, probably of the quince, and raisin seeds, with granular *débris*. The patient's assurance that he had eaten no quinces or other seed-fruit since his return to England would suggest that his bowel had proved more retentive than

his memory. On admission his unclothed weight was 8 st. 12 lb.; height, 5 ft. 10½ in. The stomach was slightly enlarged, and the ascending colon distended, and succussion sounds were audible over both. Tenderness existed in the epigastrium, just at the junction of the epigastric and right hypochondriac regions near the eighth costal cartilage, and at a point just to the left of, and below the umbilicus. Pain was also referred to the back and across the loins at the level of the second lumbar vertebra. Moist, bubbling sounds were heard in the small intestines; pain was also felt in the right hypochondrium, and through to the back. Examination per rectum, folds of mucous membrane protruded into the rectum, and on bearing down there was felt a sharp small ring with thin edges, but there were no sacculi containing fæces. Good relief from the bowels with a quantity of mucus was obtained, the patient having taken the *ligu, euonym, pepsin, et cascar, co., ℥i., bis die.* The pulse was slow, 50, the tongue furred thickly towards the base. On October 22nd the weight was 9 st. 1 lb.; on 27th, shortly after midnight, there was much gurgling in the small intestines, and the sleep was disturbed, the patient complaining of 'fermentation inside.' The motions were relaxed. The physic was stopped. On October 29th the weight was 9 st. 3½ lb. Regular action of the bowels every two days without physic occurred, but the motions were hard, and enwrapped in inspiss-

sated mucus. November 2nd, he complained of slight pain in the right hypochondrium and back, with a sense of weight after meals. On the 4th the stomach was found to be dilated, there were nausea, vomiting, gurgling in the intestines, and diarrhœa, the motions being sour, frothy, and yellow. P. 80; temp. 99.4. He had passed a bad night, and was much depressed. During the next few days the diarrhœa continued, and the evening temperature rose; but on November 8th the temperature was normal, the limits of the stomach were reduced, but there was much gurgling in the ascending colon, which was much distended. Dr. Brunton saw the patient on the previous day. On November 12th the patient was much better, but since November 5th had lost $2\frac{1}{2}$ lb. in weight. December 3rd, had been steadily improving since November 19th, there was much acne over the back, shoulders, and chest; weight, 9 st. $5\frac{1}{2}$ lb. On December 14th the motions were healthy and formed; but the patient was still very anxious about his condition. The tongue was fairly clean, and nothing abnormal could be detected on abdominal or rectal examination. January 7th, the tongue was perfectly clean, the abdomen normal, no discomfort was felt, save, very rarely, a little flatulence at night. There was daily relief from the bowel, the motions being somewhat soft; weight, 10 st. $1\frac{1}{2}$ lb. unclothed. The patient was sleeping, eating, and walking well.

The treatment, which consisted of rest in bed till the last three weeks, abdominal massage three or four times daily, and general massage once daily, followed by resisted exercises, and walks abroad during the last three weeks, was continued somewhat longer than necessary at the request of the patient, and was not concluded until the end of the eleventh week. The dietary at first was confined to milk, and meat passed through a sieve, farinaceous foods, and the pulp only of stewed fruit; but during the last three weeks ordinary food was taken with appetite, and well digested.

One of the interesting features noticed in the early days of the treatment in this case was the slowness of the pulse, which on the first day was only 46, and did not exceed 60 until the attack of diarrhœa on November 4th, when it rose to 78, subsequently falling to 65, and as health improved, remaining steadily between 68 and 75. During the first fortnight the motions were often composed of hard, facettèd lumps, some of which contained little spicula of bone, which must have been ingested before treatment was commenced, as none but very finely divided food was taken, and all the meat was passed through a hair-sieve. The aperient continued up to October 27th either had no effect at all in softening the motions, or, as at other times, appeared to produce watery stools. Certainly, with the exception of the attack of diarrhœa in November, the patient seemed to do

better without the laxative mixture, and steadily progressed towards recovery from November 8th.

For persons who have been rendered unfit for the ordinary duties of life by the debility and emaciation, often co-existent with habitual constipation, success is rarely to be looked for from local measures alone; indeed, where the impairment of nutrition is so general, thorough treatment is indicated, and the plan pursued with the best results in a large number of cases, entails a course of active and energetic perseverance for periods, varying with the progress made, of six to ten weeks. For the first three weeks at least it is best to ensure rest and equable warmth by keeping the patient in bed, for it will almost invariably be found that the temperature is sub-normal in these cases, the axillary reading often not exceeding 97° F., and in some cases, during the first few days, in the morning before the bath, it has not been so high. The difference between the axillary and surface temperature of the extremities is also greater than normal, the hands and feet often remaining as low as 86° F. when the axillary temperature is ten degrees higher. One noticeable feature in these cases is the apparently general depression of bodily temperature; but after a few days' treatment these subnormal inequalities of temperature give place to a gradual rise with less marked fluctuations, and gradual approximation

of the surface and internal temperatures, though even after two or three weeks' treatment the cooling of the extremities during and after the manipulation of the abdomen is perceptibly recognised by the patients themselves.

Just as none of these patients present identical conditions, so it is necessary to vary the mode and duration of treatment for each individual, and this is especially true in reference to the administration of massage, on the intelligent performance and proper dosage of which the results greatly depend. The general rubbing and kneading of the trunk and limbs may be safely entrusted to a reliable person who has been taught not only the mechanical details of the process, but something of the effects it is sought to produce by employing them. It is useless to prescribe massage for so long, or so many times daily, in these cases, without watching closely the effects produced. During the first week firm friction of the trunk and limbs, with gentle muscle-kneading of the extremities once daily, and abdominal massage twice, may suffice; but in regard to the latter, time and suffering will be saved, if, in addition to the usual daily manipulation, the conditions of the abdomen in respect of pain, distension, and the action of the bowels, are recognised as indications for more frequent administration of local massage. In most cases of habitual constipation the consistency of the stools is the same; preternaturally

hard, sometimes cretiform masses of unwieldy bulk, generally coated with a thin film of slime, tinged or streaked with blood, being the character of the stool one first sees on the admission of a patient for treatment. For some days smaller rounded masses will be passed, if the dislodgment of the rectal mass is not followed by that form of diarrhœa often associated with the existence of scybalous concretions. Now if these scybala are lodged anywhere between the cæcal valve and the lower end of the sigmoid flexure, *save in one place*, they can be felt; and usually without, always with, the aid of a long rectal tube and irrigation they can be dislodged by careful manipulation. Sometimes, however, there is a fæcal mass tucked up in the corner at the junction of the transverse and descending colon, which will often be found, under circumstances of great distension, either by flatus or fæces, to rise as high as the fourth rib on the left side, just in front of the axillary line, and extending backwards. Its encroachment on the lung space can be distinctly mapped out by percussion; the pain, dyspnœa, and palpitation aiding the diagnosis of this common upward displacement of the splenic flexure.

By dint of perseverance in manipulation, which is most difficult to acquire, both by reason of the tactile skill required on the part of the operator and of the physical suffering with uncontrollable

spasm of the patient's abdominal walls if any other than very careful handling is attempted, the contents of the bowel, whether solid or gaseous, may be coaxed down into the descending colon. It is a process which should not be attempted nor permitted save at the hands of a medical man skilled in abdominal manipulation; but when carried out as it should be, the relief afforded to the patient is ample reward for the painstaking, finger-aching performer, securing for him the pleasure of reducing the patient's heart-beats and respirations to their normal and painless exercise.

Douglas Graham¹ has collated several cases in which massage has proved effectual in intussusception and fæcal obstruction. Bitterlin also records cases 'to show that in obstruction of the intestines massage of the abdominal region can bring about quite unlooked-for results, when other means have failed. Before having recourse to such extreme measures as puncture of the intestines, enterotomy, or gastrotomy, operations which are always of a certain gravity, it is important to try massage, which can effect cure in the most desperate cases.'²

No case of acute intestinal obstruction has come under the immediate notice of the writer, but on one occasion he had an opportunity of removing, by manipulation, an obstruction in the transverse

¹ *Practical Treatise on Massage*, p. 125 *et seq.*

² *L'Union Médicale*, March 18th, 1862.

colon of a patient under the care of Dr. Lauder Brunton, at whose request massage was being administered for sleeplessness. A large sausage-like tumour could be seen and felt extending across the umbilical region for a few inches towards the left, the nature of which was a subject of doubt: the late Sir Andrew Clark, who had seen the patient with Dr. Brunton, inclining to the belief that the tumour was of a malignant character. The patient was extremely thin and losing weight. Dr. Brunton requested that in performing abdominal massage the locality of the swelling should be avoided; but the writer, noticing that the tumour appeared to alter in size and shape from day to day, obtained permission to gently manipulate it one evening. The following morning the tumour had completely disappeared, and the patient was greatly elated, having passed in the night a large mass which resembled nothing so much as a quantity of boiled vermicelli. On examination Dr. Sheridan Lepine found that the mass consisted entirely of inspissated mucus churned into threads by the action of the bowel.

Massage of the Liver is extremely valuable in simple hyperæmia due to excess in the pleasures of the table or to long-continued residence in tropical or sub-tropical climates, and may also be practised with advantage in the chronic enlargement of this organ, sometimes met with in persons of sedentary

habits, in whom the act of respiration is very inadequately performed. Deep breathing acts as a kind of massage upon the liver, the contraction and relaxation of the diaphragm and chest-walls alternately compressing and permitting the organ to expand. But the majority of persons suffering from hepatic torpidity and congestion of the portal circulation are disinclined to make such exertions as would call for vigorous breathing, so that the beneficial effect of auto-massage is not obtained. In these cases epigastric oppression, flatulence, somnolence after meals, pain in the shoulder-blade, and many other more or less distressing symptoms of hypochondriasis, may be overcome by abdominal massage especially directed to the liver itself, and general massage will take the place of more active exercise, from which so many shrink at first. The sense of relief and buoyancy experienced after a few minutes' massage over the liver is very remarkable; and the effects, temporarily obtained, become permanent in many cases after a short course of treatment.

In many of these cases constipation and bilious headaches are the conditions of which the patient complains the most, and the relief from these symptoms following massage of the liver is often very marked. Frequently after massage the stools, which before had been somewhat colourless, will for a few days be very dark indeed, as if an excess of bile had been poured out. The

headache usually attributed to 'liver' also disappears, and the quantity of urates excreted is synchronously increased. Here massage acts as an excellent substitute for active exercise, and well fulfils its office for those who are unable by infirmity or otherwise to take the vigorous exercise demanded by the state of their portal circulation.

Sometimes the gall-bladder can be felt distended and bulging under the lower border of the liver, and may be successfully reduced in size, and its contents evacuated. Dr. George Harley has recorded cases in which gall-stones have been extruded by digital manipulation.¹ Dr. Wylie and others have also reported favourably of the use of massage in the extrusion of gall-stones. It must be remembered, however, that manipulation of the gall-bladder may cause hepatic colic when the massage of the liver and gall-bladder has not been undertaken with a view to the extrusion of calculi. At least, in one case in which the author had practised daily massage of the liver, on the third day the patient had a severe attack of paroxysmal pain in that region, the cause of which was clearly demonstrated by the evacuation of two small gall-stones on the following day.

Massage in Chronic Diarrhæa.—At first sight it would appear anomalous to suggest that the

¹ *The Extrusion of Gall-Stones by Digital Manipulation*, by Dr. George Harley, F.R.S.

same or very similar means can be employed successfully in the treatment of such absolutely dissimilar conditions as constipation on the one hand and diarrhœa on the other ; but if these terms are employed in their true sense, merely to denote symptoms which predominate in certain derangements of the digestive functions, not always easily defined, and frequently admitting of no more than conjectural diagnosis, consideration of some other less prominent but equally important objective signs of perverted function or pathological change will enable the observer to recognise the value of the same remedy for apparently widely different morbid conditions.

It is by no means sought to claim for the mechanical manipulations which enter so largely into the method of treatment here described, that they alone would suffice to produce the excellent results attending their use in the class of cases noted, for rest, both physical and physiological, is as necessary to the desired end as massage ; but the manipulations employed in cases of mal-nutrition, depending on disorders of the digestive organs, may justly be appraised on a somewhat higher scale than that which they appear to reach when regarded merely as a means 'to deprive rest of its evils.'¹

In all cases unquestionably *rest* is an important factor, and in this connection the term rest is used in its most comprehensive sense to imply not only

¹ *Fat and Blood*, S. Weir Mitchell, p. 71.

the absence of muscular or bodily fatigue, but of all such conditions as cold, hunger, business worry, or domestic anxiety. It may not be so difficult to ensure for the patient physical and even physiological rest; but it is not always easy to compel mental quietude, depending as it does on external influences frequently beyond the control of patient and physician alike. It is therefore of no small importance to urge upon the patient the necessity of placing himself as far as possible under conditions affording the least temptation to indulge in mental or emotional activity; and without suggesting isolation, it is certainly something in favour of a successful result if the physician can assume a control over the communications between the patient and the outer world, which can thus be modified according to the individual requirements of the case. So far as physical rest is concerned the recumbent position in a warm bed must be enjoined. In many cases of chronic diarrhoea it will be found that after the acute stage has passed patients have not been enjoined to spend a lengthened period in a recumbent position, and some who have not already reached a condition of serious cachexia are somewhat averse to the rigorous adoption of absolute rest. But so far as the experience of the writer goes, the most assured success has followed treatment in which for the first few weeks at all events the patient has been kept in bed.

An *equable surface temperature* appears to be necessary to the successful treatment of these cases, and until the powers of assimilation have been regained, and thus the nutrition of the body re-established, the most convenient way by which to ensure the absence of cold impressions on the skin is to promote the existence and maintenance of a layer of warm air enveloping the surface of the body.

To those for whom the constant drain of frequent relaxation of the bowels for many weeks or months has rendered muscular activity wellnigh impossible, or to be undertaken only with the certain consequence of extreme fatigue and exhaustion, absolute rest under careful supervision is not objected to as irksome ; but by others who have not yet reached the same condition of physical prostration, the maintenance of the recumbent position, involving abeyance of muscular exercise, is none the less appreciated when the secondary office of massage in overcoming the evils of rest is recognised. Its value is moreover impressed upon the minds of both patient and physician when, on reference to the history of the case, it is almost always discovered that bodily exercise, and certainly fatigue, are followed by increased severity of the diarrhœa.

Physical rest and bodily warmth being obtained so far as external means will allow, the next point which claims attention is perhaps the most difficult problem calling for solution in all cases of chronic

diarrhœa, namely, to obtain and maintain the *physiological rest of the gastro-intestinal canal*. The very existence of diarrhœa is in itself a symptom of pathological unrest, which, however, may be greatly modified by the quality and quantity of the ingesta prescribed; but before any particular practice can be initiated in this respect, it is necessary first to ascertain as far as possible the nature and locality of the disease from which the patient is suffering. In this, no doubt, the history of the case will greatly aid, and with careful observation of the topography of the abdominal organs, the recognition of any variation from their normal size, shape, and position, coupled with inspection of the stools, will serve to guide us in the choice of an appropriate diet, which must vary with the condition of the disease. Hence the great importance of a scientific test of the state of digestion, and this we have in the 'salol test.' Its employment in these cases of chronic diarrhœa will confirm the presence of some condition which greatly interferes with the free and rapid assimilation of food. When administered at regular intervals its excellence as a clinical method of estimating the effects of treatment, as well as for guiding us in the choice of diet and employment of remedies, can hardly, in the opinion of the author, be overestimated. Hitherto in no case has he found the 'salol test' an unreliable indication of the power of assimilation.

The significance of the salol test is very remarkable when the observations as to the reaction-time are closely compared with the objective and subjective symptoms of the case. Repeatedly the writer has administered salol with meals to patients suffering from diarrhœa. The urine has been carefully tested for salol every half-hour after the administration of fifteen grains. Meanwhile the abdominal conditions have been carefully noted. The limits of the stomach and the variations they have undergone from the time of ingestion of food to the time when the next evacuation after the meal has occurred have been noted. The sensations of the patient, the gurgling in the intestines, and the character of the stools when passed, have been closely watched. Indeed, the whole abdominal area has been subjected to the most rigid scrutiny by auscultation, percussion, and palpation, with inspection and attention to the site of pain, during the period elapsing between the administration of salol and its evacuation in the urine.

Observation of the stomach limits and the sensations of the patient will most frequently enable one to judge pretty accurately the exact time at which the pylorus has relaxed for the passage of some at least of the stomach contents into the small intestine, and the existence of diarrhœa has always been found to be commensurate with the delay in the appearance of salol in

the urine. Thus one has frequently been able to foretell the fate of the ingesta administered with salol, by observing the length of the period elapsing before the characteristic reaction has been obtained. When more than two hours intervene between swallowing the drug and its appearance in the urine, uneasiness, dysperistalsis, and diarrhœa have occurred in less than three hours after food has been taken. Frequently in severe cases colic and diarrhœa have followed within an hour, while the salol taken at the same time has not been discovered in the urine until after three or four hours, the urine passed at the same time as the diarrhœic stool exhibiting no trace of salol, even in an ethereal solution. It would appear, therefore, that diminished absorption of salol and diarrhœa in these cases depend on one and the same cause, for *pari passu* with the gradual approximation of the time at which salol appears in the urine to the time at which it was administered by the mouth the occurrence of loose motions decreases in frequency. Moreover, as the stools approach the normal type the bodily weight of the patient increases, and this again is commensurate with the rapidity of absorption of salol. So long, indeed, as there is great delay attending the appearance of salol in the urine in these and other cases of mal-assimilation, no gain in weight is observed, and so significant is the behaviour of the salol test in these cases that one is able to judge and foretell whether

there will be a gain or not according to the results of the test.

In cases of chronic diarrhœa no improvement in bodily weight has been observed so long as the test failed to give the desired reaction within three hours. Indeed, the progress of the case both in regard to general conditions and the existence of diarrhœa itself may be measured by the rapidity of absorption of salol. In other words, the diarrhœa must be regarded as the result of diminished absorption in the intestines, and this may be measured by the rate of absorption of salol; for the more rapid the absorption the greater the gain in weight and strength, and the less the frequency of the diarrhœa and the severity of other untoward symptoms.

Now Ewald has pointed out that salol is insoluble in acid solutions, while it is readily soluble in alkaline media.

The average time in health elapsing between the ingestion of salol and its appearance in the urine is forty-five minutes, and this period, as has been pointed out elsewhere,¹ may be considerably reduced by appropriate manipulations of the abdomen.

If then there is delay in the appearance of salol in the urine after ingestion, it follows that there

¹ 'The Influence of Massage on the Rate of Absorption from the Intestines,' by A. Symons Eccles.—*Practitioner*, vol. xliii. p. 241; October 1889.

has been some interference with its absorption from the intestine. It has been shown that it is insoluble in the stomach whose contents are acid, and that it is readily absorbed in the healthy duodenum whose contents are alkaline. In these cases of chronic diarrhœa, however, its absorption is greatly delayed, pointing to the fact that after leaving the stomach salol comes late to conditions under which it is soluble, namely, the presence of an alkaline medium; but in many of these cases peristalsis is vigorous, as evidenced by the painful contractions and the gurglings and movements which can be heard and seen through the generally attenuated abdominal walls. If, then, there is vigorous peristalsis and still salol remains unabsorbed for an abnormal length of time, it follows that the alkalinity necessary for its solubility must be low down in the small intestine. Hence the diminished rate of absorption of salol appears to be due to acidity in the duodenum and consequent arrest of, or interference with, the normal processes which should be carried out in the upper part of the small intestine.

This explanation is supported by the general character of the evacuations, which are so frequently pale or colourless, showing that the pancreatic functions have been interfered with, the presence of unaltered starchy and fatty matters, with the absence of bilious coloration, revealing the existence of some condition which precludes

the action of the intestinal juices (including the secretions of the pancreas and liver) on the contents of the duodenum and ileum.

It seems probable that the want of alkalinity in the duodenal contents, which is recognised by observing the diminution in the rate of absorption of salol, may account for putrescent changes in the upper part of the small intestine culminating in diarrhœa, for it may allow enzymes that require acid media to continue active too long, and putrescence may give rise to the formation of irritating alkaloids.

If any means can be devised to prevent the undue prolongation of the time during which food-stuffs remain in the stomach, and thus to limit the duration of peptic digestion and so diminish the formation of gas, much may be effected towards the elimination of poisonous alkaloids and the absorption of soluble matters.

These means are provided by the systematic administration of abdominal massage.

In chronic diarrhœa, as in all disorders of digestion, for which the author has employed massage, frequent manipulation of the abdomen enters very largely into the mechanical part of the treatment, and perhaps in no set of cases does assiduous abdominal massage produce more markedly beneficial results than in those of long-continued diarrhœa.

The effects of abdominal massage are not con-

fined to the mere exercise of pressure, and the substitution of systematised manipulations for the abdominal muscular contractions of the atonic viscera; for dilatation of the vascular area governed by the splanchnics, is produced by abdominal massage; and if Albertoni is correct¹ in attributing the existence of diarrhœa to diminished absorption, it follows that dilatation of the intestinal vessels will probably be attended by increased absorption in those cases in which it has been deficient. Certainly the employment of the salol test by the writer, both in healthy persons and in patients suffering from various forms of mal-assimilation, goes to show that abdominal massage increases the rate of absorption from the intestines. Moreover, with the increased supply of blood to the viscera and the more rapid circulation through the abdominal vessels which this produces, the nutrition of the walls of the gastrointestinal tract is also improved.

The following cases, selected from among many, illustrate the lasting result of treatment by massage :—

H. M^cL., æt. 35, was admitted for treatment on July 27th, 1888, on the advice of Dr. Lauder Brunton. Up to the age of 27 there had been no serious illness, save typhoid fever at the age of 9. During the first year of residence in a tropical climate he had slight attacks of fever, and five

¹ 'Archiv für exper.' *Path. und Pharm.*, vol. xvii. p. 291.

years later, while on a voyage, a severe attack of diarrhœa, with pain before each motion, came on and lasted for five months. On returning to his post in December 1886 the diarrhœa again came on, and the motions were never formed. If exercise was taken, or he slept after a meal, or if food were taken directly after exercise, two or three loose motions followed. This went on till January 1888, when he had lost nearly 2 st. No physical signs of any kind were observed save distension of the colon, and slight tenderness on pressure over the cæcum. For four days after admission copious bright golden-coloured motions were passed, preceded by uneasiness and gurgling.

On August 2nd, the weight was 8 st. 8 lb. as on admission. August 20th, weight 8 st. 12 lb. There had been no distension nor relaxed motions for a week ; but the bowels had been opened once daily. September 3rd, weight 9 st. 1 lb. The motions were still formed, but slightly softer during the last three days. September 10th, weight 9 st. 4 lb. ; appetite good, and motions healthy. September 17th, weight 9 st. 5 lb., and the patient left for his home, whence, a month later, he wrote that his health was perfectly satisfactory, and he was 'not conscious of having a bowel.' Some months later he again wrote that he continued quite well.

The next case, with a history of three years' muco-enteritis, has been under observation for

more than four years ; and since the conclusion of six weeks' treatment in 1890, the patient has been free from any illness or discomfort whatever.

Miss —, æt. 38, was admitted in October 1890 with the following history:—Early in 1887 she began to feel ill, and passed watery motions three or four times daily. In June 1887 she was so ill that she had to go to bed, and remained in bed till January 1888, and was more or less an invalid till early in 1889. In November 1889 the stools became fœtid, and pus was found mixed with blood and mucus. This purulent discharge has recurred. In May 1890 the diarrhœa had almost ceased, but in September all the old troubles returned.

Physical examination revealed general distension of the colon, and thickening about the cæcum and ascending colon. Slimy motions with shreds and blood-stain were passed till the 28th of October two or three times daily. On November 4th the bowels had been open once daily without any abnormal appearances ; and the weight, which on admission was 7 st. 9 lb., had risen to 7 st. 12 lb. Regular relief from the bowels was obtained once daily with occasional shreds of mucus till December 4th, when the weight was 8 st. 7 lb. ; and the patient left for her home. A month later further gain of weight was recorded. This patient was last seen in January 1895, when she declared her-

self to have been in the enjoyment of excellent health since December 1890.

Out of thirty-one cases of chronic diarrhœa, including such conditions as lienteric catarrh, mucous and membranous enteritis, tropical and hill diarrhœa and true sprue, no relapse in five years has occurred in two cases, in four years in three cases, in three years in ten cases, and in twelve cases recovery has remained assured for periods varying from two years to six months. In eleven cases, including three out of seven of psilosis or sprue, the results obtained were unsatisfactory. In one case of sprue, which had existed for ten years, the patient being greatly emaciated, after three months' treatment 18½ lb. in weight were gained, and no relapse occurred for two years. The importance of restricting the diet to milk in these cases cannot be gainsaid; but unfortunately some of them lose weight very rapidly even when the milk is taken in large quantities and in a concentrated form. It has been the practice of the author to add to each portion of milk a certain quantity of milk-powder or dried milk, which involves less trouble, and apparently meets the same requirements as the plan suggested by Dr. Thin, of evaporating the milk and so reducing the bulk of fluid given to the patient. Massage in conjunction with rest appears to promote more efficient absorption in sprue, certainly reduces the abdominal distension and fermenta-

tion present in these cases, and enables the physician to introduce other articles of diet into the regimen more rapidly without inducing a return of the frothy, sour, white motions, characteristic of this malady.

Not a little of the muscular prostration so frequently observed in cases of all forms of chronic diarrhœa may be referred to the circulation through the tissues of toxines absorbed from the intestines, and it is not improbable that the weary, aching and severe muscular pains, complained of by patients suffering from diarrhœa, are produced by the retention of poisonous albuminoids in the lymph spaces of the muscles. Under the circumstances of extreme debility, so often associated with the long-continued drain from the system, there is no process which so readily favours the excretion of materials of a poisonous rather than a nutritive character as thorough massage of the affected tissues.

For this reason, in addition to the local manipulation of the abdomen, general corporeal massage is practised once or twice daily, the muscles of the trunk and limbs being thoroughly and vigorously kneaded, mechanical expulsion of the lymph from the general tissues of the body being thus effected, while at the same time the return of venous blood is aided, and circulation of fresh arterial blood through the limbs and trunk is induced. Indeed, the effects of general massage

may not inaptly be compared with the process of stoking an engine, for it may be said that the process of combustion is improved, the clinkers which clog the furnace being raked out and replaced by fresh fuel. In this way a call for supplies is created in the flabby and ill-nourished tissues, and perhaps the better absorption of nourishment from the intestines is not a little influenced by the stimulation of the circulation through tissues whose previous prolonged inactivity has induced an habitually imperfect supply.

CHAPTER VI

Massage in Anæmia—Obesity—Uricacidæmia—Glycosuria—
Myxœdema—Rickets—Skoliosis.

ALTHOUGH a large proportion of sufferers from anæmia and atrophy may present distinct evidence of primary disturbance of the digestive functions, giving rise to mal-assimilation, there are not a few in whom it can be said that the bloodlessness and wasting were not preceded by any vitiation of the digestive processes, so far as the history and clinical observation could show. It is true that in the class in which anæmia exists most largely, viz., in young women and girls of all ranks and occupations, fresh air and ferruginous tonics frequently suffice to restore the qualitative and quantitative richness of the blood, and that the shortness of breath, palpitations, pallor, and dyspepsia disappear without any very serious interference with their usual pursuits. But there are some cases of chlorosis in girls, and anæmia in subjects of both sexes, wherein the more easy and pleasant means of treatment afforded by change of air, chalybeate waters, etc., fail to influence the blood conditions on which the debility of these patients depends.

Under these circumstances the combination of massage with rest and appropriate diet proves more rapidly successful than any other method of treatment which has yet been devised, and except in instances of markedly nervous type it is quite unnecessary to seclude such cases from the cheerful influence of agreeable visitors and correspondence. No doubt good results will not follow the treatment by massage, diet, and the recumbent position in the patient's own home if real mental, as well as bodily, rest cannot be secured. Unfortunately the conditions of family life in most households do not conduce to repose and freedom from care or petty annoyances; and as a great deal depends on attention to detail for success, so much harm will arise from the little worries of life which are most easily avoided by absence from the environment in which they most frequently occur. At the same time failure will result just as often when it is attempted to carry out the 'rest cure' in dingy 'home-hospitals,' where the food is not prepared or served in an appetising fashion, where the cleanliness and brightness of a hospital ward is replaced by the frowsiness and gloom of a third-rate lodging-house in which the nursing is all in the imperative mood, and the treatment nothing but a bad routine imitation of the excellent and well-considered system of Weir Mitchell, which has familiarised both the profession and the public with the value of mechano-therapy. It may not be out of place to

quote here the words of the veteran clinician himself, which are as true to-day as when he published them ten years ago :

‘As regards the acceptance of this method of treatment I have to-day no complaint to make. It runs, indeed, the risk of being employed in cases which do not need it, and by persons who are not competent, and of being thus in a measure brought into disrepute. As concerns one of its essentials—massage—this is especially to be feared. It is a remedy with capacity to hurt as well as to help, and should never be used without the advice of a physician, nor persistently kept up without medical observation of its temporary and more permanent effects.’¹

If these precautions are adopted, the employment of rest, massage, and carefully selected diet is attended by most excellent results in cases of anæmia and marasmus, whether resulting from some previous acute disease or from long-continued drain on the system.

The recent researches of J. K. Mitchell, already alluded to, reveal the actual value of massage in producing an increase in the number of red blood corpuscles, which he suggests are brought into the circulation by manipulation, the greatest augmentation in the number being observed about an hour after the cessation of the manipulation; and he also states that under these conditions the blood of anæmic patients may be richer in red blood

¹ *Fat and Blood*, by S. Weir Mitchell, 4th Edition, p. 13.

corpuscles per c.m.m. than is given as the average number in health in text-books ; at the same time the hæmoglobin was not usually increased to a corresponding extent. In cases of serious anæmia which have greatly improved in strength, weight, and colour after a course of rest and massage, varying from one to two months, the author has found an increase both in the number of corpuscles, counted by Gower's hæmacytometer, and in the yield of hæmoglobin. In one case of malarial cachexia in which the spleen remained enlarged for three weeks after the commencement of treatment, at the end of the seventh week the hæmoglobin, which had continued under 40 per cent. for four weeks, rose to 80 per cent. in the last week of treatment ; the patient, a young man, who only weighed 9 st. on admission, having gained 20 lb. in the last five weeks of treatment. It must be remembered in regard to the hæmacytometry in these cases that massage produces diuresis, sometimes copious and prolonged, so that the blood is increased in density, and it is possible that the early improvement in the number of corpuscles noted in cases of anæmia by Mitchell may be more apparent than real ; the concentration of the blood, due to the excessive excretion of water, giving rise to the ostensible improvement in the number of red cells per square. Be this as it may, it is certain, on Mitchell's showing, that massage alone, while it may improve the quantity of the corpus-

cular elements in the blood-current, is not able similarly to affect their quality; but if we examine the blood of chlorotic and anæmic patients before and after subjecting them to a course of massage and diet with rest, both the vehicles which carry the hæmoglobin and this substance itself will be found, at the close of treatment, in excess of the proportions recognised at the commencement. In six cases of anæmia in men, and four of chlorosis in girls, the patients, prior to the employment of the rest-massage treatment, had undergone periods varying from three months to as many years of drug treatment; iron in almost every form, with and without arsenic and laxatives, had been exhibited without any satisfactory modification of the well-known symptoms arising out of impoverishment of the blood. In three of these cases the patients declared that they were unable to take iron in any form, violent dyspepsia, and in one instance vomiting and diarrhœa, following its administration; but in all these, at the end of the first week they were taking large doses of malt and iron after each meal containing farinaceous matters, and it did not appear to signify whether the iron was taken in the reduced form in sandwiches, as a pyro-phosphate, or as a carbonate in bi-palatinoids; though the most easily assimilable form appears to be in these, as in other cases in the experience of the author, the pyro-phosphate given in an extract of malt. The conclusion arrived at in regard to

the influence of massage on the assimilation of the ferrous salts is that oxidation is greatly improved by the manipulation of the muscles, and while waste products are removed, a demand is created for the supply of hæmatinic material to the pale, flabby tissues of the sufferer from anæmia.

Obesity.—In some cases of chlorosis in young women, and in a larger number in adults of both sexes, anæmia is frequently associated with undue fat-formation, and indeed, as is well known, obesity may accompany other morbid states in which the oxygenising function of the blood is deficient. Under these conditions the various methods of reducing the surplus accumulation of fat by dietetic or hydro-therapeutic means are not always unattended by risk of further blood impoverishment, to which the obesity has been primarily due. Especially may this be the case when cardiac mischief is associated with the fatty infiltration and muscular degeneration so frequently observed in stout and bloodless persons. The adoption of strict regimen may be followed by a diminution in weight, and the bulk may be reduced; but these conditions may not be reached without establishing serious loss of strength, particularly in those subjects in whom lipogenesis is superadded to the dyspnœa, palpitation, and muscular feebleness of anæmia. Under these circumstances the necessary restriction in diet to

ensure diminution in the supply of fat, and the augmentation of the oxidising function of the tissues, may best and most safely be carried out by the aid of massage.

Before the enfeebled patient can promote his or her own well-being, by strict attention to diet and regular exercise, the excess of fat may be speedily reduced without loss of strength by the means suggested by Weir Mitchell,¹ which may be followed after a fortnight by active movements and a modification of the Oertel treatment, hereafter to be described.

In some cases the writer has found the immediate use of raw meat juice more desirable than the skimmed-milk diet alone. The massage must at first be moderate in duration and force, but even in cases of fatty-heart with distant and feeble sounds, fairly vigorous kneading of the whole body may be practised at an early date without producing any exhaustion. The rate at which weight is lost under these conditions varies very considerably in the same individual from day to day, and in different individuals according to the effects produced by the diet and massage. If, as may sometimes occur, the reduction in quantity of fatty and starchy foods and the administration of massage appear to have too depressent an effect on the heart's action, the modification of the dietary and the employment of massage needs to be very

¹ *Fat and Blood*, p. 105.

gradually and watchfully initiated ; but the author has never seen any ill effects produced when the treatment has been carefully regulated, and the patient has been prevented from attempting any over-exertion.

From 5 to 8 lb. per week is the largest reduction that the author has seen in cases of anæmic obesity without interference with the strength of the patient, except in the direction of improved muscular power.

The permanency of the results must depend upon the perseverance of the patient in curtailment of the pleasures of the table, and prolonged activity of the muscular system. Few, however, who will submit to any method for the reduction of fat, will undergo the irksome discipline, which the mildest form of treatment must entail, and subsequently abandon the slight restrictions in diet, which adherence to the rules laid down by the late Mr. Towers Smith¹ involves. No doubt the majority of sufferers from obesity may obtain adequate relief by pursuing the course prescribed by him ; but there are some cases not uncomplicated by renal troubles, which may with safety be treated at first by rest, massage, and modified diet.

Uric-Acidemia.—In a number of cases diag-

¹ 'Obesity and its Treatment by Diet,' *Edin. Med. Journ.* ; 1892.

nosed as neurasthenia, it had been frequently noticed by the author that the depression and irritability from which the patients suffered were most marked in the forenoon; while as the day advanced the nervous phenomena subsided, and many patients who were at their worst in the early morning hours, became comparatively cheerful, and certainly less restless in the evening, in contradistinction to the usual chronology of subjective and objective symptoms in sufferers from other, and particularly acute maladies. With the morning hebetude and comparative misery, sometimes amounting to abject hopelessness, into which such patients fell, it was noticed that the arterial tension was high during the period of matutinal despondency, the extremities were cold, and the aspect of the patient pallid and shrunken; but it was not until after the publication of Haig's¹ brilliant series of observations on Uric Acid that the writer was able to explain the clinical phenomena exhibited by many so-called neurasthenics who sought relief from their troubles by a course of 'rest-cure,' in which massage is such an important element of treatment.

Subsequent investigation into the urinary conditions, on the lines laid down in Haig's work on Uric Acid, not only explained, in a great number of cases, the higher tension recognised in the pulse in the forenoon, and sometimes in the afternoon,

¹ *Uric Acid in Causation of Disease*, by Alex. Haig.

associated with corresponding waves of depression and irritability, but it further furnished a reason why so frequently in cases of sleeplessness, mental depression, and nervous debility, when betterment at first takes place, 'rheumatic' or gouty pains are found to alternate with the periods of depression, and sometimes to replace them. It is most remarkable, in looking over old case-books, before Dr. Haig's facts and views thereon were known, to note the frequency with which such variations in the state of the patients have been observed, and the periodic substitution of aching pains for the nervous symptoms of which they complained. The facts were observed, but the reason for their existence remained unrecognised. Moreover, the author had learned to prescribe massage in these cases in the forenoon and afternoon, because it was found that the peripheral resistance and cold misery associated with the periods of greatest depression were overcome, and for a time held in abeyance, by the administration of vigorous massage, increasing the vascularisation not only of the muscles, but of the skin, which, previously pale and bloodless, often mottled blue, became ruddy and warm.

Subsequently, in the light of Haig's work, the value of massage in cases thus recognised as dependent on uric-acidemia, was fully explained, for the excretion of uric acid in these cases is in the early days of treatment distinctly increased,

though as diuresis is established under the influence of massage, the uric acid sometimes disappears, and at others is only found in excess at long intervals, or is decreased in amount per diem, and this, too, sometimes occurs even though the diet is comparatively rich in proteid matter. In cases of Sciatica, also, the author believes that he has been able to account for the nocturnal exacerbations so constantly characteristic in this malady by the existence of the acid tide described by Haig, which rises between 9 P.M. and 3 A.M., when the uric acid is retained in the fibrous sheaths of the nerve and muscles affected. The retention of uric acid in the tissues, and its storage in the body, must be greatly favoured under the conditions of enfeebled circulation so often concomitant with thin-walled and dilated hearts found to be present in a certain proportion of cases which have perhaps rather loosely been regarded and described as neurasthenics; the term, in the minds of some, signifying a subjective and almost wilful nervous state, not far removed from the opprobrium attached to hysteria, and, in the minds of many, occupying a sort of half-way house between true and feigned disease. Every day, and more especially since physiological chemistry has been brought to the aid of diagnosis, the etiology of wide-reaching and still somewhat obscure conditions of ill-health is becoming clearer, and underlying the varied phenomena grouped under the

vague term neurasthenia, disorders of digestion, vitiation of chemical processes and retention of toxic substances, with the periodicity of their storage and excretion, will be found, and indeed have already been recognised to be the true and sufficient cause of suffering, none the less real because hitherto inability to recognise objective and truly existing signs has prompted us to suspect the reality of the subjective symptoms so painfully experienced by those who endure them.

It has been the misfortune of the author to listen to bitter railing against the association between neurasthenia and massage, which has been described as unscientific and unnecessary; but what more rational and scientific treatment can be brought to bear on the class of cases designated neurasthenic, if it can be shown that the functional derangement and enfeeblement of the nervous system is due to the conditions suggested above? Surely the indications are to conserve energy, improve nutrition, and increase elimination. All these may be fulfilled to the best advantage by a course of rest, diet, and massage, with or without seclusion, as, in the opinion of the physician, the nervous state of the patient may demand. In the case of uric-acidemia, where the manufacture, storage, and circulation of the acid is in excess (giving rise to increased tension, headache, dyspepsia, mental depression, irritability, and aching weariness), the administration of massage under circumstances of

comfortable rest, freedom from the daily and hourly worries of active life, and with a well-devised scheme of diet, will increase metabolism, improve oxidation, and by accelerating circulation and dilating the vessels will reduce tension, and favour the solution and elimination of the uric acid.

Glycosuria.—Douglas Graham¹ quotes the results in seven cases of diabetes, associated with obesity, in which Dr. Forestier treated this malady successfully with the douche-massage as commonly practised at Aix-les-Bains; but as proof of the efficacy of massage alone in such cases, Graham cites the experience of Prof. Finkler of Bonn, in fourteen cases in which the quantity of sugar and of urine was decreased, thirst was diminished, the bodily weight increased, and in one case, after three months' treatment, sugar entirely disappeared from the urine, which remained normal for three months. That massage may be temporarily useful in diminishing the excretion of sugar in gouty glycosuria appears to be well assured; but the disappearance of polyuria, diminution of thirst, and increase in bodily weight frequently occur in subjects whose symptoms have only been manifested after middle age. Massage would seem to be useful in these cases, as it is in uric-acidemia, oxaluria, and leucomainuria, in promoting better oxidation and freer interchange between the

¹ *Recent Developments in Massage*, p. 37 et seq.

blood and the tissues. The author has certainly seen disappearance of sugar from the urine take place in two cases of a gouty character while the patients were undergoing massage, but subsequent relapse into lazy habits, uncompensated by massage, brought about a return of the glycosuria. In another case, in which traces of sugar and albumen were found in the urine, it was noted that the patient was free from both albuminuria and glycosuria through the whole of one winter during which general massage was given once daily; but the effect was not lasting, and as soon as the patient discarded the services of the rubber, the morbid conditions in the urine returned.

Myxædema.—In this disease, the well-known beneficial effect of thyroid extract supersedes all other means yet devised for the alleviation of the distressing symptoms which characterise the malady; but prior to the remarkable therapeutic advance made in the direction of organic extracts, Douglas Graham had noted the satisfactory result following a course of six weeks' massage in a case of myxædema of four years' duration, in which the boggy condition of the tissues gave place to suppleness and freedom of motion, the mental tone was improved, and after six years the improvement is recorded as still continuing; the patient is practically well, and able to attend to business. Since 1885, when Dr. Graham first

employed massage in myxœdema, several cases have been recorded in the journals of this and other countries in which massage has proved a most valuable adjunct to the treatment by thyroid extract. Others remain unrecorded, one in the practice of the author's friend, Dr. Gowan of Stanmore, and another in his own, in which seven weeks' massage increased greatly the rapidity of improvement already commenced under the influence of thyroid extract taken by the mouth. In view of the researches of Horsley, it is possible that the value of massage in myxœdema may depend upon the increase of red blood corpuscles in the circulation, to which the recent investigations of Mitchell point; at the same time, the mechanical effect of massage in unloading the tissues of their mucin may also co-operate with the increased vascularity produced by the manipulations. At any rate, it appears to be unquestionable that massage greatly aids the rapidity with which the excellent effects of the gland extract treatment are produced in these cases.

Rickets.—Of all the maladies depending upon mal-nutrition to which young children are subject, none affords a more encouraging field for the use of massage than rickets, for while all authorities appear to agree that the change undergone by the bones of rachitic children arises out of certain defects in nutrition, none show the same unanimity

as to the best methods of arresting the effects following mal-assimilation, which certainly occurs even in children whose diet and hygiene are most carefully and skilfully regulated. The inefficient diet, foul air, insanitary surroundings, and want of cleanliness, to which the majority of cases of rickets are commonly, and perhaps fairly, attributed, cannot always account for the examples met with among children who, in spite of the strictest scrutiny, cannot be alleged to have suffered from carelessness of the smallest details affecting the development of their well-being. In these, if not in all, the arrest in growth and development appears to be the result of mal-assimilation rather than defective dietary, in diminished oxidation not dependent on a lack of fresh air, in deficiency of elimination unassociated with an insanitary environment or lack of personal cleanliness. In such cases, the food may be properly selected, the child may be taken regularly into the open air, and may be kept perfectly clean and sweet by the abundant use of soap and water and frequent change of garments; still he sweats profusely, his wrists enlarge, his legs become weak, his joints loose, and his chest soft, while he constantly suffers from chill in his chest, or belly, the latter of which is enormously swollen out of proportion to his stunted, anæmic little body. He is nervous and fretful, sensitive to all external impressions, backward in dentition, capricious in his appetite, and, instead

of exhibiting the lively and restless activity of the healthy youngster, he lolls about, sleepy and fretful, listless and sick. Under these circumstances, nothing is more remarkable than the excellent revolution wrought in such a case by the gentle, patient, and persevering application of massage, modified in force and duration to meet the requirements of a tender babe ; literally tender, for many of these rickety children are so full of pain, that they cry out even when the nurse lifts them up. Any good, conscientious woman may, if she will, learn from a skilled source enough of the technique of massage to be serviceable to a little child ; but her hands must be soft and pliant, her patience long-suffering, and her sympathy for the sufferer maternal in its wealth, otherwise the little frame will be bruised, fears aroused, and confidence destroyed ; a condition of affairs which will effectually preclude the advent of such beneficial results as the author has had the good fortune to witness in more than twenty cases of pronounced rachitis.

The best time for the application of massage in cases of rickets, as indeed in all maladies of young children in which massage is prescribed, is after the bath in the morning and evening. The child should be carefully lifted from the bath on to a wicker-work frame fitted with a mattress, which may be protected by waterproof-sheeting, and covered with a piece of thick flannel of sufficient size to enwrap the child warmly and closely

after it has been rapidly dried with a soft Turkey towel. The wicker frame, with the child resting thereon, should be laid across the nurse's lap, whose left arm protects the child from the risk of rolling off the mattress, while with the right, gentle palmar friction is used over the abdomen and chest. The arms may next be rubbed and handled lightly in a centripetal direction, and while the lower extremities are similarly dealt with, the rest of the infant's body should be swathed in the warm flannel, whose under-surface may be fastened to the frame by means of tapes, thus obviating any danger of the child slipping off the frame. The front surface of the body and limbs having been manipulated, the infant should be turned over for the friction of the lower limbs; these should be well wrapped up before the most important rubbing of the back is performed.

The opinions of authorities on massage differ as to the use of lubricants, and the author has, in a previous chapter, expressed his views thereon; but if the employment of an emollient may be regarded as unnecessary in the massage of adults, it is certainly indicated for use in infants and young children.

Of all fatty matters for this purpose the author prefers purified neat's-foot oil, which should be quite clear and free from odour. When employed for children the oil must be thoroughly

warmed and poured in very small quantity into the palm of the rubber's hand, the strictest care being taken never to pour the heated oil directly on to the skin of the infant. It is not an easy matter to rub gently, but effectually, a weak and fretful baby, but the expenditure of time and trouble on the detail of the process will be rewarded by the quiescence and comfort derived therefrom by the little people, some of whom appear to thoroughly enjoy the manipulation of one in whom they have learned to repose confidence.

Lateral Curvature of the Spine sometimes occurs as a result of rickets, and if any tendency to skoliosis is observed in a rickety child it is well to enjoin the constant use of the wicker frame already mentioned. If the infant is always carried on the frame the risk of curvature is greatly reduced; and though it is rare to find any great improvement taking place in a case of rachitic skoliosis, increase of the deformity may be arrested by the employment of massage, and the substitution of a firm mattress for the usual soft bed at night, while during the day the horizontal frame takes the place of the nurse's arms.

In the treatment of lateral curvature due to pain, *e.g.*, sciatica, lumbago, or rheumatic conditions of the fibrous and muscular tissues of the back, massage of the muscles of the back will

often be of service in promoting better nutrition, and in the same way some appreciable good may be done even in cases of severe skoliosis in which the muscles on both sides are pale, flabby, and ill-nourished. In the earlier stages it may be possible to arrest the further development of deformity by systematic massage and exercises; but when once rotation has occurred the only real benefit which can follow the employment of muscle-kneading and movements is the development of power in the muscular and strength in the ligamentous and fibrous structures which aid in bearing the weight carried by the vertebral column. There is little doubt that freedom of movement and treatment by massage, and exercises, are preferable to the employment of rigid and heavy supports in cases where it is possible to train the patient to adopt habitually the attitude of least deformity; but all that can be promised to patients suffering from skoliosis is that mechano-therapy affords the best prospect for the prevention of further deformity. In lateral curvature resulting from habitual faulty attitude, or occupations involving asymmetrical use of the arms, massage with passive and active movements will certainly effect a cure, in so far that no curvature can be recognised in some cases after treatment, which before exhibited all the signs of marked lateral deviation of the spine. It is doubtful, however, in some of these cases in their earlier stages whether rotation has actually

taken place ; and, of course, if this has not occurred the success of treatment is greatly favoured.

The value of massage in the treatment of scoliosis may easily be recognised when it is employed for growing children or adults by testing the muscular strength of the back before and after a fortnight's manipulation. If the patient is placed in the prone position upon a couch with the trunk swinging over the edge, while the attendant throws all his weight on the thighs in order to save the patient from falling, it will be found at the commencement of treatment that, unless the trunk is supported, the subject will have no power to raise the body from the downward bent position to the horizontal level of the couch ; but at the close of a fortnight, after daily massage without exercise, the patient will usually have gained the power to rise up from the bent position, and after one or two practisings he will be able to bend the body backwards without assistance.

Under the influence of assisted, unaided, and resisted movements the power developed in the muscles of the back speedily exceeds that with which unpractised, healthy persons are normally endowed. The progress of the treatment by exercises is greatly facilitated by the preliminary and continued use of massage.

Pain in the back is so frequent a complaint among growing girls that it is important to make

sure of the absence of any curvature. Very often slight lateral curvature will be found to exist, and to be associated with faulty attitude in these cases, due to general debility and want of muscular development. Here massage is of service in relieving the rachalgia and increasing the circulation through the dorsal muscles. The rubbing and kneading should be gentle, and employed equally on both sides of the spine, the walls of the chest also being subjected to firm friction along the intercostal spaces. Exercises employed too early will only increase the pain and lassitude; but preceded by a few weeks' massage, they are most useful in improving and maintaining healthy tone.

CHAPTER VII

Massage in Diseases of the Nervous System—Neuralgia—
Neuritis—Perineuritis—Sciatica—Paralysis—Of Central
Origin—Toxic—Peripheral—Occupation-Neurosis.

As may well be supposed, massage has been proved to be more particularly valuable in functional disorders of the nervous system, and in diseases of the nerves of peripheral origin, rather than in central nervous affections; although in these also its employment is not without utility in some cases, especially in the earlier stages of progressive diseases, in which it appears to have aided the temporary arrest or delay in the onset of serious symptoms.

Massage in Diseases of the Peripheral Nerves—Neuralgia.—The term neuralgia is here used to denote a condition of pain of a paroxysmal character, usually unilateral and shifting from one point to another corresponding with the distribution of the superficial nerves. By far the largest number of cases of neuralgia appear to be associated with anæmia, and for this reason local massage alone, though it may serve to relieve pain, and reduce the frequency of the paroxysms, will not be so

valuable as it may prove to be when the pain experienced in the course of the trunk and branches of the nerve is dependent upon neuritis or perineuritis. Local massage of the part affected by idiopathic neuralgia will often alter the character of the nerve pain, and allay its severity, especially when the determination of locality depends upon exposure to cold impressions which have not been sufficiently intense or prolonged to produce any inflammatory condition of the nerve sheath. But in neuralgia associated with anæmia, glycosuria, or uric-acidemia, the local pains which may be due to the hæmic conditions require something more than the improvement of the local circulation following massage. In these cases, of course, means must be taken to remove, or at any rate to modify the causes on which the pains depend, and here general massage serves as a valuable adjunct to the other means of treatment adopted. In the majority of instances *neuralgia of the fifth nerve* is associated with anæmia, which, again, may be due to malarial or other causes, resulting in qualitative blood changes. In severe cases the rest cure, with frequent manipulation over the site of the pain, will often result in general improvement and a cessation of the local suffering; but, unless the state on which the neuralgia depends can be permanently affected for the better, a very slight exciting cause will suffice to induce recurrence. The same experience will also be met with in

neuralgias affecting the head and neck, apparently for the reason that (as in *cervico-occipital neuralgia*) the pain occurs in a region which is frequently exposed to variations of temperature and direct currents of air. In *cervico-brachial neuralgia* and *brachial neuralgia*, which, as Gowers has pointed out, may often be associated with neuralgia of the fifth nerve, the author has been able to successfully relieve the pain in the arm and neck by local massage; whereas the trigeminal pain has proved much more obstinate, and in some cases unyielding. Intercostal neuralgia, as a rule, is speedily and permanently relieved by one or two applications of local massage, except when associated with herpes-zoster, when the occurrence of the eruption prevents the employment of manipulation.

Rachialgia of a distinctly neuralgic type occurring in anæmic patients of both sexes, and not resulting from an injury involving compensation, yields more readily than any other form of neuralgia to treatment by friction and kneading of the spine, even in those cases in which the patient complains of an exacerbation of pain following prolonged effort or slight fatigue. It is perhaps unnecessary to cite cases of the various forms of true neuralgia in which massage has been employed with varying success by the writer; but the records afforded by notes of fifty cases, in which neuralgia was a prominent symptom, point to the uncertainty of results except in patients

whose local pain evidently depended on conditions of mal-nutrition which improved under treatment, including general massage among the means adopted.

In all forms of neuralgia of an idiopathic character, *i.e.* independent of causes on which it is obvious that no local treatment, save the removal of the cause, could exercise a beneficial effect other than temporary anæsthesia may produce, massage of the part affected will alter the character of the pain and frequently postpone the onset of a paroxysm. This is very markedly the case when it is found on examination that the surface temperature is lower over the area of pain than it is over the corresponding area of the opposite side or in the adjoining parts outside the painful zone. Thus in trigeminal neuralgia it will frequently be noticed that the skin over the painful area is cooler by two or three degrees than that of the unaffected side of the head, and the condition of the superficial arteries of the two sides will, at the onset of a paroxysm, be found to be very different on the two sides. For instance, in cases of supra-orbital neuralgia, the author has often found that the side of the head, nose, and forehead corresponding to the side of pain is usually colder to the hand, and actually lower in temperature, as ascertained by an Immisch thermometer, than the opposite side, both at the commencement of a paroxysm and in the interval. Sometimes after

long-continued pain the temperature of the aching part will be raised, and the pain, in the earlier stage of the attack described as lancinating and boring, then assumes a throbbing character, which is frequently hailed by the patient as a herald of cessation from suffering. Similarly the tension in the anterior temporal, supra-orbital, and angular arteries of the two sides will differ. While the vessels of the painful side will be small and sometimes hard like cords under the finger, those of the opposite side will be full and soft. Subsequently after long-continued pain the previously small, hard arteries supplying the painful area will become tortuous, full and bounding, as they are in congestive headache. Now, the influence of massage applied locally in cases of neuralgia appears to depend greatly on its effect in altering the condition of the circulation through the painful area. Moderately firm friction, rolling, and kneading of the tissues overlying the temporal, frontal, nasal, and malar bones for a few minutes will completely alter the conditions of local temperature and circulation. Pleasant warmth and low tension will supersede the coldness and arterial rigidity, and with very rare exceptions the pain will be allayed, the severity and duration of the paroxysm will be decreased, and the dreadful anticipation of suffering will be relieved. But the effects so produced must be kept up by the maintenance of the warmth and easy circulation.

Warm applications, not superheated fomentations, the part being well swathed in flannel or woollen wraps, so that radiation of heat from the surface may be prevented, are most comforting; and, in the case of trigeminal neuralgia, the addition of a few drops of laudanum to the stupe, which is applied next the skin, will often induce sleep, from which the patient awakes refreshed and free from pain.

Cold applications are inadmissible in neuralgia, and the use of cold water for ablution, and exposure of the painful part to great changes of temperature, must be forbidden to all sufferers from neuralgia if they are to hope for the good results obtainable from massage. Perhaps it may be said that the success attending the employment of massage under such circumstances is due not so much to the mechano-therapy as to the precautions taken during the course of treatment. This may be so in a measure; but from actual personal experience in taking these precautions, with and without massage, the results have not been so happy in the latter as in the former case.

If the induction of local warmth and the reduction of peripheral, arterial, or capillary resistance are the conditions favourable to the arrest or modification of neuralgic pain, are there not other and more simple means at our disposal equally effective? Again, this may be so; but these conditions are brought about by local massage gradu-

ally and gently, while the application of warmth subsequently sufficient to maintain the effects does not prove efficacious when employed to obtain them.

The heat required to raise the temperature and alter the state of the circulation is greater than that which is needed to prolong the conditions produced by manipulation; and such heat does not, in the writer's experience, produce the same equable and favourable results. The temperature is suddenly raised, the vessels of the part become turgid, and the pain is altered only to the extent of prolonging the stage of throbbing agony, which, under other circumstances, is the transient precursor of freedom from acute suffering. Then, again, the conditions on which the observations of the writer have led him to believe that the efficacy of massage in temporarily relieving or controlling neuralgic pain depends, may be unduly limited; for although the most obvious and visible effect of local massage on a neuralgic area is the alteration in the temperature and arterial tension, it may well be that the unloading of the efferent vessels, the distribution of the lymph in the tissues, and the vibrations set up mechanically in opposition to those associated with pain are all factors in the production of the desired result in these cases. There is nothing in the mode of using local massage for the relief of neuralgia which calls for any detailed description; but it

may be well to briefly notice the methods found most useful and appropriate in the different localities most frequently the site of neuralgia.

In supra-orbital neuralgia, the forehead, from the superciliary ridge to the roots of the hair, should be subjected to moderately firm friction with both thumbs in a linear direction transversely from the nose to the ear. The patient may be in the recumbent or semi-recumbent posture, the head being well supported; while the operator, placing his two thumbs above the nose in a parallel position, with the tips pointing upwards towards the roots of the hair, draws them gently but firmly apart, and outwards towards the ears on either side. This movement is repeated till the whole of the forehead has been similarly dealt with, so that all the tissues are subjected to friction, and are rendered alternately tense and relaxed. The skin and subjacent fascia may then be rolled between the fingers and thumbs, and, without rubbing the skin, the finger-tips should be employed in moving the skin and tissues over the frontal bone as far as their attachments will allow in every direction.

By a rotatory movement of the thumb the malar and nasal regions should also be rubbed, and afterwards kneaded between finger and thumb-tips, so far as the character of the tissues will permit. Percussion with the finger-tips may afterwards be employed over the painful area, the

rate most usually found agreeable to the patient being between thirty and forty taps per minute ; but as percussion over the tender points, generally present in these cases, is very much more painful than friction and kneading, the practice of the author has been to omit percussion in cases of trigeminal or other neuralgias in localities where the tissues overlying bones are thin, and the nerves running in them are thus more exposed to the painful pressure between the finger-tip (or percutor when used) and the slightly covered bone which tapôtement perpendicular to the surface entails.

The relief afforded by gentle friction and kneading with the finger-tips of the whole scalp in vertical and general headache is often very marked ; but this procedure needs no description, and partakes more of the nature of dry shampooing than of massage ; any one with a light hand can employ it for the production of the soothing effect on the sensorium which follows monotonous impressions.

Massage of the scalp for rheumatic headache, wherein the pain appears to be caused by pressure on the sensory nerves of the occipito-frontalis muscle and aponeurosis, should be vigorous, the friction and kneading being applied from before backwards, and carried down over the cervico-occipital region, the manipulations concluding with neck massage, as already described (*vide* Chap. I.).

In *Occipito-Cervical Neuralgia*, the superficial branches of the small occipital nerve appear to be the subjects of the pain; but it is difficult to differentiate in this—as in other cases of pain occurring over the aponeuroses and fasciæ of muscles which may be affected by rheumatism—between neuralgia and rheumatism. The existence of pain depending for its onset or exacerbation on movement or pressure, points to a rheumatic origin, in which case deep kneading of the occipito-frontalis, trapezius, and splenius muscles must be added to the ordinary neck massage of Gerst.

Pain in the back of the head and neck is not an infrequent concomitant of intermittent fever and ague; indeed, it is almost as commonly associated with malaria as 'brow-ague,' and has been observed by the author in co-existence with the frontal pain.

An interesting fact which has been noticed both by Dr. Lauder Brunton and the writer is, that a direct current of air, such as may be too frequently encountered in churches and other places of public resort, when it impinges upon the occipito-cervical region, will produce an attack of malarial fever in persons who have been previously attacked by fever and ague; and this may be verified, as has been done by the writer for experimental purposes, if any one in whom the aguish tendency still remains can induce a friend to

direct a current of air from a pair of bellows on to his unprotected cervico-occipital region. Sitting with one's back to a slightly open window will produce an attack of ague in the same way. Dr. Head, in his remarkable contribution on disturbances of sensation with special reference to the pain of visceral disease,¹ associates occipital headache and tenderness with the subumbilical area, which does not coincide apparently with affections of the spleen, to which organ the author has failed to find any reference.² Cervico-occipital neuralgia with superficial tenderness is very frequently associated with malarial cachexia, of which the author has seen very many examples.

In his own case vigorous massage of the back of the neck and head appears to have influenced the duration of the cold stage of ague; but the observation needs further confirmation. Cervico-brachial neuralgia should be treated by massage of the whole upper extremity and side of the neck corresponding to the area of pain. Tapôtment and vibrations seem to be more applicable in this locality than in the areas in which the bones are less well covered.

The mode of applying massage in *rachialgia*

¹ 'On Disturbances of Sensation and the Pain of Visceral Disease,' by H. Head, M.D.: Part ii., *Head and Neck*.—*Brain*, Part lxxvii.

² Save in one case, where the spleen *post mortem* was found to be 'small, and congested with small fresh infarct in upper part.'

differs in no respect from that previously described (*vide* p. 20) : save that special attention must be paid to the tender points, the tissues over the vertebræ themselves must be well kneaded, and somewhat vigorous rubbing must be done along the whole length of the spinal column. Pain in the sacral region is not usually of a neuralgic character, unless it is referred from a pelvic origin, as Gowers has shown. Pain in the lumbar region is almost always associated with sciatica, and in the experience of the writer, which now extends over more than two hundred cases of lumbago and sciatica, neither of these painful conditions is usually of a neuralgic character ; but in the former case rheumatism or muscular overstrain is the most frequent cause of pains in the loins, while in the latter, perineuritis and neuritis are the most usual conditions which produce pain in the course of the sciatic nerve and its branches.¹

Neuritis.—The treatment of simple and multiple neuritis and perineuritis by rest and massage is attended by much more certain and enduring good results than that of idiopathic neuralgia. In the earliest stages of alcoholic and rheumatic

¹ For detailed consideration of the causes, nature, and treatment of sciatica, the reader is referred to the author's work on the subject.—*Sciatica*, by A. Symons Eccles. Macmillan and Co. May 1893.

neuritis the inflammatory conditions would doubtless be increased by an injudicious attempt to perform thoroughly vigorous massage of the part to which the affected nerve is distributed; but in the commonest situation for perineuritic and neuritic disease, viz., the sciatic nerve and its branches, it is not necessary to postpone active mechano-therapy beyond one or two days if care is taken to avoid bruising the nerve in the more exposed situations, especially in the case of the peroneal nerve, where it is superficial behind the head of the fibula, and where it crosses that bone on its way to pierce the muscle. The posterior tibial and sciatic trunk being well protected from any danger of bruising, except where the sciatic nerve lies in the popliteal space, deep kneading along the course of the nerve from the internal malleolus upwards to the sciatic foramen may be practised without danger of increasing inflammation. Indeed, even when the pain during the massage may be very severe, the author has never seen a case in which his own manipulation, or that of skilled assistants, has failed to produce relief as soon as the massage is ended; and in cases in which systematic massage has been practised at regular intervals, the recurrence of pain in the interim between the administrations of the remedy has never been characterised by the same severity as that of which the patient has complained prior to the initiation of the treatment. In this temerity

in dealing with cases of perineuritis and neuritis of the sciatic nerve the author is borne out by Schreiber. He, however, adopts a different method of procedure from that employed by the writer, who commences immediately with massage of the affected limb, deferring the passive movements involving nerve-stretching to a later period, while Schreiber appears to begin treatment with passive movements and active exercise, subsequently kneading the limb. Doubtless each method is equally successful in the hands of those who practise them respectively. At any rate, there is no condition for which the author has employed massage wherein he has had the same proportion of almost unvarying success; so that in a case of sciatica unassociated with pressure from pelvic disease or tumours in the course of the nerve, he regards the issue with very little apprehension. Five or ten minutes twice daily suffice for the earlier applications of massage; before the end of the first week, ten, fifteen, and twenty minutes' thorough manipulation by friction and kneading is administered twice a day. Hacking and vibrations are added as may be indicated by the tolerance of the patient, and, very shortly, passive movements of the limb and stretching of the nerve may be added without fear of increasing pain. Towards the close of treatment, which varies in duration from ten days to a month, or more, according to conditions which can only be

recognised in each individual case, active exercises are performed, including the most excellent mode of progression over blocks of wood, as devised by Schreiber.¹

Cervico-brachial and Brachial Neuritis.—This is perhaps the most painful form of neuritis met with, and, so far as the experience of the writer goes, it is most commonly due to overuse of the upper extremity. In three cases of brachial neuritis the cause has unquestionably been excessive exercise of the arms in piano-playing. One case occurred in an organist, and another in a masseur. In the early stage, when the pain, both in the trunks of the plexus and its branches, is most severe, attended by great tenderness, exacerbation on the smallest movement, glossy skin, and paresis, massage is contra-indicated. Absolute rest, and the use of the constant current until the acute pain is decreased, will afford the best results. In some cases butyl chloral in 8 grain doses every four hours has proved of the greatest service. As soon as the acuity of pain has subsided, very gentle massage may be used, but should be discarded if increased suffering follows its use. Subsequently massage will be found most valuable in improving the condition of the muscles and restoring power. It is difficult to understand why massage may be used in cases of sciatic neuritis or perineuritis in

¹ *Manual of Treatment by Massage*; Schreiber, 1887.

the earliest stages without risk of harm, while in cervico-brachial or brachial perineuritis, massage is distinctly contra-indicated during the stage of tenderness. There is no question about the good resulting from early massage in the one case, and the mischief which may result in the other. Gowers confirms the author as to the abuse of massage in early brachial neuritis; but he does not appear to recommend massage in any form of sciatica, while, in the experience of the author, rest, with careful and thorough massage, is the most effectual of all remedies. In the multiple neuritis of alcoholism and lead-poisoning, massage is most valuable in the later stages, that is to say, after the cessation of acute pain, more frequently found in the alcoholic than in the saturnine form; but in symmetrical inflammation of the sciatic nerve-sheath due to uric-acidæmia, early massage, carefully applied, has certainly proved useful, and harmless, in the cases which have come under the writer's notice. Care must be taken not to produce accumulation of fatigue-products in the limb by overdoing manipulation, as it is very easy to produce a condition precisely similar to muscular rheumatism by rough and unskilful handling. Few cases of a 'rheumatic' origin can be regarded as affections of the sciatic nerve only, and although the more acute suffering may be referred by the patient to the distribution of the great sciatic nerve and its branches, examination will reveal the co-

existence of anterior crural and small sciatic inflammation. In such cases rest, massage, and exercises, at first passive, and, after the lapse of a period varying from one to three weeks, active movements will relieve all the symptoms; but again precautions must be taken against injudicious overuse of mechano-therapy. When active exercise has been added to the other forms of treatment, the second massage of the day should be administered immediately on the conclusion of the active movements, so that the waste products prematurely accumulated in the enfeebled muscles, nerve, and muscle-sheaths of the limb may be speedily eliminated, for nothing so easily induces the recurrence of acute pain as rest, with immobility of the affected limb, without the intervention of centripetal massage to squeeze out the acid products formed during unaccustomed exercise.

Massage in Paralysis.—The utility of massage in *paralysis of central origin* cannot be denied, although its effects must necessarily vary very considerably, and depend upon the nature, extent, and duration of the lesion producing the palsy. Some certain value may fairly be attached to the early use of massage in paralysis when it is employed to maintain the circulation and temperature through the palsied limb during the period which may elapse between the onset of the central disease and recovery therefrom; but since the pathological

changes, of which the paralysis is a symptom, may be such as will yield to no known therapeutic measures, it is impossible to claim any curative efficacy for massage in nervous diseases of cerebral or spinal origin. All that can be said with assurance is that steady, patient, and persevering massage of the palsied muscles will greatly help to prevent, or at any rate to delay, the secondary peripheral changes following central mischief. Then if the *fons et origo mali* is susceptible of cure, massage will have served to maintain a measure of nutrition which without it would have been absent and have caused impairment of function and atrophy. In infantile paralysis (anterior polio-myelitis) the importance of frequent rubbing and kneading of the affected limb cannot be over-rated; first, because massage in these cases undoubtedly improves the circulation through, and the temperature of the palsied extremity; and, secondly, because, as it is very easy to teach an intelligent nurse manipulations which will suffice for the production of the effects desired in the liliputian limbs of little children, instructions to perform massage at frequent intervals, and to keep the limb warm between-times, will serve to concentrate a fair amount of attention on the part affected, and thus obviate some of the ills which must arise from neglect. It is not the intention of this work to discuss the relative value of massage as compared with other means of treatment; but

one element in favour of massage as contrasted with electricity, when used in infantile paralysis, is its simplicity and the absence of necessity for any apparatus, *e.g.* a battery. It is much easier to teach a clever, kindly nurse how to employ massage for her little charge, than it is to instruct her in the proper use of the continuous current. Moreover, it is much more difficult to prevent frightening and really injuring the child by the application of an electric current, even when the battery is furnished with a galvanometer, than it is by the employment of the gentle centripetal friction and kneading sufficient in such cases. The author has seen grievous harm done, and time wasted, in the attempt to employ electricity by a nurse thoroughly anxious to avoid shocking the infant ; but no such untoward accidents have come within his ken, when a little time and patience have been expended in teaching and explaining the use of massage to a nurse who is willing and able to apply the knowledge so gained to the treatment of the paralysed infant. In *acute atrophic paralysis*, massage, passive movements, and especially extension, of the affected muscles must be continued for many months. And here again the advantages of mechanical over electrical treatment are obvious, for batteries are prone to get out of order with amazing facility when used by comparatively ignorant persons. Both patients and nurses are harassed by the frequent necessity for

recourse to the instrument-maker, when, for some mysterious but often simple reason, 'the battery won't work,' and unwittingly the child has been subjected to pain on the one hand, or, on the other, no current has been passed through the limb. Murrell, in his work on massage, places a very high value on its employment in infantile paralysis, in which disease his first experience of mechano-therapy was gained. He points out that the susceptibility of the muscles to the electrical current is greatly increased, so that they contract at once after massage to a stimulus which would not otherwise produce any effect.¹

In *chronic polio-myelitis* Gowers² records the value of massage and passive movement in preventing and diminishing deformities. In two cases, diagnosed by others, of this disease, the author believes that some improvement in the muscular atrophy has followed the use of massage, but in others no such excellent effect has been recognised. In *spastic paraplegia* massage with rest has proved useful in overcoming the spasm, and in one case the walking power was restored after a long course of massage, extending over three months.

In *pseudo-hypertrophic paralysis* Eulenberg recommends massage in the earlier stages of the

¹ *Massage as a Mode of Treatment*; Murrell, 1886; and subsequent editions.

² *Diseases of the Nervous System*, vol. i. p. 498.

disease, though at a later period no good is to be expected from its use. The author has had no opportunity of testing the value of massage, save in the later stages, when little good was achieved, and beyond the improvement in circulation, and the arrest of muscular contraction, no appreciable result was obtained.

Toxic Paralysis.—In no forms of palsy does massage prove so useful as in those resulting from chronic poisoning, either due to the ingestion of a metallic poison, *e.g.* lead, or to the accumulation of toxic *débris* after an acute fever, *e.g.* diphtheria and ague. In chronic lead-poisoning massage is not only useful in the treatment of the local paralysis, but general massage greatly aids in the elimination of the lead in the urine; at the same time the tendency to colic and diarrhœa which frequently remains after the acute stage has passed, is diminished by the employment of abdominal massage. Nutrition is certainly improved, and the anæmia yields rapidly to a course of daily massage. In this connection the recent observations of Mitchell, already referred to, on the increase of red corpuscles occurring immediately after massage, are extremely interesting, when it is remembered that the anæmia of saturnism is said to depend upon an actual diminution in the number of the red blood-cells. Of course, it is most necessary to employ drug-treatment, and such precau-

tions as will obviate the accumulation of lead in the system; but in one case of severe lead-palsy, in which iodide of potash had been given for some time previously, and the gums still remained marked by the characteristic blue line, while wasting, wrist-drop, and muscular pains were still present, after a fortnight's massage and rest the symptoms had greatly improved, all pain ceased, the power of extending the hand was greatly increased, and the abdominal disturbance no longer existed. The blue-lined condition of the gums persisted for some time after, but the patient recovered completely in a few months. In the few cases of *diphtheritic paralysis* which have come under the notice of the writer, the anæsthesia and progressive paralysis in the limbs appeared to yield steadily under the influence of massage, which was persisted with during six weeks in one case, and two months in the others. In *malarial cachexia* the good effects of a course of rest and massage are equally satisfactory with those following similar treatment in chlorosis and other forms of anæmia. In one case which came under the care of the writer, the patient complained of partial loss of power in the lower extremities, sometimes occurring after any fatigue, and always associated with severe aching pain in the front of the leg and in the small of the back. There was paresis of the flexors of the ankle, and the toes of the patient's boots were worn out by the dragging of

the feet, which ensued after a few minutes' walking. In this case, after seven weeks' rest and massage, with good feeding, nearly a stone was added to the bodily weight, complete power was regained, and six months afterwards the patient came to show himself, and drew especial attention to the durability of his boot-soles and the absence of any damage to their toes, notwithstanding hard wear.

Peripheral Paralysis.—*Bell's paralysis*, of rheumatic origin, or associated with a history of prolonged exposure to cold impressions, furnishes examples of good results apparently attributable to the early use of massage; but of course it is open to doubt as to whether the limitation of muscular atrophy and the return of irritability of the nerve may be justly regarded as due to the massage employed in cases where it seemed to modify the course and duration of the disease. In any case the application of massage to the palsied facial muscles certainly increases their excitability to faradic stimulation, as may be well seen by testing the muscles in which the irritability has not been entirely lost, before and after massage. In three cases of Bell's paralysis which came under the care of the author within a week of its sudden onset, response to faradisation was not completely lost at any time, and the excitability increased till it was nearly equal on both

sides of the face, and was not subsequently lost. The treatment followed was thorough massage of the facial muscles once daily, and imperfect rubbing and kneading of the face was also practised by the patient twice daily; meanwhile, the affected side of the face was kept constantly enveloped in a mask of cotton-wool, which was only removed for the purposes of manipulation. The skin was rubbed and rolled between the finger and thumb, each muscle was gently kneaded for one or two minutes daily, and stretched as far as possible at the close of each sitting. Subsequently the patient was exercised in the various facial movements, which were in a great measure regained, though not altogether equally with the other side, save in one case, in which the return of power occurred five weeks after the acute attack. In the later stages of facial palsy the influence of massage is not so beneficial, at least so far as the experience of the author proves; though the contracture in one case appeared to be less after a fortnight's manipulation. The maintenance of an equable surface temperature seems to be very important in these cases, and although massage is valuable in stimulating circulation, and attracting a better blood-supply to the palsied side of the face, in which a glow of warmth will remain sometimes for two or three hours after the employment of manipulations, more harm than good will follow the dilatation of the superficial and muscular

vessels of the face, if, directly or shortly after massage, the patient is exposed to cold or strong currents of air.

Pressure Paralysis.—The only cases known to the writer in which massage has been successfully employed in the treatment of traumatic paralysis, or palsy due to pressure, have occurred in his own practice, and are only three in number, one being a case of crutch-palsy occurring in a member of his family, the others being cases of sleep-palsy of the ulnar nerve and traumatic paralysis of the supinators, with wasting of these muscles, and the extensors of the wrist and fingers, due to a blow upon the middle of the upper arm. In the first case the patient had suffered from an attack of gout in the great toe of the right foot on September 22nd, 1892; four days afterwards he began walking with crutches, and, three days later, felt 'pins and needles' in his right hand and fingers, and lost power to guide the crutch with the right hand, and was obliged to throw it forward with the right knee. He was able to hold a knife in his hand for three weeks, but all other movements of the limb were made from the shoulder. The whole limb became numb, and very cold, and he lost sensation in the fingers, being unable to distinguish between hot and cold water.

Gradually all power was lost in the arm, forearm, and hand. Sensation slowly returned from

November 15th, motor power being restored only to the extent that he was first able to move the fingers and forearm; the limb sweated very freely, and was colder than its fellow of the opposite side. The patient was first seen on November 30th. Physical examination revealed muscular atrophy of the forearm, the maximum circumference of which was $\frac{1}{2}$ in. less than on the other side. The deltoid, supra, and infra spinatus muscles were also wasted. Electrical reaction was delayed to faradism, and normal for galvanism over the median and radial distributions. There was pain on pressure for three inches along the median trunk in the upper arm, none in the axilla or forearm; no loss of cutaneous sensibility for touch, heat, or cold, and no hyperæsthesia in the upper extremity. The pain in the median nerve was explained by the patient, who stated that he had purposely shifted the crutch from the armpit to the upper and inner surface of the arm, on account of the pain which pressure in the axilla appeared to cause over the deltoid and shoulder-blade. The case had been treated by the writer's brother, Mr. G. H. Eccles of Plymouth, who had employed galvanism up to the date on which he sent the patient to the writer for treatment. Massage was employed twice daily from December 1st till January 7th. The surface temperatures on December 1st and 15th respectively of each limb, in the situations named, were as follows:—

	Dec. 1st.		Dec. 15th.	
	Right.	Left.	Right.	Left.
Axilla	97° F.	98° F.	98° F.	98° F.
Inner surface } Upper Arm }	89° F.	92° F.	92° F.	92° F.
Forearm } Extensor }	87° F.	90° F.	90° F.	90° F.
Flexor	87° F.	95° F.	90° F.	95° F.

with the temperature of the room at 65° F.

The dynamometry was as follows:—

Dec. 1st.	Right	<i>nil</i> ,	Left	45
„ 7th.	„	10	„	45
„ 15th.	„	20	„	45
1893, Jan. 7th.	„	35	„	45

and on the same date the surface temperatures were equal on both limbs in the situations named above. The limb was quite restored to its normal functions ; but some slight thickening of the median nerve in the upper arm was still perceptible.

The case of sleep-palsy occurred in a lady of middle age, who habitually slept on the right side, owing, as she explained, to an enlargement of the liver from which she had suffered for some years. She had frequently noticed complete numbness of the little finger and partial numbness on the ulnar side of the hand immediately on waking from sleep ; but sensation returned with the usual tingling shortly afterwards, and there had been no weakness of the wrist or muscles of the little finger, nor any

wasting of the inter-ossei until a month previously, when she first noticed the loss of power and commencing diminution in the size of the hand. Massage of the hand and forearm twice daily, and of the whole limb once daily, was continued for two months, when the symptoms of paralysis disappeared ; but the wasting of the inter-ossei and adductor of the thumb still remained. Meanwhile the patient had desisted from lying upon her right forearm, and the conditions had so much improved that treatment was abandoned.

The case of musculo-spiral paralysis occurred in a gentleman aged 47, who was reticent as to the cause of the blow he had received on the outer surface of the upper arm, and it is possible that alcoholism may have had something to do with the condition of neuritis, as the patient complained of feeling very shaky in the morning, and suffered from morning sickness. The power of supination and extension of the elbow and wrist was lost at the commencement of treatment. There was some tenderness over the site of injury ; but otherwise no other symptoms, save slight loss of sensation in the fingers, and tingling. Massage of the whole limb was employed daily for three weeks, when the power of supination was restored, and the extension of the wrist and fingers could be slowly accomplished. The patient was compelled to leave town, and the subsequent progress of the case was not reported to the author.

Occupation-Neurosis.—Writers on nervous diseases, equally with those on massage, class together a number of cases differing somewhat widely in symptoms and localisation; but possessing one trait in common, viz., that all the affections described are produced by the undue exercise of certain co-ordinated movements, usually, but not always, involving the persistent employment of the smaller muscles of the hand, and the extensors and flexors of the forearm, in occupations requiring the constant performance of delicate, precise, and unvarying actions.

By far the largest number of occupation-neuroses occurs in persons whose callings necessitate too great assiduity in performing one and the same series of small muscular actions with the hands and fingers: as in writer's, sempstress', and violinist's cramps; while others are met with in persons who may bring a larger number of muscles into use for a wider range of movements, still however of the same precise and unvarying character: as in pianist's, harpist's, and painter's cramps, in which certain muscles of the whole upper extremity are brought into constant and rhythmical action, involving the frequent repetition of the same movement. The various theories advanced as to the pathology of these disorders (which, by the way, may also be met with more rarely affecting the lower extremity, as in treadler's cramp) all tend to the assumption that the morbid

state is either a central or peripheral nervous disorder; though one theory, which is strongly upheld by Poore in this country, attributes the conditions most commonly found in writer's cramp to the feebleness of one set of muscles permitting over-activity of the antagonistic group, which culminates in spasm. The existence of spasm, however, is much more common in scrivener's palsy than in allied affections occurring as a result of muscular overuse; as for instance in instrumental musician's cramp, where paresis rather than spasm is the symptom most usually associated with the pain frequently present in all forms of 'occupation-neurosis.' The writer cannot support the views he is inclined to hold by reference to hundreds of cases, as Wolff and others have done; but so far as his reading on this interesting subject enables him to recognise the opinions of those whose experience is doubtless greater than his own, none of the authors whose works he has consulted appear to regard these maladies as possibly due to muscular rather than nervous exhaustion or disorder; although Douglas Graham appears to have realised, more than other writers on the subject, the muscular element in these affections.

All are agreed that overuse of muscles in an unvarying set of movements is the predisposing cause of the 'neuroses' to which it gives rise, and many acknowledge the value of massage in aiding recovery, while none gainsay the importance of

rest as the main and necessary factor in the treatment. But not a few cases are on record in which rest alone, even when prolonged for a term of years, fails to prevent the recurrence of the symptoms shortly after an attempt has been made to resume the use of the affected muscles in the performance of the act primarily deranged.

If the maladies commonly known as 'occupation-neuroses' depend on the establishment of lines of lessened resistance between connected cells, which, in order to produce morbid conditions in the periphery, permit the evolution or transmission of excessive nerve energy: then the effect of massage on the nutrition and function of central nerve-cells must be regarded as established without doubt, and Erb's views in regard to the utility of an electric stimulus applied to a motor tract, in forcing a channel for the conduction of motor impulses to the muscles, and restoring the pathways previously obstructed for the passage of volitional impulse, may be equally true of mechanical stimuli as applied in massage. The testimony to the value of skilful, systematic massage in occupation-cramps is as incontestable and free from suspicion as it is possible to be. It has not been given by those who may be deemed unreliable on the ground that they are enthusiasts, specialists, or experts in massage; but by men of the highest repute and the most judicial character.¹

¹ *Vide* Graham on Massage, p. 177, *op. cit.*

Still there may be reasonable room for doubt as to whether massage of the muscles of the hand and forearm will speedily and seriously modify morbid conditions of the central nervous tissues, such as are held by some neurologists to exist in writer's palsy, musician's cramp, and allied derangements of function. It has not yet been shown that local massage can improve central nutrition; though such vigorous measures as friction, kneading, and percussion of the upper arm must needs result in the transmission of sensory impressions to the central cells in connection with the nerves which conduct them.

It appears to the writer not improbable that the performance of repeated delicate or monotonously unvaried movements may result in the accumulation of waste products in the muscles, muscle-sheaths, and lymph spaces of the nerve-sheaths of the limb so exercised. And that while the comparatively slight but constantly repeated movements executed by the finger and forearm muscles in the act of writing may lead to storage of waste products in the comparatively few muscle fibrils and in the lymph spaces between the fasciculi brought into action in these movements, the full contraction involved in the performance of the coarser movements, when the writing or any other act is carried out, by bringing the muscles of the whole limb into play, will tend to increase the circulation through the muscles, and to favour

the expulsion of waste products by the lymph-heart function of the more fully and thoroughly contracting larger muscles of the extremity. There are few cases in which the immediate effects of massage are so easily seen, as in these conditions, whatever they may be, which follow muscular overuse. Douglas Graham has reported cases in which he has been able, by massage, to restore immediately the power to write temporarily, and the author has had similar experience in two cases of writer's cramp, and in several of musician's cramp. In the former, tonic spasm was present; but with the exception of two cases, one of harpist's, and the other of violinist's cramp, he has never met with pronounced spasm in musicians. A condition closely allied to scrivener's palsy may be temporarily induced in persons who attempt to write immediately after overuse of the right upper extremity in the performance of coarse movements. Let any one fatigue the muscles of the limb by an athletic exercise, and then attempt to write. It will be found that the handwriting is so altered in character, and, in the case of good penmanship, so greatly deteriorated, that none familiar with the ordinary handwriting would recognise it as the work of the same individual, before and after fatigue. In such an experiment the waste products of muscular exercise are diffused through all the muscles of the extremity, and not especially in the smaller muscle-groups or bundles

concerned in the act of writing, which, however, share in the general weariness and powerlessness engendered by over-fatigue. If the experiment be varied by the interposition of thorough massage of the whole limb between the athletic exercise and the act of writing, no appreciable difference will be detected in the penmanship before and after the exercise followed by massage; but comparison between these examples of handwriting, and one taken after fatigue and before massage, will readily show the value of systematised manipulations in squeezing out from the over-fatigued muscles the accumulated waste matters, and inducing a fresh blood-supply through the dilated vessels. This effect of massage is mechanical and local, and has been demonstrated by von Mosengeil in his classic and well-known experiment, which clinical experience has abundantly confirmed. The overuse of the fingers, hand, and forearm, or of the whole extremity, in pianoforte playing always induces more or less œdema of the fingers and hand, and sometimes swelling of the wrist and forearm. Massage for a few minutes relieves this condition, and the hands are restored to their normal size. This effect can be seen and felt both by the patient and the physician. With it all sense of fatigue is abolished, and the subject is able to play again with the same vigour and precision as before the supervention of fatigue. No hypothesis as to the influence of massage on the motor centres is

necessary to account for its value in cases of paresis or tonic spasm following overuse. It may be true that the mechanical stimulus applied to the muscles and nerves acts favourably upon the cerebral and spinal centres in connection with the limb; but this, after all, is surmise, while the local effect on the muscles of the extremity is a well-ascertained and demonstrable fact. In ten cases of musician's palsy, five in pianists, two in harpists, and three in violinists, the author has obtained the very best results. In pianists, paresis of one or more fingers, almost amounting to actual paralysis of both flexors and extensors, abnormally early fatigue of the whole limb, associated with more or less acute pain, which in some cases is also felt in the muscles of the shoulder-blade, œdema of the fingers and forearm, and in two cases tendovaginitis, are the usual symptoms with which he has met. A certain amount of stiffness and a semi-flexed position of the fingers, which can only be slowly and with difficulty extended, occurring when œdema is present, but completely passing off after its removal, is the nearest approach to the tonic spasm observed more frequently in writer's palsy. In the case of a celebrated pianist, the following conditions were noted by the author, who was consulted first fourteen days prior to the date of an important recital, which it was imperatively necessary for the artist to give, for reasons that would seriously affect his immediate future. After

a four months' tour, during which the patient sometimes played fourteen hours daily, he began to feel very severe pains in the extensors of both forearms and fingers, in the biceps and triceps of the upper arms, and a sense of stiffness about the shoulder-joints and blades; the tip of the index finger of the left hand felt quite numb, and the little and ring fingers of the right hand had lost power, and responded very slowly to the will. The percussion force in these three fingers was greatly inferior to that of the others. A very short time at the piano produced over-fatigue and a sense of complete exhaustion. The author was asked to say, then and there, whether it would be possible by treatment to restore to the limbs in a fortnight their wonted power and painless exercise. The anxiety of the patient and his friends was very great; serious issues would be involved by the postponement of the engagement, and still more serious consequences would follow a breakdown, or any evidence of deterioration in his performance at the recital. The writer shared very fully the anxieties of all concerned, but undertook to produce the patient fit and well and able to carry out his engagement on the appointed day. It was pointed out that the recital could not take place unless the patient practised for two hours daily, so that absolute rest could not be secured. Massage was administered by the writer himself three times daily, once in the morning, again immediately after

the two hours' practice, and again in the evening. The muscles, which responded feebly to faradic stimulation at the commencement of treatment, became normal in their electrical reaction on the eighth day. The sense of fatigue, which at first was accompanied by severe pain after the two hours' practice, did not entirely cease until the tenth day. The percussion power of the fingers, except that of the ring-finger on the right hand, was completely restored, and towards the end of the fortnight, even the anxious-minded patient, who could not be dissuaded from frequently testing it, failed to detect any very appreciable loss of power. He played for three hours consecutively under circumstances of great excitement at his recital, and his performance was said by his many admirers to have surpassed, if it were possible, all former displays of his remarkable talent.

To massage alone must be attributed the success in this case; for, save in the restriction of the number of hours spent at the piano, no interference with the habits of the patient was made, no drugs were taken, and mechano-therapy alone was employed. Previous experience in the cases of musical friends who had derived benefit from massage under the author's care, emboldened him in the treatment of this particular case, in which the result amply justified his temerity. In both cases of harpist's cramp, the ring-finger of the left hand was affected more markedly than the others.

Powerlessness and numbness, which prevented the use of the ring-fingers, and obliged the patients to relinquish the practice of their art, were overcome after three weeks' rest of the limb and massage in one case, and four weeks in the other, in which there had also been spasm of the flexor.

Writer's cramp appears to be a much more intractable malady than some of the other forms of occupation-neuroses; but in the hands of Wolff, whose method consists in massage and active and passive movements, especially directed towards certain muscles, writer's cramp and other allied conditions have been successfully treated in a very large number of cases.

Von Nussbaum,¹ believing that overuse of the adductors and flexors of the fingers is the cause of the cramp, advocates the use of a contrivance by which the act of writing is performed by the hand and forearm rather than by the fingers, and the pen is held by means of an apparatus which compels the patient to throw his extensors and adductors into action, in order to prevent the oval ring, worn over the fingers and thumb, from slipping off. Nussbaum's apparatus² can be used only when the malady has not seriously affected the muscles of the forearm. He approves the use of

¹ Von Nussbaum. *Münchener Aerztliches Intelligenzblatt*, 1882, No. 39.

² It can be obtained from Messrs. Krohne and Sesemann of Duke Street, Manchester Square.

massage and gymnastics as adjuncts to the treatment by his penholder; but differs from other authorities on the subject in permitting, and indeed urging, the patients to write with his apparatus instead of insisting on absolute rest.

G. V. Poore,¹ who states that he has seen at least 300 cases of scrivener's palsy, includes among them many conditions in which difficulty in writing has been the symptom attracting the patient's attention; but many of these cannot be regarded as examples of true writer's cramp, or of overuse of muscles in which the morbid state is directly due to excessive occupation in otherwise comparatively healthy folk. If one may include so large a variety of diseases affording evidence of impaired writing power under the term professional neuroses, as Dr. Poore seems to do, then the modest tale of occupation-cramps which have come under the treatment of the author might be greatly increased, and his views as to etiology and therapy must be modified. But it is not in this unlimited sense that the early use and assiduous performance of massage in occupation-neuroses is recommended. When there is pain and tenderness, only severely felt after muscular over-fatigue, massage will greatly relieve both; and if the pain is not increased by massage of the affected muscles (*i.e.* those which are parietic or subject to spasm) even though it is of a neuritic

¹ 'Professional Neuroses,' by G. V. Poore, M.D.—*Clinical Journal*, vol. iv. No. 12.

character, the administration of slowly performed friction and kneading will often be useful, not only in restoring the muscular power, but in soothing the nerve irritation. Neuritis produced by cold, alcoholism, or other toxic conditions is almost always harmfully affected by too early massage; but the aching weariness, pain, and tenderness sometimes due to perineuritic effusion, or neuritis itself, in occupation-neuroses may also be associated with muscular rather than nerve pains; just as in cases of sciatica due to cold or gouty conditions, the pain felt in some situations is obviously in the fasciæ of the muscles rather than in the sheaths of the nerves.

Dr. Poore says :

‘When the nerve-tenderness has been removed I think a thorough rubbing and massage of the whole limb, but especially of the intrinsic muscles of the hand, is very useful. I must give a word of warning as to the danger of practising massage while the nerve-tenderness persists; such a course, in my experience, being always harmful. This, I think, is the commonest mistake made in the treatment of writer’s cramp, and therefore I repeat that there must be no massage until the patient has got rid of the nerve-tenderness.’

In spite of this strong pronouncement by one with such wide experience as Dr. Poore, the present writer still would venture to employ massage himself carefully and judiciously in the earlier stages of professional neuroses in which the existing

tenderness and pain were directly traceable to overuse in subjects not rendered liable to neuritis by such conditions as gout, alcoholism, or other states, themselves the cause of the local functional failure.

CHAPTER VIII

Massage in Diseases of the Nervous System (*continued*)—
Chronic Alcoholism—Morphinism—Chorea—Hypo-
chondriasis—Neurasthenia—Railway Spine—Megrin—
Insomnia.

IN functional or nutritional disturbances of the nervous system, massage must always find a place in combination with the other means, which together bear the name of the one who first originated their collective use. In the 'Weir Mitchell' system, the two ingredients in the prescription which can under no circumstances be omitted, are rest and massage; for in some cases in which these are most valuable, over-feeding, electricity, or seclusion may one or all be contra-indicated, as the original framer of this scheme of treatment himself points out in the earliest editions of his work, and in later contributions to the subject.

In spite of Weir Mitchell's own expressed views on the necessity, not only of careful selection of cases, but of judicious modification and application of the separate measures first combined by him to form a complete scheme of treatment, a large

number of persons, both practitioners and patients, appear to be under the misapprehension that his system implies the rigid and unvarying use of each and all the recommendations made by him in the treatment of nervous disease. Reference to his own works on the subject and to a further contribution from the pen of his son, John Mitchell, will dispel the unfortunate misinterpretation which unskilful imitation in this country has engendered. It is not uncommon to meet with patients who assert that they have undergone the Weir Mitchell treatment without success: this happens even under the best conditions; and the very difficulties inherent in cases deemed suitable must promote failure in a certain number, which, however, is greatly increased, when on inquiry it is found that the so-called treatment has been administered without any medical supervision whatever, or under the auspices of a medical practitioner whose only experience is borrowed from the learned lady whose card announces that she is a certificated 'masseuse electricienne.' To skilled manipulators of both sexes, and to those who combine with an intelligent knowledge of massage, an acquaintance with the simpler methods of applying electricity, every medical practitioner fortunate enough to secure their services must be grateful; but however great the knowledge of these persons may be in the application or administration of the remedies, it cannot be alleged

that the patients intrusted to their hands are likely to obtain the best possible results, if the medical adviser, who prescribes their adoption, is not himself familiar with the minutiae of massage and electricity, and is able to supervise their effects and direct their employment.

In the majority of cases depending on nutritional disturbance of the nervous system, something more than mere routine treatment is requisite to induce success, which is less likely to suffer from errors in judgment than from the absence of any judgment at all. In the administration of massage the mode, duration, and frequency of manipulation will need modification for each individual; and experience in a very large number of cases will not suffice to enable the physician to prescribe the dosage of this therapeutic agent any more certainly than that of a drug, unless he is competent and willing to note the effects of his prescription of massage as closely as he would observe the behaviour of a potent medicine. Certain broad lines for the employment of massage may be laid down just as the pharmacopœial doses of *materia medica*; but both need equal care and constant watching in order to obtain the end desired in every instance of their use.

In functional nervous disorders precautions are no less necessary than in other diseases in which massage is available, and may prove valuable;

though there are still some members of the profession of medicine who appear to regard mechanotherapy, and particularly that branch of it whose practice is generally left to laymen, as something requiring neither skill in its performance nor knowledge of its effects. In regard to two of the general and opposite results obtainable by the same manipulations employed for the same length of time, the operator may produce irritability and excitement amounting to intolerance by rapid, and at the same time not ungentle movements, which, if administered slowly and more firmly, would soothe and comfort the most nervous invalid. It is most important in all cases of neurotic individuals to commence the use of massage gently and slowly; then as time goes on, if necessary, the force and stimulating quality of the rubbing and kneading may be increased, and the other manipulations added according to the indications it is desired to fulfil.

Chronic Alcoholism—Morphinism, and other drug-habits have been successfully treated by the 'Weir Mitchell' system of treatment; though the results obtained in these cases are not so generally good as those following its use in other conditions in which moral as well as physical elements in treatment are essential. Many cases of cure have been reported; but in some the time elapsing between the termination of the course and the

report of the case leaves room for doubt as to the permanency of the benefit temporarily gained. In one case the author succeeded so far that the patient, who had been an habitual drunkard for several years, remained free from any craving, and quite cured apparently for six years; but some serious trouble occurred, and the man, who had been up to that time unquestionably temperate, relapsed into as bad a condition as before. Physical well-being and mental tranquillity may for a time maintain the improvement promoted by the moral suasion and therapeutic means brought to bear on the patient, when the desire to obtain release from the habit is strong enough to out-balance the weakness of the will caused by long self-indulgence; but unfortunately there are few cases in the earlier note-books in which inquiries, lately made, have not proved that relapse into the old habitual abuse of stimulants or drugs has followed the occurrence of some mishap which has proved too much for the patient to endure without recourse to the temporary assuagement afforded by the particular stimulant or narcotic to which the sufferer has previously been addicted.

The strychnia habit, which seems to be more widely indulged in of late years than heretofore, is perhaps more rapidly amenable to treatment by rest and massage than morphinism or the chloral habit; but when combined with the former, as it sometimes is, the results are no more easily

obtained, and relapse appears to be earlier than in the single drug cases. Unfortunately no method of treatment can be vaunted as a cure for deficiency of moral courage ; and, although one may seek to explain the existence of thelathenia on chemico-physiological grounds, and to account for psychical defects by theories and facts pertaining to uric-acidæmia and other toxæmic conditions, the truth remains that, while one individual will fight through a combination of sorrow, misfortune, and physical disability, another will take refuge in the abuse of alcohol or drugs from the most trivial derangement of his mental or physical ease. Heredity, self-control, and environment will be the factors in the equation governing the result of treatment by whatever means in all cases of chronic alcoholism or addiction to drugs. Still the results of 'the rest cure' in some of these cases are undoubtedly worth gaining, and perhaps in the experience of many the effects have been more enduring than those obtained by the author.

In chronic alcoholism massage is particularly useful in promoting elimination, relieving restlessness, and improving digestion, while, at the same time, the insomnia so frequently present yields to the administration of massage at bedtime, very often more readily than to the exhibition of narcotics. The neuralgia in the limbs, and cramps which occur in many cases in which actual neuritis is not present, subside rapidly, and often disappear

altogether in the first week. In morphinism also the extreme restlessness following reduction of the dose is greatly modified by general massage, which in augmenting the flow of blood through the muscles may serve to increase oxidation of the morphia alkaloids, and thus aid in their elimination. It certainly relieves for one or two hours the depression in all cases of drug-habit so distressing during the period of cure, and under favourable conditions the effects of each application are prolonged. The sinking, craving sensations referred to the epigastrium are lost immediately under the influence of vibrations practised over the abdomen, and seldom recur with the same force and frequency after one or two days' manipulation. Reference must here be made to the value of massage in alcoholic paralysis. After the acute neuritic pain has ceased, the most valuable results may be obtained by the steady, regular use of massage to keep up muscular nutrition, and prevent those changes which would otherwise follow the loss of the normal stimulus. Improvement may not be rapid, as it sometimes appears to be in saturnine paralysis; but gradually the powerlessness in the affected limbs becomes less, and the response to electricity is much more readily obtained than in those cases in which massage is omitted. In one case which lately came under the writer's observation, the patient had severe eczema over the ankle and shin of

the left leg, preventing the use of massage on that limb for more than a fortnight, during which the right foot and leg were thoroughly manipulated, with the result that the muscles of the right limb responded to the interruptions of the galvanic current much more rapidly than those of the left leg, which, however, on being also treated by massage, soon reacted to the same current as that employed for the opposite side. Thus, as has been previously noticed, the greater saturation of the skin and subjacent tissues with blood under the influence of massage, reduces resistance to the passage of electricity, and so mechano-therapy helps to render the effects of electrical treatment more easy of production.

Massage in Chorea.—It is difficult to find any subject in reference to the use of massage for maladies, in which experience has taught its therapeutic value, not already alluded to in Napoleon Laisné's work on massage, and by far the largest number of chorea cases successfully treated by massage yet recorded, occurred under the care of Paris physicians who appointed Laisné to carry out treatment by massage and exercise, to which he refers.¹ But prior to the publication of his treatise, Séé reported the value of massage and gymnastics,² and his testimony was followed by

¹ Laisné, *Du Massage*, etc. ; Paris, 1868.

² Séé, *La Chorée*, etc. ; Paris, 1851.

that of Blache,¹ who stated that thirty-four cases of moderate, and sixty-eight of severe chorea had been cured in twenty-eight and fifty-five days respectively. In the milder cases massage was not so much used as rhythmical exercises of the arms and legs; but in the more intense forms of the disease the patient was subjected to massage for an hour once every three or four days, the involuntary movements being prevented by assistants during the application of the remedy. The process as described does not commend itself for use in the acute stages of the disease, and at any rate there are few instances in which it would be possible to employ massage entailing the attendance of four or five persons on one patient for an hour at a time; but the success which attended the practice in the treatment of acute chorea under these circumstances in 1854 and previous years, at the Children's Hospital of Paris, was attained by Goodhart and Phillips in 1882 by daily massage for fifteen minutes, associated with rather liberal feeding and rest, in twelve cases treated at the Evelina Hospital and at Guy's. In all the cases the involuntary movements were speedily reduced in violence, the circulation was improved, sound sleep was induced and bodily weight increased, while at the same time cardiac murmurs disap-

¹ *Moniteur des Hôpitaux*, August 1st, 1854. 'Du traitement de la Chorée,' etc.; *Rapport à l'Académie de Médecine*, April 10th, 1855.

peared.¹ The results obtained by massage in the acute stage appear to be so satisfactory, judging from the reports furnished by Blache in Paris, and Goodhart and Phillips in London, that it is surprising to find so few subsequent references to its utility by other observers; but the apathy which still pervades the medical world in this country in regard to the proper supervision and systematic teaching of massage accounts in a great measure for the neglect and scepticism with which any attempt to place mechano-therapy on a firm basis is met. It is unfortunate both for practitioners and the public that no measures have yet been taken to provide for the efficient teaching and practice of massage and medical gymnastics in the great schools of medicine attached to our hospitals, in which thousands of cases must exist in want of such treatment by more careful and thorough massage than can be obtained under present conditions. The small experience of the writer in the use of massage in chorea is confined to a few cases of long standing, wherein the chronicity of the disease has been confirmed by the injudicious treatment, or rather want of treatment, they have undergone. The position of choreic children, members of a large family perhaps, is most unfortunate. With the best intention in the world, they are drugged with arsenic and iron, or other remedies supposed to control the disease, sent

¹ *Lancet*, August 5th, 1882.

hither and thither for change of air, sea-baths, etc. ; often relegated to the care of incompetent attendants, and sometimes regarded as a nuisance, or at least a grievance, by parents and relatives. The mishaps arising from the faulty co-ordination of their movements are too frequently regarded as moral delinquencies, so that impatience, reproof, and punishment often protract the length and increase the severity of the malady in sensitive and suffering little children. It is far more difficult to treat chronic chorea successfully in private households than in an institution. In the former the child is but one of many other interests which govern the daily routine of the family, and it is wellnigh impossible in ordinary middle-class life to provide for the regular and systematic employment of the means most suitable to the needs of the sufferer. A daily visit to a gymnasium, or establishment in which the necessary treatment could be given, is difficult to arrange, even if such provision existed within reach of the patient ; but the excellent results to be obtained from daily massage, with carefully planned exercises, when provided under circumstances ensuring personal attention, kind and encouraging control, and arrangements made with a view to the well-being of the patient as the first consideration, are well worth the expenditure of time and patience which such cases involve.

Hypochondriasis.—The value of any form of

treatment in this malady is very doubtful, and it cannot be claimed for mechano-therapy that its employment affords more certain prospects of good result than any other means ; but the opportunity for the improvement in morale which is provided during a course of rest and massage, followed by gymnastics, is perhaps greater than can be obtained by other means. The diagnosis being taken for granted, it will often be found that some small peg of real disease exists, on which the patient hangs his many complaints, and it is useless to assure him that there is nothing wrong. Habitual introspection and a complete loss of mental perspective for cause and effect, make the imaginary diseases from which the hypochondriac believes himself to be suffering, appear to his anxious mind very real. The malady is fostered by constant intercourse with the various members of the medical profession, to whom the patient 'goes the rounds,' culling prescriptions and dovetailing advice, which is followed or not, according to the mood of the moment. All sorts of incongruous measures are selected from among those suggested. Dr. A.'s treatment is followed in the morning, Dr. B.'s in the afternoon, and the patient's selection from half a dozen others in the evening. Regrets are expressed that, while one man quite understood his nerves, his advice was inefficient to cope with the state of the digestion. For this another was pre-eminently satisfactory,

but he, again, failed to understand the condition of the skin, and so on, *ad desperandum*. Spas, and cures of all kinds have been tried and found wanting; but it is generally recognised that the treatments pursued have all been more or less pleasant and without serious restrictions, though, in some cases, the hypochondriac will martyrise himself in the indulgence of his morbidity, or, if he has not already done so, the temptation offered by the 'rest cure' is too great to be withstood. Then comes the opportunity for treatment, which may avail in restoring health of mind and body, at least for some length of time after, though in half the cases so treated by the author, some accidental mischief, *e.g.* influenza, an attack of summer diarrhœa, or some more trivial ailment, becomes the starting-point whence the patient again travels over the old ground of exaggerated fear. These cases must not be confounded with neurasthenia. True hypochondriacs are those whose only nervous symptom is fear of disease, either altogether groundless, or based on very slender grounds of trivial importance, from which they deduct, by false reasoning, evidence, satisfactory to none but themselves, of serious ill-health. Under such circumstances, seclusion from opportunity to take drugs and discuss disease with all and sundry, regulated diet and systematic treatment, to which the dyspepsia, disturbed sleep, or other genuine condition present speedily yields, will often allay some of the morbid

fears to which the patient is a prey. Steady gain in weight and strength, as shown by the scales, and the test of increasingly hard work at the exercises prescribed, generally suffices to reassure the invalid, who gradually awakes to the fact that the only means of treatment he now needs is plenty of physical labour and mental occupation. In four cases of a very pronounced type, two months' treatment sufficed to ensure health of mind and body for periods varying between two and eight years without relapse. In six cases relapse occurred within six months, and in two, within a short time after the course was concluded. In one, sufficient time has not passed to enable any conclusion to be drawn. The physical exercises are perhaps the most important feature in the treatment; but a man who fears that he is the subject of cancer, spinal disease, or softening of the brain, cannot be persuaded to perform gymnastics of a somewhat arduous character at the commencement of his acquaintance with the physician who desires to prescribe them. The patient must be trained up to a healthy existence by rigid discipline of his bodily functions, and careful supervision of his mental attitude. It may be contended by some that the treatment described is merely suggestive; even if it were, it is no more so than the last sheaf of prescriptions, dietaries, etc., which it is earnestly desired should be carefully perused. But the treatment by rest,

massage, and exercises in these cases is not all suggestion, for very often the patient has been induced by his fears to adopt a mode of life most inimical to health, and unless he can be removed from the surroundings associated with his morbidity, no amount of suggestion will serve to cure him. Frequently the muscular system is found to be flabby and ill-nourished, for most of these imaginary invalids really suffer from sloth. Massage will restore the nutrition of the muscles and stimulate all the sluggish functions, making the way easy for the introduction of active co-operation on the part of the patient.

Hysteria.—If the characteristic of hypochondriasis is the morbid fear of organic disease, then hysteria may be said to be a malady characterised by a morbid mimicry of the same. In the one case the patient may fear the existence of serious lesion; in the other, the invalid may have no fear as to the nature of her complaint; but the physician will often find great difficulty in differentiation between simulated and true disease,¹ as the perusal of Dr. Buzzard's Presidential Address to the Neurological Society of London in 1890 will show. Taking for granted, after careful examination, that hysteria is the cause of the severe symptoms so frequently present in these cases, no

¹ 'The Simulation of Hysteria by Organic Disease of the Nervous System,' by T. Buzzard, M.D.—*Brain*, Part xlix.

form of treatment has yet been devised which fulfils the indications in this malady so well as that which was first advocated by Weir Mitchell, and has been so successfully employed by him in America, and Playfair and others in this country. Nothing has been added to our knowledge of the treatment and its value in hysteria since the publication of Mitchell's work on *Fat and Blood*, and Playfair's on *The Systematic Treatment of Nerve-prostration and Hysteria*, to which the reader is referred for complete information on the various factors which combined make up the method of treatment now so well known. But one point may perhaps be emphasised, viz.: that whereas seclusion need not necessarily be strictly enforced in any other malady to which the Weir Mitchell method is appropriate, rigid seclusion in cases of hysteria is essential to success.

Having met with a very large measure of success in the treatment of nutritional disturbances, not associated with hysteria, but frequently accompanied by neurasthenia, in which rest and massage without seclusion have been relied on, the writer has attempted to obtain equally good results in hysterical cases. In all such attempts, the absence of strict seclusion has proved to be a mistake, and disappointment in the few cases so treated has resulted. The same necessity for seclusion does not exist in neurasthenia, and, indeed, it appears to be absolutely contra-indicated in some cases

which do well under treatment by rest, massage, and carefully regulated diet. The differential diagnosis between hysteria and neurasthenia assumes great importance under these circumstances, and experience teaches that, while in all hysterical conditions the method of Weir Mitchell must be pursued without any relaxation, in the majority of cases in which neurasthenic manifestations are present the patients are none the worse, but rather the better, for the visits of cheerful and discreet friends.

Neurasthenia.—If the position of massage as a remedial agent depended solely on its recognised value as a means of treatment in conditions of nervous prostration, surely to it must be accorded a very high place on the list of proved and tried therapeutic measures. Even if it be regarded merely as an aid to the use of rest, Weir Mitchell, who first thus employed it, has abundantly certified the utility of massage; but since he first drew attention to its value in depriving rest of its evils, many observations on the physiological effects and therapeutic uses have placed massage on a somewhat higher level than that which was accorded to it in the earlier editions of Mitchell's work on the treatment of certain forms of neurasthenia and hysteria.

The value of massage as a means of treatment in certain disorders of digestion has already been

discussed in a previous chapter, and in view of the large proportion of neurasthenics in whom there is not only evidence of digestive disturbance at the time when they come under observation, but a distinct history of chronic gastro-intestinal mischief prior to the onset of neurasthenic symptoms, and, indeed, as the author believes, producing the ultimate nerve-prostration, a great deal of the benefit derived from the employment of massage in these cases may be attributed to its influence, when employed locally for the relief of conditions, *e.g.* gastrectasia, gastropptosis, enteroptosis, sigmoid prolapse, chronic gastro-enteritis, colitis, and functional disorders arising from muscular atony of the gastro-intestinal tract. In a paper read before the Royal Medical and Chirurgical Society in February 1894, the author pointed out the relationship between disorders of digestion and neurasthenia, in which dilation of the stomach and constipation, arising from muscular atony, were more particularly referred to.

* Few writers on neurasthenia have adopted the view that disorders of digestion are very frequently the precursors, if not the cause, of nervous debility. Beard regards the 'dyspepsia,' which he acknowledges to be co-existent with other symptoms of nervous exhaustion, as a result or an effect of nerve malnutrition.¹ Other observers,

¹ *A Practical Treatise on Nervous Exhaustion*, by G. M. Beard, M.D., p. 72. New York, 1890.

while noting the existence of disordered digestion, do not recognise it as causative. Thomson,¹ however, supports the view, that in very many cases the disordered nerve energy is due to some poison resulting from gastro-intestinal disturbance. Kowalewsky² confirms the opinion of the writer, that neurasthenia depends on malnutrition on the one hand, resulting from insufficient pabulum, and on the other, on intoxication from the accumulation of nervous waste product.

Although the chemical and mechanical derangements of the digestive organs are frequently, if not always, coincident, for the convenience of consideration the author has adopted a classification of the cases on which these observations are based, illustrative of the prominent feature noted in each case characterised by the presence of gastric or intestinal functional disorder.

Reference to the tables shows that the great majority of neurasthenics in which digestive troubles were prominent afforded evidence of motorial deficiency.

Out of sixty-five cases, nineteen presented distinct and incontestable signs of gastric ectasia; then if we regard the cases in which constipation was present, as examples of muscular atony, thirty-six out of the sixty-five may be quoted as neuras-

¹ *Journal of Nervous and Mental Disease*. New York, April 1890.

² *Centralblatt für Nervenheilkunde*, etc. Coblenz, April 1890.

thenics in whom muscular inefficiency of the gastro-intestinal tract was a prominent symptom, preceding, and, as he believes, actually causing the disturbance of nerve-nutrition from which they were suffering when they first came under observation.

Of the remaining twenty-nine cases wherein derangements of the digestive organs were co-existent, thirteen suffered from one or other form of diarrhoea, and sixteen from disorder of digestion not associated with dilatation of the stomach, constipation, or diarrhoea.

Dilatation of the Stomach has been recognised by some few observers as a frequent concomitant with the neurasthenic state.

Dujardin Beaumetz,¹ Champagnac,² Germain Sée,³ Albert Mathieu,⁴ and others have recorded many such cases; Champagnac especially insisting that the nervous theory of Beard is insufficient and incapable of explaining the neurasthenic phenomena when these have been preceded by the dyspeptic symptoms.

It was not until a search had been prosecuted through the literature bearing upon the subject,

¹ *Journal de Médecine de Paris*, November 24th, 1889.
Berliner Klin. Wochenschrift, August 24th, 1889.

² *Gazetta degli Ospitali*, Naples, March 29th, 1891.

³ *Des Dyspepsies gastro-intestinales*, 2nd ed., 1883.

⁴ *Revue de Médecine*, May 10th, 1884.

that the author was at all aware that other writers had recognised the importance of digestive symptoms in neurasthenia ; and long before he had become acquainted with the views of others, the conclusion had forced itself upon him that in the majority of cases of nerve-exhaustion, evidence has been afforded and an unsolicited history given of disordered digestion, often long preceding the development of nervous phenomena, which subsequently overshadowed the symptoms of local abdominal disease. Since the tables were compiled in 1894 other examples of neurasthenia, arising out of dyspeptic troubles, have come under observation ; but the existence of prolapse of abdominal organs has not been recognised as always present, though careful search has been made for the conditions which Glénard¹ believes to be the cause of neurasthenia. There is little doubt that ptosis of the abdominal organs, and alterations in the dimensions of the hollow viscera, are present in the large majority of cases in which depression, enfeeblement of the mental and bodily capabilities for sustained effort, and other symptoms attributed to neurasthenia exist ; but other disorders of digestion, not entailing change of position or size in the abdominal organs, give rise to defective nutrition,

¹ 'Application de la Méthode naturelle à l'analyse de la Dyspepsie nerveuse. Détermination d'une Espèce.' *De l'Entéroptose*. Lyons, 1885. 'A propos d'un cas de Neurasthénie gastrique.' Paris, 1886.

almost amounting to starvation, and frequently accompanied by auto-intoxication, arising from the circulation through the system of poisonous products formed in the stomach or intestines, resulting from vitiated chemical processes therein. It may be true, as Blocq in his 'Critical Digest of Neurasthenia' (*Brain*, Part lv.) points out, that the general disorders of nutrition caused by dyspeptic derangements are at the root of the mischief; but it is no less true, that treatment directed towards the relief and cure of the abdominal disorder will speedily be followed by marked improvement in all the symptoms of a nervous type. Not only so: failure to modify and correct the gastrointestinal disturbance of function will entail disappointment in the treatment of the nervous malady for which the patient seeks advice. Not a few cases have come under the observation of the author at varying periods, after a course of Weir Mitchell treatment has been pursued under most favourable circumstances, but in which the dyspeptic troubles have been regarded merely as local manifestations of nerve-prostration. Careful examination has proved the existence of some defect in the digestive organs, not always of a mechanical nature, but, in some, associated with atonic conditions of both the mucous and muscular walls of the stomach and intestines. Under these circumstances abdominal massage, with careful dieting, has frequently been attended by the best results, and

patients who have relapsed after, or have not been relieved by isolation, rest, massage, and over-feeding, have been cured, no return of their troubles having occurred in periods varying from three to six years. The use of Penzoldt's test, salol, Günzberg's test, and Frerich's method of distending the stomach, with physical examination of the abdomen by combined auscultation and percussion, and rectal exploration, will often reveal remediable disease underlying, and causing neurasthenia. Here massage of the abdomen, especially when performed by the physician himself, will greatly aid the diagnosis and appreciation of the curability of the disease; and it may be said that, if during a period of three weeks no fluctuations in the physical signs and chemical reactions take place under the influence of abdominal manipulation (sometimes undertaken three or four times daily), the case is not amenable to mechano-therapy, or, indeed, in some cases not otherwise recognisable as malignant, to any other form of treatment. The value of abdominal massage as a means of diagnosis in cases of visceral disorders, obscured by neurasthenic symptoms, has been proved by the author repeatedly. In two cases, which had been justly regarded as typical examples of neurasthenia by others, who had seen them and sent them to the writer for treatment, he was able, after observation for a fortnight in one case, and a month in another, to express a decided opinion as to their malignant

nature, before the supervention of any of the pathognomonic signs of gastric carcinoma. In both, massage of the abdomen failed to influence the hypo-chloracidity, defective absorption, delayed salol reaction, and loss of bodily weight, which pointed to some grave disturbance of digestion and assimilation. In one, œsophageal spasm, at first present, ceased after a week's treatment, but three pounds gained in the first ten days was lost in the next. The subsequent history and post-mortem examination in each case confirmed the opinion which had been based on the behaviour of the tests applied in association with abdominal massage.

In both these cases the patients had been ailing, and gradually developing a train of symptoms of a more or less distinctly nervous character for so long a time, that in spite of the loss of bodily weight, the possibility of malignancy was regarded as most improbable; in neither were there any signs which could be said to suggest the presence of organic disease until they had been under close observation while undergoing a course of treatment by rest, massage, and diet. Each had suffered from long-continued worry, which was followed by occipital headache, sleeplessness, flatulent dyspepsia, anorexia, and loss of weight. Both complained of vague pains over the back, and one of œsophagismus, the other of cardiac troubles (palpitation, and paroxysmal heart-hurry).

No sort of treatment by drugs, change of air, etc.,

had proved availing, and they were considered by those who had seen them to be typical examples of neurasthenia. Now, the remarkable feature common to both of these cases was the comparative triviality of their gastric troubles, if the length of time during which they had existed, the absence of vomiting, and of any fixed pain, or palpable tumour, are taken into consideration. Undoubtedly the nervous prostration, wasting, anorexia, headache, etc., from which these patients suffered were due to the cancerous conditions affecting the gastric mucous membrane, so that as far as long observation by one medical man, and careful examination by three in each case, could aid in determining the nature of the malady, here were two individuals presenting all the symptoms of severe neurasthenia and none of the usual signs of malignant disease. Yet the one had suffered more or less from 'indigestion' before any nervous prostration supervened, and the other broke down in his digestive functions simultaneously with the occurrence of nervous irritability and failure of intellectual working power. Surely these cases may be regarded as examples of lesions of the digestive apparatus leading to mal-nutrition and consequent neurasthenia. If the disturbance of function in the gastro-intestinal organs had not been associated with organic disease the cases would have been rightly described as typical neurasthenics, and almost precisely identical symptoms

have been observed by the author in patients who have lost all their troubles after treatment by rest and massage. The only difference in behaviour between the two cases of cancer of the stomach simulating or giving rise to neurasthenia, and those cases in which gastric symptoms have been present in neurasthenics without any recognisable alteration in the form, size, or position of the stomach, has been the absence of any fluctuation in the rate of absorption, the conditions of hydrochloracidity, and the delay in the appearance of iodide of potassium in the saliva after the ingestion of Günzberg's capsule before and after the employment of careful manipulation of the abdomen, which gave rise to no pain in either case of cancer. In all the cases of neurasthenia in which the tests employed have proved the existence of hypo-chloracidity, diminished absorption, and motorial deficiency of the stomach, fluctuations have been observed under the influence of massage, not always sufficiently pronounced to affect the prognosis in the first two or three weeks, but often affording good grounds for a proximate estimate of the probable result in a week; especially in those cases associated with muscular atony, in which the dimensions of the stomach vary from time to time, and almost invariably decrease under the application of massage over the affected organ. It is quite possible to promote the assimilation of large quantities of food, even

in persons affected by ptosis or ectasia, if the stomach is trained up to its duties by preliminary care in the selection of the diet given at first, and by ensuring the passage of the food from the stomach into the intestine at proper intervals, by means of purposive massage intelligently administered.

Cases of true gastric neurasthenia, neuroses in the sense that no chemical or mechanical defect can be detected, no doubt exist, and in these, conscious digestion, even with gastrodynia, does not prevent the prescription of over-feeding; but the effects of over-feeding hysterical or neurasthenic patients in whom genuine disturbance of the digestive functions is due to conditions which ought to be tested and recognised, are very unfortunate and sometimes disastrous. It is by no means the fault of the patient when a 'violent bilious attack' concludes the course of treatment without beneficial effect on the nervous symptoms, for careful clinical observation should sufficiently afford warning when the digestive powers are being too severely tried. The question naturally arises in this connection, why over-feeding, safeguarded by proper supervision, can be practised in combination with rest and massage in neurasthenic cases without producing the uncomfortable results which most assuredly follow ingestion of the same quantities of food when taken by healthy individuals in the pursuit of their ordinary avocations.

It is well known that in neurasthenia, hemiplegia, and other disorders of the nervous system, complicated with anæmia, the physiological oxidations within the tissues are diminished. The investigations of Bouchard¹ and others point to the existence of toxic alkaloids in the urine, under certain morbid conditions, and Gautier² has described the influence of oxidation in the destruction of leucomaines, or in splitting them up and rendering them fit for evacuation in the urine. Latterly, von Poehl of St. Petersburg has advanced the claims of spermine in promoting oxidation within the tissues when his preparation is injected subcutaneously.³ Under the influence of such injections, he states that the leucomaines in the urine are sensibly diminished, with a corresponding increase in the excretion of urea, which is followed, as the practice of spermine injection is pursued, by considerable augmentation of urea, coupled with disappearance of leucomaines from the urine. The methods of testing for the presence of these alkaloids, described by Poehl, have been employed by the present writer in cases of neurasthenia, and the results obtained certainly appear to show that oxidation is greatly increased in tissues undergoing massage. The experiments of Ludwig and Sczelkow upon the consumption of oxygen and the

¹ *Compte rendu Soc. Biolog.*, 604, 1882, 665, 1884.

² *Ptomaines et Leucomaines*; Paris, 1886.

³ *Compte rendu Acad. des Sciences*; Paris, Oct. 10th, 1892.

production of carbonic acid in active muscle proved the increased oxidation which takes place when the blood-vessels of the muscles are dilated, a condition occurring under the influence of massage, as well as in the circumstances of active muscular contraction.

Now, if 100 c.c. of urine be taken from the total quantity passed by a neurasthenic patient during the twenty-four hours prior to the commencement of treatment by rest and massage, it will be found, on the addition of 25 c.c. of hydrochloric acid, and 10 c.c. of a decinormal solution of phosphotungstic acid, that a dense white flocculent precipitate is formed. On standing, the greater part falls, and a rough visual estimate may be made of the amount of leucomaine phosphotungstates thrown down; but some flocculent masses remain in suspension or rise to the top of the flask, so that a more correct appreciation may be obtained by collecting the precipitate on a weighed filter-paper, drying and weighing the filter-paper with the precipitate thereon. If daily examination of the urine is continued in this wise during the course of treatment by rest and massage, it is found that the amount of precipitate in the first few days is slightly increased, but, with occasional variations, gradually the quantity of phosphotungstates diminishes; and although the precipitate never entirely disappears, still it becomes so small that, both visually and by weight, the proportions be-

come quite insignificant in comparison with those of the earlier days of treatment, or with those of other patients on whom the methods of mechanotherapy have not been sufficiently prolonged to produce the effects observed in the later stages of successful cases. Then if the ureameter is also employed, the amount of urea will also vary inversely with that of the leucomaine precipitate. It is true that, from a strictly chemical point of view, the somewhat clumsy methods pursued by the author cannot be regarded as satisfactory, nor in any degree comparable, for accuracy, with the more exact estimation to be obtained by adopting von Poehl's recommendation in regard to the quantity of nitrogen in the precipitate by the employment of Kjeldahl's method; but it is interesting, from a clinical point of view, to watch the behaviour of von Poehl's test during the treatment of a case of neurasthenia by rest and massage, and to note the gradual subsidence in the quantity of the precipitate as the patient shows other signs of improvement. In the cases in which this method of examining the urine has been employed, albumen has been first tested for by nitric acid and heat; then if it has been detected by this test, the urine is acidulated with strong acetic acid; and to 100 c.c. so treated, 10 c.c. of the decinormal solution of phosphotungstic acid is added.

If, then, a precipitate falls, this will consist of albumins and peptones (?), from which must be

filtered the urine, in which the presence of leucomaines is suspected, if it is desired to employ the method of von Poehl described above ; but in the only two cases in which the biuret test showed the presence of peptones, the plan adopted was that of Hofmeister. 500 c.c. of urine previously filtered has been acidulated with 100 c.c. of hydrochloric acid (density 1.124), and phosphotungstic acid in 10 per cent. solution has been added till a precipitate no longer formed. 'This precipitate consists of peptone combined with phosphotungstic acid, and various other substances (ptomaines, etc.).'¹ The precipitate has been collected and weighed, the other steps of the Hofmeister method being omitted.

In neither of these cases was there any suspicion of suppuration, and both did well under treatment, so that the peptonuria was evidently independent of pyogenesis.

It appears, in view of the almost invariable reduction of the phosphotungstate precipitate in the urine of neurasthenics, when treated by massage and rest, that mechano-therapy has a distinct influence on the processes of oxidation, and that muscle-kneading is a most powerful process for aiding the elimination and oxidation of toxins, such as leucomaines and ptomaines, to whose presence it is probable that the vague muscular pains, pre-

¹ Von Jaksch, *Clinical Diagnosis*, translated by Cagney, p. 266.

mature fatigue, and general prostration present in neurasthenia are attributable. Indeed, the association existing between neurasthenia on the one hand, and disorders of digestion and leucocyturia on the other, points to such near relationship between toxæmia and nervous prostration, that further and more accurate research may demonstrate a correlation of cause and effect in the presence of 'retention-toxicosis' or 'exogenic-toxicosis,' and the symptoms hitherto termed neurasthenic.

TABLE I.—*Dilatation of Stomach*

No.	Initials.	Age.	Duration and Character of Digestive Disorder.	Physical Examination also revealed
1	H. W. W.	56	20 years flatulent distension.	Right floating kidney.
2	Miss A. G.	40	5 years pyrosis and epigastric pain.	Nil.
3	F. F. R.	38	Flatulent colic since boyhood.	Oxaluria.
4	Mrs. C.	62	Dysentery 20 years before ; dyspepsia since.	...
5	H. M.	33	Chronic dyspepsia ; 18 months acid eructations.	Dilated ascending colon.
6	W. J. R.	35	11 years indigestion.	...
7	Miss E. B.	30	6 years dyspepsia.	Small intestines distended.
8	Mrs. B.	37	5 years flatulent distension.	Reduced surface temperature, left side.
9	Mrs. C.	55	20 years sick headache	...
10	C. B. L.	50	25 years migraine	Ballooned rectum.
11	V. T.	29	20 years flatulent dyspepsia, and constipation since scarlatina.	Ballooned rectum.
12	Mrs. T.	29	3 years indigestion ; 1 year gastralgia.	Sigmoid prolapse.
13	L. J. M.	28	2½ years migraine.	Colon sigmoid distended ; rectum ballooned.
14	Lady G.	52	14 years migraine.	Ptosis of transverse colon.
15	Mrs. A.	37	2 years indigestion.	Right floating kidney.
16	Mrs. H.	46	17 years indigestion.	Right floating kidney and mitral disease.
17	W. H. D.	43	Migraine 5 years.	Nil.
18	Miss M. H.	16	12 months dyspepsia.	Emaciation, weight 6 stone 6 lb.
19	A. P.	30	9 years dyspepsia.	Prolapse of sigmoid.

associated with Neurasthenia.

Prominent Nervous Symptom.	Duration of Treatment.	Weight gained.	Result and Remarks up to Jan. 1st, 1894.
Insomnia.	14 days.	Nil.	Nil.
Myelasthenia.	8 weeks.	9 lbs.	Cured 5 years.
General hyperæsthesia.	8 weeks.	12 lbs.	Calculus recurred.
Insomnia, morbid fears.	6 weeks.	9½ lbs.	Cured 4 years.
Cerebrasthenia.	10 weeks.	7½ lbs.	Cured nearly 3 years.
...	7 weeks.	10 lbs.	Cured nearly 3 years.
Insomnia, mental exhaustion.	6 weeks.	7 lbs.	Cured 2 years.
Emotional, asthenopia.	5 weeks.	8 lbs.	Cured 2½ years.
Myelasthenia, photophobia.	8 weeks.	3½ lbs.	Cured 18 months.
General hyperæsthesia.	8 weeks.	6½ lbs.	Temporary relief.
Cerebrasthenia.	7 weeks.	14 lbs.	Still complained of ill-defined sensations on leaving.
Myelasthenia.	9 weeks.	23 lbs.	Cured 10 months.
Cerebrasthenia, asthenopia.	13 weeks.	15 lbs.	Cured 9 months.
Cerebrasthenia.	7 weeks.	9 lbs.	Cured 8 months.
Myelasthenia.	10 weeks.	7 lbs.	Cured 6 months; gained 15 lbs. since.
General prostration (and migraine).	4 weeks.	4 lbs.	Improved.
General prostration.	4 weeks.	5½ lbs.	Cured 2 months.
Anorexia nervosa.	4 weeks.	6¼ lbs.	Still under treatment.
Prostration.	4 weeks.	12½ lbs.	No return of trouble 1 month.

TABLE II.—*Constipation associated*

No.	Initials.	Age.	Duration and Character of Digestive Disorder.	Physical Examination also revealed
1	I. F.	50	Always constipated.	Distension of colon ; cyanosis of extremities.
2	J. G.	27	Constipation since childhood.	Ballooned rectum.
3	— L.	40	6 years indigestion.	Dilatation of colon and mitral regurgitation.
4	Miss M. G.	42	9 years indigestion.	Anteversión.
5	Mrs. S.	36	6 months dyspepsia.	Subnormal temperature.
6	R. B.	38	12 months dyspepsia ; lost 25 lbs. in 9 months.	Dilated colon.
”	”	”	Constipation 2 months.	Colon slightly dilated.
7	Miss E. B.	16	Dysentery some years.	General flatulent distension.
8	Mrs. O.	37	Enteritis 8 years.	Sigmoid prolapse.
9	W. J. W.	33	Indigestion 7 years.	Sigmoid prolapse ; rectal dilatation.
10	A. E. P.	45	Dyspepsia.	Nil.
11	Mrs. A. H.	34	6 years constipation.	Ballooned rectum.
12	Miss E.	26	Since childhood.	Enlargement of thyroid (slight).
13	Mrs. G. E.	28	2 years obstipation without enemata.	Prolapsus ani.
14	Miss A. R. J.	39	Chronic constipation.	Colon distended.
15	W. B. F.	34	16 years constipation and frequent dyspepsia.	Colon distended.
”	”	”	”	”
”	”	36	Dyspepsia 3 months.	”
16	Miss M. M.	23	Dyspepsia 3 years.	Nil.
17	L. M.	60	25 years sick headache.	Colon dilated.

with Neurasthenia.

Prominent Nervous Symptom.	Duration of Treatment.	Weight gained.	Result and Remarks up to Jan. 1st, 1894.
Myelasthenia.	4 weeks.	7 lbs.	Cured 7½ years.
Sleeplessness; delusions.	6 weeks.	23 lbs.	Cured 7 years.
Sleeplessness.	5 weeks.	7½ lbs.	Improved.
Emotionalism.	8 weeks.	28 lbs.	Quite well 6 years.
Myelasthenia.	8 weeks.	18½ lbs.	Improved.
Irritability; insomnia; cerebro-asthenia 4 months.	6 weeks.	23½ lbs.	2 years well.
Dull headache.	3 weeks.	4½ lbs.	3½ years well; 13 stone 2 lbs.
Severe headaches; insomnia.	5 weeks.	6 lbs.	5 years well.
Insomnia; hemi-crania.	6 weeks.	18 lbs.	5 years well.
Myelasthenia.	7 weeks.	25 lbs.	4 years well.
Restlessness; depression.	2 weeks abdl. massage.	...	Well 3 years 2 months.
Claustrophobia; agoraphobia.	6 weeks.	10½ lbs.	Quite well 3 years 9 months.
Myelasthenia.	5 weeks.	7½ lbs.	Quite well 3 years 8 months.
Myelasthenia; insomnia.	Not treated.	...	...
Cerebrasthenia.	4 weeks.	4¾ lbs.	Well 2 years.
Cerebrasthenia.	6 weeks.	19½ lbs.	Well 5 months.
„	3 weeks.	6 lbs.	Well 12 months.
„	3 weeks.	6 lbs.	Well 2 months.
Rachalgia; anæsthesia.	8 weeks.	5½ lbs.	Cured 13 months.
Hyperæsthesia.	2 weeks abdl. massage.	...	Improved; headaches less often.

TABLE III.—*Diarrhœa*

No.	Initials.	Age.	Duration and Character of Digestive Disorder.	Physical Examination also revealed
1	Miss M. H.	21	Vomiting and dysentery 2½ years.	Intestinal catarrh ; tenderness in right iliac region.
2	W. G. R.	40	Dyspeptic 20 years.	Muco-enteritis.
3	W. D.	58	Sprue 6 months.	Nil.
4	H. G.	46	Gastro-intestinal catarrh 3 years ; membranous enteritis.	Ballooned rectum ; sigmoid prolapse.
5	Mrs. G.	45	4 years gastro-intestinal catarrh.	Bronze patches on skin.
6	H. W.	40	Dysentery 13 years, recurrent.	Flatulent distension.
7	Mrs. A. D.	53	5 years diarrhœa ; 20 years dyspepsia.	Psoriasis.
„	„	56	3 weeks diarrhœa.	Acute psoriasis.
8	Mrs. F.	50	8 years morning diarrhœa.	Ballooned rectum.
9	Miss S.	38	3 years muco-enteritis.	Distended colon ; alopecia areata.
10	Mrs. C. D.	38	10 years sprue.	General abdominal distension.
11	J. R.	32	6 months muco-enteritis.	Nil.
12	Mrs. H. R.	22	1 month diarrhœa.	Anæmia.
13	E. H. D.	28	Sprue 4 years.	Anæmia.

associated with Neurasthenia.

Prominent Nervous Symptoms.	Duration of Treatment.	Weight gained.	Result up to January 1st, 1894.
Hyperæsthesia, myelasthenia.	8 weeks.	14 lbs.	No relapse in 5 years.
Cerebrasthenia.	5 weeks.	6 lbs.	No relapse in 4½ years.
Myelasthenia.	Not treated.	...	...
Cerebrasthenia.	6 weeks.	9½ lbs.	Not satisfactory.
Myelasthenia.	8 weeks.	20½ lbs.	No relapse in 4 years.
Cerebrasthenia.	Not treated.	...	...
Cerebrasthenia.	6 weeks.	5¼ lbs. (10 st. 8¾ lbs.)	3 years well.
Cerebrasthenia.	8 weeks.	No gain nor loss.	6 months well.
Cerebrasthenia and patches of anæsthesia.	6 weeks.	14 lbs.	3 years no relapse.
Rachalgia, cerebrasthenia, myelasthenia.	8 weeks.	11½ lbs.	No relapse for 3 years.
Asthenopia, myelasthenia.	3 months.	18½ lbs.	2 years no relapse.
Cerebrasthenia.	4 weeks.	6 lbs.	6 months no relapse.
Myelasthenia.	5 weeks.	3 lbs.	6 months no relapse.
Myelasthenia.	5 weeks.	14 lbs.	6 months no relapse.

TABLE IV.—*Disorders of Digestion not included*

No.	Initials.	Age.	Duration and Character of Digestive Disorder.	Physical Examination also revealed
1	R. W. P.	37	3 months dyspepsia.	Expiratory crepitation over back of both lungs; dulness about left base.
2	H. W. W.	50	10 years dyspepsia; pyrosis 5 months.	General distension of gastro-intestinal tract.
3	Miss N.	39	3 years dyspepsia; attacks of vomiting at frequent intervals.	Anæmia; weight 8 st. 6 lbs.
4	Mrs. W.	50	Papilloma of rectum removed by Mr. Cripps 2½ years previously; dyspepsia several years.	General abdominal distension; tachycardia; slight contraction at site of operation.
5	H. A. H.	44	Dyspepsia some years; bilious attacks frequent.	Facial paralysis (right).
6	R. B.	49	Enteric fever 2 years previously; dyspeptic ever since.	Colon dilated; rectum dilated; liver enlarged.
7	K.	49	32 years oxaluria.	Leucomaines in urine; oxalates occasionally.
"	"	"	...	No oxalates, but leucomaines.
"	"	"	Dysentery 14 days previously.	Leucomaines.
8	J. E. S.	47	'Biliousness' some years.	Nil.
9	W. F. S.	43	13 years ill since enteric fever.	Ballooned rectum.
10	J. A. M ^c D.	46	13 years dyspeptic since enteric fever.	Heart 1st sound inaudible.
11	H. J.	26	4½ years previously entero-peritonitis.	Nil.
12	Miss L.	43	Nausea and indigestion 6 months.	Nil.
13	J. C. P.	35	Gastrodynia 3 years.	Liver dulness decreased slightly.
14	W. H. B.	21	Dyspepsia since boyhood.	Præsystolic murmur; pulmonary cartilage.
15	Miss S. E. B.	37	Indigestion migraine.	Systolic bruit at apex.
16	Mrs. V. S.	41	Gastric irritability some years.	Nil.

in other tables associated with Neurasthenia.

Prominent Nervous Symptoms.	Duration of Treatment.	Weight gained.	Result up to January 1st, 1894.
Sleeplessness.	8 weeks.	15 lbs.	No relapse in 4 $\frac{3}{4}$ years.
Sleeplessness ; cerebrasthenia.	4 weeks.	8 lbs.	No relapse in 4 $\frac{1}{2}$ years.
Exhaustion after any mental or physical effort.	8 weeks.	10 lbs.	No relapse for 3 years.
'Anorexia nervosa' ; insomnia ; great depression.	7 weeks.	4 lbs. (10 st. 3 lbs.)	No relapse for 4 years.
Cephalalgia occipital ; twitching of face ; vertigo ; cerebrasthenia.	7 weeks.	No gain (11 st. 12 lbs.)	No serious relapse in 3 years.
Cerebrasthenia.	2 weeks (great heat in July ; suspended treatment)	1 $\frac{1}{2}$ lbs.	Unknown.
Vertical headache ; insomnia ; utter prostration.	5 weeks.	9 lbs.	Relapse after 3 months.
Same condition.	4 weeks.	8 $\frac{3}{4}$ lbs.	Relapse after 6 months.
Same condition.	4 weeks.	7 lbs.	No relapse for 6 months.
Insomnia.	4 weeks.	4 $\frac{1}{2}$ lbs.	No relapse for 14 months.
Myelasthenia ; exhaustion after motion.	8 weeks.	19 $\frac{1}{2}$ lbs.	Relapse after 7 months.
Insomnia ; depression ; myelasthenia.	8 weeks.	17 lbs.	No relapse for 14 months.
Vertigo, scotoma, agoraphobia.	7 weeks.	19 lbs.	No relapse for 12 months.
Rachalgia.	5 weeks.	4 lbs.	No relapse for 9 months.
Myelasthenia ; depression.	5 weeks.	Lost 10 lbs.	No relapse for 6 months.
Sleeplessness ; irritability.	7 weeks.	6 lbs.	Not satisfactory.
Tremors ; insomnia.	3 weeks.	4 lbs.	No relapse for 3 mths.
Myelasthenia.	4 weeks.	6 $\frac{1}{4}$ lbs.	No relapse for 3 months.

There are, however, cases of neurasthenia in which it is not possible to demonstrate any relationship between the disturbance of function in the nervous system and toxæmic conditions. Of these the most striking examples are afforded by patients who complain of all the characteristic subjective symptoms of neurasthenia, with or without objective signs of injury following on accident, in which mental shock and bodily concussion have caused nutritional damage to the nervous centres. The severity of the physical shaking and the intensity of the mental shock are so great in railway accidents, that these cases of traumatic neuroses are familiar under the term 'railway spine'; but they often occur under other circumstances, in which the genuineness and duration of the symptoms cannot be affected by a question of compensation. Rest and massage have proved as useful in traumatic as in other forms of neurasthenia, and the following case is selected, not only as an example of the value of massage as a means of treatment, but because it is a striking instance of the existence of symptoms precisely similar to those of 'railway spine,' though not caused by a railway accident. Dr. —, a relative of the writer, was thrown out of his dogcart in the second week of June 1889. He fell on to the back of his head, turning a somersault, so that the head was forcibly thrown forwards, the chin being pressed firmly against the breast-bone. He was unconscious for

twenty minutes, and remained in bed for a fortnight with broken ribs, and some pain in the left arm, which was felt from the first. Six weeks after the accident tremors and numbness came on in both upper extremities, with tingling in the fingers of both hands. The patient was admitted for treatment on October 7th, 1889, when he complained of giddiness, slight headache, asthenopia, aching in the back, weariness, great depression of spirits, accompanied by fits of weeping, loss of appetite, and disturbed sleep. Occasionally during the day, and always on first waking from sleep, formication was felt in both arms, and especially in the fingers. The head was carefully carried erect, and any attempt to bend it forwards produced numbness in the fingers and altered sensation in both arms, with pain in the left wrist. On examination some rigidity of both trapezei and matting of the tissues on both sides of and over the ligamentum nuchæ, between the third and seventh cervical spines, was felt. Passive flexion of the head on the chest produced the subjective symptoms above noted, and tremors in both upper extremities. On October 28th all the nervous phenomena were less marked, and neither numbness nor tingling could be produced in the arms save momentarily on first moving the head. On November 14th the treatment was discontinued, as the patient appeared to be restored to his normal health. He was seen again on November 20th, 1889, on

January 1st, and again in February 1890, when he left London for his home in Australia, no return of the symptoms having recurred. In subsequent correspondence Dr. — has confirmed the permanence of the good results obtained during treatment, which consisted of rest in bed, general massage once daily, and thorough kneading of the cervical region twice a day. The thickening and exudation about the back of the neck entirely disappeared, and the movements of the head became quite free and easy under the influence of the manipulations. At first, pressure in the neighbourhood of the cervical spinous processes provoked tingling sensations in all the fingers; but towards the beginning of the third week, when there was a perceptible change in the appearance of the neck, these symptoms were no longer elicited.

No doubt in this, as in cases of a like nature, the steady improvement in the local conditions effected by massage greatly aided the general amelioration in health of both mind and body attending the gradual cessation of the unpleasant sensations from which the patient had suffered ever since the accident, and in spite of the rest and change afforded by the long sea voyage.

In the experience of the writer there appears to be a large number of neurasthenic patients who, when suffering from the effects of overwork or mental strain, are recommended to give up their

usual occupations, and to take such rest as change of air, sea voyages, mountain-climbing, and other forms of travel will afford. Sometimes the unfortunate sufferer is advised to abstain from the work on which his livelihood depends for a twelvemonth, and perhaps, at the expense of his savings or through the charity of his friends, he seeks restoration to health by these means ; but in a large proportion of cases idleness, with change of scene, does not suffice, and the patient finds that little lasting benefit follows the waste of time and money entailed by travel in search of health. At any rate, a great many persons who have adopted the more pleasant forms of treatment suggested return to their homes and occupations unfit for sustained effort, and are compelled to seek relief by other means. Complete rest, with seclusion from business worries and domestic cares, combined with the administration of massage for a few weeks, seldom fails to produce a marked improvement in mind and body, which is maintained and often increased by a short holiday taken under conditions of health which permit of enjoyment. On the resumption of work it is found that a reserve has been created on which the erstwhile neurasthenic may draw without fear of a nervous breakdown. The following case well illustrates the opinion that much time, suffering, and expense would be spared if, as in many instances within the author's knowledge, the 'rest cure' preceded the less irksome

but more uncertain half-measures, *e.g.* change of air, sea voyages, etc.

A professional man in large practice, *æt.* 44, had suffered almost constantly from occipital pain, vertigo, difficulty in concentrating his attention, powerlessness in the legs, agoraphobia, and other numerous subjective symptoms for seven years. At the end of the first year his sufferings were increased by an attack of facial paralysis, followed immediately by severe pain in the right ear, which continued for a fortnight, and then subsided. During the seven years before the patient came under the author's care, twenty-six months had been spent in sea-voyages, travel, and sojourn at health-resorts for periods varying from one to four months. In the intervals attempts had been made to resume work for three or four hours daily, but these were invariably followed by a return of neurasthenic symptoms. Treatment by drugs had also proved of no avail. The patient when first seen complained of giddiness, loss of equilibrium, a bruised, hot sensation over the right side of the head and face, with soreness of the scalp, occipital pain, and numbness at the back of the neck. When trying to do mental work, twitchings in the face and a drawn, strained feeling in the back of the head were experienced. While walking there was a strong inclination to knock up against the wall, and when sitting there was a swaying sensation of the trunk. Nausea and

constipation were generally present, and frequently the patient wept over his growing incapacity for mental or physical exertion. There was no history whatever of hereditary or acquired disease, nor were there any evidences of structural degeneration. There were no signs of optic neuritis, save slight congestion of the discs. The knee-jerks were exaggerated, no ankle clonus, and the electrical reactions in the muscles of the legs were normal. The patient was treated by rest and massage from December 9th, 1890, to February 2nd, 1891, and has since been able to perform the duties of his profession without intermission save during the usual holidays, and once for a fortnight, when he was again treated as before, under the care of the writer, who has seen him from time to time in the four years which have elapsed since the first course of treatment. The only discomfort which has occasionally troubled the patient after prolonged heavy work has been a slight sensation of occipital fulness; and for a few days prior to the fortnight's treatment above mentioned, there had been a return of giddiness and fear of a relapse, which was completely lost during the short course of rest and massage prescribed.

Massage in Megrin.—At the annual meeting of the British Medical Association, held at Nottingham in 1892, a paper on 'Bilious Headache and its Treatment by Massage' was communicated

to the Therapeutical Section, in which reference was made to the gastric origin of megrim, and the treatment of this distressing malady by massage was briefly alluded to. In a subsequent contribution to the *Practitioner*,¹ the views of the author, and the facts on which they were based, were more fully recorded; but within the limits of a short paper it was not possible to do more than indicate the facts and opinions, which further observation has confirmed.

During the last eight years the writer has had opportunities of examining physically the abdomens of fifty-eight individuals suffering from megrim, before, during, and after the paroxysms, varying in intensity from slight transient hemicrania to the most severe and long-continued attacks of pain, involving cerebral complications of great variety and extent. In nineteen cases the clinical symptoms have been supplemented by the employment of the salol test, and in six the salol, rhubarb, and Günzberg's tests have been used with the results shown in the accompanying tables.

In thirty-two cases the abdomen has been examined once only before, during, and immediately after an attack of megrim. In all the stomach has been found to be flaccid, inert, lying in a flabby atonic condition in the epigastric region, and encroaching on the hypogastric and

¹ 'Massage in Megrim,' by A. Symons Eccles.—*Practitioner*, vol. xlix. p. 161; Sept. 1892.

both hypochondriac regions beyond the normal limits of the healthy viscus. The contour of the abdomen has differed from that which is familiar as the result of flatulent distension of the normally contractile organ, for as the patient lay in the dorso-recumbent position the usual bulging of the abdominal wall, noticeable below the ensiform cartilage when the healthy stomach is distended by gaseous or liquid contents, has been wanting; and although, save in a few cases (where there has been much emaciation), no scaphoid appearance has been present, the profile of the abdomen has been pear-shaped, the greatest convexity being in the hypogastric and iliac regions.

The sensation transmitted to the hand of the observer has been one of flaccidity and relaxation, rather than that of bulging and distention. The 'stomach splash' has always been readily elicited, and has been found to extend beyond the limits of the healthy organ. On percussion the stomach-note is often found to extend high up into the chest on the left side, as well as low down into the hypogastric and over into the right hypochondriac region. The small intestines are distended with gas, and the flanks sometimes present the same appearance as in dilatation of the colon.

The abdominal appearances shortly before a paroxysm or when it is impending have not always been remarkable, but in the thirty-two

examinations made, once only in each individual, distension upwards of the stomach has been revealed by percussion, while auscultation elicited gurgling and movement of the stomach and small intestines. In every case the period of gastrointestinal inertia has been synchronous with the severity of the headache, and has been followed by renewed activity of the organs, and very often by vomiting, retching, or by the expulsion of gas or *fæces per rectum*.

In the nineteen cases wherein more than one opportunity has occurred for abdominal examination in the intervals, immediately before, during, and after a paroxysm of megrim, the physical signs have been constant and common to all in so far as they relate to the duration of the paroxysm and immediately before and after ; but in the intervals the abdominal conditions have varied from distinct dilatation of the stomach in three cases to apparently normal conditions in one, wherein, however, the relaxation of the stomach was very marked during the paroxysm. (No. 10, Table II.)

In regard to the subjective sensations of sufferers from megrim, all who have come under the author's observation agree that the earliest warning of the approaching paroxysm is localised in the abdomen, though it is often disregarded, and may even occur without being followed by a more than slight and passing headache. Some persons complain of an indefinite uneasiness about the stomach and intes-

tines, others specify nausea, while a few describe a hot, gnawing, sinking sensation in the pit of the stomach. With these sensations, in thirty-one out of forty-six cases visual disturbance variously described, and differing both in intensity and duration, is present as a premonitory sign, in some cases amounting to scotoma or hemiopsia, in others taking the form of a coloured Catherine-wheel or glimmer whirling round on the opposite side of the field of vision to that part of the head which subsequently becomes the centre of pain. In the case of the writer this has always been accompanied by nausea, followed by horrible pain, and in only two cases has he found it possible to arrest the progress of a paroxysm after the patient has complained of this symptom. As the nausea increases, the pain in the head becomes more marked. In all save one case of twenty-five years' standing, when it was present over both temples, and frequently commenced behind the ears or in the occiput, the initial pain is unilateral.

Synchronously with the establishment of the pain, the physical signs and subjective symptoms in the abdomen undergo a marked change.

The stomach dilates; if in the interval between the headaches this condition has been absent, it becomes very distinct during the paroxysm. The lower limit of stomach-splashing sound may reach two fingers'-breadths below the navel; and in one case wherein no evidence of

dilatation was afforded during the interval, even after blowing up the stomach, the limits of this organ exceeded three fingers'-breadths below the umbilicus, occupying the whole of the epigastric and the greater part of the hypochondriac and hypogastric regions during the paroxysms, without any bulging of the abdominal wall. With the dilatation of the stomach the patients always complain of a lifeless, sinking sensation in the abdomen. Some are so fully aware of the paralysis and the impossibility of digesting food, that they decline to attempt ingestion during an attack of mephitism, not only on account of the nausea, but because they know from experience that no assimilation occurs while the sensation of deadness remains. When this sensation passes off, as it frequently does before the pain ceases, the physical signs in the abdomen will reveal commencing muscular activity in the stomach and intestines. At this stage some patients will announce their ability to take food ; but more frequently, after a period varying from two to twelve hours, vomiting or, if the stomach is empty, retching occurs.

The vomited matters vary in character with the relation between the time at which food was taken and the occurrence of the paroxysm.

Any food taken before the paroxysm not less than one hour will be found when vomited to be semi-digested, very sour in odour, and either intensely acid or bitter to taste. If the patient

has taken food after the onset of the premonitory signs of an attack, the vomit will show that no digestion has taken place, and will consist of masticated food, whose nature is as easily distinguishable as if it had not been swallowed, mixed with frothy or ropy acid mucus and dark green bile of a bitter taste. If the retching continues, pale straw-coloured bile and watery mucus replace the former constituents of the vomit.

Sometimes, as in one case recorded by Dr. Lauder Brunton and in another observed by the writer, the act of retching relieves the headache; in three cases the act of vomiting has been attended by relief, and in six cases it has been possible to arrest a paroxysm by evacuating the contents of the stomach in the premonitory stage of an attack; but in the majority of cases this relief is only temporary, or is not obtained at all.

In twenty-two out of fifty-eight cases the patients looked for no relief until vomiting set in.

In six cases relief was always experienced after a stool preceded by conscious peristaltic action of the stomach and bowels.

In two cases, before the application of the rest-massage treatment, the attack of megrim was always preceded by a copious motion; but this ceased to be regarded as a precursor of headache after the treatment began to take effect in modifying the frequency and duration of the paroxysm.

The relaxation of the stomach, equally perceptible

to the sufferer and to the hand of the observer, with the condition of aperistalsis throughout the intestinal tract, has been a constant feature in all the cases coming under notice, and has always been preceded by longer or shorter intervals of gastric disturbance and irregular peristalsis of the bowels. In every case the period of gastro-intestinal inertia has been synchronous with the severity of the headache, and has been followed by renewed activity of the gastro-intestinal muscular coats, and very often by retching, eructations, vomiting, or the expulsion of gas or *fæces per rectum*.

In the nineteen cases¹ cited in the accompanying Tables the existence of dilatation of the stomach has been recognised by the careful percussion and palpation of the abdomen, and especially by noting the limits of the stomach splashing sound, as elicited by perpendicular digital pressure over the abdominal wall.

The splashing sound produced by the impingement of the finger-tips perpendicularly on the abdominal wall overlying the stomach is easily distinguishable by the practised ear from the wave splashing against the upper or cardiac wall of the stomach, which may be produced by *contre-coup* when firm pressure is exercised on the abdominal wall below or outside the stomach limit. In addition to the use of physical examination both with and without blowing up the stomach, in fourteen

¹ Two in each Table refer to the same individuals.

cases the salol test has been employed during the paroxysms, and in the intervals, confirming the evidence of physical examination, and establishing the existence of delay in the evacuation of the gastric contents into the intestine during the attack of headache. In six cases the rhubarb test for gastric absorption has been employed, and Günzberg's capsule has also been used after a test-breakfast, with a view to ascertain as far as possible, without washing out the stomach, the condition of the gastric digestion during the attacks and in the intervals.¹ The effect of treatment will be noticed in the increased rapidity of the reactions after the patients had been undergoing massage for a period varying from three weeks to as many months. With regard to the rhubarb test, it will be noticed that absorption is not greatly affected, save when the drug was administered during the period of gastric motor inactivity accompanying the headache, when it would seem to remain in the stomach unabsorbed till the muscular activity of the organ was restored, and the drug was then either absorbed in the stomach or escaped into the intestine, whence it passed through the liver, and so on to the kidneys. Günzberg's test points to deficiency in the gastric digestive activity in all six cases, but in four the effect of treatment is seen not only in the cessation of headache but in the increased activity of

¹ See Table II.

digestion. On reference to the Tables it will be seen that with approved assimilation and increase of weight the headaches decreased in severity and frequency in most cases, and appeared to cease, at any rate for an appreciable period, in some. When, after treatment, the severity and frequency of the paroxysms underwent little amelioration, the failure arose mainly from the fact that the patients perforce returned to conditions and habits of life inimical to health, and these must be numbered among the many cases constantly met with by all practitioners wherein we are rendered powerless by inability to alter circumstances which must minimise or frustrate any therapeutic methods employed.

If megrim is to be regarded as a neurosis characterised by the periodical discharge of a nerve-storm, involving both cranial and sympathetic nerves, there appears to be some evidence that irritation of the gastric periphery of the vagus may be regarded as the exciting cause of the head-pains and other symptoms of nerve-irritation accompanying the paroxysm. Indeed, all the circumstances recognised by the sufferers themselves, and observed by the author in cases of megrim, appear to be compatible with the view that stimulation of the vagus branches to the stomach by ill-digested food is followed by irritation of the sensory nerves of the scalp, the nerve-impulse initiated in the gastric fibres of the vagus being referred to the periphery

of the same nerve in the temporal and occipital regions, and if the stimulation be prolonged and excessive, the irritation may be, and most frequently is, diffused to the branches of the fifth and other cranial nerves; the storm often involving the fibres of the sympathetic and of the nerves of special sense, till, in the severer forms of megrim, we find excitation of such intensity that it is difficult to realise during the paroxysm that the attacks are of a temporary and functional character.

But in addition to the initial irritation of the vagus in the stomach, which alone may probably suffice to account for the production of head-pain, close observation of the phenomena frequently accompanying attacks of megrim points to absorption of toxic matters into the circulation, and the irritation of the nerve-centres by the products of albuminoid decomposition which have not been arrested or destroyed in the liver. In the milder forms as in the severer phases of megrim the premonitory symptoms referable to the abdomen are almost always, if not constantly, recognisable; but in the less severe and more transient attacks the evidence of vagus-irritation may be confined to the nausea, flatulence, and indefinite uneasiness, followed by unilateral headache and relaxation or temporary dilatation of the stomach. In the more serious attacks, the dry, furred tongue, with the sour, thick, or bitter taste in the mouth, the visual disturbance, the sallow or grey hue of the com-

plexion, with the dull eye, contracted pupil, and jaundiced conjunctiva, certainly appear to point to the absorption of some toxic product of enfeebled digestion into the system; while some of the phenomena attending paroxysms of megrim bear a close resemblance to those described by Dr. Lauder Brunton in his recent work on the *Relationship between Chemical Structure and Physiological Action*. Indeed, in many cases, the writer has observed a train of symptoms almost identical with those attributed to the action of certain ptomaines. For instance, frequently during an attack of severe megrim he has seen the pupils of the eyes contracted, hemiopsia or scotoma, profuse salivation, lachrimation, and perspiration, slowing of the heart's action from 96 and 80 at the onset down to 60, 50, and lower at the close of a paroxysm, and frequent micturition with apparently complete paralysis of gastro-intestinal movements.

Reference to Dr. Brunton's work will show that these symptoms are identical with those produced by three bodies, the first of which is procurable from bile. The association of somnolence with a paroxysm of megrim is well known, and in this regard the heavy sleep and exhaustion following the attack closely resemble the action of Brieger's peptoxin. Megrim may be regarded as a transference of stimulation from the gastric branches of the vagus to the sensory fibres of the same nerve in the head: the summation of stimuli may pro-

duce the paralysis of the vagus branches to the abdominal viscera, causing relaxation or dilatation of the stomach and intestinal aperistalsis ; and prolonged irritation doubtless produces an overflow or diffusion of nerve-impulses beyond the limits of the vagus distribution. In the majority of cases, however, the distribution of the pain in the head appears to be confined, at the outset of the paroxysms and sometimes throughout their duration, to certain localities.

The usual site of the pain is over either temple, whence it radiates upwards over the front of the head. Sometimes the pain commences in, or is transferred to, the occipital and mastoid regions, and frequently it is felt in the temple and occiput synchronously. A glance at the connections between the auricular branch of the pneumogastric and the facial nerve appears to confirm the view that megrim may be the result of irritation of the gastric periphery of the vagus, which is referred to the auricular branch of the same nerve and induces pain in the regions to which the nerves it joins are distributed.¹

¹ Arnold's nerve gives off an ascending branch to the facial trunk and a descending branch to the posterior auricular branch of the facial. The temporal branches of the facial are distributed over the temple, supply the frontal portion of the occipitofrontalis and the orbicularis, and join the supra-orbital branch of the ophthalmic division and the auriculo-temporal branches of the fifth. The posterior auricular nerve supplies the occipital portion of the occipitofrontalis and communicates with the small occipital.

Physiologists state that some fibres of the auricular branch of the vagus (Arnold's nerve) are sensory.

Irritation of this nerve in the meatus will cause vomiting, and it seems quite as reasonable to suppose that undue stimulation of the gastric branches of the vagus will cause pain in the regions supplied by fibres from Arnold's nerve in the head, as that irritation of certain fibres of this nerve supplied to the meatus auditorius causes vomiting.

The whole aspect of patients suffering from megrim points to the formation and absorption of poison in the stomach, and the conditions under which the headache is induced are precisely those which lend themselves to the manufacture of poisonous by-products in feeble digestion. The subjects of megrim are for the most part persons whose pursuits are inimical to regularity of meals, sufficient rest, and freedom from worry and excitement; indeed, megrim has been truthfully and wittily described as '*le mal des beaux esprits*,' and there are many examples of its occurrence in persons who follow intellectual pursuits, as also in emotional and vivacious individuals who are very keen in all their undertakings both for pleasure and profit.

It has been truly said that all the emotions may be expressed in terms of the vagus nerve; in other words, it is very easy to upset the rhythm of healthy digestion by indulgence in the varied

forms of pleasurable or painful excitement to which modern civilisation lends itself. We are constantly endeavouring to overcome nature by artifice; but unfortunately science has not as yet enabled us to control the vaso-motor system at will, so that we can no more command the presence of a sufficient quantity or quality of blood in two different areas at once, than we can elect to be in two different places at one and the same time. Thus, when we have been working hard with our brains for many hours, it is not surprising if, when the stomach is called on to perform its functions with regularity and despatch, it fails to do so, if we proceed to undertake intellectual work or fatiguing tasks at the commencement of active digestion directly after a meal. This may be achieved by very robust persons for a time; but sufferers from megrim are by no means of a sthenic type, and few are engaged in active muscular exercises which aid in the destruction and elimination of the poisons generated in a stomach ill provided with the powerful secretions necessary to normal digestion.

All the cases of megrim which have come under observation have afforded distinct evidence of faulty digestion and mal-assimilation, frequently associated with marked anæmia, sometimes with anæmic obesity, but more often with a spare habit of body, while in three cases bloodlessness and emaciation were the salient features.

The recognition of the apparent ætiological relationship between gastric irritation and megrim by no means involves the rejection of the views advanced by other observers in favour of the vaso-motor, malarial, and uric acid origin of unilateral headache. On the contrary, the existence of such factors seems to be compatible with the co-existence of gastric disturbance as an exciting cause of megrim; though while malarial poisoning may be itself the cause of the gastric irritation, the vaso-motor conditions concomitant with megrim and the uric-acidæmia may be results of faulty digestion, in itself sufficient to produce the headache.

During the last Russo-Turkish campaign the writer had frequent opportunities of noting the co-existence of megrim and malarial fever with disordered digestion. In the majority of the slighter cases of ague the three conditions were present together, and during the few months that he was with the troops stationed on what was then the Græco-Turkish frontier, he was able to learn the routine treatment of ague as practised by the modern inhabitants of the very home of *Æsculapius* in Thessaly. There the largest number of cases of fever and ague among the troops occurred in men who were on sentry-duty either in the evening or the early morning. They came up to the hospital with the sick party, announced the existence of nausea, shivering, and temporal headache,

were promptly given a large dose of Epsom salts freely diluted, which acted as an emetic as well as an aperient, and after a short rest swallowed a strong solution of one of the cinchona alkaloids supplied by the Government as a substitute for quinine. This rough-and-ready treatment seemed to restore the patient to such a measure of health that the sufferer of the morning was seldom missed from the evening meal. Most of the men were subject to supra-orbital or temporal headache during their sojourn on the plains of Thessaly, and many of them suffered from enlarged spleens. The congestion of the portal system especially during the cold stage of fever and ague is almost always attended by nausea and 'brow pain.' The writer has never suffered from an attack of ague without severe temporal headache occurring with the rigor, and attended by a sense of abdominal constriction and nausea. The general headache associated with the pyrexial condition of the hot stage is a throbbing bursting pain, quite distinct in character from the 'sick headache' which occurs in the cold stage. Many of the vascular theories on the ætiology of megrim, advanced by Mollendorf, Latham, and others, appear to be equally explicable by the recognition of the abdominal vascular conditions present at the onset of a paroxysm of megrim. The extremities are always cold, the whole body surface is often pale, showing that the superficial vessels are constricted;

but the portal system is congested. *Ubi irritatio ibi affluxus* seems to be true of the premonitory stage of megrim in regard to the vascularisation of the splanchnic area; later, when the hemicrania is established the vessels of the same side of the head become dilated and engorged, not as a cause but as a result of the severe pain.

In regard to the uric acid origin of megrim, so brilliantly worked out and apparently so well established by Dr. Alex. Haig,¹ it is interesting to note that the very cause of excessive uric-acidæmia is recognised as existing in the disorder of digestion, and the remedies proposed not only affect the uric acid conditions, but act on the stomach secretions and contents themselves in a fashion favourable to the improvement of gastric digestion. Dr. Haig advises the use of nitro-hydrochloric acid before and salicylate of sodium after the meals; though in regard to the latter drug he finds that its use is incompatible with the existence of nausea. Now there appears to be some difference of opinion among writers on megrim as to the stage at which gastric disturbance is present. Some of the authorities² regard the nausea as a later phenomenon in a paroxysm of megrim, while others recognise the existence of nausea, or some other equally marked gastric symptom, as among the earlier phenomena of an attack. Dr. Haig refers

¹ *Uric Acid* (page 71 *et seq.*), by Alex. Haig, M.D., etc.

² See Liveing, *On Megrim*.

to 'a feeling of emptiness and ravenous hunger quickly replaced by a feeling of distension and satiety,'¹ to which the author has referred as among the premonitory gastric symptoms of megrim. In the writer's experience of megrim, both in his own case and in all those which have been closely watched, the existence of appreciable dyspepsia or abdominal malaise is the earliest warning of the onset of an attack, and, provided it has not continued unchecked too long, may enable one to arrest the paroxysm by evacuating the contents of the stomach and administering a small dose of salicylate of bismuth as a gastric disinfectant.

So far as drug-treatment has availed in dealing with megrim, the writer has found largely diluted doses of hydrochloric acid, given with or directly before food, followed by a capsule containing β -naphthol shortly after food, useful in preventing the dyspeptic conditions which are causative of paroxysmal hemicrania. But valuable as drug-treatment and dietetics undoubtedly are in megrim, there are many cases which do not yield to these means alone, and of these cases not a few are of such severity that it is difficult to believe them to be uncomplicated by organic disease, though happily the results prove in some cases that grave disturbance of function may alone be accountable for the most remarkable nervous phenomena, including more serious derangement than the

¹ *Uric Acid*, p. 72.

violent nerve-storms characterising severe megrim. If it is true that the occurrence of megrim is due to disordered digestion, in the sense that coupled with sluggish portal circulation there is interference with the quantity or quality, or both, of the gastric secretion, that with this insufficiency of secretion there is also inactivity of the gastro-intestinal motor apparatus, permitting the generation, accumulation, and absorption of toxic matters in excess, so that the liver is unable to cope with them either by arrest, combination, or excretion with the bile,—it seems that the indications for treatment are to improve the circulation through the chylo-poietic viscera, and at the same time to aid the activity of the liver, in its function as a policeman in guarding the system against the intrusion of evildoing leucomaines and ptomaines, while such a diet is prescribed as shall be easily assimilated, demanding as little activity and richness of secretion as possible.

These indications are best fulfilled by the judicious employment of rest and massage, combined with appropriate diet and such drugs as may assist in preventing the formation of toxic matters in the stomach and intestines.

Rest in the recumbent position is most valuable in order to conserve, as far as may be, the overtaxed nervous force, rendered feeble and exhausted by the frequent paroxysms of suffering.

Massage of the abdomen serves to promote the

better vascularisation of the viscera and so favour healthy and sufficient secretion, and to act mechanically in propelling the contents of the stomach and intestines onward, so that food-stuffs and the products of digestion may not remain too long in the atonic stomach and bowels, wherein they may undergo decomposition and induce the absorption of poisonous matters which have escaped the hepatic vigilance ; lastly, but by no means least in importance, to act mechanically on the liver by rhythmical compression and firm kneading, to aid the circulation of the blood and hepatic secretion through and out of the organ so as to favour the excretion of matters which may not have been rendered innocuous in the liver.

General massage of the whole body at least once daily is advisable in order to improve the functions of the skin, and by thorough muscle-kneading to increase the interchange between the blood and the tissues, to squeeze out and favour the elimination of effete material, and to prevent the storage of the products of mal-assimilation in the muscular system.¹

Almost all sufferers from megrim will be found to possess little muscularity ; some who have attempted to practise muscular exercise, and even those who have led an open-air and active life of

¹ 'Physiological Effects of Massage,' *Practitioner*, June 1887, vol. xxxviii. p. 401.

sport or business, will evince signs of muscular waste rather than improved muscularity. Indeed, the similarity of appearance, and the evidence of mal-nutrition existing in cases of megrim on the one hand, and of oxaluria and other toxæmic conditions on the other, point to the existence of toxæmia as a cause of megrim ; while the results of treatment in both series of cases go far to establish the belief that they are dependent on similar though not identical conditions.

The dietetic treatment of sufferers from megrim is by no means easy to formulate ; but in every case the choice of food must be at first directed to the administration of nutritious matters in a form as easy of assimilation as possible. Milk is often very valuable, though frequently it is necessary to sterilise it or to peptonise it, in order that indigestion may not follow its use. In some cases such a dietary as Dr. Haig recommends may be useful, but frequently the employment of vegetables, whether green or feculent, is attended by severe gastric derangement. All the food at first must be in a state of fine division, and in regard to this matter it is often necessary to look to the state of the teeth and counsel a visit to the dentist before beginning treatment, as much time and discomfort may be saved by the detection and prompt treatment of an aching tooth, to which many chronic invalids appear to be subject. If after each meal the patient is given abdominal massage for a period

varying according to the state of the viscera, much may be done in preventing the dyspepsia otherwise so apt to recur.

Coldness of the extremities and body surface must be avoided, and if, as will probably occur in spite of all precautions, a paroxysm threatens, the stomach may be washed out either by the administration of hot water or by means of a tube and saline solution. Then the patient, after gentle kneading of the abdomen, should be provided with hot applications to the nape of the neck, to the abdomen and extremities, and be left quiet till sleep supervenes, or till those simpler means have proved ineffectual in allaying the severity of the attack. It is useless to give either food or drugs during the period of gastric paralysis. Vomiting towards the close of the paroxysm will disclose the fact that nothing has been digested or absorbed. In very severe cases, where the attacks are longer than the intervals, it is well not to be guided entirely by the feelings of the patients as to the time at which they can take food with a prospect of assimilating it; but the writer has never seen any good arise out of the administration of anything so long as examination of the abdomen proves that there is no activity of the stomach and intestines. Oftentimes the first sign of renewed motivity is the onset of retching and vomiting, when the administration of two or more pints of hot water will often be of great value in

stimulating peristalsis, and subsequently soothing the irritated viscus.

The urine should be examined daily, as it sometimes follows that after the administration of salol the drug is not entirely eliminated the same day; and if it is being used for test or antiseptic purposes, the slow elimination may easily lead to erroneous observation or over-dosage.

The results, in the majority of megrim cases, of systematic rest and massage treatment, avoiding routine and employing such diet and drugs as may appear best for each individual, have been sufficiently encouraging to warrant the hope that, for those who can afford the time necessary to the due carrying out of the method, it may prove successful in modifying or curing a malady which assumes the gravest aspect in not a few cases.

All the cases cited in the following Tables suffered from nervous prostration in the intervals between the attacks of paroxysmal hemicrania, and were unable to follow their usual occupations. In all, save Nos. 1 and 5 in Table 1., the subsequent attacks noted were of much shorter duration and less frequent in occurrence than before treatment. No. 10, Table 1., suffered from a slight attack of asthma in the winter following treatment, but remained completely free from megrim until the winter of 1894, when, in consequence of the severe weather, she was unable to take the open-air exercise prescribed for several

weeks. After two attacks of sick-headache occurring within a fortnight, general massage was employed every other day, and an abdominal belt was worn for the support of the relaxed stomach, with the beneficial result of preventing the recurrence of headache.

TABLE I., showing behaviour of Salol, Rhubarb, during Treatment by

No.	Sex.	Age	Salol.	Rhub.	Glinzb.	Salol.	Rhub.	Glinzb.	Salol.	Rhub.	Glinzb.
1	M.	50	3 hrs.	20 min.	2½ hrs.	3 hrs.	2 hrs. ¹	4 hrs. ¹	2 hrs.	20 min.	2 hrs.
2	M.	32	2 hrs.	30 min.	2½ hrs.	2 hrs.	20 min.	2 hrs.	1 hr.	20 min.	1½ hrs.
3	F.	49	3¼ hrs.	25 min.	2½ hrs.	3 hrs.	25 min.	2 hrs.	1¾ hrs.	20 min.	1½ hrs.
4	F.	38	3 hrs.	20 min.	3 hrs.	...	...	...	¾ hr.	20 min.	1¼ hrs.
5	F.	42	5 hrs. ¹	3 hrs. (?)	...	1 hr.	20 min.	1½ hrs.	2½ hrs.	25 min.	2½ hrs.
6	F.	27	3½ hrs. ¹	2 hrs. ¹	3 hrs. ¹	1 hr.	25 min.	2 hrs.	1 hr.	20 min.	2 hrs.
7	F.	55	3½ hrs.	25 min.	...	2 hrs.	20 min.	2 hrs.	1½ hrs.	...	...
8	M.	28	2 hrs.	30 min.	2 hrs.	3½ hrs. ¹	...	...	1¼ hrs.	25 min.	2 hrs.
9	F.	37	3 hrs.	30 min.	2½ hrs.	...	...	2 hrs.	2 hrs.	20 min.	...
10	F.	52	3¼ hrs.	20 min.	3 hrs.	2½ hrs.	20 min.	2½ hrs.	2 hrs.	20 min.	2 hrs.
11	M.	43	3 hrs.	30 min.	2½ hrs.	2 hrs.	20 min.	...	2 hrs.	15 min.	2 hrs.
			First week.			Third week end.			Fifth week.		

No. 1 had daily attacks for four months prior to admission, and ten days before admission. Emaciation. Paroxysms attack diminished. Slight gain in weight. Food well condition.

No. 3 had headache three or four times in a month and some—
Twenty-five lbs. gain in weight.

No. 10 had suffered constantly for many years, and had lived

¹ Tested during

and Günzberg's Tests in cases of Biliou's Headache
Rest and Massage.

Salol.	Rhub.	Günzb.	Salol.	Rhub.	Günzb.	Result.
	20 min.	1½ hrs.	1 hr.	20 min.	1¾ hrs.	Not permanent.
	25 min.	1½ hrs.	¾ hr.	20 min.	1¾ hrs.	Less frequent.
hrs.	20 min.	1½ hrs.	1 hr.	...	1½ hrs.	Two attacks in three months.
	20 min.	1½ hrs.	...	...	...	No return in five months.
	25 min.	2 hrs.	¾ hr.	20 min.	2 hrs.	Severe after three months.
	20 min.	1½ hrs.	¾ hr.	15 min.	1½ hrs.	One headache in six months.
	20 min.	2 hrs.	1 hr.	10 min.	2 hrs.	No return in two years.
...	20 min.	2 hrs.	1½ hrs.	20 min.	2 hrs.	Twelve weeks' treatment. No return in two years.
hrs.	15 min.	2 hrs.	...	...	...	No return in one year.
...	20 min.	2 hrs.	1½ hrs.	15 min.	2 hrs.	No headache one year and a half.
hrs.	15 min.	2 hrs.	70 min.	15 min.	1¾ hrs.	No return in one year.
Sixth week.			Eighth week.			

frequent attacks for twenty-five years. No food by mouth for attended by salivation and vomiting. Frequency and force of attacks. Morphine discarded. Subsequent relapse to former attacks weekly. Nine attacks in first five weeks of treatment. darkened rooms for five years. ...oxysm.

TABLE II., showing behaviour of Salol
Treatment by

			Week of Treatment.				
No.	Sex.	Age.	1st.	2nd.	3rd.	4th.	5th.
1	M.	45	2½ hrs.	2¼ hrs.	0	1 hr.	1 hr.
2	M.	32	4 hrs. ¹	2 hrs.	2 hrs.	0	1 hr.
3	M.	31	3 hrs.	3 hrs.	2 hrs.	0	3 hrs. ¹
4	M.	50	2¼ hrs.	2 hrs.	1 hr.	0	¾ hr.
5	F.	49	3¼ hrs.	3 hrs.	3 hrs.	2¼ hrs.	1¾ hrs.
6	F.	38	3 hrs.	1 hr.	0	¾ hr.	¾ hr.
7	F.	53	2 hrs.	2 hrs.	2 hrs.	0	1 hr.
8	F.	42	5 hrs. ¹	2¼ hrs.	1 hr.	¾ hr.	¾ hr.
9	M.	42	2½ hrs.	2 hrs.	¾ hr.	0	¾ hr.
10	M.	38	1 hr.	4 hrs. ¹	0	¾ hr.	¾ hr.

All the cases were characterised by severe temporal or
quently than once a month. No. 2 and No. 8

¹ Headache at time

Test in cases of Bilious Headache during Rest and Massage.

Week of Treatment.			Result.	Weight gained.
6th.	7th.	8th.		
$\frac{3}{4}$ hr.	...	...	No return of headache for six months.	11 lb.
$3\frac{1}{2}$ hrs. ¹	1 hr.	$\frac{3}{4}$ hr.	Less frequent.	$15\frac{1}{2}$ lb.
1 hr.	1 hr.	...	No return for three months.	7 lb.
$\frac{3}{4}$ hr.	...	...	No return for four months.	$12\frac{1}{2}$ lb.
$1\frac{1}{4}$ hrs.	1 hr.	1 hr.	Not severe, about two attacks in every three months.	25 lb.
$\frac{3}{4}$ hr.	$\frac{3}{4}$ hr.	...	No return for five months.	$9\frac{3}{4}$ lb.
1 hr.	o	$\frac{3}{4}$ hr.	Slight, no prostration after.	$5\frac{1}{2}$ lb.
1 hr.	$\frac{3}{4}$ hr.	$\frac{3}{4}$ hr.	Severe after three months, an attack every month.	9 lb.
$\frac{3}{4}$ hr.	...	...	Three attacks in seven months.	$3\frac{1}{2}$ lb.
o	$\frac{3}{4}$ hr.	$\frac{3}{4}$ hr.	Less severe, one attack in four months.	$4\frac{3}{4}$ lb.

temporo-occipital headache, recurring not less frequently than had headaches nearly every day before treatment.

of administration.

Massage in Insomnia.—All physicians who have much to do with cases of insomnia are constantly confronted by the problem how best to overcome persistent sleeplessness, and all are agreed in deprecating the careless prescription of a hypnotic drug. There are very few conditions of disturbed sleep function which will not yield to means fraught with less danger than that which attends the routine administration of sedative drugs; and excluding disorders of sleep arising from pain, febrile conditions, and cerebro-spinal diseases, one of the most potent remedial agents at our disposal is massage. Even in cases in which it is impossible permanently to remove the cause of insomnia, alone or in combination with rest and other remedies appropriate to the state on which the disturbance of function may depend, massage will often excel all other means of treatment in temporarily restoring the healthy rhythm of metabolic activity in the nerve-cells, on which sleep depends. Acting directly, massage of the trunk and extremities, and especially of the abdomen, produces vascular dilatation over a large area, accompanied by a corresponding contraction of the cerebral vessels. In employing massage for the relief of sleeplessness, the author has endeavoured to utilise, in a modified form for clinical purposes, the physiological experiments of Goltz on the frog and Schüller on the rabbit. It will be remembered that the former, by repeated tapping on the un-

injured abdominal parietes of a living frog, was able to reduce the frequency of the heart's beat almost to a standstill, while on post-mortem examination immediately after, he found that the blood-vessels of the abdomen were greatly dilated and distended with blood. The latter observed the effect of cold and warm compresses respectively when applied to the belly of a rabbit. He found, on removing the walls of the cranium, leaving the transparent dura-mater intact, that instantly on the application of cold to the abdomen, the meningeal vessels dilated, and remained so for some considerable time, while a warm compress over the belly caused immediate and long-continued contraction of the vessels of the meninges, with slowing of the cerebral movements.

Now, Durham asserts that the brain is anæmic, and the vessels of the pia-mater are contracted during sleep; if, then, the capacity of a large vascular area—*e.g.* the trunk and extremities, or the abdomen—can be greatly increased, the relaxed vessels will be filled at the expense of those in which dilatation has not been artificially produced, as it is in the vessels of the skin, muscles, or abdomen, when subjected to friction and kneading. Thus the normal tension in the vessels of the brain is reduced, as the blood pumped out of the heart with each contraction flows into the dilated arteries so as to fill them. Prolonged kneading of the abdomen produces dilatation of its vessels to an

extent sufficient to cause a compensating contraction in other vascular areas. Experiments on healthy persons show that the heart's action can be reduced in force and frequency, and surface temperature is lowered by the practice of abdominal massage. Visible contraction of the superficial vessels and anæmia of the hands and feet can be recognised during and after abdominal kneading. If, however, by previous manipulation of the trunk and extremities, and subsequent maintenance of their temperature while the kneading of the belly is practised, one can prevent contraction of the cutaneous and muscular vessels, arterial tension will be greatly lowered, and it is probable that collateral anæmia of the brain will be produced by the dilatation of so large vascular areas as those represented by the muscles and abdominal organs. Reduction of the volume of blood in the cerebral vessels will be followed by a fall of temperature coincident with the decline of activity in the metabolism of the nerve-cells, and thus sleep will be induced. This appears to be the correct interpretation of the result usually, and happily, following the employment of evening massage in cases of insomnia dependent on digestive disorders, cardiac, renal, and other diseases characterised by increased vascular tension. In such cases of sleeplessness the direct effect of massage may be followed by an immediate or very early restoration of the sleep-function, either partially or completely, especially

when rest in the recumbent position in a quiet room away from domestic, social, or business cares can be secured. If sleep is dependent on a state of comparative bloodlessness of the brain, and its character and duration are modified by the conditions of cerebral circulation, it is important, particularly in cases of extreme anæmia, valvular disease, or arterio-sclerosis, to insist upon the maintenance of the recumbent posture throughout the day as well as the night, by patients seeking relief from sleeplessness, not only because the rest so much needed is thus secured, but for the reason that the heart is not called upon to work so vigorously, all the arterial system being approximately on the same horizontal plane. Thus the circulation through the brain, trunk, and extremities is equalised, and the tendency to variation in the force and frequency of the heart's action which follows transition from the erect to the recumbent posture and *vice versa* is avoided. In many instances the assumption of the reclining attitude on retiring to bed, even when adopted very slowly and gradually, is followed by wakefulness; and here, when it is not possible for patients to relinquish altogether their daily avocations, retirement to bed at an early hour, followed by the administration of gentle massage, will often overcome the defect in the sleep-function characterised by the inability to get to sleep for several hours, though the wakefulness of the earlier night hours may be

followed by more or less continuous sleep till morning. The writer has frequently been able to increase the number of hours of sleep, and to break the habit of prolonged restlessness occurring at the commencement of the night by evening massage, and the application of a hot compress to the abdomen. In the more serious conditions of insomnia, in which the patient may not experience difficulty in getting to sleep for a very short period, but awakes after one or two hours, and spends the remainder of the night in a state of restless and wakeful irritability, often associated with an overwrought and enfeebled nervous system, some time elapses before the good effect of rest and massage is produced. In these cases it has been found useful to employ massage in the earlier hours of the day for the improvement of nutrition and the stimulation of waste removal, while the whole wet-pack, the hot bath, or abdominal compress is used to induce nocturnal tranquillity until the general betterment in the patient's health, under the influence of the 'rest cure,' obviates the necessity for these artificial aids to sleep.

Persons suffering from the ill effects of prolonged overwork, mental distress, morphine habit, chloral drinking, and chronic toxæmia, exhibit a train of symptoms perhaps best described by the term erethetic neurasthenia. In these it is almost useless to look for any *immediately* beneficial results from a method of treatment which nevertheless

rarely fails to prove eventually successful. These are by far the most difficult and anxious cases of sleeplessness, and they tax the ingenuity and try the patience of those from whom they seek relief. For be it understood they do not as a rule submit themselves to a course of treatment involving, as must usually follow, a period of enforced idleness, until compelled thereto by the severity of suffering or inability to work; though, indeed, on referring to his notebook, the writer finds record of some who, having run the gauntlet of narcotics, spas, 'cures,' and voyages in search of sleep, have been sent to undergo what one who regained healthful rest facetiously termed 'six weeks' solitary confinement with hard labour.' With the approach of nightfall comes the exacerbation of all the worst symptoms in these cases—headache, palpitation, eructations, tremors, exalted sensations, and withal mental anxiety, the anticipation of a bad night, with a craving for 'something that will give sleep,' or, in the case of *habitués*, for a dose of their particular poison. Sometimes, with a little encouragement and under the influence of a few judicious words, the patient will make an effort to compose himself for sleep, and perhaps the nurse will bring the pleasing news that the patient is asleep; but after the lapse of an hour or more, just as one is beginning to hope that the day's rest and treatment may possibly have served to induce a quiet night, the call-bell

rings, and a glance at the unhappy sufferer reveals the restless brain and excited nerves from which healthy sleep has been so long estranged.

In such cases drugs are contra-indicated, moral suasion proves useless, and as yet the tonic treatment by massage, etc., has only just been commenced. Prompt action is necessary, the brain must be quieted, the nervous system soothed, if the ill effects of a sleepless night are to be avoided; and of all the means at our disposal for bringing this about none exceeds in value *the wet-pack* carefully administered. The use of this agent as an antipyretic is so well known that it is unnecessary to refer to the method of application except in relation to certain points, attention to which has been found greatly to enhance its efficacy when the wet-pack is employed as a hypnotic. And first, with regard to the patient whom it is proposed to pack, it must be ascertained that the surface temperature of the body is not sub-normal, a condition very frequently met with in cases of insomnia not depending on fever; so, whenever the temperature of the foot is found to be under 90° F., and that of the palmar skin of the hand below 95° F., it is advisable to raise the superficial warmth by moderately firm friction of the limbs and trunk, exposing the surface as little as possible, or, better still, performing the rubbing under the bedclothes, removing only such proportion of them as may by

their weight interfere with the freedom of the manipulations. One other precaution which may save much time and discomfort—the patient should evacuate the bladder before the application of the sheet, as frequently the sudden cold impression causes an urgent necessity to do so. In regard to the administration of the pack, it is best carried out either on the bed itself or on a ‘massage couch’ brought close to the bedside, so that at the conclusion the patient need not exert himself on leaving the pack, which he should do as soon as the circulation previously retarded begins to be accelerated; or if this increase of the pulse-rate, usually but not always observed, does not occur within twenty minutes, it will be found that half an hour is sufficient in most cases to produce a satisfactory soothing influence on the whole nervous system, resulting in calm, refreshing sleep. On opening the pack it is important that the night-clothing of the patient, having been well warmed, should be put on as quickly as possible, and that he should lie down in a well-covered bed immediately, too great abstraction of heat from the body being thus avoided, and a cold stimulation of the cutaneous nerves prevented. There are some cases in which the soothing effect of the wet-pack appears to be almost as transitory as the initial irritation occurring on the first contact of the wet sheet with the skin, and in these the renewal of the damp sheet has been employed as suggested by Winter-

nitz ;¹ but just as the reaction from the cold stimulus in the first packing is of a rapid and violent character, so again the renewed application of the wet sheet is followed by excessive irritability of the cutaneous nerves, often followed by a shivering fit, so that one has failed to obtain the desired result of the renewed pack. Under these circumstances, *i.e.* where, after a very short contraction of the cutaneous vessels, there follows a rapid dilatation, with only a short retardation of the temporal pulse, replaced after a few minutes by an increase in frequency exceeding that which was noticed on applying the sheet, and accompanied by a burning sensation with great restlessness, one has found it best to follow very carefully the condition of the pulse, and, as soon as the number of beats begins to decrease, to gradually remove the outer coverings used to promote warmth, until the patient is enveloped only in the sheet, and two, or perhaps three, folds of blanket.

In this way too great an accumulation of heat on the surface of the body is avoided. The sheet will be found to keep damp for a longer time, and, though there is little evaporation through the blankets as far as one can judge by one's hand or the thermometer, yet it would appear that there is sufficient to maintain an equable temperature, thus precluding the accession of too great heat-

¹ 'Hydrotherapeutics,' by Winternitz ; Von Ziemssen's *Handbook of General Therapeutics*, vol. v.

storage on the surface of the body, and ensuring the continuance of the soothing warmth to the easily irritated sensory nerves. This simple modification of the packing method rarely fails, and by adjusting the number of wraps one is able to prolong the effect sufficiently to ensure a lasting calm, which is more often than not the precursor of restful sleep; indeed, in some cases the patient has been permitted to doze on the couch, care being taken to watch the temperature, and from time to time to place additional coverings on the sleeper.¹

The hot bath, the hot abdominal compress, with or without previous kneading of the belly, or the whole wet-pack modified to suit the requirements of the case, and all of these followed by the most rigid observance of the recumbent position in a warm bed placed in a quiet, cool, well-ventilated room, so arranged that direct or reflected light, whether from fire or candle, shall not disturb the patient, have been found almost invariably successful aids to sleep in the different disorders of this function not dependent on pyrexial or severely painful conditions which have come under the notice of the writer. The value of massage as a means of treatment in sleeplessness does not so much depend on the immediate production of rest-

¹ The loss of rest on the part of the watcher is more than rewarded by the pleasant effect of the sleep so obtained on an irritable patient.

ful sleep, such as may sometimes be obtained by its use at nightfall or by the employment of the methods already mentioned for the temporary restoration of sleep; but is rather based on the permanent results happily occurring in a large number of cases after a period of treatment by massage varying from three to ten weeks.

The disorders of sleep in which massage proves most useful are:—

(1) Habitual sleeplessness, as a result of persistent curtailment of the hours for sleep.

(2) Insomnia from indirect causes, *e.g.* indigestion; or from toxic conditions, *e.g.* gout, malaria, etc.

(3) From abuse of stimulants, *e.g.* alcohol, tea, and cocoa.

(4) From exhaustion following overwork, emotional excess, and defective nutrition of the brain through diminution of the blood-supply or deterioration in its quality.

(5) From increased vascular tension.

Massage may also be employed with advantage in some cases of drug-habit, asthma, and cardiac hypertrophy and dilatation, in which disorders of sleep are prominent symptoms; but the results are not so uniformly good under these conditions as they are in the cases arising from the causes cited above.

The character of the massage administered in

the treatment of defective sleep should vary with the indications it is desired to fulfil. When used in cases of impaired nutrition and auto-intoxication to promote the circulation of sufficient nutritive material, and to aid elimination of waste products, the massage should be given in the earlier hours of the day, and should more especially be directed to the thorough kneading of the muscles so as to create a demand for the supply of fresh pabulum, and to mechanically squeeze out of the tissues used-up matter.

It is well known that massage will enable patients suffering from mal-assimilation to ingest and digest large quantities of food without the same risk of upsetting the digestive organs as if equal taxation of their powers was attempted without it; and in cases of sleeplessness, it is remarkable that *pari passu* with the gain in bodily weight the quality and quantity of sleep is improved.

It is very certain that insufficient sleep seriously militates against any increase in strength and weight, so that the use of the weighing machine will enable the physician to gauge pretty accurately the effect of treatment on the sleep function. Frequently, in cases of insomnia, the writer has compared notes with the patient in reference to the conditions of sleep and the gain in weight. Invariably it is found that little or no weight is gained in a week of 'bad nights,' while four or five

pounds, or even more, will be put on when a fair amount of sleep has been obtained.

When massage is employed directly to induce the supervention of sleep, care must be taken to avoid any handling which might excite the sensory nerves or lead to undue acceleration of the circulation. Vigorous friction and muscle-kneading are contra-indicated when it is desired to obtain the soothing effects produced on the sensorium by rhythmical, monotonous impressions, such as may be ensured by long, slow, steady strokes and gentle kneading. Very much depends on the character of the manipulations, something on the hand itself and on the personality of the rubber. It is useless to hope for the attendance of 'nature's soft nurse' if she 'be frightened' by rough, careless, or jerky handling on the one hand, or fussy garrulity on the other. No conversation or moving about the room should be permitted, and all light, save a night-light shaded from view, should be excluded. Under these circumstances a good night will probably follow evening massage, pleasant sleep supervening shortly after its conclusion, especially when the manipulations (commencing with the abdomen and passing to the back, legs, and arms) are conducted with as little exposure of the parts to the outer air as possible.

It is most important to prevent the radiation of heat from the surface of the body either during or after the performance of the manipulations, which,

when practised for the speedy induction of sleep, are directed not so much to the evacuation of the lymphatic and venous vessels of the parts dealt with, as to the rapid and sufficient stimulation of the sensory nerves with the dilatation of the arteries over as large an area as possible.

CHAPTER IX

Massage in Heart Disease and Asthma

THE remarkable success claimed for the Oertel treatment, the Schott method, and other forms of 'heart-gymnastics' in cases varying in gravity from extensive non-compensatory dilatation, with or without valvular mischief, to the minor forms of transient disturbance of rhythm has led to some controversy and diversity of opinion, which as yet show no signs of abatement. While some writers extol the merits of gymnastics, exercises, and mountain-climbing in cases involving muscular debility, fatty degeneration, and insufficient compensation, others again declare that such methods of treatment induce the very conditions it is sought by these means to improve, insisting upon the necessity of rest, especially in valvular disease.

In a paper 'On the Use of Rest in Cardiac Affections,'¹ Dr. Lauder Brunton urges the importance of absolute rest in advanced mitral disease, while at the same time he points out the value of massage in such cases, and advocates its employment in cardiac dilatation.

¹ *Practitioner*, vol. li. p. 190 (1893).

During the last eight years the writer has had opportunities for testing the value of massage combined with rest in bed, in several cases of cardiac disease, including aortic regurgitation, mitral incompetence, and dilatation.

In eleven cases the treatment by rest and massage has been followed by the use of assisted and resisted movements and carefully regulated active exercise.¹

Generally the plan adopted has been as follows:—

For a period varying from a fortnight to a month the patient has been kept at rest in bed. Either immediately, or after the lapse of a few days, general corporeal massage has been administered, at first once, and after a time, depending on the conditions of the case, twice daily. The character and duration of the manipulations have been modified, according to the effects observed during and after the application of the remedy. In some cases it has been necessary to restrict the employment of massage to comparatively brief administration of firm but gentle centripetal friction of the limbs and trunk. Then from day to day the length and force of the manipulation have been gradually increased, till thorough massage, both rubbing and kneading, of the whole body is borne without exciting any disturbance of the heart or respirations.

As the patient becomes habituated to the massage,

¹ 'Mechano-therapy in Chronic Diseases of the Heart,' by A. Symons Eccles.—*Practitioner*, vol. liii. p. 106, Aug. 1894.

passive movements of the limbs are practised, the number and character of these varying with the state of the case. As soon as it is recognised that slight exertion may be made by the patient, without cardiac disturbance, active movements of the limbs, assisted by the attendant, are prescribed. Very shortly after the initiation of these slight exercises they are followed by unassisted systematised movements, and by degrees resistance is offered by the manipulator to the active exercises practised by the patient.

At this stage difficulties will arise and disappointment ensue, unless the utmost care is taken to avoid over-exertion. The writer looks back with regret to cases in which too keen desire on the part of all concerned to record progress has led to relapse and failure, due to the want of judicious control of the force employed by the patient and the manipulator. Impatience is the stumbling-block most readily impeding recovery, and unless this can be curbed success will not attend the methods advocated.

It is most important, both in the administration of massage and in the employment of exercises, with and without resistance, to watch very closely the rate of the pulse and respirations, for if there is any acceleration of either the object of the treatment will be defeated.

The value of massage in chronic cardiac disease is twofold, for while it induces the removal of

waste-product by mechanically squeezing out the lymph from the lymphatics, and driving the blood out of the veins, kneading the muscles also increases the circulation through them, dilating the arteries, and thus decreasing peripheral resistance. In a few cases of anæmic obesity, in which cardiac dilatation and weakness of the heart-muscle were markedly present, the writer has employed massage over the præcordial region after the manner prescribed by Oertel, and in two cases the immediate effects of the rhythmical movements so performed were certainly very remarkable.

In one case, before manipulation of the chest-wall the first sound was inaudible, the apex beat was hardly perceptible in the fifth interspace in the left nipple line, the area of deep cardiac dulness extended from the apex beat horizontally to the right fourth interspace just beyond the border of the sternum, thence upwards to the junction of the second right costal cartilage with the sternum, and, crossing the breast-bone to an inch to the left of its border in the second left intercostal space, the left border was continued downwards and outwards to the apex beat. The use of the phonometer confirmed the limits made out by deep percussion and combined auscultation and percussion.

The area of the dulness was measured while the patient was in a semi-recumbent attitude on a couch. Oertel's heart-massage was then administered for some five minutes. The area of dulness

was again examined as before : the apex beat on palpation was more distinctly felt, and was found to occupy a position half an inch internal to that previously noted ; the upper limit of the dulness did not rise above the level of the third right costal cartilage, and passed thence across the sternum to the second left interspace just $\frac{3}{4}$ inch from the left border of the breast-bone. The pulse before massage was 104 (just after the patient had been moving about and standing up) ; on the conclusion of the chest-rubbing and pressure over the left thorax it fell to 80 per minute. The respirations, which were previously 28 per minute, fell to 20. At the conclusion of general massage the limits of deep cardiac dulness remained the same ; but the pulse had fallen to 76 per minute, and the respirations to 16 per minute. No permanent effect on the area of cardiac dulness was produced in the first fortnight of treatment by rest and massage ; but at the conclusion of five weeks the patient had lost 20 lbs. in weight, the heart sounds had greatly improved in character, and the area of dulness was permanently decreased, being slightly less than the dimensions recorded after the first application of massage. The pulse, lying down, was between 75 and 80 per minute ; standing up, 90 to 95 ; above which rate it never rose, even after walking upstairs, an exercise causing heart-hurry and dyspnoea when the patient first came under observation.

Similar good results have been obtained in three of the six cases of post-influenzal cardiac dilatation mentioned hereafter, in which Oertel's 'heart-massage' was employed. In the other cases of cardiac disease coming under the author's care the local massage has not been used; but the effects of general massage have conclusively proved that by its careful use the blood pressure is reduced, and relief is afforded to the enfeebled heart. It has already been shown that muscle-kneading and abdominal massage produce slowing of the heart-beats; but if either of these manipulations is too vigorously employed or too long continued, the opposite effect will follow, and exhaustion will induce the very results which it is desired to avoid in prescribing rest and massage.

In regard to the exercises, the same care is necessary in order to obtain their beneficial effect, and precautions are especially needed in the use of resistance. Every patient instinctively holds the breath when called upon to practise movements of the limbs and trunk resisted by the attendant, and the attempt to employ them must be abandoned unless the regularity and depth of the respirations are ensured during the exercise. This can only be achieved by unceasing vigilance on the part of the attendant, and careful co-operation by the patient.

All the foregoing treatment is employed while the patient still remains in bed, but as the massage

and exercises practised in the recumbent position become more and more easily carried out without causing untoward symptoms, removal from a bed to a couch is permitted, and the exercises are practised in the sitting posture. This allows of greater diversity in the movements of the limbs, to which are added assisted, unassisted, and resisted exercises of the trunk. These are again supplemented by movements of the whole body, *e.g.* swaying backwards and forwards, the lower extremities being alternately raised in the same and in the opposite direction to the trunk. Crouching, kneeling, and rising from the sitting and horizontal positions are practised as before with and without assistance, and resistance is gradually increased on the part of the attendant. Finally, locomotion is permitted, and exercise in the open air is added to the indoor manipulations.

Here, again, it is necessary to lay down rigid rules as to the length and duration of the drive or walk abroad. The patient must be at first, in any case, accompanied by a trustworthy person, who points out the direction and regulates the duration of every walk according to instructions. It so happens that in the majority of cases treated by the writer the outdoor exercise has been carried out under the most favourable circumstances possible in London. The patients being treated in a house close to Hyde Park, the whole of the park and adjoining gardens have been mapped out into

some eighteen or twenty routes, till at the close of the treatment in successful cases the patient is able to walk by a circuitous route from Hyde Park Corner to Holland Park, through Hyde Park and Kensington Gardens, down the Notting Hill and back again, without stopping. To those who are familiar with the distance and conformation of the ground, this will doubtless be regarded as a fair test of the improvement in cardiac cases associated before treatment with muscular weakness, fatty infiltration, deficient compensation in valvular disease, and various forms of functional disturbance to be subsequently detailed. The writer does not claim any success in some cases, by reason of their apparent incurability by any means, and in others because the treatment has been abandoned before the active outdoor exercises have been commenced, either at his own instigation, or at the request of the patient.

In one case of aortic regurgitation, in which the patient sought relief from sleeplessness, throbbing headache, and gastric disturbance, which he had attributed to disordered digestion, being apparently unaware of the valvular disease of his heart, the result of the treatment was excellent in so far as the relief of insomnia, vertigo, headache, and dyspepsia enabled the patient to pursue his vocation as a lawyer without the recurrence of these troubles for more than a year. The diastolic murmur, increased cardiac dulness, and diffused

impulse were unaffected; but the pulse, which was only sixty-five per minute, rose under the treatment to eighty, and quite recently remained generally between seventy and eighty. Walking exercise, which had been attended by great fatigue unduly supervening, with occasional palpitation, is now enjoyed to the extent of three or four miles without any unpleasant consequences. During the month of rest, massage, and exercises, the weight rose from 9 st. 2 lb. to 9 st. 10 lb., and the patient, though still of a spare habit of body, weighs now, twelve months later, 10 st. 6 lb. in light clothing.

At first the patient was fed exclusively on light milk-puddings, with milk as a beverage. After a fortnight of rest in bed, with gradually increased exercises, passive, assisted, and actively resisted, the dietary consisted of milk, rusks, *purées* of meat and vegetables, and a cupful of Benger's food at bedtime. Subsequently the midday meal consisted of any roasted meat, a small portion of green vegetables, and custard or jelly made with milk.

No fluids were given with the meals, but milk was given as a beverage half an hour after luncheon and dinner, and with rusks for breakfast. The sleeplessness, which had been very marked before the initiation of treatment, yielded in the first week to the plan of keeping the patient in the recumbent position day and night, and from five

to seven hours' good sleep were obtained every night for three weeks. When the walking exercises were first attempted, the hours of sleep were reduced, but after the third night the patient regained the power to sleep, and the throbbing in the head ceased. With slight attacks of transient insomnia this patient has enjoyed fairly good health ever since, and plays golf for several hours every week without any ill effect. There is no increase in the area of cardiac dulness, and apparently the characteristic regurgitant pulse is less marked, the diastolic collapse of the pulse-wave being certainly less than it was when the case first came under observation.

The other case of aortic regurgitation in which the treatment was employed showed no improvement after three weeks, and the attempt to alleviate the symptoms was abandoned. The patient was a well-nourished lady, æt 50, of highly neurotic temperament, who suffered greatly from the distressing pulsation of the carotids, and complained of occasional præcordial pain. The murmur was very loud over the ensiform cartilage, there was marked anæmia of the nails and hands when the arms were raised ; and as the patient was intolerant of the enforced rest, a sea-voyage was prescribed, but without any good result.

The cases in which the combination of rest and massage with systematic exercises has proved most useful are those in which cardiac arrhythmia, with

palpitation, an intermittent and irregular pulse, breathlessness on exertion, cold blue extremities, and enfeebled digestion, have been associated with the physical signs of dilatation, sometimes accompanied by systolic *bruit* after one or more attacks of influenza.

It is in these cases of increased præcordial dullness, with a weak and diffused impulse, and an apex-beat to the left of its normal situation, sometimes beyond the mammary line, that the efficacy of Oertel's treatment has been most vigorously denied by the opponents of his methods. Lépine, Lichtheim, and others appear to oppose the treatment, alleging that in diseased hearts it produces the very condition leading to dilatation—namely, weakening of the walls, with increased intracardiac pressure. Hausmann also considers it inapplicable to cases of deficient compensation after endocarditis, and in valvular disease with muscle-weakness; though he advocates mountain-climbing and the withdrawal of fluids in certain cases of fatty heart and disordered circulation.

The selection of cases in which Oertel's treatment will be beneficial is perhaps rendered the more difficult in this country, inasmuch as it is not without some hesitation that the medical expert advises a patient suffering from the consequences of an overworked heart, a weakened cardiac muscle, or inadequate compensation in valvular disease, to undertake a long journey involving the sea-passage

fraught with so much discomfort to the majority of invalids; if, at the destination resorted to, the treatment should prove unavailing, or, as it is asserted by opponents, damaging in such cases.

Nothnagel distinctly declares that he regards the Oertel cure as objectionable in all cases wherein there is any degeneration of the cardiac muscle, while he recommends gymnastics under careful supervision in dilatation and valvular lesions followed by degeneration. Rest under all circumstances appears to be regarded by most authorities as valuable; though in chronic conditions there is a division of opinion as to how far this may be tempered by active exercises, even when carefully regulated. Judging from the results obtained in the comparatively few cases in which the writer has yet had opportunity for the employment of rest, massage, passive and active exercises with and without resistance, followed by rigidly prescribed and carefully limited outdoor walking, gradually increased according to the effects observed, it seems that such a method as he has employed gives promise of results in some cases as good as those claimed for the Oertel system, and in others it may serve as a preliminary introduction to the more severe conditions involved by resort to *Terraincurorte*.

In six cases of post-influenzal cardiac disturbance, characterised by dyspnœa and tachycardia following any exertion, palpitation after meals, increase of

cardiac dulness, a diffused impulse, and either a systolic or præ systolic murmur heard loudest at the apex, the effect of the treatment was all that could be desired.

In two such cases, however, no apparent good resulted from the treatment, and in one the condition of the patient, after seven weeks' rest, massage, and exercise in the recumbent position, was so little improved that the resisted exercises in the sitting and erect postures were not attempted. Hæmorrhages from the bowel, abdominal pains, gastric distension, anorexia, and insomnia alternated with heart-hurry, intermittence, vertigo, and muscular exhaustion. As soon as one symptom subsided another replaced it, so that no steady improvement was gained. The evidence of dilatation varied from time to time. When there was breathlessness the heart appeared to enlarge, the area of cardiac dulness certainly increasing towards the left anterior axillary line during a paroxysm of combined dyspnœa and tachycardia. So long as the attack continued, the tumultuous action of the heart and the breathlessness were accompanied by an improvement in the regularity of the pulse; but afterwards on the resumption of the recumbent position, intermittence and irregularity recurred. The patient had been bidden by previous observers to disregard the cardiac symptoms in his case, and to take exercise; but every attempt to do so was followed by dyspnœa and tachycardia,

with subsequent intermittent action of the heart and pulse. Strychnine, digitalis, strophanthus, caffeine, and many other drugs had been tried, and failed to give relief; sea-air and the very best hygienic conditions were of no avail; but it is possible that, if the heart-gymnastics had been pursued with regularity and rigid supervision, the organ might have been reduced to quiescence, as in the other six cases cited. In order that systematised treatment should prove useful in these cases, the medical adviser must have freedom of action in every respect, which is not always accorded either by patients themselves or by anxious relatives.

In four cases of anæmic obesity, in which there were no evidences of arterio-sclerosis, but wherein there were in one case frequent attacks of syncope, and in all breathlessness, dyspepsia, and irregularity of the pulse, with lassitude and general debility, the treatment resulted in the diminution of obesity, relief from dyspnœa and gastric disturbance, and decided augmentation of general strength. In five cases of functional disturbance of the heart, unattended by any physical signs, but accompanied by various more or less distressing symptoms of impaired function, *e.g.* palpitations, præcordial distress, anorexia, insomnia, and pseudo-anginal attacks, the treatment, pursued for periods of from one to two months, invariably succeeded in effecting complete relief.

Three such cases have lately been restored to the active enjoyment of good health ; the patients have been able to pass through the somewhat severe ordeal of a London season, dancing, riding, and walking without any discomfort ; appetite, digestion, sleep, and muscular strength, all of which had been wanting, now sufficing to maintain the bodily vigour and mental buoyancy necessary to the fulfilment of social duties or pleasures which involve late hours in crowded rooms, and other conditions not to be regarded as in any sense favourable to the maintenance of such hygiene as would be conducive to good health in robust individuals.

In all these cases, however, the patients have learned the value of resting in the recumbent position after a fatiguing morning or afternoon before they attempt to take food. The value of healthy exercise has been taught, and the necessity for taking precautions against the undue fatigue following over-exertion and irregular meals has been enforced. Thus, in spite of the excitement involved by participation in the whirl of fashionable life, a certain measure of rhythm has been imparted to their existence which they had previously ignored.

In regard to the cases cited, exhibiting the physical signs of dilatation with symptoms of deficient compensation after influenza, the existence of some toxic influence irritating the cardiac

nerves, and producing vaso-motor disturbance, must not be overlooked. This is evidenced by the apparent variations in the area of cardiac dulness, which seemed to be increased during paroxysms of breathlessness and heart-hurry, while in the interval of quiescence the physical signs of dilatation were not so marked. It thus seems possible that the heart-muscle is capable of active relaxation of its fibres as opposed to the passive dilatation due to increased resistance only. Frequently the writer has observed almost sudden increase in the præcordial dulness, with displacement of the apex-beat outwards without any change in the bodily position of the patient. The same rapid alternation of contraction and augmentation in the size of the stomach has so often been noticed in the course of close observation of the gastric viscus in cases of *ectasia ventriculi* of purely muscular origin, that the writer must plead forgiveness for suggesting the possible existence of *active* relaxation of muscular walls of the heart and stomach in cases in which he believes he has been able to detect rapid variations in the size of these organs.

The occurrence of these phenomena, frequently observed about an hour after the ingestion of food, both in the heart and stomach cases, has suggested the probable influence of leucomaines and ptomaines absorbed into the circulation, acting as irritants upon the cardiac and gastric nerves

governing the muscular action of the organs to which they are distributed. Whether this can possibly occur or not, it is a matter of ascertained clinical fact that the most curious alternations between cardiac and gastric disturbances take place in some of these post-influenzal cases, and that frequently not only do the intermittent pulse, tachycardia, and hurried panting respirations alternate with epigastric or general abdominal pains, flatulent distension, intestinal colic, and diarrhœa, but occasionally all these symptoms recur simultaneously and apparently as a result of auto-intoxication. For this reason, in these heart cases it is necessary to pay the strictest attention to the quality and quantity of the food ingested; and it has often been observed that so long as the patient has been kept on carefully prepared diet in a finely divided and easily assimilable state, the distressing symptoms referable both to the cardiac and gastric functions subside. A premature attempt to vary and increase the meals has resulted in the recurrence of the cardio-vascular and digestive derangements.

The *rationale* of the treatment of certain chronic diseases of the heart by a combination of rest, massage, assisted and resisted exercises, followed by out-of-door walking carefully graduated, is based upon—

(1) The rest afforded to the overstrained or enfeebled heart by the adoption of the recumbent position for a time.

(2) The aid given to the circulation by the mechanical centripetal pressure exercised on the limbs and trunks by massage.

(3) The more rapid oxygenation induced by the increased circulation, and the diminution of peripheral resistance by the same means.

(4) The improvement in general nutrition, the elimination of waste products, and the increased metabolism induced by the massage, passive and active exercises in and out of doors.

(5) The careful preparation and selection of suitable food, coupled with the aid to digestion afforded by abdominal massage and exercises acting directly on the walls of the abdomen, and exercising pressure on its contents.

(6) The substitution of regular, graduated, assisted, and resisted movements for the spasmodic and ill-regulated exercise taken by patients suffering from cardiac functional disturbance with or without organic lesion.

In *Bronchial Asthma* massage of the chest and back appears to exercise a distinctly beneficial influence both in allaying the severity of the spasm and in relieving the wheezing and oppression remaining after an attack of paroxysmal dyspnoea. The effect of massage in these cases is probably of a twofold character. The stimulation of the cutaneous sensory nerves over the skin areas which may segmentally coincide with the viscus affected

is possibly effectual, in view of Dr. Head's researches; or the counter-irritation may, without any segmental relationship between the skin area and the bronchial innervation, produce a reflex effect on the pulmonary branches of the pneumogastric nerve. Friction and vibrations are the manipulations which apparently exercise the most marked effect, and the former, in promoting dilatation of the superficial cutaneous vessels over the chest and back, acts, no doubt, as a derivative, thus reducing the congestion of the bronchial mucous membrane. It is not surprising that massage of the chest should be useful in asthma when it is remembered that the pulmonary plexus derives branches from the spinal nerves, the vagus, and the sympathetic, all susceptible to reflex stimulation through direct irritation of the cutaneous sensory nerves. Whatever may be the correct interpretation of the effect produced by local massage, the fact that it is unquestionably valuable is supported by the evidence of the relief experienced by asthmatic patients who have had opportunities of testing its results; and if, as in the case of Oertel's plan of 'heart-massage,' we are unable to give a satisfactory explanation on physiological grounds of the therapeutic effects of chest-massage in cases of asthma, it is but another instance of 'science following art with limping pace.' The facts are before us, though the reasons for their existence are not yet intelligible. It is com-

paratively clear why general massage should prove useful in certain chronic cardiac diseases, in spasmodic asthma, and emphysema ; for in these conditions the obstruction of the circulation by the overloading of the venous system and the consequent resistance to the capillary and arterial blood-current can, in a measure, be overcome by mechanotherapy. Œdema can be diminished, the action of the skin is promoted, and digestion improved by the systematic and judicious administration of massage, while the patient is still able to obtain all the benefit of rest ; but it is not so easy to understand why local manipulation of the chest should produce such effects as are temporarily obtained in cardiac dilatation and bronchial spasm. At any rate, this local massage for affections of the thoracic viscera is not open to the grave objections which may be raised against the employment of Thuré Brandt's methods in the treatment of the pelvic organs. Of the value of such proceedings the writer is personally ignorant, for the reason that the published descriptions of them sufficed to convince him that the manipulations could not with safety be entrusted to any masseuse however skilful, nor could they be practised with propriety by any practitioner of medicine who is not also a gynæcologist of the highest repute, *sans peur et sans reproche*.

It is not possible for any one individual to acquire practical knowledge and manipulative

dexterity in all the various uses to which massage may be put in the treatment of diseases, many of them demanding special study and skill, involving the devotion of a professional career to the attainment of particular intimacy with their nature, pathology, and treatment. For this reason the consideration of massage as a therapeutic agent in many maladies of organs, either already regarded as within the realms of speciality, or rapidly approaching this position in medical practice, has been omitted, or very briefly referred to in this work.

On good grounds the writer has a high appreciation of massage as a remedial agent of special effectiveness that comparatively few know or recognise at present ; but if it is to take this place the manipulations in difficult cases must be practised by the doctor himself, not by any necessarily less educated person. Especially this is so in some diseases of the gastro-intestinal tract in which automatic massage by unskilled lay-hands would be fraught with probable disaster.

Doubtless in the large majority of cases in which massage is appropriate, the ordinary application of the remedy may well and rightly be confided to skilful manipulators acting under the supervision of medical practitioners who, in addition to their knowledge of disease, possess some acquaintance with the *modus operandi*, physiological effects, and therapeutic application of local and general massage.

If this little work should in some measure prove to be of service in fostering a wider acquaintance and a closer intimacy with the uses and limitations of massage as a means of treatment among his professional brethren, the writer will have attained the end for which he has hoped in the accomplishment of his task.

APPENDIX

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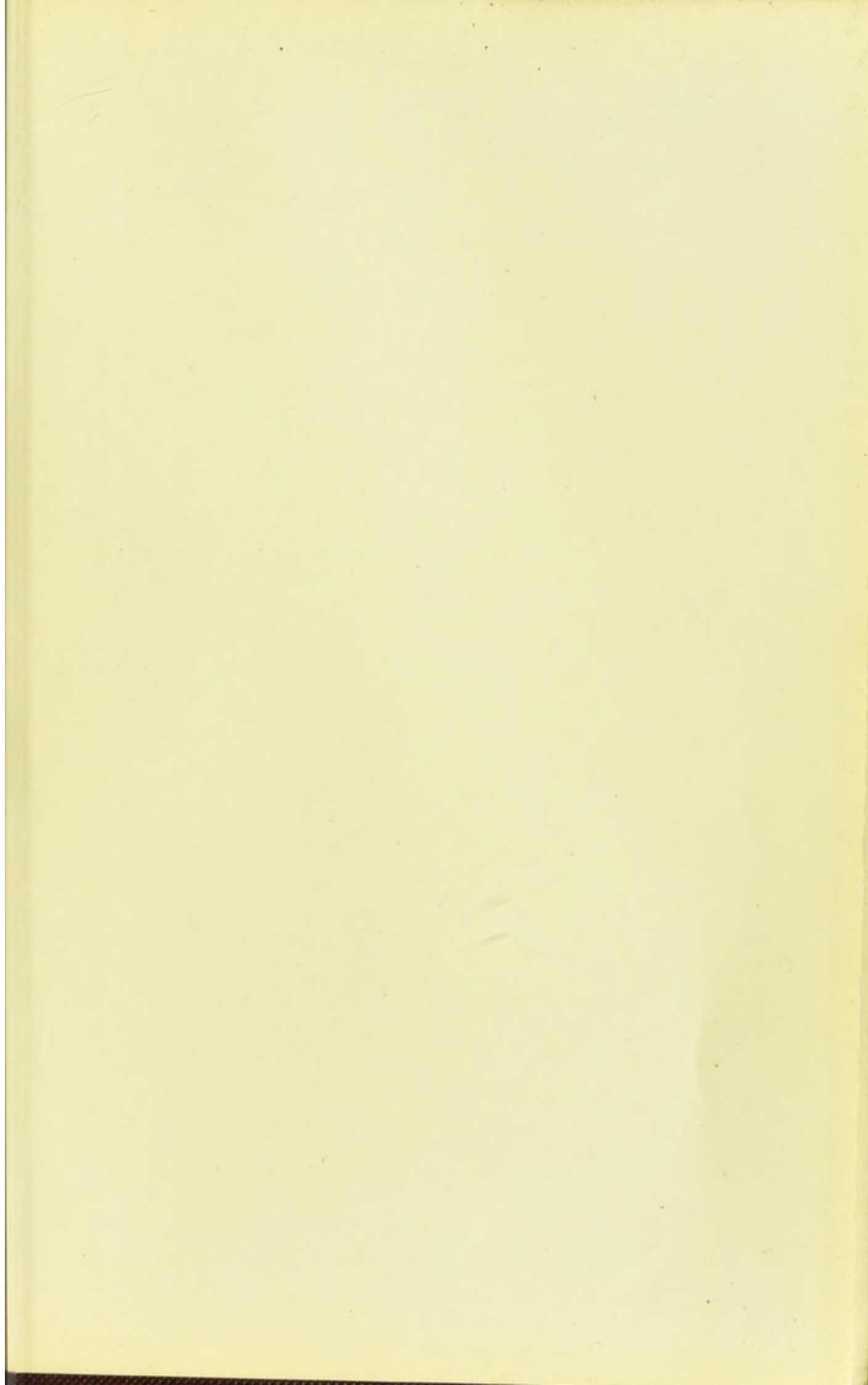
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Printed by T. and A. CONSTABLE, Printers to Her Majesty
at the Edinburgh University Press



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