

# Manual of Osteopathic Technique

By: Alan Stoddard

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ALAN STODDARD

M.B., B.S., D.O., D.Phys. Med

*Consultant in Physical Medicine  
Brook Hospital, London*



HUTCHINSON MEDICAL PUBLICATIONS  
*London*

HUTCHINSON MEDICAL PUBLICATIONS LTD

*178-202 Great Portland Street, London W1*

London Melbourne Sydney

Auckland Bombay Toronto

Johannesburg New York

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*First published October 1959*

*Second Impression January 1961*

*Third Impression (Revised) November 1962*

*Fourth Impression March 1964*

*Fifth Impression February 1966*

*Sixth Impression August 1969*

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*This book has been set in Times, printed in Great Britain  
on White Art paper by Anchor Press and  
bound by Wm. Brendon, both of Tiptree, Essex*

09 051121 2

## CONTENTS

<i>Prefaces</i>	7, 9
<b>1 PRINCIPLES OF OSTEOPATHIC TECHNIQUE</b>	<b>13</b>
Making a diagnosis—Restoration of mobility—Relaxation of extraneous structures—Passive movements (articulation)—Indirect specific adjustments—Direct specific adjustments—Specific thrusts—Minimum force	
<b>2 THE DIAGNOSIS OF THE OSTEOPATHIC SPINAL LESION</b>	<b>25</b>
Definition—Characteristics—Types of lesion—Diagnostic procedure—Mobility tests	
<b>3 ATLAS OF TECHNIQUES</b>	<b>87</b>
Articulatory techniques—Soft-tissue techniques—Specific techniques—Neck—Cervico-thoracic area—Thoracic area—Thoracic cage—Lumbar region—Pelvis	
<b>4 THE INTERVERTEBRAL DISCS</b>	<b>230</b>
Herniated discs—Prolapsed discs—Chronic disc degeneration—Spinal traction	
<i>Appendix</i>	<b>260</b>
The apophyseal facets—The normal movements of the spine—Surface markings	
<i>Index</i>	<b>273</b>

## PREFACE TO THE SECOND EDITION

It is with considerable pleasure and not a little pride that I write this preface to the second edition of my manual. The fact that there is a demand for the book shows there is still need for a description of the manipulative techniques used by osteopaths.

Only a few minor points have been altered in the techniques themselves, but the theoretical description of the lesion written by Dr Louisa Burns thirty years ago has been omitted. I was advised by medical colleagues to do this, because so little is known about the histological and morbid anatomy changes which follow trauma to spinal joints, and the observations made by Dr Burns were on animals. Such changes do not necessarily occur in human spines, and moreover the chronological sequence of those changes is bound to be fallacious.

The description of the osteopathic spinal lesion in Chapter 2 is a description of a clinical entity based on observation rather than on experimental evidence, and there is no doubt that the syndrome is a reality. The reason why I prefer to retain the special epithet 'osteopathic' for this condition is that the osteopaths were the first to attempt the description of this elusive entity and they deserve the credit for this. It might well be called an internal derangement of a vertebral joint, but such a term is really no better except that it would be more acceptable to opponents of the osteopathic concept.

When and by what process the osteopathic spinal lesion merges into the disc syndrome is debatable, but as I say in Chapter 4 I believe that much antecedes the advent of symptoms in disc lesions, and such processes merit close study. Those of us who are interested in the subject must keep our eyes open for new knowledge—in whatever field—if it has any bearing on the subject.

In the meantime a description of techniques of manipulation which have been found to have practical value, even though empirically performed, is desirable. It would be wonderful to be able to explain exactly what happens when a joint is manipulated, but the details may always remain obscure. If the techniques do work, as in fact they do, using methods based on anatomical and mechanical considerations, we are achieving our objective. If the practitioner develops a keen sense of tissue tension and palpation, and learns to co-ordinate the various components in any manipulation however simple, he will achieve success. Many patients will be grateful, and provided he does not forget the contra indications to manipulation he will raise the status both of himself and of the art of

manipulation as a whole. I would, however, urge the practitioner not to concentrate exclusively on the details of techniques, nor to limit his horizon to the single and isolated spinal joint, but always to bear in mind that one joint is just a part of the skeletal framework. The whole spine, the whole body, the whole man has to be adjusted to his environment.

## PREFACE TO THE FIRST EDITION

The purpose of this book is to set down and illustrate the main techniques of manipulation used in osteopathic practice. There are numerous techniques and many more of them are in constant use than I have described, but I have included only those which I personally have found to be most effective. The art of manipulation is a very individual matter and certain techniques are more appropriate for some practitioners than others. The techniques may all have to be modified to the needs of both practitioner and patient. The details of procedure are clearly somewhat personal, but while these may vary between one practitioner and another, the underlying method should be based upon the same principles. These principles I have elaborated in the first chapter, but the practitioner may well find that he has to adapt the finer details to himself and his patient. The reader will find that the principles of techniques here enunciated are somewhat different from those which are commonly submitted that they are based upon anatomical and mechanical facts and are supported by the practical experience of many years of active practice in the osteopathic field.

The manual is merely an outline and is not an attempt to be comprehensive. Nor is the book written just for beginners, and, while it is primarily directed to the osteopathic student and graduate, it is hoped that all practitioners, of whatever school of thought, will find something of value in its pages. I have written it for all those who aspire to perfection in the art of manipulation, and although the osteopathic profession has contributed more than any other to the elaboration of techniques, the art of manipulation is not the sole prerogative of the osteopath. Rather it is the prerogative of the patient. The patient has a right to expect a high degree of skill in all those who purport to practise manipulation. It is desirable, therefore, to disseminate as widely as possible the available knowledge of this work so that the maximum numbers of suffering humanity may derive benefit. As far as I know, no purely osteopathic technique textbook has been published in this country though several excellent ones have been written in America.

A great deal more could have been written, and probably will be later, on the wider aspects of Osteopathy, but I have restricted myself primarily to practical matters in this book.

It must not be thought, however, that because the manual is limited to technique procedures that osteopathic treatment is so limited. The underlying principle of Osteopathy is that structure governs function, that

disturbances of structure in whatever tissue within the body will lead to disturbances of functioning in that structure and, in turn, of the function of the body as a whole. The objective, therefore, in the osteopathic approach is the complete restoration of the structural integrity in the body. This high aim may not be achieved but that is the goal, and whatever means are used to restore harmonious structural integration, these fall within the ambit of osteopathic practice. Within this framework of osteopathic treatment, our chief agency is manual manipulation of joints, but also of importance are the improvement of posture, the encouragement of good lymphatic and venous drainage, the improvement of the arterial blood flow, the removal of mechanical obstructions by surgical means if necessary, the reposition of viscera, the use of exercises for strengthening muscles or the stretching of contracted tissues. The theme is that given a structurally sound framework, the bodily functions will proceed harmoniously and healthily. The elaboration of these osteopathic measures belong rather more to a textbook of Principles in Osteopathy, but suffice it here just to enumerate some of the methods.

The techniques of manipulation described here are limited to the vertebral column and pelvis, partly in order to keep the book within reasonable limits but also because the osteopathic influence upon the art of manipulation is much more significant in spinal than in other joint manipulations—but the reader must not assume that osteopathic treatment is limited to the spine. Every joint, every tissue, every cell in the body influences every other structure in that body. There are stimulatory and inhibitory treatments to viscera and soft tissues; treatment may be directed to normalizing the autonomic nervous system, affecting visceromotion and vasomotion and so on. Osteopathic treatment, then, has a much wider significance than merely joint techniques and, therefore, this manual is but a small part of the larger subject of Osteopathy itself.

There are four main sections to the book. The first chapter deals with the principles of manipulative technique; the second with a description of the osteopathic spinal lesion, its significance in the overall pattern of the osteopathic concept of health and disease, followed by a detailed account of the diagnosis of the osteopathic spinal lesion. In the third section the chief substance of the manual is to be found. It is an atlas of techniques, with illustrations adjacent to the descriptions. It was thought desirable to arrange the matter thus so as to make the procedure more readily understood. It is notoriously difficult to describe the details of technique and, without the help of illustrations, it is almost impossible. Ideally, techniques should be demonstrated rather than be read about, but, even with the best teachers in the world, textbooks are invaluable for the student to dwell upon and refer back to time and again. It will be seen that there are three subdivisions in this chapter, viz. soft-tissue techniques,

articulatory techniques and specific techniques, and they are dealt with regionally so that all the techniques of each region are in a convenient sequence for teaching and treatment purposes. The final chapter is devoted to the manipulative techniques which are applicable to the various stages of intervertebral disc lesions, and in this section traction techniques are described in detail because they play such an important role in the treatment of disc lesions.

During the preparation of this manual I have been much indebted to my secretary, Gillian Wright, for her painstaking and patient typing and retyping, to my radiographer, Edith Knott, for the help she gave in making the X-ray films, to Mr. A. E. Sait for the photography, also my daughter and Mrs. B. Shearer for being such excellent models, to Drs. W. Hargrave-Wilson, B. H. Pentney and D. Turner for reading and criticizing the script, but most of all I have been indebted to Dr. Andrew Taylor Still who in 1874 started the first school in Osteopathy at Kirksville, Missouri, U.S.A. Without Dr. Still's pioneering work in Osteopathy, the art of manipulation would never have achieved the place of importance which it holds today. Steadily and continuously since then thousands of osteopaths have made it their life's work to use this method of treating the injured and the sick. Some may have failed lamentably in having inadequate knowledge of the instrument they were using but the majority have succeeded in rendering invaluable service to mankind in their efforts to advance the art and science of Osteopathy.

The medical profession has lagged far behind the osteopathic profession in developing and teaching the art of manipulation and it has sadly neglected the mechanical causes of disease and disability. It is because of this that a separate school of thought had to be maintained in the past and still has to be maintained; but when the true importance of the structural factor has been fully recognized, and when the medical profession has modified its thinking on these lines and added mechanical derangements to their list of etiological factors in disease, then there will no longer be any need for a separate organization and the world will be a healthier and happier place to live in. Already the recognition of the intervertebral disc lesion by orthodox medicine has focused attention on the spinal column; its local and remote effects are better understood and it is being recognized that these lesions cause disturbances of the autonomic nervous system as osteopaths have claimed for many years. At present there is a keen and awakening interest in manipulation and many doctors are trying different techniques without sufficient knowledge and without a proper analysis of the joint mechanics. The techniques here outlined are the outcome of something like eighty years of development in manipulation and are, therefore, worthy of the attention of all who desire to excel in this method of practice.

## PRINCIPLES OF OSTEOPATHIC TECHNIQUE

**I**N OSTEOPATHY we are concerned with the establishment and maintenance of the normal structural integrity of the body and to achieve this end we use diverse methods. These methods may be classified in three groups:

- (1) The techniques of joint manipulation, i.e. the normalization of mobility and position, and the relief of abnormal tension in muscles, ligaments, capsules and fascia.
- (2) Manipulative techniques other than joint corrections directed, for example, to improve circulation, venous and lymphatic drainage, the repositioning of viscera, and soft tissue treatments.
- (3) Other methods which have as their aim the improvement or restoration of normal mechanics in the body, such as the correction of posture, the surgical removal of abnormal tissues which are impeding nature's attempts at returning the body to normal, and exercises and activities which help to maintain and improve normal mechanics.

All these come within the broader aspect of the osteopathic approach, but in this book we are mainly concerned with the first heading. Let us deal then with the principles of the technique of joint manipulation. Our immediate purpose is the restoration of normal conditions in the joints we are dealing with. It is clearly unnecessary to manipulate normal joints. Therefore, before describing the details of manipulative techniques, it is necessary to know and understand what abnormal state is present.

THE FIRST PRINCIPLE, then, is the *making of a diagnosis*. As the establishment of a diagnosis is of paramount importance I have devoted a whole chapter (Chapter 2) to this problem. In it are described techniques of diagnosis—mainly mobility tests—which are of great value and must of necessity be used prior to any techniques of manipulation.

In arriving at a diagnosis of the joint fault we must first exclude pathological changes. That is to say we must exclude those changes due to disease which lead to local structural alteration in the various components of the joint; changes which may mislead us into thinking that a

simple osteopathic lesion is present. I do not propose to deal with the diagnosis of pathology in joints. For the present, our objective is the diagnosis of faulty mechanics in the joint or group of joints we are presented with, and we are concerned with the manipulation of joints which, though functioning poorly, are yet not actually diseased. The function of a joint is movement and it is disturbances of joint mobility which command our attention. Clearly a joint may have restriction of movement or it may have an abnormal range of movement, i.e. it may be hypomobile or it may be hypermobile. Both of these states cause disability to a greater or lesser extent.

In *hypomobility* there is subjective stiffness and often pain, particularly when the joint is forcibly moved. Such restriction often forces adjacent joints to become hypermobile to compensate and enable a full range of movement to take place in the area. The *combination of hypo- and hypermobility in the spine is very common*, and the lack of realization of this important diagnostic point is a frequent cause of failure to achieve good results by manipulation. It is so easy to stretch the already freely mobile joint without materially affecting the restricted joint. The standard technique of orthopaedic manipulation of the spine disregards this type of case. The method used is to free the spine in every direction without the object of ensuring movement to the full range in all the joints manipulated. The method may work quite well in, say, a knee joint where only one articulation is involved, but in the complicated series of joints in the spine the method is inadvisable and may well be harmful by the very fact that the hypermobile joints are forced still further into a state of hypermobility while the hypomobile ones may fail to yield. All the skill and art of the operator is required to localize the manipulative forces to the one joint which requires the forced movement, while protecting and preventing undue movement in the hypermobile joint. The differential diagnosis of hyper- and hypomobility will be discussed at length in the chapter on diagnosis. The methods whereby forces are localized to one joint are described later, together with details of localizing devices to protect adjacent joints.

Having excluded pathological conditions and established a diagnosis of hyper- or hypomobility, we must ascertain if there is any positional change in case malalignment is also a factor in the faulty mechanics of the joint. If the positional relationships of adjacent bones are altered as well as the mobility, then we must note it down and attempt later to restore the normal anatomical relations. If there are altered positional relationships and yet normal mobility, then the position is not of material significance—it is due to anomalous shapes or soft-tissue thickenings and we can ignore them. An astonishing amount of time and study has been wasted upon the positional question because this rule has been ignored. Much of the

osteopathic and chiropractic literature abounds with the idea of 'the bone out of place' and manipulations have been devised to replace the displaced bones. This is a misconception. The fault is a joint lesion not a bone lesion. We are not concerned with, say, the 3rd lumbar vertebra being in a faulty position but with the 3rd-4th lumbar joint which is not moving properly.

THE SECOND PRINCIPLE OF TECHNIQUE is to aim at the *restoration of normal mobility*—and all subsequent treatment is subservient to this objective. As it is the joint of restricted movement which needs manipulating, all the following principles of technique appertain to the treatment of hypomobility, but before proceeding to these principles, let us consider in more detail the question of hypermobility.

### *The Hypermobile Joint*

The diagnosis of hypermobility rests upon the tests of passive movements. Difficulties arise immediately in stating what is the normal mobility in a given joint, because the range of passive movements in a joint is a very individual matter. It depends upon the length and elasticity of the ligaments of that person. Some people are naturally stiff and some are 'double-jointed'—the term lay people give to individuals who have excessive ranges of movement in certain joints. The child has a much greater range of movement than the adult who in turn has a greater range than the elderly person. Ligaments may be lengthened by exercises, the remarkably free range of movement in childhood can be maintained throughout adolescence and early life by diligent daily exercise designed to stretch ligaments. This is how the acrobatic dancer achieves such weird and wonderful positions, though such people are born with long ligaments anyway. Equally so, ligaments may be allowed to shorten by inactivity and the avoidance of exercise. Yet we cannot say that either condition is abnormal. The range of movement is essentially an individual matter and there is a wide range of normality, so wide is it that it would be difficult to state what is the average normal range for a particular joint in the spine. It is a much easier matter to compare the range of adjacent joints and to obtain a general impression of the normal mobility of the individual we are dealing with. The degree of movement varies in different sections of the spine, but this variation is fairly gradual as we move from one section to another so that any pronounced difference in mobility of adjacent vertebral joints can be considered abnormal. A description of the normal movements of the spine is given in the Appendix.

The hypermobile joint must be considered abnormal when it gives rise to *pain of ligamentous origin*—that is, the type of pain which develops when the part is under continuous stretch. The pain develops gradually after assuming some posture in which the joint is held at the limit of its range, as

for example the pain which develops in the lumbar spine after the patient has been sitting curled up in an armchair without any support for the lumbar spine. Ache develops in the supraspinous and interspinous ligaments and possibly in the posterior longitudinal ligament of the spine. Another example of ligamentous ache is that which develops in the planter fascia and ligaments of the feet in 1st degree pes planus, after the patient has been standing for a long time. The ache tends to go when the stretch is released, though it may take several hours of complete rest before this happens. Ligamentous ache as above described is in marked contrast to the type of *pain caused by adhesions and tightened capsules*, which is the basis of most hypomobility. The pain of adhesions occurs at once when the capsule is stretched, and if adhesions are stretched further, a sharp pain ensues, leaving the joint and surrounding muscles in a 'limp' condition. The intensity of the pain varies according to the site and size of adhesions, but it is momentary and leaves a dull ache which usually goes off in a few minutes. The pain of a tight capsule is not intense. It just hurts to stretch the joint beyond a certain point and consequently the patient avoids the painful range.

Faulty ligaments, either over-stretched or tight ones, cause local tenderness and, where they are accessible to pressure, as for example the supraspinous ligaments and the posterior sacro-iliac ligaments, we have further evidence of the site of lesion. All ligaments when sprained give rise to pain locally and where the ligaments are on the surface the diagnosis is easy, but with deep ligaments the pain may be segmental in pattern—referred pains which can cause difficulty in diagnosis. A valuable contribution to this subject was made by G. S. Hackett,<sup>1</sup> although he fails to discriminate between 'relaxed' ligaments and 'tight' ones. *His criteria for 'relaxed' ligaments are:*

- (1) Pain localized to the area of the ligament.
- (2) There is often referred pain of a particular pattern.
- (3) The pain is aggravated by activity which puts a strain on the ligament.
- (4) At rest or relief from strain, the pain is no longer present.
- (5) Tenderness can be elicited by pressure over the ligament.
- (6) The pain is reproduced by insertion of a needle and the injection of fluid into the ligament.
- (7) The diagnosis is confirmed by injecting an anaesthetic solution into the ligament and abolishing the pain.

The hypermobile joint has had its ligaments stretched unduly, not just once, for this produces a sprain, but repeatedly; the ligaments are longer and weaker than they should be and therefore in *treating such joints:*

<sup>1</sup> HACKETT, G. S., M.D., F.R.C.S., *Joint Ligament Relaxation* (C. C. Thomas, 1956).

- (1) Further stretching must be avoided. The hypermobile joint must therefore not be manipulated. No harm will arise from gentle controlled stretching of such joints, but very little is achieved in this way, and they are best left alone. The patient must be warned to avoid movements and activities which stretch the joint further.
- (2) Support must be given to enable the ligaments to regain their normal strength. This is a slow process and often requires months of support.
- (3) The other supporting structures—in particular the muscles which move the affected joint—must be strengthened and greater control achieved in doing a job that they are not primarily designed to do.
- (4) The adjacent hypomobile joints must be rendered more mobile so that a more uniform distribution of movement in the area can occur. Instead of, say, 80 per cent of the movement in a group of three joints occurring in one joint and only 10 per cent in the adjacent joints, the range becomes equally divided and 33 per cent occurs at each joint. The methods whereby the hypomobile joints can be manipulated without straining the hypermobile joint are described later. When an osteopath can do this in practice he has indeed reached a high degree of skill in manipulation.
- (5) A sclerosing fluid can be injected into the relaxed ligament after the manner described by Hackett.
- (6) The stage of hypermobility in intervertebral disc lesions is discussed in Chapter 4.

In achieving the second principle of technique, which is the restoration of mobility in the hypomobile joint, we must first relax or stretch extrinsic structures. This leads to the third principle of technique.

THE THIRD PRINCIPLE OF TECHNIQUE is *the relaxation or stretching of extraneous structures*. We are concerned here primarily with the muscles which move the joint in lesion. These muscles are frequently 'on guard'—reflexly contracted and beyond the patient's control. The degree and extent of such 'guarding' depends upon the degree of trauma and the acuteness or chronicity of the lesion. There are several methods whereby contracted muscle can be encouraged to relax. Heat and rest serve this purpose admirably but manual methods are often more effective and expeditious.

- (1) Approximation of the origin and insertion of the muscle combined with deep pressure over the belly of the muscle. In osteopathic terminology this deep pressure is referred to as *inhibition* and while there is no satisfactory explanation of why it works, it is certainly an effective way of relaxing moderately contracted muscle. The pressure may be applied

with the thumbs or heel of the hand. Considerable pressure has to be used and maintained until the hand feels a gradual relaxation of the muscle. Several applications of pressure are usually required for a minute or more. It is important to commence and cease pressure gradually to avoid irritation of the muscle.

- (2) Separation of the origin and insertion of the muscle combined with kneading of the muscle belly at right angles to the direction of the muscle fibres. This is of value in moderately contracted muscles though simple stretching of the muscle is very effective in cramp—the severest contraction of muscle.
- (3) Transverse frictions. This technique has limited value but may well be useful in chronically contracted fibrotic muscle.

It is a reasonable view that the condition of the muscle is almost always secondary to the state of the joint. It is from the joint (in its ligaments, articular cartilage, synovial membranes and capsule) that the abnormal afferent impulses arise. These impulses reflexly influence the tone of the muscles which move the affected joint. Treatment, therefore, if directed to the muscles alone, would be merely palliative, but if relaxation of muscles is necessary prior to the correction of joint mobility, then it forms an essential step. Sometimes the muscle condition can be ignored—some lesions are amenable to specific manipulation alone, in which case the muscles can be left to normalize themselves. This they will do if normal joint mobility and position is restored in acute or subacute joint lesions. In chronic lesions, however, lasting changes may have occurred in the surrounding muscles and special attention may have to be directed to such muscles before the whole lesioned area can be considered normal. Details of treatment to soft tissues are to be found in Chapter 3.

THE FOURTH PRINCIPLE OF TECHNIQUE is the restoration of mobility by *passive movements to intrinsic structures* by slow and rhythmical methods rather than sharp quick movements, as in subsequent methods. The objective here is to stretch the ligaments and capsule of the joint and to stretch adhesions which may be present but which are too recently formed to yield to snapping techniques.

There are several ways in which these passive movements can be performed:

- (1) Using long leverages—the ‘articulation’ of joints in osteopathic terminology, details of which will be found in Chapter 3.
- (2) Using short leverages—e.g. the pull or push technique against spinous processes to articulate adjacent vertebrae.
- (3) Using sustained traction. This technique may have additional value

besides merely stretching, namely, the separation of articular surfaces which may be inflamed and the widening of intervertebral foramina.

- (4) Intermittent sustained traction. This has as its objectives the same as sustained traction, but it is a method often of more practical value. Many times it is possible to give intermittent sustained traction when sustained traction is impracticable.

More details of traction will be found in Chapter 4.

THE FIFTH PRINCIPLE OF TECHNIQUE for the restoration of mobility is the use of *indirect specific adjustment*, with the object of releasing fixation in a joint by using long levers working upon a fixed point. For example, using the leverage of the femur and anterior thigh muscles to move the innominate bone upon a fixed sacrum at the sacro-iliac joint. This method sometimes produces an audible click at the joint but less frequently than subsequent methods.

THE SIXTH PRINCIPLE is in the use of *direct specific adjustment* with the object of sudden release of joint fixation, using short leverages and faet-locking of adjacent joints, the accurate positioning of the patient and using a high velocity movement of short and powerful amplitude. The direction of the movement may be:

- (a) Along the plane of the joint surfaces.
- (b) At right angles to the joint surfaces.

In these movements we are concerned with the snapping of adhesions and the release of fixation. If there is a positional fault, such release of movement usually enables the normal resting position to be restored.

THE SEVENTH PRINCIPLE OF TECHNIQUE is the one of *specific thrust* upon one vertebra without adjacent locking, with the object of altering the relationship of one vertebra with the one above or below. This method is used mainly by the chiropractic school of manipulation. A high velocity thrust is directed against a spinous or transverse process with all surrounding tissues relaxed, rather like moving one brick in a column of bricks without moving any of the others, or the use of a hammer with a short sharp movement and recoil, a 'riveting' blow instead of a 'nail-driving' blow.

In applying a thrust, we have to consider its direction, timing, velocity and amplitude. We have to consider the position and relaxation of the patient. We have to consider protective devices to ensure that the thrust does not go too far, and to avoid the locking which is used in direct

specific movements. While there is no complete locking, we require some degree of stabilization. We must use the minimum of leverage—in fact, the leverage of the spinous process or transverse process we are thrusting upon. We must position ourselves so that all slack is taken up before we apply the thrust. We must find our position of thrust and stick to it, avoiding the slightest variation while the thrust is applied. By ‘taking up the slack’ I mean that the normal elasticity of the tissues has been absorbed, rather like tightening the guy ropes of a tent, to take up the slack in the rope. The rope is not by this means excessively taut—it would be possible to tighten the rope still further, but the sag has been taken out of it. The same idea can be applied to a joint. It is stretched by positioning the patient so that a slight feeling of tension is present, and yet with more force it is possible to stretch the ligaments further during the thrust.

In the thrust technique, we are not concerned with the breaking down of adhesions, rather the release of articular fixation. There is something curious about an intervertebral joint; it can get ‘hitched’ as it were for no apparent reason; it can feel in faulty position, then it can be ‘clicked’ and the position and movement restored. It is difficult to believe that this ‘hitching’ or ‘binding’ is due to adhesions<sup>1</sup>—for they are not painful to break, nor can one envisage a synovial fringe getting into the joint or a loose body or any other completely satisfactory explanation.

It is a phenomenon with which all osteopaths and chiropractors are abundantly familiar. Furthermore, patients are vaguely aware of a ‘hitch’ and are immediately relieved by the manipulation. It is not a painful manipulation when expertly done. How or why the joint gets ‘hitched’ is a mystery. It is, of course, easy enough to ‘pop’ a normal joint and we achieve nothing by doing it. It is only where there is restriction of movement present that ‘popping’ the joint achieves any result.

*Adjustive manual traction* is a special type of technique which is of particular value in herniated discs but it is also of great value in breaking down fixation in the longitudinal direction of the spine (see Chapter 4).

In restoring mobility to a joint, we are concerned not only with restoring active movements, i.e. with those movements which are under the control of the patient’s own muscles, but also with accessory movements, i.e. with movements which are not under active muscle control. For example, a patient may well be able to flex, extend, rotate and circumduct his shoulder to the full range and yet the shoulder movements are painful because of limited gliding movements up and down or forward and backward within the glenoid cavity. Similarly in the spine, a joint may have apparently full active range yet hurt because of longitudinal adhesions which are only broken by adjustive manual traction. Again in the elbow,

<sup>1</sup>MENNELL, J., *Joint Manipulation*, Vol. II (J. & A. Churchill Ltd., 1952), p. 6.

adhesions in the lateral ligament, often responsible for tennis elbow, can only be released by adducting the elbow at the radio-humeral joint. Adduction at this joint is not under the control of the patient. Only by passive testing of the joints can we obtain the information we need about movements which are not under voluntary control. The operator who wishes to excel in manipulation must learn to detect these passive ranges of movement and be aware when they are normal or abnormal, and he must be able to manipulate the joints to restore those movements.

We cannot leave the question of principles of technique without indicating important aspects relative to body stance of both patient and operator, and to their relaxation; to the rhythm of movement and to the timing of specific manipulations.

We might call these *rules of procedure*.

- (1) The part of the patient being held should be held firmly but not rudely. Gripping should be light and the skin not screwed up or unduly stretched by the gripping. The limb should be held as closely as possible to the operator's body so that the limb of the patient becomes temporarily part of the operator, as it were.
- (2) Where possible, make use of the patient's own weight to do the work of moving rather than using the operator's muscles. The patient's weight must be carefully poised against the operator's so that at all steps of the manipulation the movement is under full control. To slip from one's balance is a sign of faulty technique.
- (3) Obtain relaxation in the patient by suggestion, entreaty, distraction or any other method so long as it is achieved. The objectives in manipulating joints are lost by resistance on the part of the patient. If the condition is too painful or the patient too nervous to relax, a general anaesthetic may be necessary, but this is only rarely indicated. In my own practice, I find only about 1 per cent of patients require an anaesthetic. Much resistance to manipulation arises from fear on the part of the patient. Very often this fear can be overcome by gaining the patient's confidence. The attitude of confident assurance helps enormously and such confidence as the operator has in himself is imparted immediately there is contact between the operator and the patient—it is a subtle thing which the patient can sense at once. No amount of verbal reassurance will be effective  
 outcome of the treatment, and it is virtually impossible for the operator to disguise his own attitude. There is something about physical contact of the operator and the patient which registers very quickly. The patient 'knows' whether he can trust you the moment you put your hands on him. This aspect of manipulation has received scant attention in the past. It is surprising the difference

between two operators even though they are apparently performing the same movement.

While an operator is manipulating a patient, the patient feels the pressure of the operator's hands, gentle and firm or rough and harsh or soft and flabby. The patient senses the smooth rhythm of the movement or the jerkiness of disconnected unpurposeful manipulation; he feels the localizing effects of tension created by the positioning of limbs and the 'taking up' of slack before an adjustive movement is done. If it were possible for an operator to appreciate what the patient feels as a result of his manipulation, the operator would learn very quickly the right and wrong ways of applying treatment, but unfortunately this is impossible. The nearest approach to this method of learning technique is to have a colleague as a patient who will describe faithfully the 'receiving' end of the treatment.

By continuous practice and 'thinking hard' through the fingers, in other words concentrating upon the sensations of tissue tension observed from the finger-tips and arms, in contact with the patient, it is possible to acquire an understanding and working knowledge of that elusive quality of the manipulator's skill, *tissue-tension sense*. This sense is the operator's 'sixth' sense and without it no operator will ever achieve real success in manipulation.

Tissue-tension sense is not merely palpation, though a highly developed palpating sense is a prerequisite to tissue-tension sense; for palpation merely feels stationary tissue, bone, ligament, muscle, connective tissue, fascia, fat—all of these have their own quality perceived by palpation alone, but tissue tension sense is the appreciation of the amount of stretch there is in moving tissues, an interpretation of such tension during the process of movement in a limb, joint or muscle. It is dynamic rather than static.

An understanding of the condition in which you find a joint depends upon history-taking, inspection and palpation of the joint, observing the range of active movements but particularly in sensing the restrictions on passive movements—this observation is dependent upon the practitioner's tissue-tension sense. I am not here referring to gross restrictions of movement, which are obvious to the eye, but rather the more subtle restrictions of those movements which are not normally under the patient's control.

Again, tissue-tension sense is of paramount importance in treatment. By practice and experience, one develops a sense of the amount of force which can safely be applied to any tissue (it is the disregard of tissue-tension sense or the absence of such sense which leads to the inexcusable complications of manipulation in inexperienced hands). Tissue-tension sense enables the operator to choose the precise moment at which the thrust should be

applied. It enables the operator to co-ordinate the component parts of a manipulation and to mould them into a smooth rhythm which looks so easy to the onlooker and feels so effective to the patient.

A keen tissue-tension sense will enable the operator to make all his movements purposeful. So often manipulation is carried out on a rule of thumb basis or even in a haphazard way without a specific purpose in view. Such manipulation may be pleasant enough to receive but it is virtually a waste of time.

Proper and effective manipulation requires continuous concentration on the part of the operator and that is why it is such a tiring occupation, using up not merely physical energy in applying the treatment but concentrated mental effort. Performing a series of movements in an automatic fashion while carrying on an animated conversation with the patient is rarely of much value. By all means let the patient talk, it may help him to relax better, but do not yourself chatter away unless you are content to waste the treatment time.

The rhythm and timing of manipulative techniques are important, and much practice should be performed in an attempt to obtain smoothness of rhythm and accuracy in timing. Ideally, the positioning of the patient and operator, the taking up of slack, the protective guarding of adjacent joints, the combination of flexion, extension, sidebending and rotation, and the final thrust should all be done in one cycle of movement. At first, all these aspects of technique will have to be done separately and precisely, but with practice the whole may be smoothed out into one harmonious movement. The technique may be compared with driving a car. The learner driver has to perform all the movements separately with individual thought for the brakes, clutch, gears and accelerator and the resultant motion of the car is jerky and unpleasant, but the expert driver performs all the phases in a continuous motion so that the car glides away from rest beautifully in a gradual acceleration of motion to the satisfaction and comfort of his passengers.

THE EIGHTH PRINCIPLE OF TECHNIQUE is that we should use the *minimum of force consistent with achieving our objective*. There is no place in skilled osteopathic technique for brute force. There should be no need for undue force if we obtain first the confidence of the patient, and thereby his or her relaxation, and then apply our force whether it is traction or articulation or thrust in the proper direction. Careful application of this principle will save the patient a lot of unnecessary reaction after treatment, and will earn for the practitioner the reputation of gentleness and skill which is so eminently desirable all round. The idea of gentleness can, of course, be carried too far and in this case our manipulations become ineffectual, and we may just as well treat by 'the laying on of hands'. No