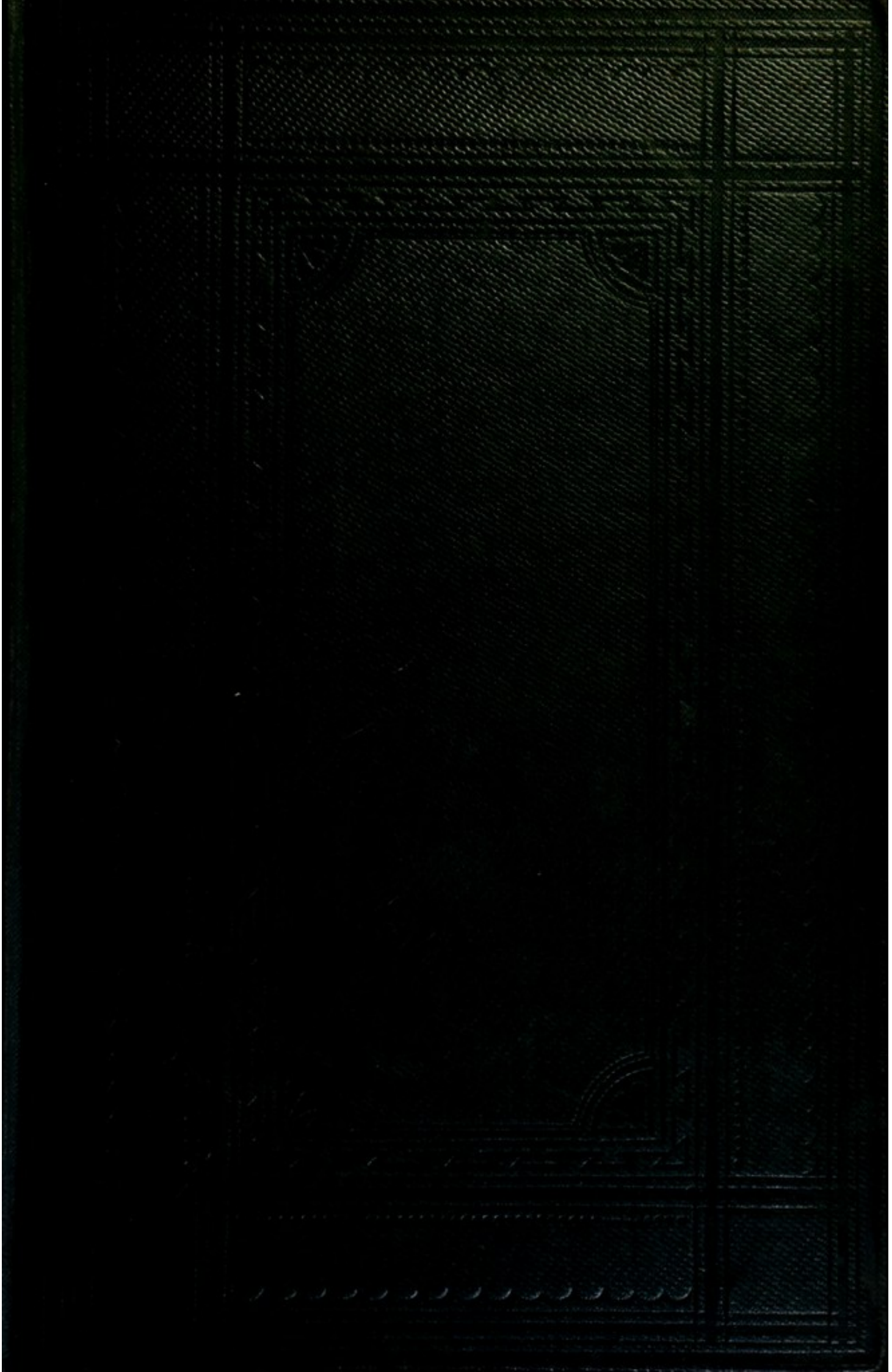
Spinal debility, its prevention, pathology and cure, in relation to curvatures, paralysis, epilepsy, and various deformities / by Edward W. Tuson.



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SPINAL DEBILITY

ITS

PREVENTION, PATHOLOGY, AND CURE,

IN RELATION TO

CURVATURES, PARALYSIS, EPILEPSY,

AND VARIOUS

DEFORMITIES.

BY

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CONTENTS.

PREFACE.

The following pages are intended to furnish the Practitioner and Medical Student with the details of some practical observations and facts relative to Spinal Debility and its consequences—also Contractions of the Chest and other Deformities. It is to be regretted that many of these cases are inadmissible into our Metropolitan Hospitals, so that their condition and treatment seldom come under our notice.

One of the objects the Author has in view is to inculcate the necessity of more frequently examining the vertebral column, in cases of spasm, epilepsy, paralysis, and other distressing symptoms, which may often be traced to pressure on the spinal nerves, and relieved by the means narrated.

In the examination of the vertebral column, the length of the trunk should be measured, in the

erect and recumbent positions; if debility exists, the spine will be longer when freed from any weight it had previously to support. To enable the reader to judge of the extent of such debility, and determine the plan of treatment, the natural measurements of the trunk in a state of health and disease have been fully entered upon.

The pathological condition of the vertebral column in spinal debility was a subject of much obscurity, and with the exception of the condition of the vertebræ in angular curvature, we were in doubt on the subject. A pathological specimen, from a patient who died under our care at the Middlesex Hospital, considerably removed this difficulty, as the bones were observed to be in a generally softened state. The inter-vertebral substances, and other ligamentous tissues, participated in the same weakened condition, which rendered the whole vertebral column yielding, and unable to sustain the weight it ought to have maintained. In some instances the shape of the spine may be preserved, but its length is diminished: in others it becomes curved in several directions.

Debility of the spine having been considered, contractions of the chest are next pointed out, and various deformities of the superior aud inferior extremities.

In the description of each deformity, it has been considered advisable to enter into the anatomy of the part, and this has been done with much brevity; and, where possible, rules have been advanced in respect to treatment.

It might be considered that I should have done better by publishing a new edition of my work on the "Cause and Treatment of Curvature of the Spine and Diseases of the Vertebral Column;" but one object being to produce a work less voluminous, extracts to illustrate the subjects under consideration have been made from the former volume where necessary.

The utility of such a work can only be appreciated by its perusal, and the consideration of those cases brought forward to illustrate the mode of treatment. The impossibility of performing a cure by alone treating the deformity, or prevailing symptoms, has been clearly demonstrated. Many persons have found the greatest benefit, some

almost immediately, others at a remoter period, from the methods recommended in the present work. The relief of pain, the comfort of the patients, and their restoration to health, are the primary objects of the Author.

6, Devonshire Street, Portland Place,
October, 1861.

GENERAL OBSERVATIONS.

It is a curious and remarkable fact that, at the beginning of this century, it was found that one half of the children born in this country died before they had attained their seventh year, and this fact led some of the medical profession, ever anxious to promote the healthy condition of society, to investigate the cause of such a fearful mortality. Dr. Cadigan, Dr. Alex. Hamilton, Dr. Clarke, and others diligently made every enquiry into the cause of so many deaths at such an early age, when they arrived at the conclusion that they arose from the erroneous mode of nursing, improper feeding, and injudicious clothing; that this mortality was in a great measure attributable to these causes, and occurred principally during the first and second years of infancy, and that those who survived encountered ill-health in a variety of forms, had delicate constitutions, and that some were deformed, consequent upon the interference with the laws of nature.

The brute creation, guided only by instinct, influenced only by the dictates of nature, suffer few early and premature deaths, and almost all attain the natural limits of their existence. But the human race, proud of its intellectual power, and yielding to the frequent absurd directions of prejudice, fashion, and folly, have presumed to use means more calculated to obstruct than improve the healthy growth and organization of its offspring, and thus the melancholy effects before alluded to have been produced.

During the last sixty years science and art have been making most rapid progress. Much improvement has been made, and a far better plan of treatment adopted with our infants; consequently mortality has diminished, sickly constitutions decreased in number, scrofula is on the decline, and deformity in a measure lessened; but still, at the present time, there is sufficient room for improvement, as deformity still exists in its various and distressing characters—and to alleviate and ameliorate such a painful amount of human affliction, is the object with which the present observations are presented to the public.

They are the result of much experience, practice, and diligent observation, during twenty years, subsequent to the publication of a work from the same pen on the cause and treatment of curvature of the spine and diseases of the vertebral column, which was very favourably received by the medical profession.

Deformities consist of a want of symmetry of parts;—want of gracefulness or regularity, may be either congenital (produced at, or prior to birth), or be the abnormal adaptations of particular parts after the birth has taken place, at any period of life, —parts or portions of any of the structures of the frame varying from their natural position in the animal economy.

Deformities differ from malformations, as the latter are variations from the laws of nature. An addition, superabundance of any part will constitute malformation, always caused prior to birth.

"Among the multitude of persons afflicted with deformity, by far the largest proportion were born with the usual symmetry of figure, and the abnormal condition of the system will generally be found to have commenced in childhood, to have lessened at puberty, and to have terminated at or before the adult state."*

As the trunk is the central or connecting medium of the extremities and head, influencing all the other structures of the body, I shall first consider it, and afterwards proceed to dilate upon other deformities.

At the back part of the trunk, there is situated the spine, which supports all the other parts, by forming a prop for the head, and a firm base from which all the muscles of the trunk take their attachment.

*Bishop on Deformity, page 8.

The Spine or Vertebral Column,

Is the central pillar that supports the head and arms, in the front of which are placed the thoracic and abdominal viscera (the organs of respiration, circulation, and digestion). Observe the situation of this column or pillar, how it is placed in, and between the centre of the pelvis, the bones of the pelvis being supported by the legs, in such a manner as to give them the greatest strength and power. The spine is broader at its base or lower part than at the upper portion, and is composed of twenty-four bones or vertebræ, so connected as to give them the greatest mobility or action compatible with strength.

In the spinal column the spinal marrow is placed and protected by a bony sheath. The spinal marrow is the central union of the nervous influence—that influence which endows all the other parts with functions, energy, and strength; so it became essential that it should be protected in the same way as the brain, with a bony covering, so constructed that free exit should be given to the nerves, the strings, or conductors of motion and sensation.

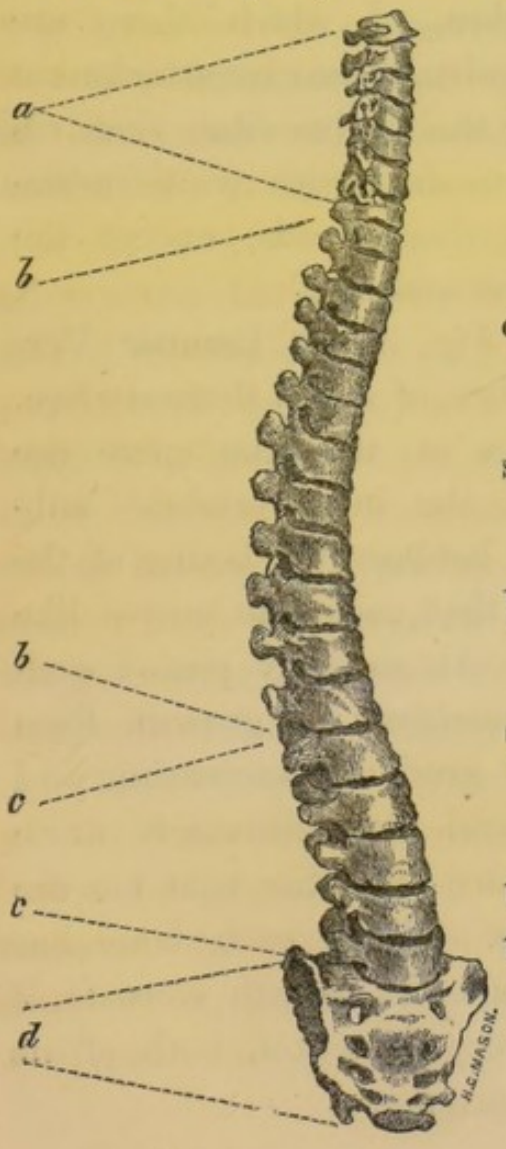
With these facts before us, we must all be convinced how important it is that the spinal column or chief pillar which supports all the other parts, should be in a state of health, so as to retain the spinal marrow which endows all the other parts with such wonderful influence.

If the spinal column be not perfect in its form, how can it properly protect the spinal marrow? as the state of the one must, in a measure, have considerable influence over the other.

The Vertebral Column or Spine, consists of, The True and False Spine.

The True Spine consists of Cervical, Dorsal, and Lumbar Vertebræ:—seven Cervical, twelve Dorsal, and five Lumbar Vertebræ.

The False Spine, of the Sacrum and Os Coccygis.



THE SPINAL COLUMN.

a.—The Seven Cervical Vertebræ.

b b.—The Twelve Dorsal Vertebræ.

c c.—The Five Lumbar Vertebræ.

These constitute the True Spine.

d.—The Sacrum with the Os Coccygis constituting the False Spine.

FIG. 1

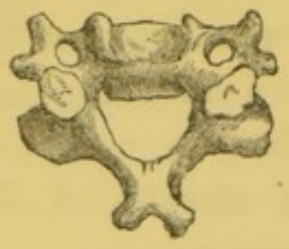


FIG. 2

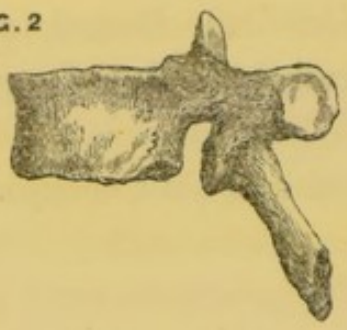
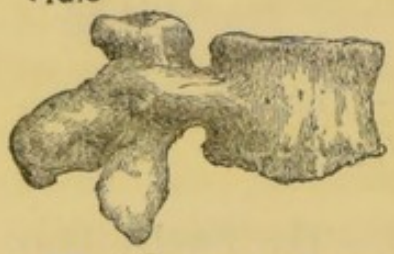


FIG. 3



THE SPINAL COLUMN, DIVIDED INTO CERVICAL, DORSAL, AND LUMBAR VERTEBRÆ.

Fig 1.—A Cervical Vertebra, of which there are seven:—the first, the Atlas—the second, the Dentata—and the other five termed Cervical.

Fig. 2.—A Dorsal Vertebra, of which there are twelve, these give attachment to the twelve ribs; each rib articulates with two Vertebræ at their heads, except the first and last.

Fig. 3.—A Lumbar Vertebra, of which there are five.

The twenty-four bones of the true spine are connected by means of the inter-vertebral substances, which are placed between the bodies of the vertebræ, so constituted that each one moves like a ball and socket joint. At an early period each bone of the spine commences its growth from several points, each point gradually increasing and approaching the other, until they ultimately unite to form one, leaving a space on either side for the exit of the spinal nerves. When each bone has been completed in its shape, its growth consists of a gradual increase in every direction, both of its consistence, solidity, and firmness.

The bodies of the vertebræ have placed between them a fibro-cartilaginous texture, termed the inter-vertebral substances, which forms an important part of the connecting medium of the spinal column. This substance deserves much attention, as, upon mature reflection, many obscure symptoms, most distressing to the patients labouring under them, may be traced to an abnormal condition, or a deranged state of the anatomical texture of the inter-vertebral substance and adjacent structures, that serve to connect the vertebræ with each other.

"The inter-vertebral substances between the bodies of the vertebræ provide for the elasticity as well as the flexibility of the spine. The solidity of this substance gradually diminishes from the circumference towards the centre, where it forms a soft and almost incompressible pulp, permitting, to a limited extent, the motions of a ball and socket joint, namely, a gentle bend in every direction, with a small amount of rotation. Its great elasticity breaks the force of jars by gradually yielding, and always tends to restore the column to its erect form. Long-continued pressure during the day will indeed make the inter-vertebral substance yield; so that a man loses in height perhaps one-third or even half an inch; but this is recovered after a night's rest."*

These inter-vertebral substances are placed between the bodies of the vertebræ, extending from the dentata to the upper part of the sacrum, and the aggregate length of these twenty-two

* Holden's Osteology.

inter-vertebral substances has been estimated as one-fourth of that of the vertebral column,* so that they constitute a material part in the formation of that pillar, which has to maintain the weight of all the parts of the upper portion of the body, so as to constitute the chief support of the whole frame. Between the arches of the vertebræ, at the back part of the spine, there are placed the Ligamenta Subflava, each one consisting of two thin plates of elastic tissue. These counteract, by their elasticity, the efforts of the flexor muscles of the spine, and by preserving the upright position of the trunk, limit the expenditure of muscular force. Now, as these ligaments are most highly elastic, they serve the same purpose, at the back part of the spine, as the inter-vertebral substances do in the front, thus should the inter-vertebral substances become of a yielding nature, and lose their elasticity, these ligaments would either participate in the morbid condition, or tend, by their natural elasticity, to diminish the length of the spinal column, so that these ligaments form a most important part in the structural formation of the chief pillar that supports the whole body. Their structure must, therefore, be materially affected in any derangement or disease of the spinal column. All the parts will necessarily be more or less affected under any debilitated condition of the vertebræ. The inter-vertebral substance, by breaking shocks, to which the spinal column is subject, and also lessening the force of

* Wilson's Anatomist, VadeMecum, page 124.

concussion, (as when a man falls from a height upon the Tuber Ischii, it is not the spine which is injured, but in some cases the base of the skull), acts like a buffer to the locomotive by its resilient properties preventing the force of the blow being transmitted to the bodies of the vertebræ, and permanently keeping them apart by the aid of ligaments, thus preserving the nerves passing through the inter-vertebral foramina from injury.

What a beautiful arrangement of the All-wise Creator, that the nervous structure, which is of the very highest importance to man, and upon which all his bodily functions so much depend, should be so carefully guarded, encased in a bony column so constructed that it is very rarely broken, and the apertures through which nervous force is transmitted to the different parts of the human frame so contrived that no sudden blow can affect them!

Were it not for the inter-vertebral substance being elastic, the nerves passing through the inter-vertebral foramina would be continually pressed upon and injured; it therefore becomes of the greatest importance that this elasticity should be preserved. Atmospheric pressure and the weight of the body are said to diminish the height of us all after a day's fatigue, but sleep and rest restore the elasticity of the inter-vertebral substance, and in the morning we have regained that which we had previously lost for a time. This occurs in a state of health, but not so when the structural tissues are deranged by ill-health or disease. If a person be in perfect

health, a night's rest will suffice to restore the elasticity of the inter-vertebral substance; but when a man overtasks his strength, it will not be sufficient to restore it, and hence the true cause of weakness experienced after such a person has been up a short time. The lassitude he feels is caused by the pressure on the nerves passing through the inter-vertebral foramina, in consequence of the non-elasticity of these substances not keeping the bodies of the vertebræ at their proper distance. The weight of the head and shoulders falling upon the spinal column when erect, must, of necessity, bring the inter-vertebral notches closer together when the substance has lost its resilient property, and pressure on the nerves occurs in consequence.

The ingenious and learned author of "Spinal Irritation" (Dr. Inman, of the Liverpool Infirmary) attempts to prove, that in nearly all cases where weakness is complained of after exertion, especially when a patient is becoming convalescent, is due to muscular pains, and cites a number of cases to shew that patients, becoming convalescent, complain of great pain in the back after sitting up a short time, which he attributes to the stretching of the Trapezius Muscle, but which is more justly attributable to the relaxed condition of the inter-vertebral substances, and the ligaments not keeping the vertebræ erect and apart, and thus the weight of the head and shoulders compress the inter-vertebral substance, and the pain is produced by pressure on the nerves as they pass through the inter-vertebral

foramina. The pain arising from sitting up is as often in the lumbar region as in the cervical or dorsal, more clearly denoting it as due to other, rather than purely muscular pains.

The inter-vertebral substance losing its elasticity becomes compressed by the weight thrown upon the spinal column; in this, as in all the tissues of the body, long-continued compression causes a wasting away, loss of power, and a diminution of structure.

In all the skeletons that have been examined, where there existed curvature of the spine, it was invariably found that the inter-vertebral substance had diminished, and the inter-vertebral notches were smaller on the side of the curvature. This is easily explained by the fact of the compression being greatest on that side, and consequently less hope of the substance regaining its elasticity. How important then does it become to have the spinal column properly supported in such cases, and the inter-vertebral substance relieved of the compression caused by the weight of the head and shoulders, and, in addition, by tonics and exercise in the open air, to restore to the ligaments and muscles their proper action.

If we estimate rightly the properties of the inter-vertebral substance, and its liability to compression, we shall see that it becomes one of the most important portions of the human frame, and should be most carefully studied, in order that we may mark any deviation from the natural curves of the spine, whether anterior, posterior, or lateral; for it

has been shown by Dr. Brown Séquard, in his "Researches on Epilepsy," that injury to the spinal cord is an undoubted cause of epilepsy; we would therefore suggest that a very probable cause of injury to the cord is an alteration in the natural curves of the spine.

Where debility exists in the system, and a person has to sit writing for hours, bending over a desk, we frequently find posterior curve in the dorsal region, caused by the compression of the inter-vertebral substances in the anterior part of the column, and paralysis is a very common result of such curvature not being attended to.

In girls (more than boys), where they grow very fast, we frequently find that an excessive anterior and posterior curve in the lumbar and dorsal region is caused by the fact that the weight of the head and shoulders is greater than the spinal column can bear, which, unsupported, causes pressure on the nerves and a prostration of the system, which frequently ends in consumption, from the inability to get proper exercise and pure air.

It will be well to notice carefully the natural curves of the spine at various ages, in order to judge correctly of any departure from their normal position. In infants the spinal column is nearly straight; at the age of five years the dorsal curve begins to make its appearance, and it is not until the age of ten years that there is much visible appearance of the anterior lumbar curve. At the age of fourteen years the dorsal and lumbar

curves are well marked; but there should be a preponderance of the dorsal over the lumbar. As age increases, up to twenty-five years, there is a more perfect equipoise in the various curves, and the dorsal posterior curve commences in the sixth and seventh cervical vertebræ, and the lumbar anterior curve commences at the tenth dorsal vertebra. The curves of the cervical and sacral regions do not call for much notice, beyond the fact, that in any departure from the natural curves of the other regions they are altered to correspond. Where there is excessive and sudden growth, as sometimes takes place in youth, great care should be observed in the exercises they may be called upon to perform, as by any over-exertion, straining the ligaments of the vertebral column, the inter-vertebral substance soon loses its elasticity by the increased weight thrown upon it.

Many cases have come under treatment of this kind, where the patients have been suffering for months, and even years, without receiving any benefit from medicines; yet when the spinal column has been supported, the patients have recovered rapidly under judicious general treatment, and have been soon restored to perfect health.

How many cases are there, where a general debility and wasting away of the body takes place without any assignable cause, which can only be explained by the facts already mentioned, and which may be relieved by proper means, indicated by the prevailing symptoms. Once establish this truth, that

the nervous disorders proceed from some hidden pressure on a nerve or nerves, and then it will be more clearly seen that you must look for the cause, in most instances, to arise from some deviation in the natural curves of the spinal column, and a loss of elasticity in the inter-vertebral substance, producing pressure on the nerves passing through the inter-vertebral foramina.

The pathology of the vertical column is a subject that has only of late years attracted the attention of the medical practitioner. Curvature of the spine and deformity in general are considered inadmissible into the Metropolitan Hospitals, except those institutions which have of late years been established for their reception. On that account, the medical student has no means of making himself acquainted with this branch of medical science while he is pursuing his studies, and consequently knows little or nothing about the treatment of such cases. So this branch of the Profession has fallen into the hands of any who choose to take it up, and pursue his own views on the subject—one taking a single plan for all manner of cases, another adopting means not sanctioned by a scientific knowledge of the subject. At length, however, this branch attracted the attention of some few, and, amongst these, of the late Mr. John Shaw, who entered into the subject most scientifically, and successfully treated many cases; some of these I had the advantage of seeing when I was a pupil. Since that period, his plan has been successfully adopted in a number of cases,

many of which were under my own care at the Middlesex Hospital, and many in private practice. This induced me to publish the result of such experience in 1841. But twenty years having elapsed, and much additional knowledge and information having been acquired during that time, by a careful investigation of a number of cases that have fallen under treatment, I presume to offer to the public the result of my additional experience.

First, I would state, that after mature consideration, much experience, and numerous opportunities of making examination of facts, I have come to the full conviction that, in almost all cases of curvature of the spine, either laterally or anteriorly, and in some of the cases posteriorly, the condition of the vertebræ is in a softened state, somewhat like sponge, and that the bony ring which surrounds the body of these bones, is not sufficiently strong to support the weight placed upon them, from a want of due deposit of phosphate of lime or earthy matter, so as properly to ossify them, and produce their natural structure and development.

When such a condition of the spinal column exists, the increased action of one set of muscles, or the weight of the other parts of the frame being thrown upon the vertebral column, causes its natural position to be so altered and deranged as to produce a curvature in a lateral direction, when the right scapula is discovered to project with an accompanying projection on the left side of the front part of the chest. But this tendency arises from the softened

state of the bodies of the vertebræ themselves and their connecting medium, which may result from several causes.

If we examine the development of the spinal column at its earliest formation, at a period of uterine gestation, we see its minute structure, and must be satisfied that, from the nature of its formation, it requires a large portion of ossific deposit to produce its proper growth and development up to the adult period.

Now, should a deficiency of earthy matter exist in the system, or should it be carried to other structures, it is clear that the consolidation of the spinal column cannot take place, and, therefore, it will remain soft, and consequently yield to the weight which it cannot properly sustain. The contracted chest, the want of the proper performance of the respiratory function, the want of proper assimilation of the food, tend to produce a softened state of the spinal column, and a want of its consolidation.

Curvature of the spine is sometimes accompanied with hydrocephalus, or water on the brain, and such cases of course are by far the most serious, as the brain not possessing sufficient energy to impart nervous power to the soft parts and vascular system to repair the malady, the disease remains or makes rapid progress, or terminates fatally.

When the spinal column does not become consolidated in a due proportion with the other bones of the frame, the inter-vertebral substances and

the ligaments of the spine participate in the same deficient development; for the one part being in a weakened condition, weakens in the same ratio, the adjacent structures; so the whole parts constituting the spinal column are more or less affected by the deranged and unnatural condition of the spine. The other bones having obtained phosphate of lime, or earthy matter, have acquired strength, and with it weight; so increased weight becomes thus placed upon the vertebral column, and parts adjacent to it, which additional weight they are less able to sustain, consequently they yield and bend.

The too rapid succession of the infantile complaints, namely, measles, scarlet fever, hooping cough, and eruptile diseases, may induce this condition of the spine. The child has been on a sick bed for some weeks, or even months, and the whole frame out of order; the child rises after this illness—the weight of all the structures being upon the spinal column, the whole of its textures being weak and exhausted, is it therefore to be wondered at that it bends under the burden it cannot possibly sustain. Too much care cannot be paid to a state of convalescence of children under these circumstances. They should not be allowed to remain up too long at any one time; they should be carefully watched at this period, and if any variation be observed, the case should have immediate attention, and with proper aid and judicious management, the production of further mischief may

be prevented, and deformity remedied, which otherwise might be established, and might probably defy the best efforts of medical skill.

Scrofula may be the cause of a deranged position of the vertebral column; and although this complaint may not be apparent in other parts of the body, it is by no means uncommon for it to cause a softened state of the cancellated structure of the vertebræ, giving them a yielding and compressible nature. Such cases are usually marked by a scrofulous temperament, but in some cases this cannot be detected. Children of sickly parents are very often the subjects of deformity; so the progeny of parents who have suffered from syphilis, although no apparent vestige of the disease remains in their system, are not unlikely to become deformed; for the same disease may affect the bones of the infant, either at an early or later stage of its life.

Several cases of this nature have fallen under treatment where this malady could be only traced to the parents. In the same manner malignant disease of the bones may be apparent in a new generation; and although the parents of the child may shew no appearance of cancerous or other malignant disease, still such disease, or any apparent hereditary disease, may appear in a fresh generation, not only in the osseous structure, but in the other tissues of the body.

In some cases of lateral curvature that have fallen under my care, the young ladies have complained

of a fixed pain in one particular spot on their side, about the size of a shilling, and this spot has been almost in the same place in the several cases of lateral curvature, over the cartilages of the seventh rib, which pain, no doubt, was owing to the vertebræ pressing against the nerve; and I am the more convinced of the justness of this remark, after reading Mr. Hilton's Lecture, where he quotes the case of a little boy, who was brought to him from Mr. Ray, of Dulwich, suffering severe pain just above the pit of the stomach, who used to walk about with his hands placed over that region, with the body a little inclined forward. It was noticed that the pain increased during the maintenance of the erect position. Upon examining the spine, Mr. Hilton found disease between the sixth and seventh dorsal vertebræ. This patient was free from pain when in the recumbent position, and by keeping that position for four or five months he was quite cured.

Mr. Hilton also details another case of a similar character, where the pain was in the same situation, and where the patient was cured by keeping the spine quite at rest.

These cases point out the advantage to be gained by a quiescent state of the spine, and clearly illustrate the utility of artificial means being employed, where it is not considered advisable to keep the patient in a recumbent position—such means as will keep the spine perfectly quiet, and yet enable the patient to walk about as usual.

Hygiene has of late years attracted much attention, and our Public Authorities have investigated the condition of populous districts.

The Army and Navy have been much improved in the means necessary to maintain their health.

The Hospital Authorities have much improved the ventilation and condition of the wards for the reception of patients, and all the Unions have been very much improved, as regards the sanitary condition of the poor. Almost every branch of society has been led to improve its dwellings, so as to render them more conducive to health; and the subject of Hygiene cannot be too forcibly impressed upon the minds of all people, particularly the heads of families.

Too much attention cannot be directed to points that are conducive to health, or to any means that may be instrumental to promote health when disease or illness has taken place. The condition of the sick chamber is of much importance, for the removal of disease and the prevention of the malady making progress.

At birth we all breathe for the first time. The chest expands by the elevation of the ribs, the air enters the air-cells of the lungs, and the circulation of the blood is duly carried on, if not obstructed by injudicions care, and too much interference with the

laws of nature. All the new-born infant wants, is fresh air, proper clothing, and the nourishment supplied by our All-wise Creator, by a secretion in the mother's breast, of milk, containing all the requisite food for the infant's growth, nourishment, and the development of the most minute structures of the frame, if the infant be left in the undisturbed performance of those functions that are so essential to life.

The first evil often inflicted upon new-born children, is loading them and binding them with rollers, flannels, stays, &c. of much weight, and by such practice, we use the most effectual means to obstruct respiration and the circulation of the blood, both of which functions are so necessary to health and life.

Let the young mother observe her child after ablution,—see the stretching of the limbs, the heaving of the chest, and the natural free movements of the muscles of the various parts of the body. All these she is about to obstruct by the tight and heavy clothing she binds round her offspring; but not only does she do this mischief, but she renders the child in a little time so chilly that it cannot bear the atmospheric air, and if by chance it is exposed to a refreshing breeze, inflammatory affection of the throat, lungs, or bowels results, and should the child survive, it becomes weak and delicate. The new-born infant is naturally warmer than an adult, as the circulation is much quicker, and requires less clothing,

which should be loose, so that the chest and bowels may have room to extend, and the limbs be at liberty to act and exert themselves, so that the circulation of the blood may enter the superficial vessels, and prevent unnatural swellings and malformations, which only end in deformity and distortions. These occur more frequently in females than in males, by the mistaken notion of the mother, and her anxiety that her daughter should have a good and fashionable figure, whereas, she does all in her power to prevent this desirable object. Free respiration, free circulation of the blood, free use of the limbs, and free use of all the muscles of the body are essential to the health and growth of the child; and if any nurse or mother wishes to be convinced of this, let the child be observed, and every action noticed when it is unclothed, and if their minds be free from bias and prejudice, they must be convinced that freedom from pressure must be necessary for the growth and strength of the child, and that health cannot exist unless we aid nature and follow her laws.

Among savage nations, where children are brought up according to the dictates of nature alone, deformity never occurs. It would be well for us not to close our eyes against such a startling fact, and still continue practices which deteriorate the health of the rising generation.

The contrivances that were, and are sometimes now used by nurses, so ridiculously supposed to keep

the bones of the head in their place, are productive of much mischief, by confining and compressing the brain, impeding the development of that organ; affecting the circulation, producing debility and sometimes water in the ventricles of the brain. Sometimes inflammation of the brain or its coverings results from this practice by the unnatural increase of heat to the head.

The more simple an infant be dressed, and the less encumbered by clothing, the more conducive to health, and the less chance of any deformity resulting.

It is far better to prevent the mischief than to relieve it after it has made its appearance. Keep in sight Nature, and follow her laws. Ablution, light loose clothing, good and proper food, moderate exercise, rest and sleep in properly ventilated chambers, early rising, early resting: these are the means most conducive to the development and growth of all the parts of the frame in a state of health, strength, and longevity.

Curvature of the Spine.

The spine may deviate from its natural position, and become deranged from its perpendicular state in the following forms: namely, laterally, posteriorly, anteriorly, and in a posterio-lateral direction, termed lateral, posterior, anterior, and complicated curvature of the vertebral column, which will be

considered under those distinct forms of the complaint.

It should be remembered that if the vertebral column swerves from its normal position in the trunk, in whatsoever position it directs its course, it must lose a certain extent of its height, for no perpendicular line can be bent without a diminution in its height, so that by a loss of its normal length, other parts must become altered or deranged out of their natural position, which they would occupy if the vertebral column was in its normal state. For example: the vertebral column takes a lateral direction, this alters the position of the ribs, they accommodate themselves to the new shape, so the blade-bone (Scapula) changes its position, the shoulder blade projects; and the mother's first attention (in very many cases) is directed to the projection of the shoulder bone, and this only after the primary curvature has progressed some time. Now, if the ribs and blade-bone alter their position, so the chest changes its form, and influences, more or less, the viscera contained therein; so that the one part has very considerable influence over other more important structures, all of which are conducive to health, and the growth and development of the whole frame.

If the vertebral column, which forms the support of the body, be bent, of course the body must undergo some change in its outward appearance, and hence the deformity results. Now, it becomes useful to be acquainted with the proportions of the

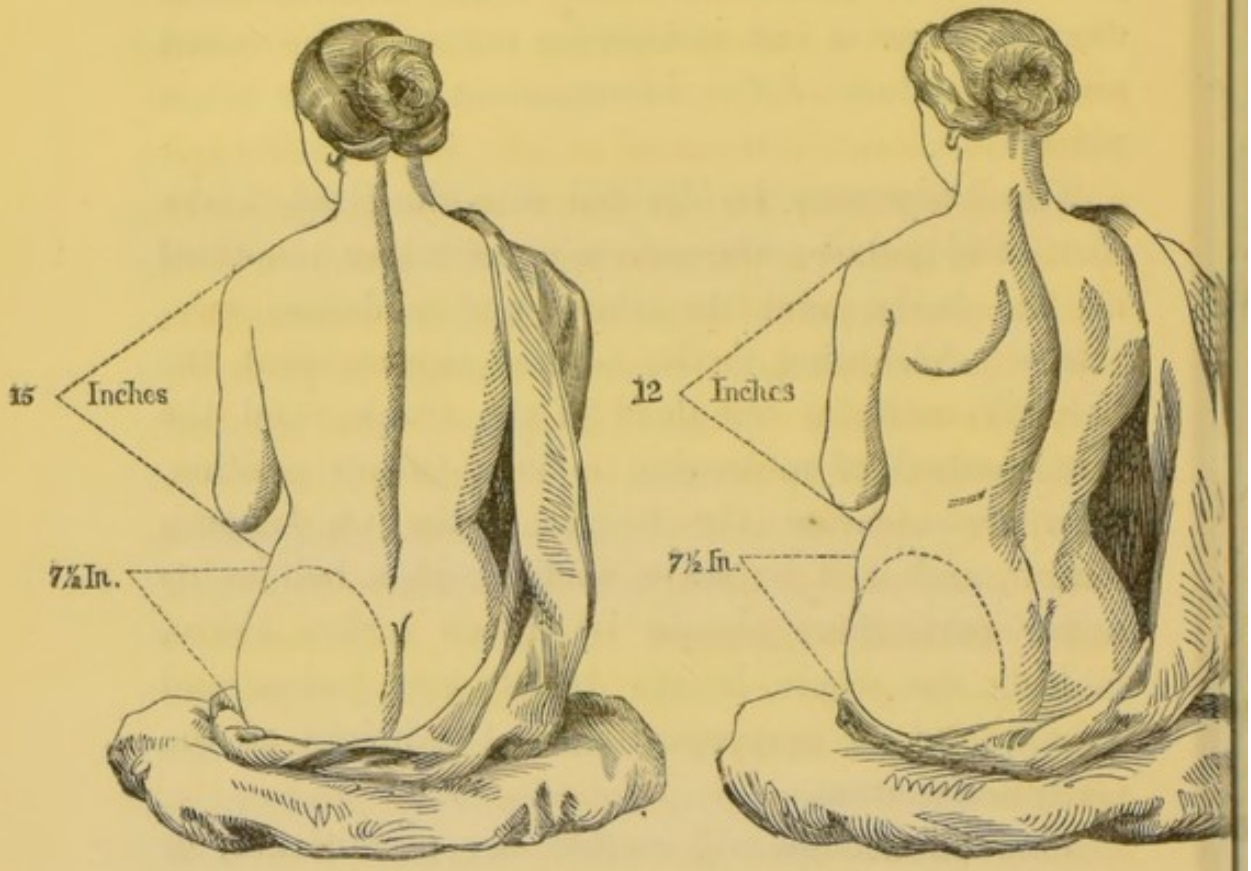
trunk, and of course of the vertebral column, when free from any variation, and in a natural and healthy state, as this knowledge will necessarily enable us to judge and form, together with other circumstances, a just and proper notion of the extent and the nature of the derangement that has taken place.

The body may be divided into the chest, abdomen, and pelvis; the pelvis constituting one-third of the body, and the chest and abdomen two-thirds. According to the natural measurement, the pelvis constitutes one-third of the trunk; and the best method of measuring is in a sitting position. Now we measure the height of the Os Innominatum, and if it be seven inches and a half to its upper part, there should be fifteen inches above, making the whole length twenty-two inches and a half, and so in proportion to the height of the Os Innominatum.

This knowledge will enable any practitioner, or any person, to ascertain if the natural proportions be perfect. Also, suppose we measure any person in the erect position and in the dorsal recumbent position, their height should be the same, both erect and recumbent; if this be not the case there must be some cause for the variation.

I make these remarks after having measured twenty-one persons in a state of health, and in all, except one, I found the measurement the same, and in that one a variation of only a quarter of an inch

existed in the recumbent position. Now, suppose curvature of the spine be present, let us notice the variation.



The Os Innominatum, seven inches and a half; space between the Os Innominatum and Acromion process of scapula, twelve inches. Now measure this person in the recumbent and in the erect positions, and you will find a variation of an inch or so; this increase will be in the recumbent state. What does this prove? That the spine is weak and yields to the weight thrown upon it in the erect position; but place it recumbent, free it from

the weight of the head and arms, and it is longer, but still not in proportion to its natural state, owing to the weight of the body having caused the curve in the back; and according to the diminution in the length of the trunk will be the extent of curve produced.

Let us follow up these remarks. Suppose we find a variation of one inch in the recumbent and erect positions, and we wish to ascertain the extent of weakness or softened state of the vertebral column, place the patient in the dorsal recumbent position, in which she is one inch longer. Now use gradual extension of the spine, not by fixing it or the body, but merely by the weight of the trunk lying on the couch; and after twenty minutes measure again, and if we find an increase of half an inch, does not this clearly point out the debilitated state of the spine? Does it not prove that we have allowed the curvature to increase by permitting the weight of the head and arms to be thrown upon a part incapable of supporting any additional weight whatever? and the curve will continue to increase so long as means are not used to remedy the weakness; thus I am enabled to estimate the extent of debility in the vertebral column, and devise the best means of strengthening it. If any person be doubtful on those points, I am prepared practically to convince him of the justness of these remarks.

Some years since I was consulted on the following very interesting case:—

A young gentleman of distinction, nine years of age, of a very healthy appearance in every respect, suffered from inability to ascend the stairs, or even the slightest elevation. He could walk very well on plain or smooth ground, but when he attemped to ascend the stairs, or get over any elevation, he fell down and could not rise up again. One day he was found on the hearth rug, having fallen in an attempt to raise his foot over it, as it was very thick. I measured the length of the Os Innominatum from the Tuber Ischii to the crest of the Ilium, and then the distance from the crest of the Ilium and Acromion process; I found a deficiency of three inches and a half.

I then measured the height of the patient in the erect and recumbent positions; I found a deviation of one inch and a half.

I then measured the distance from the crest of the Ilium and the Acromion process in the erect and recumbent positions, and found that the variation existed between these two points, and that there was an inch and a half variation in the length of the vertebral column in the two positions. In this case, I found by extension, I could increase the length of the spine nearly an inch, and that after such extension, he was always better when he arose than he was before he lay down. I viewed this case as a debilitated state of the vertebral column; and pursuing a plan of treatment for six months, I acquired in that time, an increase of an inch and a

quarter between the crest of the Ilium and the Acromion process, he could then ascend stairs three inches and a half in height, but not the common stairs. I deemed this case to be a softened state of the vertebral column, a want of consolidation of the bones of the spine, so that when he attempted to raise his foot, the nerves were compressed as they passed out between the vertebræ, causing him to fall down.

I had some stairs constructed that might be raised in height, they were gradually elevated, measuring from a quarter of an inch until they were raised three inches and a half.

Thus, measurement in this case was productive of benefit, by enabling me to ascertain the nature of the case; and so it will be in respect to the plan of treatment, because, by measurement, we can ascertain what benefit has been accomplished; and if at the end of six months we have acquired an inch, or even three quarters of an inch in the length of the spinal column, we ought to be satisfied with the result, and continue the plan.

In many cases of lateral curvature of the spine, the expansion of the chest is a great desideratum: for suppose the chest, at the commencement of the treatment, measures twenty-six inches round, and at the end of a few months it measures twenty-nine inches, the lungs, by containing so many more cubic inches of air, cause more oxygen to enter the blood, and thus that fluid becomes much more likely

to consolidate the bones, than when the chest was contracted.

I have found parents of patients with lateral curvature of the spine, surprised, that by the means of extension on the couch, I could cause the spinal column to become elongated, that when the patient stood against the wall after extension had been used, that there was frequently an increase of half an inch in height; this was gradually lost as the weight of the body was allowed to remain on the spine, pointing out to us the use and advantage to be derived by such extension, also the advantage of keeping for a certain time the spinal column at rest, to enable it to become more in a straight or proper position. It also most strikingly points out the advantage of artificial means, by mechanical contrivances to support the weight of the body.

Lateral Curvature of the Spine.

The abnormal condition of the vertebral column at an early period of lateral curvature of the spine, I consider to be due to a softened state of the cancellated structure of the bodies of the vertebræ, and a softened state of inter-vertebral substances and ligaments. These parts, being softened like sponge, yield to the weight they ought to support, and if the case be allowed to progress, the vertebræ become ossified in this curved state, the bodies of the vertebræ

on the one side being broader than on the other side. This may be seen by examining the vertebral column after death. Now the cause of such a state of the bones too frequently arises from tight lacing and a contracted state of the chest; the lungs being preternaturally compressed, cannot afford sufficient oxygen to the blood, so that a healthy deposit of ossific matter no longer takes place; the bones are therefore deficient in the proper supply of earthy matter to produce solidity. During the natural growth of the frame, a large supply of earthy matter becomes essentially necessary for the formation of the teeth and the various bones. The teeth require a large amount of ossification to produce their development. Frequently from a too rapid succession of the infantile diseases, such as measles, hooping cough, scarlet fever, &c., the due quantity of earthy matter becomes deficient, and thus, of course, the bones cannot acquire proper firmness. A softened state of the vertebral column may exist without producing any apparent deformity, except a variation in the proper proportions of the body and back, and a softened state of the vertebræ may produce excurvation of the spine as well as lateral curvature, which the following plate will explain.

Fig. 1.—A sketch from a preparation in the Museum at the Middlesex Hospital.

Fig. 2.—A drawing from a section of the spine of a patient who died under my care, in the Middlesex Hospital, in 1841.

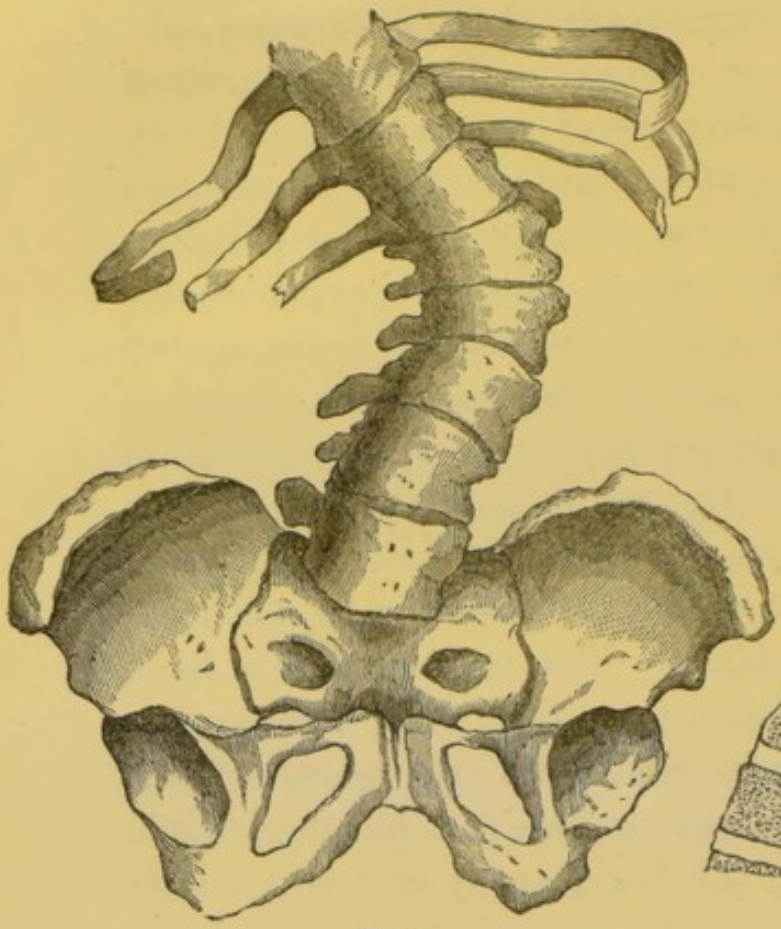


Fig. 1.

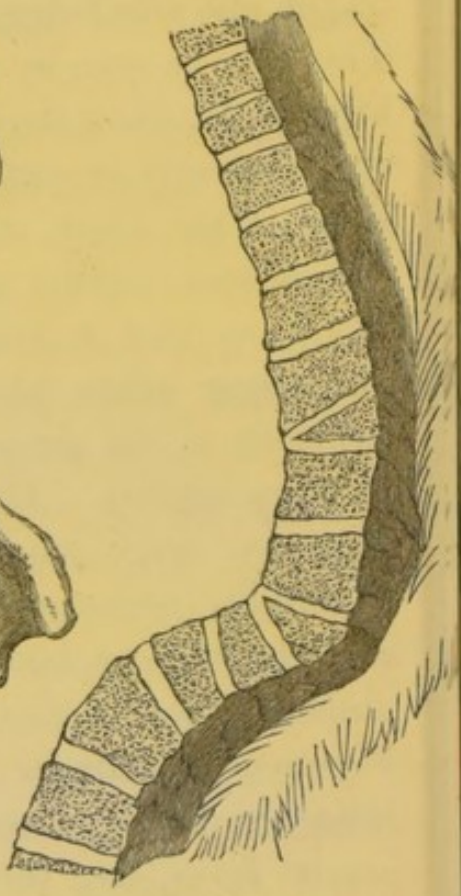


Fig. 2.

In both these cases the state of the bodies of some of the vertebræ are compressed in the form of a wedge, being somewhat of a triangular shape; in neither instance is there any existence of caries; and the latter plate exemplifies that excurvation of the spine does not always result from caries of the vertebræ.

If the vertebral column be so weak as to bend under the weight it cannot possibly bear, surely some means are indicated to us by nature to support the weight. If left alone, nature does it herself, by forming ossific deposit to unite the bones in such

a manner that they cannot any longer yield to the weight thrown upon the weakened part; but, unfortunately, nature does not do this until deformity has appeared to a greater or smaller extent. In such instances the surgeon can do no more; if firm Anchylosis has been established, the deformity is fully and permanently formed beyond all means of restoring the natural figure. Prior to the bones becoming united, the surgeon may do much to diminish the deformity and prevent its increase; and after this, nature, by uniting the bones, establishes the cure with permanent benefit to the patient.

Treatment of Lateral Curvature of the Spine.

The treatment of lateral curvature of the spine will depend upon the condition of the curvature, the time it has existed, the extent of weakness in the vertebral column, and the state of the chest in regard to its natural size; the treatment will also depend upon the constitutional stamina and age of the patient.

To establish a solitary plan of treatment, indiscriminately for all cases, whether the strength of the patient can bear it, or not, must be unscientific, erroneous, and liable to failure.

The late Dr. Harrison employed extension, with the pelvis and upper part of the body fixed by straps, by the aid of a kind of windlass at the base of the couch, the patient lying in the facial recumbent

position; after a certain degree of extension, he employed an instrument to press against the spinous processes of the vertebral column somewhat like a kneading kind of pressure, fancying that he pushed the bones into their proper position. After this treatment, the patient had shields applied for the purpose of using pressure, with a view to force the bones into their places, the patient being kept on the couch for years, until, no doubt, Anchylosis of the bones took place. Friction was also amply employed.

Every credit must be given to him for establishing the Institution for the Treatment of Curvature of the Spine, and no doubt, in certain cases, his plan was beneficial.

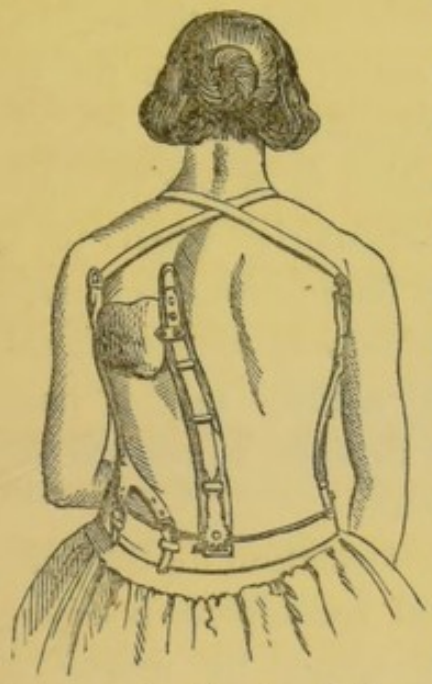
Some practitioners advocate the prone position. The late Mr. Verrall established this principle, and his son has been successful in a number of cases, but he had recourse also to mechanical means which preserved what he had gained, the principal plan to benefit the shape of the patient, and remove the curvature.

Mr. Amesbury's plan of treatment consists principally of mechanical means, and those instruments which have fallen under our notice are so weighty and cumbersome, that they must have caused very considerable inconvenience. Several patients have complained of suffering much annoyance and weariness from the use of them.

We will next narrate the treatment at the

Orthopœdic Hospital, and we cannot do so better than by the following paragraph.

"Tavernier's belt has been superseded by Tamplin's apparatus (of which a representation is given in the accompanying wood-cut.) After many alterations, it is the instrument now commonly used at the Orthopœdic Hospital. It consists of a steel padded pelvic belt; of two crutches, capable of elevation to reach the axillæ, and to take off the weight of the head and upper extremities; of a webbing band to pass in front of the abdomen, where, moderately tightly laced, it holds the instrument forwards, and of one or two pads on steel supports, worked with cog-wheels, to press the displaced vertebræ steadily but slowly back. Patience on the part of the patient, care and skill on the part of the surgeon are necessary, that the apparatus may fit without rubbing, and the weight, which is considerable, may be so equally diffused as to be borne without inconvenience."*



In regard to Mr. Hare's plan of treatment, namely, extension from various parts of the body

* Mr. Holmes Coote on Curvature of the Spine. London Medical Review No. 1, July, 1860. Page 13.

by the use of weights, and the application of pressure on the projecting parts while in the recumbent position, it may prove beneficial in certain cases and under certain circumstances, but cannot be applicable to all cases; nor can the recumbent position prove advantageous to all.

The French mode of extension is of use in some affections of the spine, particularly when it is in a weakened state, but must be injurious to certain cases of caries, as such extension will tend to break down any adhesion which nature might have previously formed in her own defence, to restore the strength of the vertebral column.

Mons. Guerin, "Sur les Malformation du Systeme Osseux," advocates the dorsal recumbent position, and employs flexion of the spine, by means of powerful screws moving different portions of the couch, to which the whole body is fixed in a horizontal position by straps and complicated means.

The body, according to my experience, requires no fixing, as I consider this detrimental and injurious.

Mr. Lonsdale employed a lateral position, and we cannot do better than quote the following observations from his work.

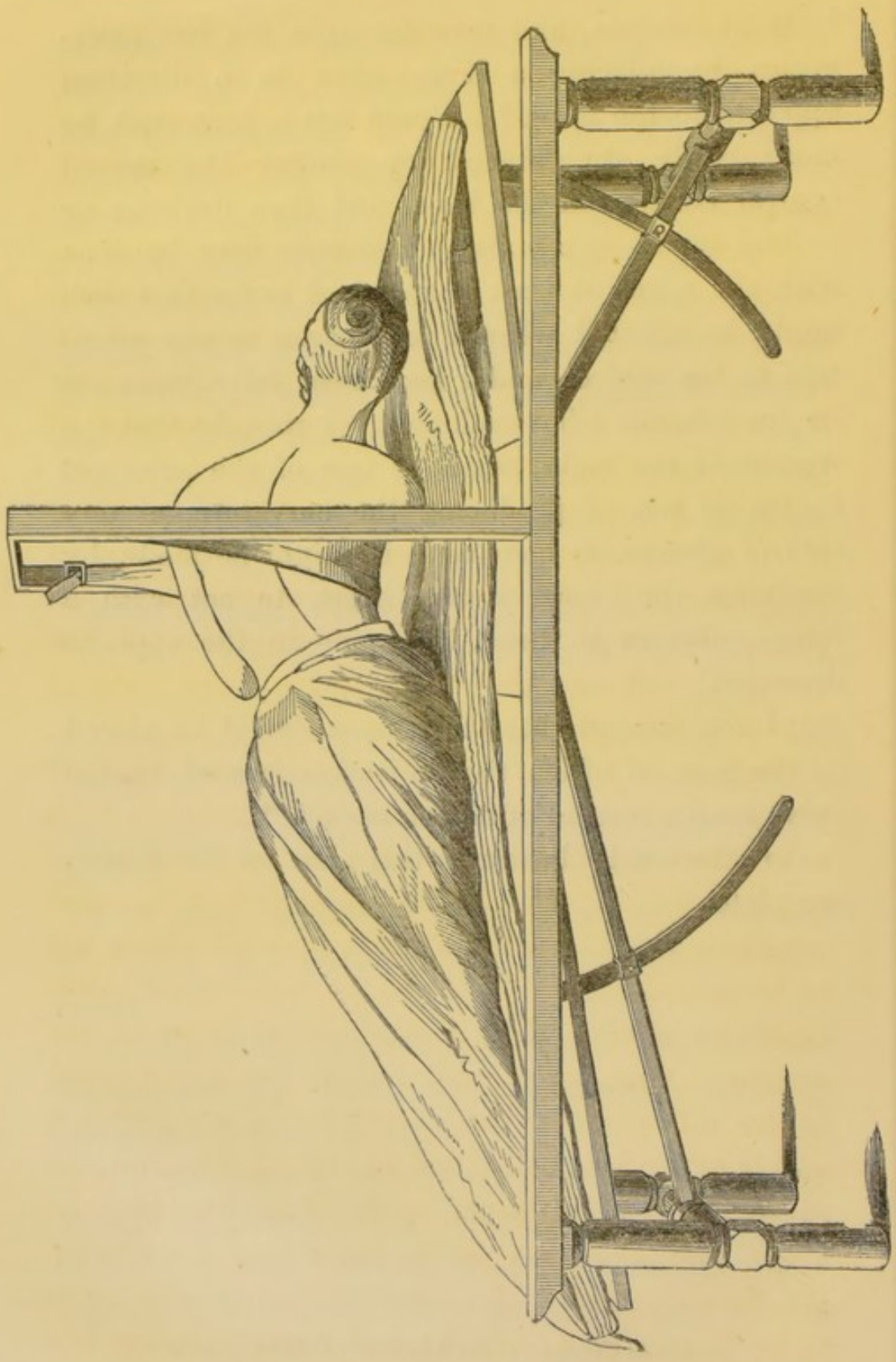
"If we desire to straighten a stick or rod of iron, should we stretch it by pulling upon the two ends in its long axis? should we not rather attempt to unbend it by placing the most curved part on some

body or fulcrum, and then act upon the two extremities by placing a lever force in a direction opposite to the curve? Would not a bent stick be more easily straightened by placing the curved central portion on the knee, and then drawing or pulling on its two ends? The same may be done with the spine, at least it appeared to me that such might be effected when I first began to pay attention to the subject, and I have been fully borne out by the practice I have adopted. I thought that the weight of the body, which is one of the principal causes, if not of producing the curvature, at any rate of afterwards increasing it, might be made, by applying the power it can exert, to act with a force sufficient to bend the spine in the opposite direction.

"I recommend that the patient should be placed on the side on which the projection formed by the curve exists, instead of on the back." *

He afterwards illustrates this plan by the following plate.

* Lonsdale on Curvature of the Spine, second edition, page 92.



Mr. Lonsdale then remarks: "The great power possessed by the above simple position of unbending the curve can be easily ascertained by passing the finger along the spine, after the patient has been placed in the belt."

Mr. Lonsdale kept the patient a certain time on the couch, and afterwards fixed on certain mechanical means. The plan is highly ingenious, and we must give Mr. Lonsdale every degree of credit for it; we have no doubt it may be productive of benefit in certain cases.

In the treatment of lateral curvature of the spine it has already been stated that several points are to be taken into consideration: the condition of the chest, its shape and size; the condition of the vertebral column; the strength, age, and state of health of the patient.

Suppose a patient, between twelve and thirteen years of age, presents herself for treatment with a contracted chest, a double lateral curvature, much lassitude and debility, attended with much weakness in the vertebral column, what points are to be considered? What are the means best calculated to remove this ill-conditioned state of the system? One object, and not the least important, is the dilatation of the chest; for if we use such means as are best calculated to expand the chest, we cause, by its enlargement, more air to enter into the lungs, and more oxygen to enter into the system. We thus strengthen the constitutional powers, so as to be beneficial to health; and Nature renders her

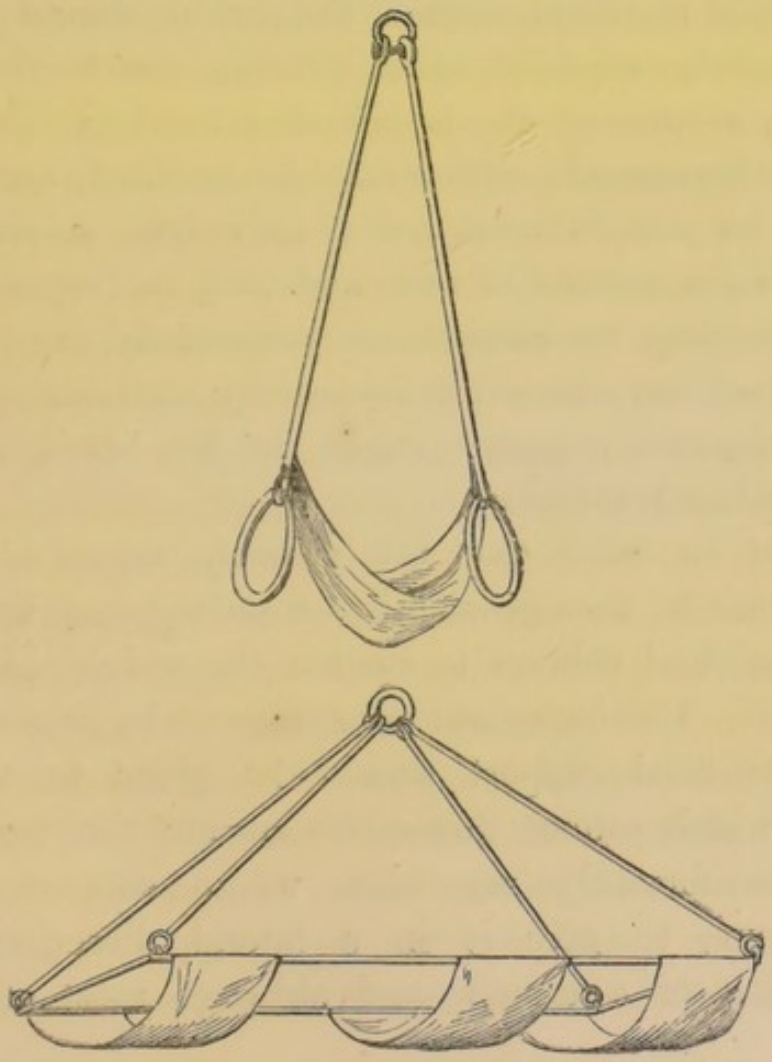
all-helping hand to assist us in bettering the condition of the patient generally. This object will best be attained by recommending the patient to use such exercises as will cause the expansion of the chest by elevating the ribs. This case denotes much debility of the vertebral column; and if we employ exercises in the erect position, we use them on the weakened vertebral column, or rather while the weight is upon the weakest part; but if we employ these exercises while the patient lies in the dorsal recumbent position, we remove the weight of all parts of the body from the spine and throw them upon the couch, and we enlarge the chest with all the advantages we possess.

Now, supposing we have been successful in our efforts in enlarging the chest to the extent of an inch, which we can easily ascertain by measurement, we must then use the best means to keep this advantage; and we can do so by mechanical appliances, that tend to support the superincumbent weight in such a manner that it is no longer placed upon the spine; and these contrivances should be based upon anatomical principles. Now, what do we gain by such means? We enlarge the chest, we place at rest the weakened vertebral column, and we thus use the best means in our power for nature to strengthen the constitution and the weakened condition of the spine.

These remarks are applicable to other cases, not where there is such an extent of mischief as in the case already quoted, but it will enable the reader to

understand the principle of treatment. Of course we shall also use such medicinal means as we consider most advisable for the restoration of health.

Delpech has illustrated his work with a variety of plates, particularly on the use of exercises in the treatment of curvature of the spine and dilatation of the chest, and, without doubt, many that he has recommended are highly useful. We most strongly recommend the use of two swings, which the accompanying plate represents: they are modifications of exercises taken from Delpech's work, and we consider that they are most highly useful.



The one is a swing, not used in the ordinary way, but to enable the patient to swing by means of the arms being suppported as if they had a crutch under each arm-pit, with a support for the spine at the same time. The other is a species of hammock for the patient to be upon, which supports the patient in a horizontal position, with a strap to be fastened under tlre curvature, and the patient may, if it be considered necessary, lie upon it in a lateral direction, somewhat like the plan recommended by Mr. Lonsdale, which, we doubt not, will be productive of a beneficial effect; but if mechanical support be employed at the same time, the patient should have it properly adjusted upon quitting the horizontal swing, so that all the benefit that has been gained by the horizontal position may be retained, and the spine be perfectly relieved of its weight, so that it may be in a state of rest, and that the reparative process may be carried on successfully, and the spinal column restored to its healthy condition.

Mechanical support ought to be based upon anatomical principles.

Bear in mind that the primary cause of the curvature of the spine, arises from the inability of the vertebral column to sustain the weight placed upon it. The important advantage to be gained is, that artificial support should be given to those parts which cannot themselves sustain the weight. It was formerly my idea, where support was necessary, to give it in a lateral direction, in imitation of a crutch, and although most of the

cases where artificial means were so employed proved successful, my experience now inclines me to believe that this plan is capable of improvement.

If nature had deemed lateral support pre-eminent, bones would have been placed in that situation; but the support has been placed in the centre by our All-wise Creator, which, without doubt, must be the best possible position. Now, can we in the employment of artificial aid, do better than follow nature, and use our means of support in a central direction; for all support should be on the same principle as the spinal column? It is thus that all the mechanical contrivances based on this plan are likely to be more successful if considered anatomically and scientifically. In regard to the use of pressure where the ribs project, what is the cause of the projection,—the debilitated state of the vertebral column. The scapula projects from the same cause —the weakened state of the vertebral column. Increase its strength gradually, and you gradually diminish the cause of the curvature, you thus relieve the vertebral column, and produce beneficial effects on the projecting ribs and scapula.

The principle to be kept in view in all artificial support is, in my mind, to apply it in such manner as to support the vertebral column and the weight of the arms; bringing the shoulders back, so as to dilate the thorax; relieving the spine of all weight; using gradual extension, so as to diminish the curvature by degrees to a more symmetrical form; giving the spine complete rest during the whole of the time, in

order to repair the debilitated state of its structural organization. In certain cases, if we combine all these means, and can enable a patient to wear the appliance with comfort, and feel the want of it when off, we accomplish all that can be desired. Such means as we have just enumerated will prevent very serious and inconvenient consequences resulting from a continuance or increase of the deranged position. Curvature of the spine produces pressure on the heart, lungs, liver, diaphragm, stomach, intestines, spinal marrow, and nerves, as they make their exit through the inter-vertebral foramina, which pressure gives rise to numerous serious consequences, all most distressing to the patient. Now all these can be removed by judicious treatment, and the ill consequences prevented which very frequently supervene the deformity or the deranged state of the vertebral column.

A light and very beneficial spinal support is represented here, and which has been found of the utmost service in a variety of cases that have been under treatment. It is invented and made by Mr. Pratt, 420, Oxford Street. A very great advantage of this support is the being able to adjust it with extreme accuracy to the weight it has to sustain, by means of the adjustment at the back. This is of the greatest importance where extension is employed. By carefully raising the back of the instrument, after the

extension by means of the couch, we thus retain the advantage we have gained and aid the efforts made to straighten the spine.

Mr. W. sent for me in the year 1843, who suddenly fell to the ground when he was walking, with complete loss of the use of his legs. He made the following statement:—About four years previously, while attending Mr. Stanley's Lectures, he felt a numbness in his thumb and fingers, so that he could with difficulty hold his pencil. He consulted Sir Astley Cooper, who recommended him to go into the country, which he did, but the numbness increased until he lost the use of both his arms, and they hung quite loosely by his side, swinging about as he walked. He found exercise beneficial, and he was very fond of walking, but of late, when he walked, he would suddenly fall down, losing the use of his legs, and this inconvenience increased. He had read many books on the spine, and, amongst others, my work, and requested to have my opinion.

Upon examination, I found that, with very little pressure, any one of the dorsal or lumbar vertebræ could be dislocated, and that when one of these bones was displaced, paralysis followed. In this case no deformity appeared; he was apparently a fine healthy young man of twenty-five years of age.

The arms were quite useless. The spinal column was deficient in its natural measurement, it had lost at least two inches in its length; it was longer in the recumbent than in the erect position, and wanted its natural height when sitting up.

He had a mechanical support made under my direction, to bear the head and arms, throwing the whole of their weight upon the pelvis. By this instrument, he could use extension of the spine, and after it was applied, no further dislocation of the vertebræ occurred, so he was enabled to walk about again quite well; but we were never successful in restoring the complete use of the arms, there was yet remaining a want of power and sensation, although we employed all the means then known for this purpose. This patient died some years afterwards of inflammatory attack of the lungs.

In this case, it is to be remarked, there was no apparent deformity, but a deficiency in the natural height of the vertebral column, a general relaxation of the whole ligamentous structure of the spine, producing, first, loss of power of both arms; then followed a dislocation of some one vertebra, with loss of power of the legs, complete paralysis for a time; but when the weight was removed from the spinal column, sensation and motion returned as the dislocated bones became reduced. The mechanical means, by keeping all the bones in their place, and by the employment of extension, enabled the ligaments to retract, producing a most beneficial result to a certain extent.

Affections of the spine, with or without any apparent deformity, will produce dislocations, not only of the vertebræ themselves, but also of some other joints, such as the shoulder, knee, toe, &c.; and the attention of the practitioner will be called by

the patient, not to the spine, but only to the part affected; but let such means be employed to relieve the spine, and no further dislocations will occur. What produces the displaced bones is the too powerful action of one set of muscles over the other by the pressure occasioned upon one particular nerve or fibres of nerves, for the same cause will produce epilepsy, and many other most distressing symptoms. In such cases we have it in our power to produce almost immediate and permanent relief. This can only be done by removing the cause. Keep the spinal column at rest; place it in such a state of quiescence that no pressure can be produced against the nerves, or any other part affected by it, and a beneficial result will follow. In all such cases the old maxim applies—"Sublatâ causâ tollitur effectus."

Epilepsy, resulting from curvature of the vertebral column, or from spinal debility, may be accompanied with convulsions, or be unattended by any spasmodic actions, and may appear, as Dr. Winslow has stated, as a third kind—nocturnal, which is sometimes limited, apparently, to an unpleasant muscular twitching. The late Dr. Marshall Hall termed this "Hidden Seisures." The patient complains of great muscular and nervous debility, disturbed and unrefreshing sleep, depression of spirits and head-ache, particularly on first waking.

This complaint depends generally upon some organic or functional cause in the brain, spinal marrow, nerves, or other organs. Spinal debility is not an uncommon cause of epileptic seisures, and

may be produced by the excitement of any irregularity of the vertebral column, or excitement of the nerves or spinal marrow; such cases are by no means uncommon. Unfortunately, the spine is but seldom examined, and even when it is, there are many cases where no derangement of the vertebral column can be detected, as the practitioner does not test the spine by measurement, so as to judge correctly as to the condition of the part in respect to its natural proportion.

No deformity may be apparent, and yet the debility may be in the vertebral column. It may vary in the erect and recumbent positions, and it may be deficient in the normal length, between the spine of the Ilium and Acromion process of the scapula, and few medical practitioners who are unaccustomed to see or treat these cases, can detect the existence of any natural deficiency.

In one case under my care, I was several hours with the patient on various occasions, and could not detect the cause, but I persevered so as to enable me to find out the variation in the spinal column. In cases of epileptic seisures arising from the debility of the vertebræ, spinal supports may be most beneficially applied, and may, after a little time, prevent the further appearance of this most distressing malady, seisures that are more distressing to the friends of the afflicted than to the patients themselves, because the patients are not conscious of their existence in many cases, nor of the dangerous result that may attend their continuance. It must be here distinctly understood, that we do

not mean for a moment to say, that all cases of epilepsy arise from affection of the vertebral column. There are other causes for epilepsy, which we cannot enter into on this occasion.

The Prone Position.

The prone position is one that is extremely serviceable under certain circumstances, and I can speak of its utility in a number of cases that have fallen under my treatment, both in public and private practice; but to recommend this position to all who have curvature of the spine, whether lateral, posterior, or anterior, must be discountenanced. Cases of a particular character must be selected; our experience will point out such, and our observation will direct us as to the continuance of this plan.

Certain stages of disease of the hip and certain cases of curvature of the spinal column may derive very considerable benefit by the employment of this position, together with judicious medicinal treatment; but I cannot maintain that because a child or adult has diseased hip or curvature of the spine that this treatment is the only one calculated to be of service.

It is from the choice of the plan for any peculiar case that successful results may be expected, and not by perseverance in that which produces pain and inconvenience. Pain and inconvenience must be detrimental to the patient, and will not lead to the progress towards a cure. If it is found that the plan adopted does not succeed to our wishes, it

becomes our duty at once to change it, and to substitute other means, which can only be ascertained to be beneficial or otherwise by careful watching and attending to the comforts of the patient under treatment.

The best and most improved prone couches are represented.

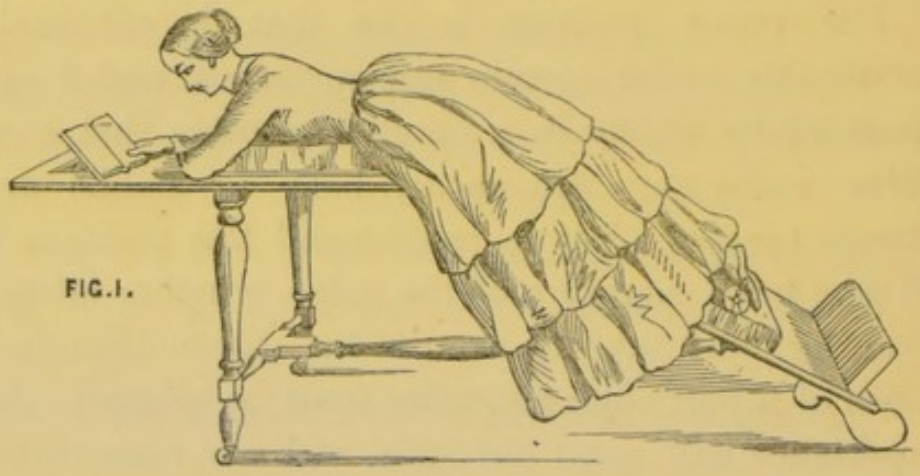


FIG. 1.

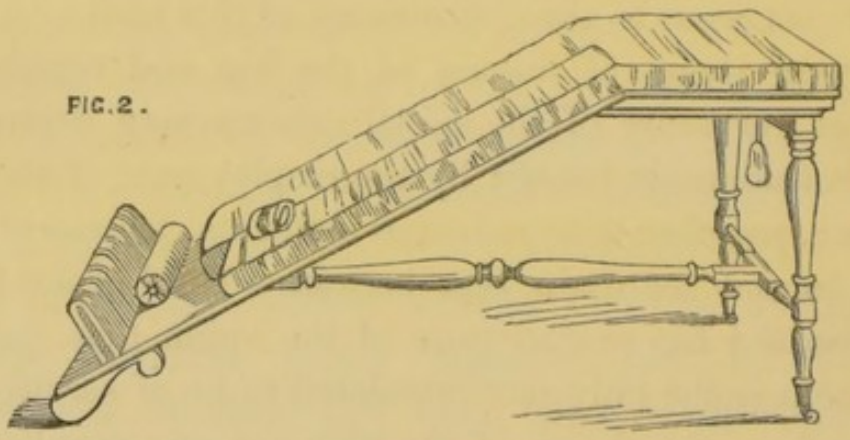


FIG. 2.

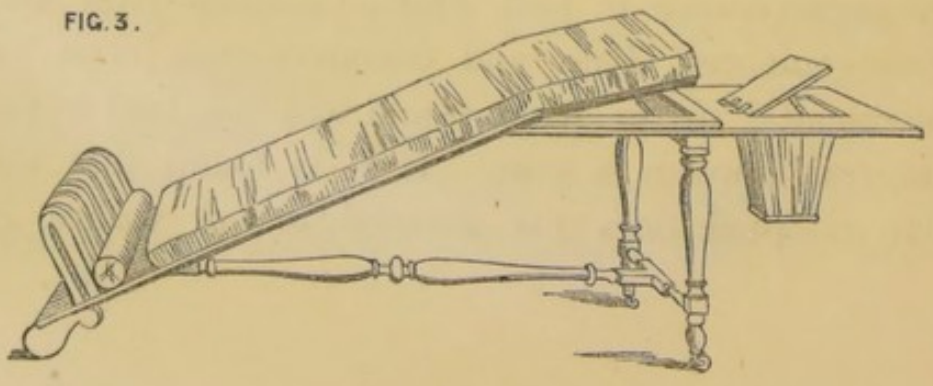


FIG. 3.

Fig. 1.—The position of the patient upon the prone couch.

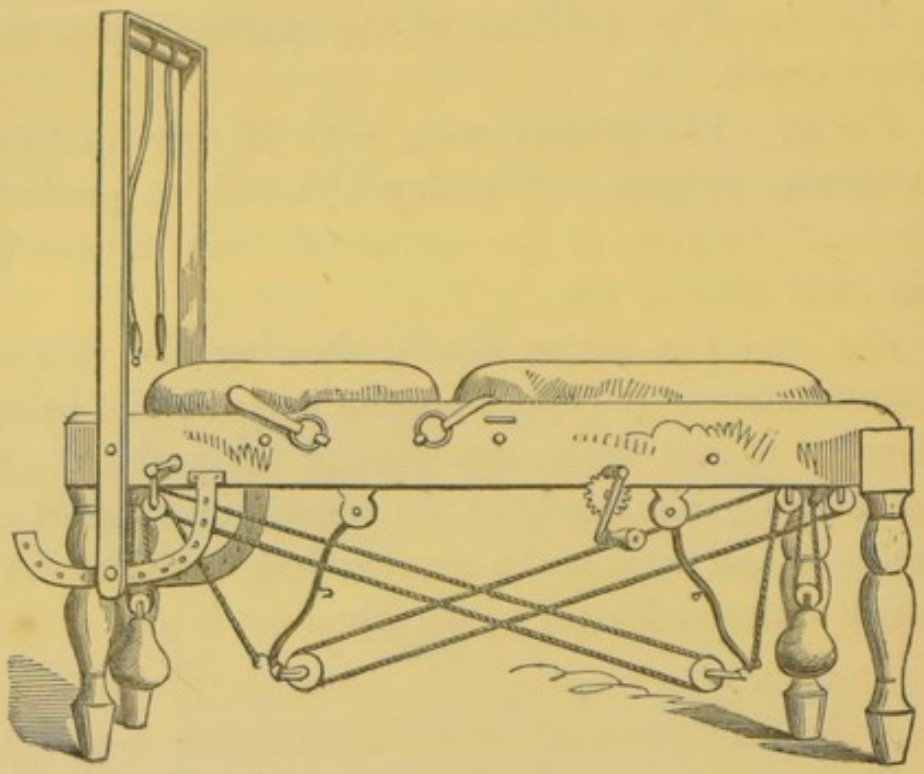
Fig. 2.—The prone couch, with sliding mattress in frame, weights and pulley attached, to produce gradual extension of the contracted limb in cases of hip joint disease, &c.

Fig. 3.—The prone couch, shewing the various appurtenances; the upper portion is capable of being elevated to suit the convenience of the patient. It has a moveable head-rest for occasional support of the head and neck, and a reading-desk or work-table, which slides under the couch when not in use.

The Supine, or Dorsal Recumbent Position.

The horizontal dorsal position is far superior to the inclined plane, because, in the horizontal position, all the weight is removed from the spine; but in the inclined plane, a portion of weight must remain upon the vertebral column.

The horizontal dorsal position may be employed for several purposes. It may be recommended to rest the spine upon, as it relieves it of its weight. It may be used to employ certain exercises upon; and it is essentially serviceable to enable the practitioner to ascertain the extent of weakness existing in the vertebral column, and thus will aid him to determine upon a better plan of treatment. The couch I employ has been in use for a number of years; it consists of a frame supporting two parts,



one to place the trunk upon as low as the pelvis, the other to rest the pelvis and legs upon. Both of these pads or parts are acted upon by springs and weights, so constructed that the pads recede from each other, being placed upon rollers, so that by these means the spinal column not only has all the weight taken away from it, but it has a moderate degree of extension employed upon it, so as to apply the best means to diminish the curved condition of the bones. The pads can be increased in their extensive power by weights attached to the springs; but in no case has it been found necessary or advisable to have either the pelvis or trunk fastened to them. The weight of the trunk and the weight of the pelvis have always been found sufficient to answer every purpose. Mischief might result by

fixing either of these parts of the body. Exercises may be employed while the patient be lying on the couch—exercises that tend to expand the contracted chest. Too much cannot be said upon this important point, as it is of the greatest utility in the treatment of lateral curvature of the spine; for if the chest be properly expanded a great advantage is accomplished, so that all means that tend to produce such a desirable end are most important, and worthy of the utmost consideration.

There are several methods to be employed to produce the expansion of the chest.

The use of exercises is of ancient date, and many instances of beneficial effects are related in our old works. Cœlius Aurelianus, an eminent physician prior to Galen, strongly advocates exercise; and, at the same time, to walking he added the exertion of the voice, that the action of the lungs might be increased.

Paulus, of Ægina, confirms this advice, which is still further ratified by the observations of Sydenham. Œtius, a physician born at Mesopotamia, living at the end of the fifth and beginning of the sixth centuries, advocated most strongly the employment of friction.

From the opinion of most experienced men, great benefit is to be derived from friction as well as exercise, in order to produce power and strength to a weak part; therefore, in the treatment of deformity, we may produce the greatest benefit both by friction and exercise of the muscles, and

also the exercise of the voice in enlarging the lungs and of course the thorax.

All exercises that elevate the ribs, enlarge the chest, and more air enters the lungs during inspiration. In the performance of the function of inspiration, the first rib becomes fixed by the Scaleni muscles, and then the ribs are elevated and drawn up towards each other, and the more the ribs are expanded, the greater the capacity of the cavity of the chest and the air-cells, and a larger quantity of air enters into them and into the lungs; the more air, the more oxygen to the blood, consequently this fluid (the blood) has greater capabilities to restore the deranged condition of the several textures that has produced the curvature of the spine, and the vertebral column is more likely to be restored to a healthy structural development. There are means recommended for this purpose; but the chest must not be confined by stays; the ribs must not be compressed, but left perfectly free; the shoulders should be placed well back, with the base of the scapulæ as near to the spinal column as possible; and the vertebral column should be as erect as is compatible with the nature of the deformity.

So far as regards the position. Now, the exercises are those above the head: calisthenic, gymnastic, the hand swing, letting the weight of the body be supported by the hands; all which tend to produce expansion of the chest. Having a ladder fixed in a horizontal position, that one hand may take hold of one rail and the other hand of another, and so the

patient supporting the body by the hands, may move along the whole length of the ladder. This may be practised until the muscles will be found to become very considerably enlarged. These means must not be indiscriminately persevered in, otherwise they will do mischief. We were lately informed that a young gentleman had the muscles so much developed, that the chest and muscles were greatly enlarged, and the patient quite in health and strength so long as he was hanging by his hands, but immediately he placed his feet to the ground, more inconvenience was occasioned, because the curved condition of the spine was below the chest, so that when he stood up, increased weight was thrown upon the deranged part, and the deformity necessarily increased. This fact will convince us that no means should be persevered in except the patient be properly watched by the medical practitioner, as he alone can judge of the benefit or ill effects of the plan.

In cases where the curve is slight, and at an early period of its formation, very great benefit will result from the employment of an exercise by means of a weight and a pulley.

Let a seven pound weight, or more (according to the age of the patient), be attached to a rope and fixed through a pulley in some beam in the ceiling, have a piece of broom-stick attached to the rope, let the patient hold the ends of the stick, and pull the weight up and down for a quarter of an hour each morning before breakfast, with the chest unconfined, except by a flannel dressing-gown,

which should be quite loose. Incipient cases will speedily be much benefited by such means. Several cases have fallen under my care where this plan has proved most highly advantageous.

The hand perpendicular rotary swing, for six or eight young people, as used in the grounds of the Foundling Hospital, is of the utmost utility in promoting health and producing an expanded chest. Few schools should be without this swing, as the prevention of curvature by all healthy action and exercise must be considered a very great advantage.

All calisthenic exercises employed by the aid of elastic bands, which are sold in the gum elastic shops, will be of much use, if properly and carefully employed, and not carried to a greater extent than the child can accomplish. We are not acquainted with a more beneficial exercise than swimming. The weight of the body is supported by the water, and the exercise of the arms tends considerably to expand the chest, and remove the curvature of the spine; where this can be recommended, benefit will follow its continuance. Rowing is also of much use in the expansion of the chest.

Dumb-bells have been recommended, and no doubt are serviceable in some cases; but when the spine is curved, it is not reasonable to place a greater weight upon it than it could support before, and therefore we consider that exercise with dumb-bells should never be used in cases of curvature of the spine. The balancing of a light wooden wicker table mat placed upon the head, in imitation of the market gardeners,

has been recommended, the patient walking along with it. No doubt this might be serviceable, but we have not, as far as our own experience goes, ever been able to carry out this method.

Many other means may be employed for the purpose of expanding the chest, which will be found in my work on Curvature of the Spine.

We presume that sufficient has been pointed out to establish the utility of such a feature in the treatment, and also in the prevention of spinal curvature.

In schools, every necessary prevention should be taken while the girls are in a sitting position at their lessons. The best chair is one under the name of "Sir Astley Cooper's Chair," one with a high back, and the music-stool should also have a back to it, that the spine may be supported or relieved.

No person can doubt the benefit of muscular exercise, or the power which the muscles acquire by proper and judicious means being employed for their increase; but it would be absurd to recommend a weak and sickly child to what would be called laborious and immoderate muscular action.

In using these means, the size of the chest will in a great degree prove the efficacy of the plan.

Suppose that, prior to the treatment, the chest measured twenty-six inches round it, and that after a few months the chest measured twenty-nine inches; three inches would have been acquired. Then again, measure the patient in the erect and in the dorsal position, and observe what change has taken place in the weakened condition of the vertebral column.

To prove benefit derived, there should be less variation in the two positions, and this diminished variation is a positive proof of benefit having been gained.

These are points well worthy of consideration to all practitioners who undertake the management of these cases.

The growth of the patient while under treatment should be taken into consideration, and care should be taken that the brain be not over-wearied by lessons and mental exercises.

Walking exercise should never be taken after any meal, as it will interfere with the function of digestion. The recumbent position is of use after meals, as rest promotes digestion. The late Mr. Abernethy always used to lie down for an hour after dinner to strengthen the health of the digestive organs, so as to enable the food to be properly assimilated.

Cases of Lateral Curvature.

Captain L—— sent for me in the year 1844 to consult me respecting his grand-daughter, whose shoulder protruded, and who was rather inclined to stand on one leg. Upon examining the spine I found a double lateral curvature, one in the dorsal and another in the lumbar regions of the vertebral column; the chest was contracted, but otherwise she was pretty well in health. She had been born and brought up in Wales, and had taken a full

quantity of exercise. I placed her under the following plan of treatment. The back was to be rubbed for a quarter of an hour every morning, in the recumbent position, with a liniment composed of tincture of ammonio-chloride of iron, with camphor oil and spirits of wine. Exercises were to be used every morning with a weight and pulley; and certain exercises were carried out by me for an hour daily at my residence, together with extension of the spinal column. The internal treatment consisted of the preparations of iron, iodine, quinine, &c. At the end of twelve months she was sufficiently improved to visit Boulogne, where she learned to swim; and the vertebral column was supported by a spinal support; and at the end of three years she was quite well. I have seen Captain L—— since, who stated he was happy to say his grand-daughter was quite cured.

Miss M——, aged sixteen, was brought up by her aunt from Staffordshire, to be placed under my treatment in the year 1845, with a double curvature of the spine. Friction, calisthenic exercises, extension of the vertebral column, with a spinal support, were persevered in for six months, which nearly restored her to a natural shape. She unfortunately broke one of her steels while she was upon horseback, and wounded her side, but not to cause much inconvenience. Great improvement took place by the treatment of this young lady, whose figure was considerably improved; but she did not very readily assist us in carrying out our plan, and but for the

aunt, who was very persevering, having in her younger days suffered from the same malady, the plan would have failed; but by diligent perseverance, it was successful beyond my best expectations.

Major H—— sent for me in the year 1844, respecting his daughter, a young lady eight years of age, with double curvature of the spine, one leg being much shorter than the other, the pelvis considerably distorted, chest much contracted, and her health greatly impaired. This young lady progressed very favourably while under my treatment. Exercises were daily employed to dilate and expand the chest, the spinal column was elongated by the aid of the couch, the shortened leg lengthened by weight attached to it—by shot placed in a bag; the pelvis expanded by means of muscular exercises, all the muscles arising from the Os Innominatum were placed in action in the recumbent position, and much benefit resulted; but she left town for Winchester, where the plan was persevered in, but not under my immediate superintendence, and the exercises so increased, that gradually her strength was unable to bear it, and she lost some of the advantage she had gained under the plan, which was at length discontinued.

I must here remark, that in this case it was stated that five minutes were to be added at the end of a week to the time of using the exercises, so that in a month twenty minutes were super-added, and in three months one hour. Now, it is clear, that to a weak and sickly child, such increased labour and

fatigue were improper, and this was done without consulting any medical man or writing to me. Under such circumstances, the treatment in this case failed, nor can we be surprised that it should have done so, taking all the circumstances into consideration.

Mrs. C——, of Russell Square, sent for me in the year 1846, respecting her daughter, aged thirteen, whose shoulder projected, according to her mother's account. Upon examining the spine, I found a complete curvature formed, which yielded much to extension,—a contracted chest, which expanded when placed in a proper position. The treatment, in this case, consisted of the use of the rope with a pulley and weight; friction to the back, an hour's recumbent position upon the couch, tonic medicine internally. This young lady was cured in three years, by following out the plan, and seeing me about once in every three months. Here was a case that at once yielded to the means recommended, for the simply placing her in a proper position caused the chest to expand, and to inhale more air, so that nature relieved the mischief, and set the reparative power into action, producing permanent benefit. The curvature in this case was brought on by tight-lacing and ill-directed management.

Mrs. D——, of Chatham Place, sent for me to see her daughter, a young lady fourteen years of age, with spinal curvature, who had been under the treatment of one of my colleagues at the Middlesex Hospital. The mother said her daughter had not

found much benefit from the treatment. In this case, exercises enlarged the chest; elevating the arms and holding them so, produced a degree of ease and comfort she had not previously felt; so the treatment became manifest. Exercises to dilate the chest, friction to the back, recumbent position for one hour daily, a spinal support to take the weight off the weakened vertebral column. Under this plan the young lady was cured. Few cases exhibited the advantage to be gained by the plan more than this did, and nothing could be more encouraging than the result. In the treatment of lateral curvature, a great deal will depend upon the state in which we find the patient after a few months' perseverance in the plan; for many circumstances will necessarily prevent the case from being generally under our observation. If improvement occurs, it only wants perseverance on the part of the patient to procure permanent benefit. It gave me the greatest gratification to examine a young lady after she had continued the plan herself for a period of seven years, as I found her figure perfectly formed. I am persuaded that her shape will bear comparison with the best figure in London. Few young ladies will have the courage or perseverance to follow up a plan when uncontrolled, or be willing to give themselves the trouble of pursuing such means as will necessarily keep them away from parties, pleasures, and gaieties. The restoration of health, one of the greatest blessings we can possibly enjoy, can alone repay

them for such steady perseverance, and sacrifice of much social enjoyment.

Miss C——, age twenty-seven, Christmas, 1859, a patient under the care of Mr. Webber, Connaught Square, had lateral curvature in the dorsal region towards the right side, with lateral curvature towards the opposite side in the lumbar region. The right scapula projected much posteriorly, whilst the left one was depressed. She was suffering greatly from pains in the head, indigestion, and general debility. She had consulted the late Dr. Todd, who had advised her to give up her profession (that of a governess in a nobleman's family) and to rest on account of the curvature in the spine. This she was very reluctant to do, as may naturally be supposed, and adopted the suggestion of Mr. Webber, to wear a properly adapted support. After due consideration of the circumstances of her case, Mr. Webber recommended the form of support invented by Mr. Pratt, of Oxford Street, and with the following results:—

After a course of medicine the patient returned to her duties at the close of the vacation, and continued to fulfil them with manifest advantage from the use of the support, aided by general treatment under Mr. Webber's direction; and at the mid-summer vacation the curvature was considerably improved, and her health was visibly benefited; and to use her own words, "She did not feel anything particularly the matter with her, except that she could not practise her music for so long a time as

she had been formerly in the habit of doing;" a fact which I think will be duly estimated, when it is stated that she had been accustomed often to practise for eight hours a day.

At the close of the midsummer vacation she returned to her duties in renewed health and spirits, and continued to gain ground up to Christmas, 1860, when she again came to London to spend her vacation, and declared herself quite well, nor could any trace of the lateral curvature be seen.

Miss G——, aged fifty, had been suffering from disease of the spine at the age of twenty-two, when she lost the use of her lower extremities for three years, then slowly recovered, having recourse to the aid of crutches. Shortly after regaining the use of her legs and feet, the head became affected to such an extent, that continued applications of blisters and leeches were necessary to afford temporary relief. Several eminent physicians were consulted, and prescribed for her; but no permanent relief was obtained. In 1855, loss of blood, by cupping, was ordered, from which she derived benefit for a few months, it was then repeated, and continued with more or less frequency, according to the attacks, till 1856, when spasmodic paralysis of the left arm first evinced itself, which gradually increased to such an extent, that a support for the arm became requisite, to prevent her being forced down on the left side towards the ground; for this purpose, a sling with rest was used, supported from the shoulders and body of the dress, so as to give the least possible

pressure upon the cervical vertebræ. Still the spasms increased, and the arm was drawn forcibly against the side, producing pain and difficulty of breathing. An india-rubber air-cushion was then placed between the arm and side, with some relief, but no permanent benefit. In October, 1858, the head began to incline to the right side; difficulty of swallowing, intense pain in the head, loss of sight in the left eye, with occasional deafness followed; and the shifting of the left arm in the slightest degree produced a violent spasm—the left arm rigid, and pressing upon the region of the heart—not relieved until restored to its usual position, which required some force. About this time, Dr. Walshe was consulted, the attacks having increased in violence, the patient losing all consciousness, and continuing in this state for an hour, sometimes longer, before she could be restored to a state of sensibility, and then only by the abstraction of small quantities of blood from the temple or behind the ear by cupping, which operation was performed by Mr. Betts, of Wimpole Street, who also, by the desire of her physician, tried the effects of galvanism and Pulvermacher's chains, with little or no benefit. Such was her hopeless condition, that another consultation was held, and upon examination of the spine, a slight lateral curvature in the cervical region was apparent, also an excessive posterior curve, commencing at the fifth cervical, down to the third or fourth dorsal vertebra. It was then suggested that some mechanical support might be of benefit, or at all events render her as comfort-

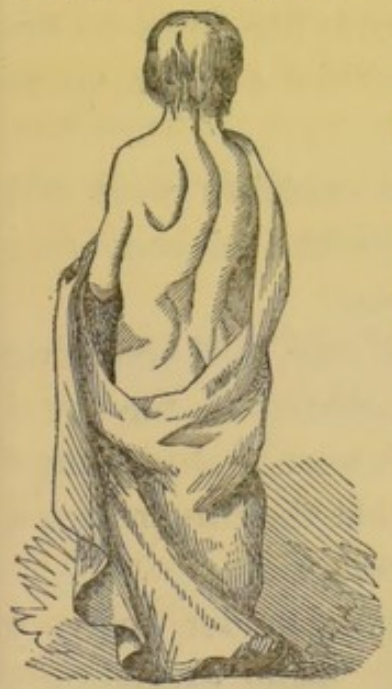
able as possible. A spinal instrument, invented and made by Mr. Pratt of Oxford Street, was applied, with the arm-rest attached to the left horn, thereby taking the downward pressure off the neck. An instrument was likewise constructed to wear in bed, as the spasms continued in the recumbent position. During the adjustment of the instrument, Miss G—— had three serious attacks, induced by the necessity of altering the position of the arm.

From the first application of the spinal support, great benefit was experienced, the arm being less rigid; but continuing powerless and insensible, it was proposed that Faradization should be tried, Mr. Betts being directed to apply it to the spine, dorsal muscles, arm, and hand; this was persevered in, and in the course of three months, a general improvement was observed; the spasm and drawing down of the left arm gradually subsided, and she was able to use her arm and hand, to work with, supported in the rest. At the end of nine months, she abandoned the use of the arm-rest, and allowed the arm to drop naturally by the side, the head became more erect, the muscles of the back, neck, and arm were considerably increased in size and firmness. It should here be observed that the head symptoms continued very obstinate, the tongue being very slowly removed from its fixed position, towards the left side of the mouth; that being relieved, swallowing became less difficult, and an improved state of health followed. In the course of Faradization being applied to the eye, one of the first

symptoms of restoration of sight was the patient perceiving a spark of light in a dark chamber, which continued to increase in size till sight was restored.

At the end of fifteen months from the first use of the spinal support, she has no serious attack of pains in the head as before; the quantity of blood taken by cupping reduced to one-half, with every hope of its not being required.

The lady has thrown aside the first instrument, at the present time wears one of a very light form as part of her dress, is able to perform all the duties of the toilet, and transact all the routine duties of every-day life with improved health and cheerfulness. October 20th, 1860.

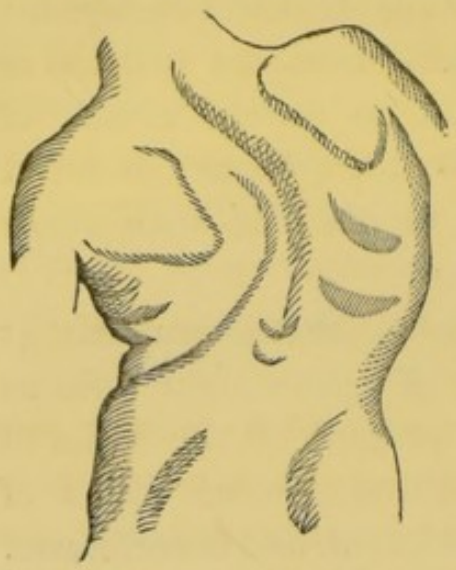


Sarah Ward, aged nine, admitted into the Middlesex Hospital, 23rd November, 1838, with lateral curvature of the spine, with weakness of the legs and knees, bending inwards. She was placed upon a generous plan of treatment and an instrument ordered to support the spine, arms, head, and whole body, throwing the weight upon the ground.*

She was discharged from the Hospital, 13th May, 1840, when the spine was perfectly straight and her general health much improved.

* See Tuson on the Spine, page 125.

Case of Excessive Lateral Curvature, with considerable displacement of the Lungs.



The accompanying plate is from a cast taken in June, 1860. Master C——, aged six years, residing in Yarcombe, near Chard, Somersetshire, a patient of Mr. Waters. He had been suffering for nearly three years with lateral curvature, arising, it is supposed, from a fall when very young. He was recommended in the early stage of his complaint to be kept lying down on his back; certain exercises were devised for him, such as swinging, pulling a rope, &c.

It is very possible that these exercises were not carried out systematically, as instead of benefiting by them, he became rapidly worse.

His health had begun to give way, his breathing was very irregular and painful, owing to the great displacement of the lungs, which were pushed almost completely to the right side, so that the ribs projected very extensively posteriorly on one side.

It may be noticed that the left shoulder was very much fallen, the ribs on that side being exceedingly compressed, and flattened from before, backwards.

On placing the hands underneath the Axillæ, and bringing the body into a more natural position, the breathing was very much relieved, and he walked more steadily.

It was decided to have a spinal support made for him to wear, which was constructed upon a principle suitable to his case, so arranged, that the pressure upon the right scapula and ribs could be modified or increased.

The following letter, written in August, just two months after wearing the support, will shew the great advantage derived.

"Yarcombe, August 1st, 1860.

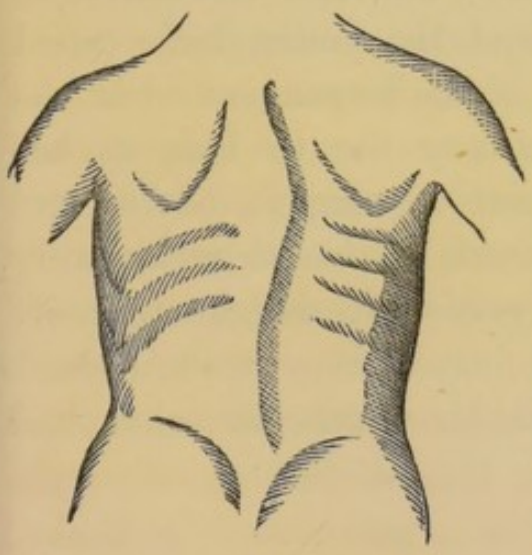
"Dear Sir,

I am happy in being able to inform you that there is already an improvement in my poor little boy's figure: the chest is expanded and the shoulders fall more naturally; his health is excellent, seems to breathe with more freedom, and is getting quite stout. I know you will be glad to hear he can wear the support comfortably all day long. He desires his love to Mr. Pratt.

I remain, Sir, yours respectfully,

E—— C——"

From a Cast taken July, 1861.



In December, 1860, he was again brought to London, and the improvement was certainly very marked; his health was excellent, breathing regular. He had grown nearly two inches, and was gaining flesh considerably, walked with firmness, and when

dressed, the deformity could scarcely be perceived. Had the child been in London to have undergone extension and exercises, I feel certain that the spine might have been brought to assume its proper form, and become perfectly straight.

Miss B——, aged twelve, 1856, a patient under the care of Doctor Thorn, of the Harrow Road, came under treatment for a severe attack of Chorea Sancti Viti, (St. Vitus's Dance), which resisted the usual remedies.

It was found, on examination being made, that there was considerable lateral curvature of the spine towards the left side.

A support was constructed for her by Mr. Pratt, under the direction of Dr. Thorn, from which the patient derived very great benefit. Soon after commencing to wear the support, the spasmodic affection yielded to the remedies employed, and the young lady was sent into the country. Nearly five years elapsed without either seeing or hearing anything of the case, as her friends had left London. In June, 1861, the mother of the young lady called upon Mr. Pratt to know if the instrument which he had made would be of any use to him, as her daughter had discontinued wearing it, having got quite straight; had enjoyed her health remarkably well ever since. Afterwards the daughter herself came in, and expressed herself very grateful both towards Dr. Thorn and Mr. Pratt for what had been done for her relief.

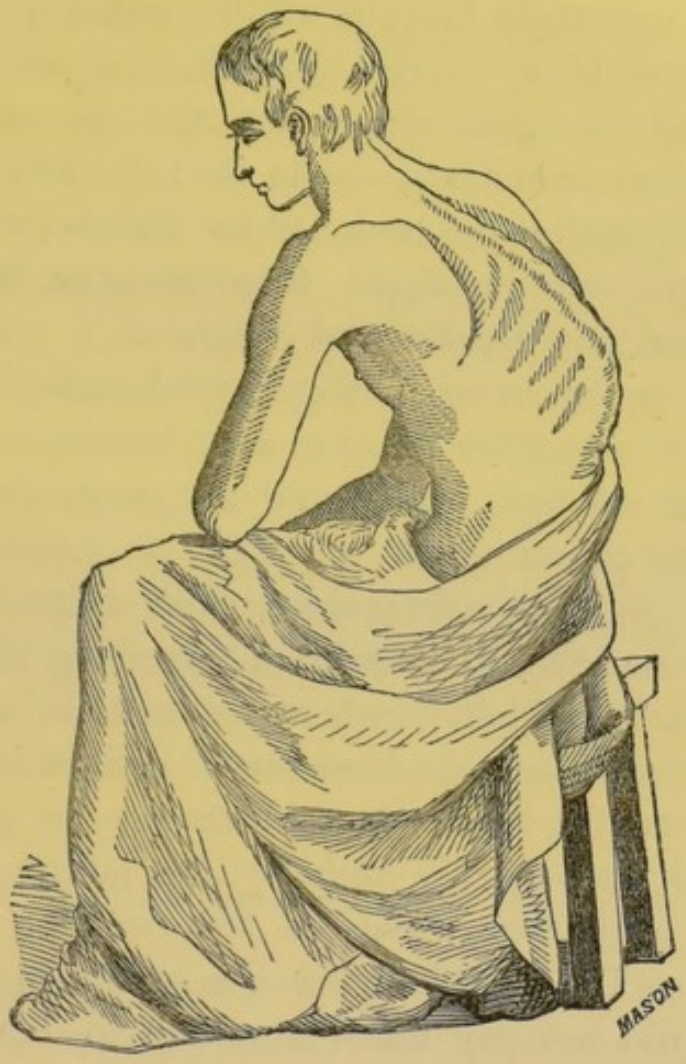
Posterior Curvature of the Spine.

The spinal column may become curved in a direction backwards; and this may occur to the whole extent of the vertebral column, when the spine becomes generally arched, forming a convexity posteriorly, the most projecting portion being the centre; or it may exist at one point only, and this be either at the cervical, dorsal, or lumbar vertebræ. The former curve results from a softened state of the vertebal column generally, and the latter from caries of the body of one or more vertebræ. The latter is by far the most serious of the two, as it is frequently attended with paralysis and other serious consequences. We will distinguish the one as posterior curvature, and the other as angular curvature of the spine, and consider them separately.

Posterior curvature, or excurvation of the spine, is very gradual in its progress after it has made its appearance; and continues its insidious growth almost imperceptibly, until it has assumed a projection, which either calls the parents' attention to it, or the attention of their friends. It is generally unattended by pain or other unpleasant symptoms, which characterizes it from angular curvature; as in that malady there is invariably pain to a greater or less extent, it being the termination of inflammatory action.

Excurvation of the spine having once commenced, and the recti-abdominal muscles having lost their resisting power, they gradually contract, thus bring-

ing the pubes and sternum nearer than they naturally should be towards each other; and the more the curve advances the nearer the pubes approach the sternum. Here, then, we see the secondary cause of the curve, the primary being the softened state of the vertebræ, and the secondary, the contraction of the recti-abdominal muscles increasing the curvature; and forming a resisting force to the bones assuming their normal position, so as to restore symmetry to the trunk. In the treatment of these cases, several of which came under my care during my hospital practice, a shield was formed to correspond to the curve, which shield was, of course, concave, corresponding with the convexity of the curvature of the vertebral column. In the concavity of the shield pads of lint were gradually placed, which, of course, tended to press on the convexity of the vertebræ; and the shield was then bound round the trunk, with a firm support or splint over the recti-abdominal muscles. By these means the curve gradually yielded, as the shield was only removed to be re-applied, with an increase of texture to fill up the hollow, so that in time it was almost straight. Mechanical appliances would, of course, be better adapted to these cases; but in our hospital practice we were unable to have recourse to such aid on account of the expense; with private patients a better plan can be employed.



William Skevens, age seventeen, a tailor by trade, admitted into the Middlesex Hospital, November 12th, 1839, with posterior curvature of the spine. When about nine years of age, he felt pain in his back, particularly after carrying any weight, but there was no projection of the spine. About twelve months before his admission into the hospital, the back began to grow out, gradually increasing, and the pains, which were slight at first, also increased. When he attempted to draw up the back to the erect position, the pains became very

violent, and made him (to use his own expression) "puff and blow." He had felt weakness in his arms and legs, but never lost the use of them. Two splints were made, one in the front and one at the back; that at the back had the hollow gradually filled up, and in about three months he was discharged from the hospital cured.

Posterior curvature of the cervical vertebræ may occur without either the dorsal or lumbar vertebræ becoming affected; and such a case may result from accidental causes.

Mr. C——, from Shropshire, came up to London in the year 1845, to consult me respecting the state of his head, which was bent forward, so that his chin rested against the breast-bone. He stated that, twelve months before, he had received a blow on the back part of his neck by the falling of the branch of a tree while he was walking in his orchard. The blow had caused a little pain at first, but he did not pay much attention to it; but he found that by degrees his head bent forward, and a swelling arose at the back part of the neck, which gradually increased both in size and tenderness. He was fifty-five years of age, and was only free from pain to a certain extent, when in a recumbent position, but could not bear the back of the neck to press against the bed; he had difficulty in getting up, and was obliged to elevate himself by the help of a cord. Upon examining the back of the neck, I found considerable tumefaction and great tenderness; so much so that he could not bear the pressure

of the finger. There was evidently chronic inflammatory action going on in the cervical vertebræ, and all the surrounding tissues. His tongue was furred, and his pulse in an irritable condition. His appetite was good, and he slept well after getting in a tolerably comfortable position. I prescribed an alterative course of treatment, with the local application of extract of lead, in a pure state (which I had used frequently before in other cases), to be painted over the whole of the swelling, to allay the inflammation, pain, and tumefaction. In the course of a fortnight, I found the swelling very considerably diminished, and the pain had much subsided; and in about a month he returned back into the country considerably relieved.

Angular Curvature of the Spine.

Angular projection of the spine, at its earliest progress, commences by an inflammatory action in the cancellated structure of the bodies of the vertebræ, inter-vertebral substances, or membrane connecting the inter-vertebral substances to the vertebræ themselves. It may or may not be attended with rigors or shivering fits. The inflammatory attack may be the result of accident, cold, or be constitutional, independent of either accident or cold. The patient feels a deep-seated pain at a particular part of the back, becomes restless with heat of skin and general febrile symptoms. The case seldom falls under the care of the surgeon at

this primary stage, it is only after the lapse of some months, generally speaking, that surgical aid is considered necessary and is called for. This is stated from my personal experience. When the angular projection has made its appearance, then the case is brought under surgical notice. At this period caries has commenced, and the body or bodies of one or more vertebræ are destroyed by ulceration—I mean a portion of the bodies of the vertebræ. In examining a patient's back with angular curvature, there can be no mistake as to the nature of the case. On feeling it it is just like the knuckles of the hand, with one thick knob or more forming the angle. The caries, it has been stated, may be the result of accident, cold, or be idiopathic, dependent upon constitutional causes. It may be produced by a knock or blow on the part, a fall from a horse, or any external violence; the exposure to cold, sleeping in damp sheets or a damp bed; or it may arise from constitutional idiosyncrasy, such as scrofula, or be the result of secondary symptoms in the system, or of cancer. Caries is ulceration of the bone, which consists of gradual absorption of its structure, producing an ulcerated condition; and nature, which is ever kind and careful to protect and preserve the vital parts of the frame; causes a thickened state of the membrane in front and around the diseased structure; so that any collection of pus may not come in contact with the surrounding tissues, such as the large vessels, if the mischief should be in the dorsal or lumbar vertebræ. This surrounding tex-

ture has the appearance of the thickened wall of a large abscess. Sometimes the matter or pus may become insinuated into the canal for the spinal marrow, which will produce epilepsy and a fatal termination. One case of this kind is given in my work on the spine, of a patient under the care of the late Dr. Harrison, and when he was making pressure the adhesion of the caries broke down, and the pus pressed against the spinal marrow high up in the neck, causing immediate death.

The cure of Caries of the Spine can only be accomplished by the diseased bones becoming in a state of anchylosis after the ulcerated condition has healed, when fresh bone becomes deposited, and where the bodies of the vertebræ become firmly united together by fresh ossific matter; the firmer the connection, the more safe the cure, and the less chance of the result of any mischief appearing afterwards. Syphilis may be the cause of caries. A late colleague of mine, at the School of Medicine, Little Windmill Street, wounded his finger, and was afterwards called to attend a midwifery case, the mother having syphilis at the time. Some years afterwards he had violent pain in his back, which terminated in caries, and thus ended his existence after a few years of suffering.

The wound in the finger was very troublesome, and remained in an ulcerated state for several months, but at last it was completely healed, and remained so, but the syphilitic virus having been absorbed into the system, produced the caries of the spine.

Case.—A lady, aged thirty-three, the mother of a family, sent for me at Walton-on-Thames, in the year 1841, with angular projection of the spine.

Upon examining the back, I found one of the spinous processes considerably projecting (the seventh dorsal vertebra), and one or two of the vertebræ above and below protruding posteriorly. She stated, that about seven or eight years before, she had slept in a damp bed, and afterwards had violent pain in the back, with an attack of fever; leeches and warm fomentations had been applied, with medicinal treatment internally, but the pain gradually got worse, until she lost the use of both her legs, and had no power over them for the last seven years. She had to be lifted in and out of bed. She had procured the work I had written, and sent to have my opinion.

I found the spine yielded to the weight placed upon it in a sitting position, and also when she was held up. Under such circumstances, I recommended a shield to be formed of gutta-percha, which I placed on, and which she found gave her support so as to enable her to sit up in her bed. She removed to town, and pursued a regular plan which I had found successful on several occasions in cases under my care at the hospital. I employed gradual extension by means of the couch; she had the shield to wear afterwards, constantly, and I prescribed medicinal treatment. Her appearance indicated a scrofulous temperament. I ordered the Iodide of Potassium and Infusion of Bark up to a certain

period, when it was substituted by the Bromide of Potassium, which was continued until a perfect cure was effected, which took place in about ten months after she had regularly commenced the treatment. She was able to walk quite well, finding no ill effects afterwards. Having lost her husband, she married again, and consulted me in the year 1854, thirteen years afterwards, when she informed me that she had been quite well ever since, never suffered any pain or inconvenience in her back; but as I had cured her in the year 1841, she had come from abroad to place herself under my care. I removed some small tumours from the cartilage of the seventh rib, having no connection with her former complaint whatever, and she quite recovered a second time.

Observations.—In Hospital practice, I remarked that the Iodide of Potassium acted as an absorbent to a certain extent, when it failed to produce any further absorption, but if, at this time the Bromide of Potassium was substituted and persevered in, absorption continued, and this generally until the cure was completed. These observations had been tested by several successful cases, and the plan has been followed in other cases with equally beneficial results. In this case the spinal column was, no doubt, in a state of caries, which produced pressure against the spinal marrow. The extension tended to restore the spinal column to a more normal position. The shield prevented the parts changing their situation; and the preparations of iodine produced absorption of all the thickened texture, and thus removed the pressure

against the spinal marrow, and restored the use and sensation of the parts that had been paralysed.

The efficacy of the bromide of potassium has been doubted by many, but this and other cases which could be brought forward, clearly prove the beneficial effect of this pharmaceutical agent, and I am able to speak very favourably of this preparation.

Dinah Sarah Ovens, aged eleven years, admitted into the Middlesex Hospital, under my care, 5th March, 1839, with very considerable angular projection of the lower part of the dorsal vertebræ. She complained of great pain in the back and sides, with loss of appetite. It appeared that in the winter of 1833 she fell down stairs, injuring her elbow; three months after that, she complained of great pain in her back, and on her mother looking at it, she found a projection about the size of her knuckle. She was then admitted into the hospital under Mr. Mayo; she was cupped, blistered, and issues were made. After being in the hospital six weeks, she was so much relieved that she went into the country. The projection continued to

increase gradually, until it assumed its present appearance, the pain being very severe.

She was now placed in the recumbent position, with warm plasters to the back, generous diet, with the internal administration of iodine; but not finding sufficient relief from the pain, two issues were applied, near the projection, in the beginning of April, which discharged very freely, and the pain in the back subsided gradually, her appetite returned, and her general health was very considerably improved, so as to enable her to leave the hospital.

This case points out the impossibility of improving the figure in cases of caries, after the bones have become united, and the marked beneficial results of issues in relieving the pain. Issues cause abundant discharge of pus, so as to establish the most effectual and quickest mode of relieving the loaded state of the vessels of the diseased part; preventing the collection of matter internally, so that nature may be able to restore the strength of the spine, and to produce anchylosis. Marked and permanent benefit has resulted in many cases by counter-irritation, and the most effectual method of establishing this is by the application of issues; they are the safest and best mode of producing this result.

Harriet Cox, aged 18, admitted into the Middlesex Hospital, under my care, 18th March, 1840. Her statement was, that she observed a lump growing on the right side of her neck about a year before. She consulted a medical man, who ordered a seton to be applied, and an issue to be made near it. Under this treatment she gradually improved. She was afterwards attacked with rheumatic fever. The neck was curved to such an extent on the left side that the cheek almost touched the shoulder, and any attempt to raise it from that position caused her the most excruciating agony. Issues were made at the nape of the neck, and she was kept in the recumbent position with a paste-board collar, and under this treatment she gradually recovered.

Master G——, aged seven years, in 1858. This young gentleman was a patient of Mr. Waters, and had frequently complained of pains in his right leg, which became so continuous as to keep him awake night after night, and alarmed his parents very much. He was of a strumous disposition, and suffered much from abscesses in various parts of the body; and had always been remarked as carrying

his chest "so forward." On examining him, he was found to have a projection, or angular curvature of the lumbar vertebræ, with anterior curve of the dorsal, instead of the usual slight curve backwards, found generally in that region at his age. His chest stood very forward, and the sternum nearly touched the chin, and his breast looked like the bosom of a pouter pigeon, with the head nestled in it, and thrown well back.

A spinal support was ordered to be made for him, and the same principle was adopted as in the other cases; only that the back of the instrument was bifurcated, to allow of the projection of the lumbar vertebræ through the opening thus made, and it was protected by a water cushion from coming in contact with any hard substance. There was great tenderness about the angular projection, which the support and the water-cushion soon removed, and after six months he was able to dispense with the latter.

He continued to improve rapidly, and we lost sight of him for some time, when, about twelve months after first having the support made, he began again to complain of the pains in his leg having returned, though they had disappeared immediately after he had begun to wear the instrument; on lengthening it, in a day or two there was no longer any complaint of pain.

The improvement in this boy's figure after two years is something remarkable. The chest has fallen

naturally, the dorsal curve is well marked, the angular projection is lessened, whilst there remains no trace of tenderness on percussion, along the whole course of the spine, his health has been excellent, he has had no return of the abscesses, and is gaining flesh fast.

Incurvature of the Spine.

The spinal column may become incurvated, or curved anteriorly, so as to occasion a great hollow in the lumbar region, and consequently a protuberance of the abdomen. The attention of the parent may only be directed to the increased size in the abdomen; whereas, the mischief is owing to the curve of the spine, which has grown forward. In such cases, which, fortunately are not very common, the legs are small and attenuated, the muscles waste away, are soft and flabby, and the child has little or no power to support the weight of the body, owing, no doubt, to the pressure on the nerves, as they make their exit from the inter-vertebral foramina.

No cases of curvature of the spine indicate so much the want of power in the patients to support themselves as these; and they are not only distressing to the parents, but also to those who behold them.

The accompanying sketch was taken from a patient under my care at the Middlesex Hospital, who was not allowed by the mother to remain under the treatment recommended. Of course, there are cases of this kind of curvature, where the deformity has not progressed to such an extent, and where the cure, and the removal of the deranged state of the spinal column, would not require so much time to remedy. The means recommended to relieve such cases, consist of mechanical appliances, which employ pressure, extension, and support, in such manner as to occasion no incon-

venience; combined with remedies that tend to give tone and strength to the system generally. The patient should gradually be allowed to use the legs, so as to strengthen the muscles, and when they can support the weight of the body, a few steps forward may be taken, while the child is supported on either side, by the hands of an attendant. In this way, walking exercise may be used until the patient can walk alone. Care should then be taken, that fatigue be not produced, or otherwise the progress of the case will be retarded.

The patients with this species of curvature are generally weak and delicate, and medicinal means are of much benefit in restoring the constitutional powers; friction to the hips, knees, and ancles will be productive of much advantage, and the muscles may be considerably strengthened by friction and shampooing. No cases acquire more strength than these, after the pressure has been taken away from the nerves by mechanical means; but no advantage can be expected so long as the nerves have not power to endow the muscles and other parts with their necessary energy. The next cases will illustrate some of those observations which I have made in several parts of this work, for which I am indebted to Mr. Pratt, of Oxford Street, who has kindly rendered me his assistance on this occasion.

The following case shows how the lower extremity may be affected by spinal debility, and its effects relieved by artificial support.

Miss C—— came to me in September, 1859, aged fourteen in the following October. She had been recommended to have a high-heel boot, on account of a supposed contraction in her leg, having for seven years, walked on the toes of her left foot. At first it was occasionally noticed, and she had been constantly scolded on account of it, as it was getting rapidly worse, and the poor child seemed quite dispirited; her countenance was exceedingly pallid and anxious, she could not bear the thought of being a cripple for life, with a clog attached to her foot. On examining her foot and leg, no apparent contraction could be discovered, and I was assured there was not, nor ever had been, any hip-joint disease, nor did there appear any signs of it. Enquiry was made accordingly who her surgeon was, (Mr. Thane, Canonbury,) and he was asked if he would kindly examine her spine; and I met him for that purpose, and demonstrated that, by putting my hands under the axilla, and supporting her when she walked, she could put both toe and heel on the ground. It was accordingly agreed that a support should be made to relieve the spinal column of the weight of the head and shoulders, which was done, and from first putting on the instrument, she walked in a perfectly natural way.

It should be remarked, there was in this case an excessive incurvation anteriorly of the lumbar vertebræ.

On her coming to have the instrument repaired in the following March, just six months after; she had

lost the anxious countenance, got quite a colour in her cheeks, grown stout, had lost her head-ache, and was quite one and a half inch taller. Her mother expressed her great delight at the change, and said exultingly, "My daughter wears out the heel of her boot now." Six months later, she was able to leave off the instrument.

Case of incontinence of urine, or paralysis of the urinary organs, cured by mechanical support and constitutional treatment.

Master M——, age fifteen, Nov. 10, 1860, a patient of Mr. Newberry, of Liverpool Road, Islington.

This patient had been suffering from the age of two years with involuntary discharge of urine, having scarcely any power to prevent it from running away continuously. He could, however, during the day, just manage to retain his water, unless suffering from any excitement or hurry, when he found himself unable to do so. At night the urine became exceedingly difficult to retain, and though all manner of expedients had been tried, he usually wetted the bed five or six times a week.

Previous to his consulting Mr. Newberry he had been frequently under medical treatment, with but very partial benefit.

On examination of the spine there was found an excessive incurvation of the lumbar vertebræ. On percussion there was great tenderness at the sixth cervical, first, second, third dorsal, and fifth lumbar vertebræ. On pressing the third dorsal vertebra it

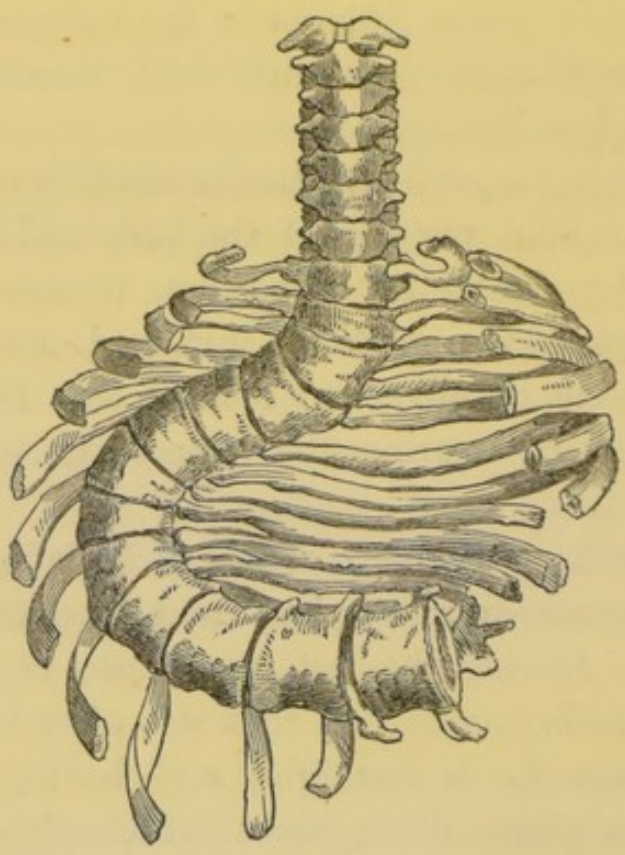
seemed to give way, and produced great twitching of the whole of the upper extremities. There was also great pain on pressing the fifth lumbar vertebra and sacrum, and a similar twitching in the lower extremities. The countenance was pallid, and anxious, heavy brows, great want of contractility of the iris on being brought to the light, a stooping of the head forward, a little deaf, muscles of the arms and legs flabby.

He had lost a good situation in the City on account of the frequent wetting of the bed, and was very anxious for something to be done to cure him. A spinal support was made for him, and after the first week a great improvement took place. During the third week of wearing the support he wetted the bed only twice.

He was then put on a course of Belladonna, after Dr. Brown-Séquard's plan, and improved very rapidly. During the last six months he has only wetted the bed once, and that was after leaving off the support for a fortnight, and having taken a strong purgative dose; since which time he has continued to wear the support, and has not had a relapse. His health has improved very much; lost the heaviness about the brows; the pupils contract readily on being subjected to a strong light; has lost the head-ache which frequently troubled him, and has become quite stout and hearty.

Complicated Curvature of the Spine.

Complicated Curvature of the Spine generally commences in a lateral direction, and then proceeds in a position between posterior and lateral.



The annexed plate will in a measure explain this species of deformity, although the position of the ribs cannot be very clearly understood without seeing and examining their relation to the vertebræ; but in the preparation from which this drawing was taken, there was no disease of the bones themselves; they were only in a softened state. After lateral curvature has been formed, the complicated takes a direction obliquely backwards, so the ribs are

propelled behind the spine. Thus at first, without making a very careful examination, it might be looked upon as a case of caries of the bodies of the vertebræ; whereas, by close observation, the situation of the ribs may be detected, and a better knowledge of the anatomical derangement ascertained, by finding that the curvature was first formed in a lateral direction.

The treatment of this species of complication will be the same as in the more advanced stage of lateral curvature. Everything will depend upon the capability of producing an improvement by ascertaining what can be gained by gradual and moderate extension. The extent of the curvature clearly proves the state in which the spine must have been to have caused so much variation. Should extension produce little or no diminution in the curve, it will prove that the bones have become fully formed and ossified; so that no violent means must be employed, to destroy what nature has accomplished to render the strength of the part as solid as possible.

All that has been said with regard to the treatment of lateral is applicable to complicated curvature of the spine.

The following case shows the value of artificial mechanical support after the patient had been eleven years confined to his bed, and unable even to sit up.

The letter was written in answer to a request that the patient would state his own case, and is exceedingly interesting and instructive.

"M——n, Derbyshire, October 4th, 1860.

"DEAR SIR,

I did not receive your letter till this afternoon, as it had been mis-sent.

"In reply to your request, please tell Dr. Hawksley, that it was in June, 1848, that I *permanently* laid in bed under the advice of my cousin, a surgeon, now dead. At that time, Dr. J—— L——, of A——, was attending me. I had for some months previously been weakly, and Dr. L—— supposed I should have gone off in a consumption.

"Whilst in this weak state I had a fall, by sitting down, believing there was a chair behind me; this partly paralysed my legs that night, but the feeling went off. However, from that time I gradually lost the use of them, and the curvature towards the left side commenced, for which I was advised to lie on my back. I suffered considerable pain down the spine; but more and sharper in my legs, which wasted away to skeletons. To relieve this pain, I took, by the advice of Dr. J—— L——, acetate of morphia; at first fifteen drops a day, but the dose rapidly increased to three table-spoonfuls. At last, feeling conscious that this must be injuring my constitution, I determined to abandon it, and by rapidly diminishing the dose, did so in about three months.

"During the greater portion of the time that I was in bed, there was an ulcer discharging much matter on the left side, at the bottom of the spine; this has left a scar. I was reduced to extreme

weakness, hardly being able to lift my books; my left hand was very weak, but never quite powerless; and my intellect, so far from being dulled, only seemed to gain vigor and brightness from the decay of my bodily powers. As a proof of this, I may state, that I determined to educate myself, and took as my model the celebrated Sir William Jones. I learnt, more or less, ten languages, including Latin, Greek, and Persian. I read largely in history, also of other literature. I learned the art of composition.

"Such was my state when H—— C—— O——, Esq., (the squire of the adjoining village) first saw me, in 1858, and with his generous impulse, determined at once that something should be done to raise me from my bed of imprisonment. As you know, he never ceased till this was accomplished. Dr. Hawksley knows the state I was in when he first saw me, and can detail it better than I myself. (See note at end of letter.)

"From the time that I first put on the instrument that you made, I have gained strength. By a determination to bear pain, if benefit could be derived from it, I used to screw up the hands to put me straighter; this has been partly accomplished, so that the irons have had to be altered; the back support has been lengthened at different times four or five inches, and bent inwards nearly as much, when the alterations of shape required it. They sit comparatively easy, only feeling a little stiff. I can *sit all day*, *write*, or *walk a short distance*, with crutches two or three miles.

"I have been working as a police reporter and correspondent of the press for the last eight months. In the operation of the instrument, considerable pain is felt (from screwing) on the right side of the spine; but vapour baths, which I have lately used, remove this, and have given more power of motion to the large sinews of the left side of the spine. I hope soon to be in London; in that case I shall be glad to see you and Dr. Hawksley, to whom I feel much gratitude for so ably seconding the views of H—— C—— O——, Esq.

"You cannot tell how I long for a complete restoration to health and strength, that I may be of use to myself and others.

I am, yours obediently,

"Mr. J. Pratt, F—— F——

420, Oxford Street, London."

Note.—When Dr. Hawksley, of George Street, Hanover Square, first mentioned the case to me, he begged of me to try and construct some instrument for a young man about twenty-one years of age, who had been eleven years on his bed, and quite unable to bear the journey to London. The Doctor having been on a visit to the squire mentioned in the letter, had been asked to see the poor young man, who was the son of a deceased clergyman, and for whom great sympathy was felt in the neighbourhood. He accordingly promised that on his return he would see me and ascertain whether anything could be done. I undertook the task, and though I have not yet seen the patient, the above shews with what success, and no doubt could I have seen him from time to time, and altered the instrument, I might have saved a great deal of the pain mentioned.

J. F. P——

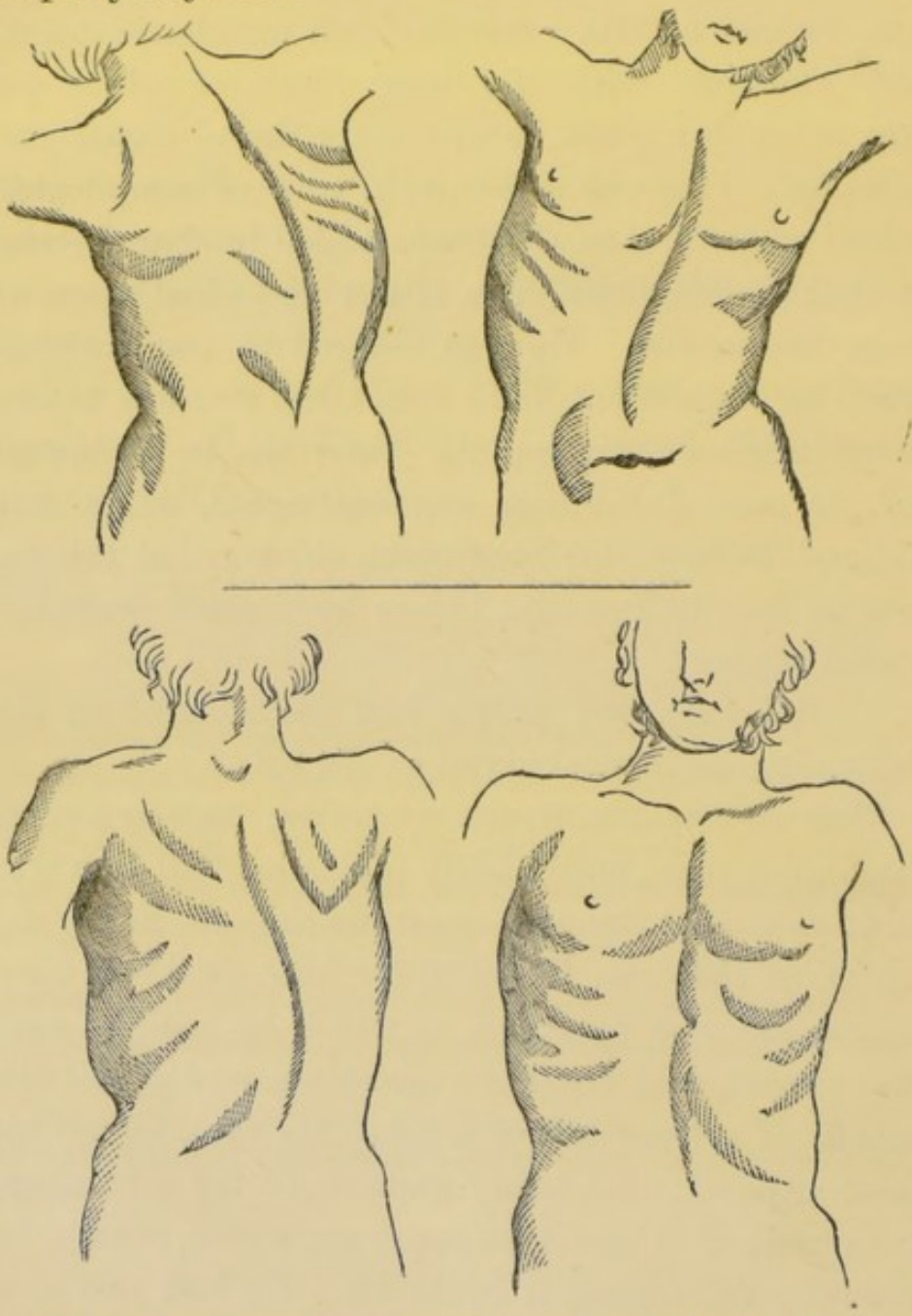
I have, since the foregoing was written, had an opportunity of seeing this patient, and examining the state of the chest, which was very much con-

tracted. The legs were much attenuated, but the back was much improved, which I could detect, by comparing it with a cast that had been taken before the instrument was made. I recommended him to use certain exercises with an elastic band, also exercises with the legs; both of which he was to employ when he was in the dorsal recumbent position. This was evidently a case of complicated spinal curvature, to which was added lumbar abscess, so that his condition now might be looked upon as most favourable. He was obliged to use crutches when he walked far, and I found that one was nearly three inches shorter than the other; this he accounted for, as one of his legs was contracted, so he was obliged to have one boot much thicker, but the leg was an inch longer than before he began to wear the spinal support.

In this case, the pelvis had participated in the deformity, as it was curved to one side.

This case is one of much interest; he was a most intelligent man, and readily understood all that was told him, and he was most willing to follow up anything that was likely to do him good. A new instrument was proposed, to which he readily gave his consent, and tried the exercises, and found the benefit of a few trials of them. He said, he felt his chest expand; and easily understood the advantage to himself, if it could be more expanded, which, he was fully convinced, it could be. He had just seen Dr. Hawksley, who had sent him on to Mr. Pratt, where I found him, when I called in Oxford Street.

Since the last report, his crutches have been substituted by two sticks, which he readily walks with, but this was only after the new instrument was properly adjusted.



This plate represents a front, and back view of the state of this patient, both before, and after

treatment at the end of two years, when he came to London.

From a letter received in the month of February, 1861, he states that he had increased five inches round the hips, can walk now without sticks, or by using one occasionally, and concludes, "I am straighter, have more strength in the back, with greater muscularity," and amuses himself with digging in the garden.

Deformity of the Chest.

The chest may become deformed either in consequence of curvature of the spine, or it may exist without the spine being in the least affected.

A person may be pigeon-breasted, that is to say, the sternum protrude and the sides of the chest become flattened; or the ribs be flattened on the one side and the other be in a normal condition; or the chest may assume various forms arising from a person keeping certain positions.

At first, deformity of the chest may produce no inconvenience; but in time, it will frequently cause very unpleasant and disagreeable effects—difficulty in breathing, irregular circulation, faintness, loss of appetite, dyspepsia, nervous irritability, &c., all which will terminate when the chest is restored to its normal condition, and this can be accomplished by exercises and mechanical appliances.

Several years since, a gentleman engaged in the bank of England consulted me. He felt most ex-

cruciating pain at the pit of his stomach, and this was very considerably increased after every meal. I examined his chest, and found the Ensiform cartilage very much depressed, owing to the position in which he usually sat at his desk. A common walking-stick was placed under both the arm-pits, behind the back; this tended to expand the chest and elevate the ribs. Whilst in that position he felt no pain, and by following up the plan of treatment, was completely cured in the course of three months.

Complaints of the lungs may be very considerably reduced by attention to position; such as expands the ribs, elevates the shoulders, and dilates the cavity of the thorax. Many patients may be rendered much more comfortable by a little attention and care as to position, and what at first appears very trifling, may prove to be most highly advantageous by perseverance. Very many cases might be brought forward to prove the accuracy of these observations. In many of the cases under consideration, expansion of the chest will be most serviceable. The calisthenic and gymnastic exercises, swinging with the hands by a hand-swing, will tend very considerably to enlarge the cavity of the chest, and benefit the health and strength of the frame.

Miss C——, aged thirty, March, 1860.

This lady, a patient of Mr. Thane, of Springfield House, Canonbury, had been suffering for nearly four years from extreme debility, and had been quite despaired of, and pronounced consumptive,

by several medical men, who had seen her in the country. She was unable to walk up stairs without assistance, there was great difficulty of breathing, great contraction of the chest, nightly perspirations, and gradual wasting away of muscular fibre, quite unable to sit upright. Her usual position was sitting in an easy chair, and stooping forwards; there was a slight cough, yet, on examination, no positive disease of the lungs could be discovered; but a slight lateral curvature of the spine in the dorsal region, and considerable tenderness on percussion, in the lumbar, at which spot the patient complained of feeling considerable pain at various times. After some considerable opposition on the part of friends had been overcome, a spinal support was made for her by Mr. Pratt, and after wearing it for some time, she said, "she was quite sure she should find benefit from it." She was not allowed to wear the support more than two hours a day for the first week, as it was feared from her then weakened condition, that the weight (light as it was) would be too much fatigue. After about a week, she persisted in wearing it nearly all day, and continued to do so till she went in the country. On Mr. Thane calling to see how she was getting on about four months afterwards, he heard from an aunt who lived at the house, that his patient was in the country, much improved in health, enjoying herself, "and," added the aunt, "she can run up stairs now, and walks two or three miles a day."

Wry Neck.

Wry Neck is a distortion, caused by a drawing down of one side of the head towards one of the shoulders, causing the face on the other side to be somewhat upwards. It is often accompanied with much spasmodic pain. It is a distressing malady, not only to the patients themselves, but to all who observe them attentively. It consists of muscular contraction on the one side only, either of the Sterno-cleido-mastoideus, or Trachelo-mastoideus, or the two combined. This may be owing to the paralysis of either of these muscles on the opposite side, for if a muscle loses the resisting power of its antagonist, its contractive power causes it to diminish in length, consequently it draws its attachments towards each other. It may also arise by the too great power of the one set of muscles over the other, causing the one side to be in a more energetic state of action. It not unfrequently occurs in hysterical females, or those whose nervous energy becomes excited by some remote influence. The affection, when far advanced, and of some continuance, causes the head to be firmly drawn towards one of the shoulders, with the face in an opposite direction looking upwards, and neither the patient nor any other person, can bring the head in a proper position.

Sometimes the cervical vertebræ become anchylosed in a curved direction, when little can be accomplished towards a cure. At other times the malady comes on spasmodically while the patient

is talking, or otherwise engaged, when the pain becomes very agonising, which is occasionally relieved by the recumbent position; but this is by no means certain to afford relief. Chloroform may be beneficially administered as a temporary agent; and when the muscles are in a quiescent state the head can be put in its natural position, or in some degree near to it. At this period mechanical means may be advantageously employed.

Several cases were admitted into the Middlesex Hospital, some as early as my pupilage there, (and two or three were under the late Sir Charles Bell) and their condition was benefited by tonic medicine, steel, electricity, and mechanical aid. Others that fell under my notice received little or no benefit. Rechter mentions several German surgeons who have been successful in dividing the muscles of the neck; and Samuel Cooper in his work mentions a plan to divide, first the tendinous origin of the Sterno-cleido-mastoideus, and if success be produced to a certain extent, then to divide the clavicular origin of this muscle. These portions may be easily disunited by making a small opening on the side of the tendon, then introduce a hernia knife beneath, place the cutting part anteriorly, and with the finger press the tendon against the knife, until it be divided. The muscular portion may also be cut through in a similar manner, but, of course, this operation will be useless if the Trachelo-mastoideus muscle be implicated in the deformity. Cooper also states that some surgeons

have cut out a portion of the muscular structure of the Sterno-cleido-mastoideus, but modern surgery will not recognise such a step. It is now admitted, and clearly proved, that every advantage may be obtained by the division of the tendons, and their union stretched by mechanical means to a very considerable extent. The belly of the Sterno-cleido-mastoid muscle may become so contracted as to form a hard swelling in the centre of the neck resembling a tumour; if this be only the belly of that muscle contracted and not the Trachelo-mastoid also, the divisions of the origins of the Sterno-cleido-mastoid muscle would be probably successful.

A very distressing case of wry neck was under my treatment a few years since. A gentleman, a former house pupil, met with much family affliction; and after a long journey by railroad, and remaining in damp and draught, suddenly found his neck contracted on one side, which has continued ever since, now about six years after its first appearance. Dr. Watson attended with me in consultation several times respecting this case, and all the means we recommended were only of slight benefit. The spasm this patient suffered was very severe, he was obliged to use both his hands to keep his head in a better position, and relieve the spasmodic action of the muscles. This medical gentleman found some benefit from sea voyages, and has now gone to India.

Electricity has been successful in some cases.

Mr. Cooper remarks, that when employed, the head should be placed as near to a natural position as possible, as the muscles are more likely to be restored in a normal than in an abnormal one. When this agent is employed, this should be strictly attended to. Mechanical means may be employed, combined with electricity, and the muscles gradually overcome.

Cooper says, "The cure of this case is very imperfectly understood. The usual means, which sometimes succeed, are camphorated mercurial friction to the part, even until salivation occurs, the internal exhibition of opium, stimulating embrocations, the shower bath, blisters, issues, electricity, &c. &c., to these may be added belladonna, aconite, æther, chloroform, &c."

I am indebted to Mr. Pratt, of Oxford Street, for the following case of T— S—, of T—, Oxfordshire.

This unfortunate gentleman injured his neck by a fall, and from that time he was unable to hold his head erect; when he attempted to walk, his head swung suddenly round towards the left shoulder and fell over to the right, and became fixed in that position. To relieve this he had to take both hands and lift the head up, and then turn it round, and with the right hand held up to it, he could prevent its slipping; if he stumbled, or drew his hand away for a second, the head would immediately escape from the position in which it was held.

A cap was made, formed of steel bars, to fit

on the head, which, covered with silk, was scarcely perceptible, and by straps arranged to a band that fastened round the body close to the arm-pits, the head was kept in a tolerably firm position; and in walking, by having a slight cane with a point fitting at nearly a right angle into a swivel fastened on to the cap, he could walk without much difficulty, and after some months of sea air and bathing, with constant rubbings, administered by A. A. Mahommed, of Brighton, he quite recovered, and was able to ride on horseback without any assistance.

Deformity of the Superior Extremity.

The arms may become deformed at various parts, the joints being deranged from their natural position, either the connection between the collar-bone (Clavicle) and breast-bone (Sternum), or the connecting medium between the clavicle and blade-bone, disarranged. The shoulder joint, elbow, or wrist, may be displaced; but deformities of the superior extremity are by no means so common as those of the legs and feet; and this may be readily imagined, when we consider that the legs have to support the whole weight of the frame, whereas the arms not having to support such a burden, are less liable to so great variation in their natural symmetry. There are such cases as blighted extremities, where the whole limb withers, and does not continue its growth with the other parts of the body, but these are more frequent in the legs

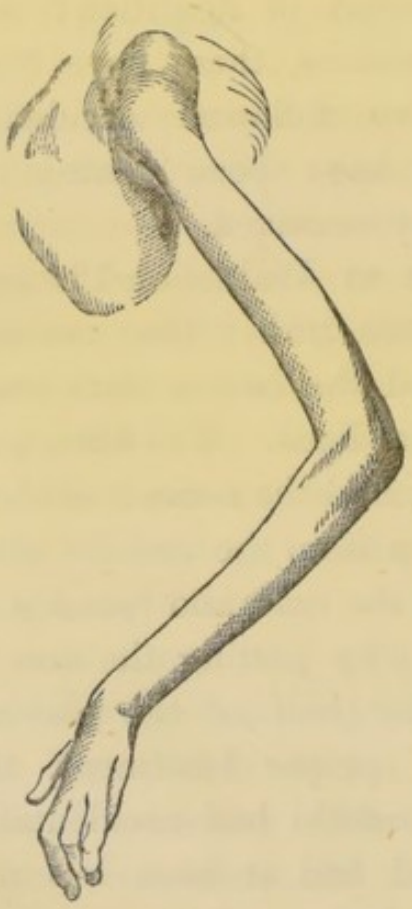
than in the arms, although such maladies may be seen in them. Several cases of blighted limbs have fallen under my notice, and in those where the children have been brought to me at an early period, some beneficial results have followed the mode of treatment recommended; but in the ones of a more advanced character, I have been able to produce little or no beneficial result. In some instances, they arise from want of nervous power in the part—a deficiency of nervous energy—a kind of congenital paralysis. Some cases that have fallen under our notice have first made their appearance during the period of dentition; and some have followed convulsions, these have been very severe. Others have followed accidental injuries, or accidents that have been unattended to at the period when they occurred.

When visiting a patient at Walton-on-Thames, I was called to see a little girl. The medical practitioner had pronounced the case a deficiency of the outer half of the collar-bone. The little girl was about two years of age, and the nurse-maid had suddenly pulled the child up from the ground after she had fallen. I examined the case, and found it to be a fracture of the clavicle; by putting the arm in a proper position, the outer half of the clavicle became apparent, and, by proper treatment, the child was cured. The nurse-maid had accidentally broken the collar-bone, and had it been left unattended, I am inclined to believe the arm would have become atrophyed, that the child would

have lost the use of the limb, whereas, by a very little judicious care, it was completely cured. Trifling as these accidents appear, if not attended to, serious results supervene, producing not only deformity, but other serious inconveniences. This fractured portion of bone, by its pressure upon the nerves of the arm, might have completely paralysed it.

We shall next proceed to consider some of the deformities of the superior extremity, or arm separately, and afterwards consider those of the leg.

Case of an arm affected with paralysis.



This is a unique specimen of growth of bone without deposition of muscle. According to the statement of the patient, his arm was paralysed at the age of four, from dentition, and hung uselessly by his side ever since; yet the bones continued to grow equally with those of the other arm, and at the age of twenty-five, when the cast was taken, the paralysed limb was equal in length to the other, the bones of the same size, the ridges marked, and could be felt through the skin, yet there

was an entire absence of muscular structure, and nothing but a slight tendinous motion in the fingers; the joints of the shoulder, elbow, and wrist could be moved by another person, yet there was not the slightest power in the patient to hold them in any position, except to let them hang; in other respects, he is a finely developed and well proportioned young man of twenty-five, rather stout, and has enjoyed excellent health. He is employed as a clerk in a wholesale house. Now, this case is of much interest, as the growth of bone must have resulted from one set of nervous fibres not being paralysed.

In an accident under my care in the Middlesex Hospital, where the spine was fractured, and the lower part of the body paralysed, although the man lived a month, not the slightest progress had been set up towards a reparative process; so that in this case, evidently both sets of nerves were paralysed—the nerves of motion and sensation; while in the blighted arm, only the nerves of motion were paralysed, and the nerves of sensation remained perfectly free from pressure, giving heat and a degree of sensation to the limbs.

The Shoulder-Joint.

This joint is formed by the glenoid cavity of the scapula above, and the head of the humerus below; it is a complete ball and socket joint, and it possesses great power of motion in almost every direction; it is surrounded by ligaments and muscles—the latter

cause it to assume the appearance of the second largest joint, the hip being the largest. The shoulder joint is liable to four dislocations, the head of the humerus being subject to be displaced in four different ways. Of course when these displacements are not reduced, a deformity of the joint results. After the lapse of a little time, nature does her best to make the part as serviceable as possible; care must therefore be taken not to interfere with those altered structures. A fresh cavity may be formed for the head of the humerus, and the joint be only limited in its action. Thus we ought to rest satisfied, and not create mischief by interference. It must be considered, that although the shoulder should become anchylosed, there may still be great mobility in the whole arm, because there is great freedom of action between the clavicle and sternum, and very considerable motion takes place here, to enable the arm to perform all necessary purposes.

Case.—I was sent for in the year 1836, into Somersetshire, to see an infant, a distant relative, who had a deformity of the shoulder joint.

Upon examination, I found a projection behind the situation of the right shoulder joint, which, upon rotation, proved to be the head of the humerus, dislocated, upon the dorsum of the scapula. It appeared that at the birth of this child, there was some difficulty in the labour, and so the dislocation occurred. The infant was then about five weeks old, and all my exertion, employed to an extent justifiable, was ineffectual in reducing the dislo-

cation. Upon my return to town, I consulted Sir Astley Cooper upon the case, who was of opinion that sufficient means to reduce the displaced bone had been employed, and having been unsuccessful, that he did not think it advisable to use any other means. The young lady has grown up, and the only inconvenience is a degree of awkwardness in that arm, as the back of the hand is forward, and the arm has the appearance of being twisted, otherwise there is no weakness or other inconvenience.

Case.—A lady consulted me in the year 1839 respecting her shoulder-joint; she was a resident at the Isle of Wight; she had already consulted Sir B. Brodie, who had given his opinion upon the case. I found, upon examination, that there was considerable swelling of the joint, with an inability of raising the arm towards the head. She stated that, about three weeks before, she had pain in the joint, and could not raise the arm to adjust her hair. When raising the joint, there was considerable roughness felt, as if the bones were in a state of caries, or else the result of a want of synovia.

I commenced a plan of treatment, consisting of warm applications to the shoulder itself, and two grains of grey powder combined with opium, night and morning; and, in about six weeks, she was enabled to return to the Isle of Wight, quite well.

She has since that period been to town, and consulted me upon another complaint; she then mentioned, that her arm had been quite well ever since, with perfect freedom of motion in all directions.

Case of Epilepsy, accompanied with frequent dislocations of both shoulders.

Miss H——, age seventeen, 1860, belonging to a distinguished family, a patient of Dr. Brown-Séquard's, was the subject of frequent epileptic attacks for three years previous.

During the last twelve months the epileptic attack was accompanied with dislocations of both shoulder-joints. The dislocations took place most frequently backwards, though sometimes the head of the humerus got displaced under the pectoral muscle, and was exceedingly troublesome to reduce. The dislocations became so frequent as often to take place twice in a day, and rarely a day passed without one or the other of the shoulders being displaced. The young lady's friends had consulted many eminent members of the faculty, both at home and on the Continent, without getting any relief.

On Dr. Brown-Séquard's making a careful examination of the spine, an excessive excurvation was discovered, extending from the fifth cervical to the second dorsal vertebræ. A spinal support was ordered to be made for this patient, with small water pads to press on the articular nerve upon the under edge of the clavicle, immediately below the coracoid process. Soon after wearing the support the dislocations became less frequent, and in the course of a few months they were reduced from five or six a week to one in three weeks. The dislocations now rarely occur with the support on, except at the time of the epileptic attack, and often an

epileptic fit takes place without the dislocations occurring.

It was doubted by some of her friends whether the support had really anything to do with the discontinuance of the frequent dislocations; but the following circumstance will place the matter in its true light.

In November, 1860, it became necessary to have some repairs and alterations made to the support, and the young lady was without it for two days. The following note was written by the lady with whom Miss H—— was staying at the time.

"Dear Sir,

Do let me have Miss H——'s instrument as soon as possible, as her arm has been out *twice* since you had the instrument away.

Believe me, yours truly,

"To Mr. Pratt." M. S. R——.

The Elbow-Joint.

This is an irregular hinge-like joint connecting the fore arm to the upper arm, the irregularity consisting in the projections, internally (internal condyle of the humerus), externally (external condyle of the humerus,) and at the back of the joint (the olecranon process of the ulna). These projections are for the purpose of giving attachment to several muscles. The upper part of the joint is formed by the trochlear of the humerus, and the lower part by the greater Sigmoid cavity of the ulna

and the head of the radius. The ulna flexes upon the humerus with the head of the radius, but the head of the radius has a rotatory action, serving to pronate and supinate the hand. The dislocations that this joint is subject to, consist of the displacement of the bones in five different directions. The bones of the fore arm may be dislocated laterally, either internally or externally, or backwards where both ulna and radius project: the ulna may alone be dislocated backwards, and the radius may be displaced either backwards or forwards. Fractures are also liable to occur near this joint. All these accidents, if not properly reduced, are likely to produce deformity of the elbow, with abnormal projections and loss of power to a less or greater extent, according to the nature of the accident and the impediment to the actions of the natural movements of the joint. This joint is also liable to disease, which may produce consequitive dislocation, and consequently deformity. It is impossible to mention the many cases that present themselves, where this joint has lost some of its action or strength, or to point out general rules for the treatment of each case, as that alone must depend upon the anatomical derangement that has occurred. The olecranon process may be broken; the internal or external condyle of the humerus may be fractured, or the humerus may be broken just above its articulating surface; and each of these accidents, if not perfectly reduced, may occasion an abnormal appearance of the joint, with diminished

strength and action, occasioning a deformity. Anchylosis of the head of the radius to the ulna will prevent the action of pronation and supination, and cause considerable inconvenience to the patient; still, this derangement in the joint will not, sometimes, produce any external appearance or deformity, but prove most annoying and distressing to the patient, as it will cause an awkwardness in the action of the hand, and the patient wonders how the elbow can influence the motion of the hand; but this can be very easily explained by any surgeon conversant with the anatomical formation of the elbow-joint.

A young gentleman, aged ten years, was brought up to town in September, 1848, to have my opinion upon an irregularity and want of power in his right arm. He had met with an accident about ten months before, and had been under medical and surgical treatment. Upon examination of the joint, it was found that it was of an irregular appearance, unlike the left arm. This abnormal irregularity resulted from a fracture of the head of the radius, the union of which had taken place when the fractured portions of bone had not been in their right position. This caused him want of power in the actions of pronation, supination, and flexion of the joint. As I was doubtful respecting the plan of treatment, and rather wished to have the sanction of another surgeon, we had the opinion of the late Mr. Keate, who fully agreed with me in regard to the plan to be pursued: — the application of a

graduated compress upon the part injured, and a splint secured by a roller, succeeded by friction and an increased degree of action, so as to restore the wanted motions. This plan was carried on with a successful result. I presume this case will be sufficient to convey the impossibility of detailing general rules for the treatment of deformity of the elbow, as very few cases of a similar nature have presented themselves to us during a period of nearly forty years.

The bones of the fore arm are liable to become bent by external violence, and this occurs most frequently in children; both bones may be bent, or either one of them, sometimes the radius, but more frequently the ulna. The arm under such circumstances has an unnatural appearance, and feels weak to the patient, giving a degree of awkwardness in some of the movements of the arm, which either calls the attention of the patients to it, or of their friends. The first case of this kind that I noticed, was in the year 1824, in the surgery at the Middlesex Hospital. It had occurred to a young boy, about seven years of age, who had been run over by a spring cart, the wheel passing over his arm, and bending both bones outwards. The dresser who attended in the surgery, endeavoured to bring the bones in a straight position, by placing the bones over his knee, but he found he could not accomplish this; so he applied a strong splint in front of the arm and a roller, applying sufficient force in the centre. In the course of about ten days, the bones

had acquired nearly their normal state. The radius at its lower part may become preternaturally incurved, or be situated nearer the ulna than naturally, and this may be the result of a fracture where union of the fractured portions of the bone has taken place nearer the ulna than natural. This will cause much weakness in the fore arm and wrist-joint, which is only to be overcome by a proper position, and putting into action the extensor of the metacarpal bone of the thumb, as that muscle takes a firm attachment from the lower end of the radius; bending the hand in a lateral direction internally towards the ulna, will place this muscle upon the stretch, and so act upon the lower end of the radius.

Deformity of the arm above the wrist, or near to the joint itself frequently results from a sprain of the wrist, or a fracture of the lower end of the radius, and this occurs more frequently in old people than in young, and the treatment of such cases is most troublesome, and frequently very unsatisfactory to the practitioner; but still in some cases, where the patient is not too aged, a certain degree of benefit may be gained by judicious surgical means and mechanical appliances.

The protrusion of one or more of the carpal bones sometimes takes place, and causes an abnormal appearance below the wrist at the upper part of the hand, which is very unsightly and annoying to the patient. Such swellings should not be mistaken for an enlarged bursa; the protrusion

of the bone is fixed and firm, unyielding in its nature, and the other is moveable, and yields upon pressure with a degree of elasticity in it. The protrusion of one or more carpal bones may be relieved by mechanical pressure, tending to cause the bone to resume its natural situation; but such means require both patience and perseverance of practitioner and patient. Enlarged bursæ, or ganglia, are obstructed openings into the sacs that tend to lubricate the tendons as they are passing over some of the bones, and are very common in their appearance and easy of cure. Striking them with a book or ruler is a very old method of treatment, and the application of blisters is frequently attended with a successful result. I have seen ganglia completely ossified in old people.

While writing upon this subject allow me to digress from deformity, by mentioning that I have repeatedly met with cases where patients have complained that upon some particular action of the hand they have experienced a degree of grating, and where the surgeon could feel a crepitus, by placing his hand over the part. Even where this has existed for years, it has been always cured immediately by the application of two or three leeches over the part. I have never seen this fail, and gained some credit by recommending a leech to one of the governors of the Middlesex Hospital nearly forty years ago.

A deformity of the upper part of the thumb may occur, at the union of the metacarpal with the

carpal bone, or at the articulation of one of the fingers; and this may cause much annoyance, more particularly in the female. If the patient be young, and the projection has resulted from a relaxation of the ligaments, it can be remedied by such means being employed as tend to bring the bone into its proper articulating surface, for if it gains its proper place and is kept so, the ligaments will become contracted, causing a cure of the displaced bone.

Distortion and Contraction of the Fingers.

The fingers are very frequently distorted or contracted, and this may result from very many causes, too many fully to enter into, as the cure is of greater importance on the present occasion. In contraction of the fingers it becomes essentially necessary for the surgeon to discover the condition of the joint itself, for if union of the articular surfaces has taken place by anchylosis, nothing can be done, but if motion of the joint exist a cure may be reasonably anticipated. The muscles that move the fingers are situated in the fore arm, and arise as high as the condyles of the humerus, so we have to look frequently for the cause of the contracted fingers in the fore arm, by an injury or destruction of the flexor muscles, or even want of power of the extensor muscles at the back part of the fore arm. Both the extensor and flexor muscles send off long tendons that pass the wrist-joint and are firmly bound down to the bones of the fingers by strong

ligamentous bands, which serve to encase them next the bones. Should the muscles that act upon these tendons be injured, so as to cause the muscular fibres to contract, of course the fingers cannot be moved, and they are either contracted or remain open or straight. The first object towards a correct method of cure is to ascertain whether the flexor or extensor muscles are in fault, for if the division of the tendons be determined upon, it becomes necessary to know what tendons are to be divided, not that I advocate the performance of this operation, except as a last resourse. I usually employ every plan prior to the division of the tendons, but still there are cases where it becomes necessary to do so. Nothing is so detrimental as not being able to bring the fingers straight, or even to bend them, and we readily seek every means to enable us to do so, for the incapacity to hold anything makes us almost useless to ourselves as well as others, although people too frequently are satisfied if two or three of their fingers are useful, and content with this condition, or seek relief when too late. When contraction has just occurred the cure is readily attainable, but after a time it becomes more difficult, and requires a more vigorous plan of treatment, so that patients should at once seek relief and not delay it too long. Much attention was formerly directed to this subject by Mr. Sheldrake, and he published the cure of about thirty cases, several of which had been considered incurable by our highest authorities. The reader

may refer to Mr. Sheldrake's remarks, which are highly ingenious and interesting.*

When the fingers are contracted by an over action or powerful straining of the muscles of the fore arm, and the fingers can be brought straighter by pressure against them, electro-galvanism may prove highly serviceable in restoring the normal action of the extensor muscles; but during the application of electro-galvanism the fingers should be brought more to a natural position, and if they can be brought perfectly extended they should be kept so for the time, when a cure will soon be accomplished. A person, by too forcibly keeping hold of anything, may violently sprain the muscles of the fingers, and soon, or immediately afterwards, find that they cannot open the hand; and this will result by the too powerful action of the flexor muscles, or the want of power of the extensor, to bring the fingers in a state of extension.

A gentleman consulted me in the year 1849 with a contraction of the three smaller fingers of the right hand. When riding in the country he was passing through a gate into a field, and had dismounted to open the gate; his horse started as the gate shut, and he held the bridle very tight, it being in his right hand. The three fingers became so contracted that he could not hold his fishing-rod, and as he was very fond of angling he was desirous of getting cured. When the fingers were examined,

* London and Medical Surgical Review, 1832, vol. 1, pp. 337, 401, 495.

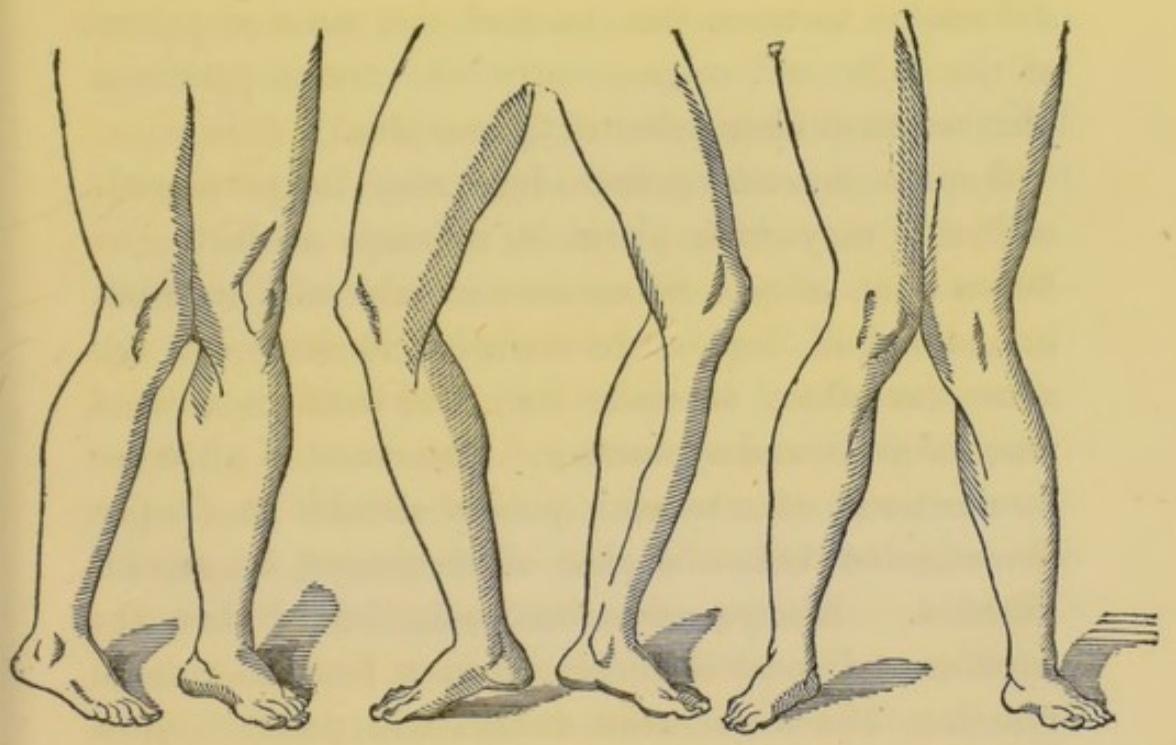
a want of power of the extensor muscles of the fingers was found to exist. I could get them more extended, but not fully, owing to the contracted condition of the flexor muscles (Flexor Sublimis et Flexor Profundus Digitorum). Friction was recommended to the fore arm, and the employment of electro-galvanism every day, bringing the fingers more extended; and in the course of a fortnight he was quite cured, and remained so; this was ascertained by meeting him in the country some years afterwards.

The fingers may become contracted by constant habit, or by the usual occupation of a person; daily employment of the flexor muscles will give them greater power, so that at last the extensor muscles will become gradually inactive; and this was exemplified, by the state of the hand in a friend of mine, a chymist, who had daily been employed in his own shop using the mortar; so that when he was between fifty and sixty years of age, his right hand was so contracted as just to receive the handle of the pestle. He could still flex or bend the fingers, but he could not extend them. There are many modifications of this condition of the fingers in the advance of life in all classes of society.

Deformity of the Inferior Extremity.

The inferior extremity may be deformed in a variety of directions, according to the abnormal condition of any of the joints, as the hip, knee,

ancle, &c.; a want of the natural shape of any of these parts, or a want of action, will necessarily produce deformity. The legs may deviate from their natural perpendicular position; they may grow outwards, or they may grow inwards, or only one may vary from its normal direction, as the accompanying plate will illustrate. All such cases may be relieved by judicious means.



The whole leg may become preternaturally wasted and attenuated, constituting a blighted limb; sometimes the whole leg may remain small and not increase, and at the adult period not be half the size of the other extremity either in length or contour; at other times the muscular structure will diminish and the bones be as large as the other leg.

In hospital practice such cases present themselves, when all the usual means have failed to benefit them, so that we have little chance of being of much service. Many cases have fallen under my notice, and in very few instances has much benefit resulted from the plan recommended, but at an early period benefit has resulted from friction, electro-galvanism, medicinal means, and mechanical appliances. It but too frequently occurs that, in these cases, we are unable to trace the cause of the want of power of the limb, and consequently we cannot pursue a plan founded upon scientific principles.

Sometimes one or both legs may be paralysed, and this may take place in infancy, at birth, or follow soon after. Sometimes a child will be weak in one or both legs, or be observed to draw one leg after the other, or walk very awkwardly, with a want of grace and symmetry. The cause of all these diminutions of muscular power should be deeply investigated before a plan of treatment be recommended. Electro-galvanism may be of benefit; friction and local applications may tend to restore reaction. In some cases worms will produce most distressing symptoms, which may be attributable to other causes, and such symptoms may exist in childhood or at a mature age; and I think it but just to relate the result of a case which has been already published in my work on the Spine, to shew that I was completely deceived as to the cause of the seisures.

Harriet Fillitt suffered from the sudden loss of the

use of both her legs, and this loss of power came on without any indication whatever. I attended her for a number of years, and she was under my care at the Middlesex Hospital. She would lose the power of her legs, sometimes, when she was carrying up her master's dinner, and fall down stairs. On such occasions leeches, local applications, and internal remedies usually produced a state of convalescence for a time, when another attack would occur; and this went on for years. One morning I called to see her early, and as the rooms were not ready she requested that I would go into the kitchen, where I saw a large dish full of salad, radishes, and green food, which she was going to eat for her breakfast. She stated she could eat as much more. I immediately inquired if she was not subject to worms, and her reply was yes; I then asked her what kind of worms, and she said tape-worms. These attacks she had been subject to for years arose from the worms. I prescribed some Tincture of Iodine for her, and the tape-worms were expelled. After this she never had another attack of loss of power of her legs. The cause of the attacks would not have been found out but by accidentally going into the kitchen and seeing the quantity of salad she was in the daily habit of eating.

It has been observed that paralysis of the legs may occur at birth, and the limbs will, in some instances, acquire the natural growth, no deformity existing either in the legs, spine, or other parts of the body, and the child be perfectly healthy in

every other respect; but in most instances a degree of debility will exist in the spine, although no appearance of any deformity.

The daughter of Col. F—— was brought to me on the 7th December, 1849. This little girl was nearly three years of age, and had no power over the lower half of her body. Her appearance was both healthy and robust, and on careful examination I found that the spine yielded when the weight of the body was thrown upon it, and that when she crawled, which she was capable of doing, she drew the legs after her; also there was more power and muscular action in the left than in the right leg. She had been under an irregular course of electro-galvanism with some slight improvement. When she was lying on her back she had more command of her legs than when she was sitting up; but there was not the slightest strength in them, and when held up they bent under her. There was a great deficiency in the spinous processes of the vertebræ, more particularly at the lower dorsal and lumbar, and they could not be at these spots in the least detected, and the vertebral column bent forward when she was held up and her feet touched the ground. A course of electro-galvanism was commenced, and a gutta-percha shield made for the back, which extended from the cervical vertebræ to the bones of the pelvis, and this was firmly fastened round the body by a jacket so formed as to keep the spine in a straight position, and to give her support when she was sitting. The electro-galvanism

gradually produced an increase of muscular action, and the sensation in the legs was also improved; she could crawl with greater ease, and raise herself upon her knees, and, when held up, could bring one leg before the other. When in a recumbent position, a hand being placed upon the soles of her feet, there was considerable strength in the legs, as they did not now yield and bend, but were kept straight by the extensor muscles. The electro-galvanism could not be continued on account of the family leaving town for Scotland. The shield was continued, except in the warm weather, when it was left off. Lime-water was given the child once or twice a day, and a gradual amendment took place, although slow. At the end of the summer the power of both legs was the same, and she could freely bring one leg before the other. The spinous processes of the lumbar vertebræ had now made their appearance, so that ossification had taken place. At this period I gave my opinion that another course of electro-galvanism would completely cure the patient, together with the other means recommended, but unfortunately I lost sight of this patient.

F. P——, aged two years and five months, October 8th, 1860. This was a patient of Mr. Waters, and had been observed from the age of fifteen months to drag the right foot soon after he began to walk; the child was of a delicate constitution, and suffered much in teething. Soon after the dragging of the foot was noticed, the right leg began to diminish in

size, and on measuring him there was considerable difference between the two limbs, the measures were, of the left thigh nine and a half inches, of the right thigh nine and one-eighth inches; the calf of the left leg seven and one-eighth inches, of the right only six and a quarter inches. After a careful examination, no disease of the bones or hip-joint could be discovered, nor was there any decided curvature of the spine, yet a very slight deviation could be detected laterally in the dorsal region, towards the right side.

On supporting him with the hands under the axillæ, he seemed to walk much better, and accordingly it was determined to try a very light spinal support, the effect of which was, that he walked quite naturally, to the great delight and comfort of his parents, and hopes are entertained that the limb will be quite restored.

Since this report was written, this patient is able to walk quite naturally, even without the support, and the leg has began to fill out in the calf to the extent of nearly half an inch.

Congenital Dislocations of both Hip-Joints.

A gentleman consulted me, in the year 1843, who felt considerable difficulty in taking walking exercise. When he moved, the pelvis appeared to have a rotatory motion upon the lumbar vertebræ; both legs were shorter than natural, and both feet turned

somewhat inwards. He stated that this inconvenience had existed as long as he could remember, and as he never could run or walk like other people, he was desirous of having something done. I found that both hip-joints had been dislocated, and he stated that this had been done at birth. At the time that I examined him he was thirty-four years of age, and all the bones fully formed. There was a certain degree of motion in each hip, but it was very limited indeed. The motion that existed when he raised the leg, occurred between the lumbar vertebræ, which had enabled him to raise one leg off the ground by a curve temporarily formed in the lumbar region, so that when one leg was raised—say the right one—the curve was to the left side, and when the left was raised, the curve was in the opposite direction.

This was the first case of the kind that I had seen; but I afterwards found that there were others on record. Nature had done all she could for this patient, and I did not see that art could possibly further assist or benefit his condition.

Miss R——, aged thirteen years, with disease ot the hip-joint, and recovery.

This young lady had had a severe disease of the left hip-joint, and was operated upon by Mr. Luke, who removed a portion of the diseased bone, from which she recovered and was able to walk about with difficulty, walking entirely on the toes of the left leg, which was five inches shorter than the other. She had a high-heel boot made for her, but

it was of very little service, as she never touched the heel, and wore the boot away rapidly at the toes. The heel was gradually getting more and more drawn up, and the labour of walking was excessive. She was sent to Mr. Pratt, by Mr. Harding of Highbury, to have something contrived for her, to enable her to walk better, and after careful study, he found that from the great weakness of the left side where the disease had been, there was too much of the weight of the body thrown on the weakened limb; to obviate this, he recommended the spinal support, which had the effect of distributing the weight of the upper extremities more equally over the pelvis, and consequently the patient was enabled to walk with greater ease and comfort, and with an improved shoe walks with but a very slight limp, and fairly bears the weight on the toe and heel, having also brought the heel down fully two inches. She has improved rapidly in health since, and has grown quite stout, continuing to wear the support, from which she experiences considerable relief.

The Knee-Joint.

The knee is the connecting medium between the thigh and leg. The upper part of this joint is formed by the articular surfaces of the Femur; the lower part, by the articular surface on the upper part of the Tibia, two semi-lunar or inter-articular cartilages intervening; the front of the joint is formed by the Patella.

There are several ligaments that connect these bones together, some on the outer part of the joint, some in the interior. There is no joint more liable to inflammation than the one under consideration, and this, no doubt, results from the numerous arteries it has distributed upon it—no less than nine arteries ramify upon its surrounding tissues. The accidents of this joint require the greatest care and the most judicious treatment, as the constitutional powers become very soon affected by injuries to it. This has been most clearly proved to me on several occasions, and I cannot do better than state the following cases to prove the justness of these remarks.

A poor woman was admitted into Bird's Ward, under my care, at the Middlesex Hospital, about the year 1844. She had been run over by a cab, the wheel of which had passed over the knee-joint; but when it was upon its upper part the wheel slipped off, taking with it the surrounding skin, which still remained attached to a great extent at the outer part of the joint. The joint itself was uninjured, but the skin was torn off from the surrounding fascia by the accident. I carefully examined the wound, cleaned away the dirt, and brought the edges nicely together with adhesive plaster. Inflammatory fever followed, and the patient died.

Soon after this a second case presented itself, which also fell under my care, which I treated in the same manner, and that patient died. A third case was brought into the hospital, and I was called

into consultation. When my opinion was asked, I replied, "I should amputate." My colleagues looked surprised, and requested to know upon what authority I founded such an opinion. My reply was, upon the result of the two cases already quoted. The man's leg was not removed, and he also died.

Thus we see the sympathy of the constitution with this joint, and the necessity of being careful in our treatment of all cases where it becomes injured. It has been stated that there are more arteries to this joint than any other, and more nerves as branches accompany these arteries, so the nervous system becomes excited by injuries to this joint and to the distribution of these nervous filaments. There are several affections of the knee-joint, too numerous to be considered on the present occasion, and some of these affections will necessarily end in deformity, such as scrofulous affections, cases of white swelling, producing a displacement of the natural position of the bones. Such cases require careful treatment, as the cure has been performed by nature at the cost of the deranged position of the joint, and an injudicious interference may be most highly detrimental, both in setting up an old grievance and producing constitutional disturbance.

Where the joint itself is not diseased, and the deformity depends upon the contraction of the muscles, the joint not being anchylosed, the division of the tendons may be productive of beneficial results. A splint being fixed upon the joint afterwards, it can be acted upon by an endless screw, so

as to bring the contracted joint in a straighter position, and a beneficial result may be attained by carefully watching the patient and not producing pain.

Deformity of the Knee.

Case.—An Irish lady consulted me in the year 1833, respecting a deformity of her knee, and an inability to walk any distance. I carefully examined the right knee, and found the joint quite natural in the sitting position, but when she stood up, and placed the weight of the body upon it, it became partially dislocated. The articular surface of the internal condyle rested upon the outer articular surface of the tibia; the external condyle of the femur projecting above the knee joint externally, and the upper part of the tibia below the knee internally. The ligaments were in a very relaxed state. I found that immediately she sat down, the parts were restored to their normal condition, but upon her rising, and placing the slightest weight upon it, the dislocation re-occurred, and the same result was proved repeatedly both in the sitting and erect position of this patient.

It became apparent to me, that if I could succeed in keeping the joint in its natural position, I should remove the deformity, and that this was only to be done by mechanical means. But it was difficult to accomplish this, as all the mechanical appliances I employed were ineffectual. We had recourse to the

French instrument maker, but with little success; but at last, after very great perseverance, we succeeded in procuring an instrument that answered the purpose most efficiently; and afterwards, my friend the late Sir Astley Cooper saw this lady, who had consulted him some years before, and he was quite surprised to see the change that had taken place, and congratulated me upon the success of my treatment.

In this case the ligaments were relaxed, and soon contracted after the bones were kept in their natural position, the knee gradually acquiring strength and usefulness, as she was enabled to walk any moderate distance. This case proves the elasticity and contractility of ligaments: throw weight upon them, and they will elongate; remove the weight, and they will contract, and give strength to the joint. This has been of much use to me in my practice afterwards, as several cases of relaxed ligaments have been treated in the same manner with the same success and beneficial results. In this case there was no organic disease of either condyles of the femur or head of tibia.

A patient was admitted under my care at the Middlesex Hospital in the year 1842, with considerable contraction of the knee-joint, the termination of inflammatory action of the knee. He could only walk with the aid of crutches. His leg was placed upon a splint, with a screw so attached to the splint that gradual extension could be employed; but after a fair trial had been given to the plan, it was

considered advisable to divide the tendons of the ham-string muscles, which I did, assisted by my late colleague and friend, Mr. Lonsdale. The tendons of the Biceps, Semi-membranosus, and Semi-tendinosus were divided, and the leg placed upon a splint. After a very little time, prior to the healing of the puncture, the knee was completely restored to a straight position, and a perfect cure was ultimately accomplished.

In this case there was at the back part of the contracted knee a thickened portion of fascia, which Mr. Lonsdale advised me to divide; but I did not do so, and the extension was sufficient to cause its relaxation, after the tendons of the contracted muscles had been cut through.

Miss D——, of S——, age fourteen, 1859, had an affection of the knee-joint, by which the knee became contracted and the leg was gradually drawn up. Several plans of treatment had been tried without effect, and the knee-joint was considered to be firmly anchylosed.

A leg had been made for her by a carpenter in the country, with which she managed to walk about; it was, however, very uncomfortable and disagreeable, as the leg rested in a trough and the knee projected anteriorly. Such was her state when she came to London to get some relief to enable her to walk with greater ease. For this purpose a leg was made for her to take the support from the Ischium, by means of a leather bucket, made to lace, moulded on to the upper part of the thigh, to which were

attached steel supports continued downwards and securely fastened to the block which received the pin leg, by which means she was enabled to walk with ease and rapidity.

The knee was left perfectly free, no weight at all thrown on it. A leather band passing round the heel and attached to the wooden block was made to act on the foot.

A simple instrument to wear for an hour a day to make extension of the knee-joint was also constructed.

After walking about with the wooden leg during the last eighteen months, she is now beginning to bring the toes to the ground, and hopes are entertained that a considerable use of the natural leg will yet be recovered, and enable her to dispense with the wooden substitute.

In some cases, every attempt to use the knee-joint produces a return of pain and swelling, and as long as the patient remains quiet he feels little inconvenience; but it is sometimes essentially necessary that exercise should be taken, and the only means to enable a patient to do so, is by keeping the joint free from action; this can only be done by mechanical appliances. We are indebted to Mr. Pratt for a novel means of accomplishing this object, which has proved successful in several instances.

Miss L——, of Pimlico, age about forty, 1859, stated that she had been suffering from an affection of the knee-joint for upwards of twenty years. It commenced from an accident received in dancing.

In endeavouring to turn the foot outwards she sprained her knee. From that time it was always very painful after walking any distance. Some few years afterwards she was attacked with rheumatism, which settled in the knee. For this she had consulted many eminent members of the profession at different periods. Rest had been recommended and persevered in, and always gave relief. On recommencing to walk, however, after each suspension, the pain in the knee-joint returned immediately. This had gone on for many years, and partial anchylosis had taken place. The knee was contracted so much as to cause a difference of two inches in the length of that leg. It was with great difficulty that she managed to move about by the aid of crutches, and then for a very short distance across the room. Means were then sought to obtain relief, and by the consent of her medical adviser, Dr. Christian, a leather bucket was moulded to the upper part of the thigh, in two parts, which were laced together. To these, steel supports were attached on both sides of the leg, with joints at the knee, to come to the ground, and attached to the sole of the shoe, which was heightened to correspond in length with the other limb. An important feature was that the supports were curved to correspond with the curves of the leg. By these means the weight of the upper part of the body was carried to the ground and the knee-joint relieved. This had the desired effect. After a few trials this patient was enabled to walk some considerable distance

without crutches, and also continued to walk without pain in the knee. By using the limb after a little time, some action in the joint had been acquired without producing any injury or inconvenience to the joint itself, but considerable benefit to the health and comfort of the patient.

Mr. J——, age about sixty-two, 1861, was recommended to consult me respecting the condition of the right knee-joint. This gentleman had been suffering from the effect of an accident which occurred seven years previously, and according to his account the knee had been partially dislocated inwards; but it was reduced at the time and he began to walk about with bandages. Being a very active man he took a great deal of exercise, walking and riding, but he very soon began to feel the knee giving way under him after any great exertion. Within the last two or three years it became rapidly worse, very weak and swollen, the internal part of the knee projected inwards and the foot was thrown greatly outwards when he stood erect, with considerable swelling and thickening of the surrounding tissues of the inner and anterior part of the joint. He had been recommended and tried rest with benefit, but after he began to use the leg, great pain was occasioned, and the knee became enlarged, and to use his own words, "He might as well be dead as have to rest for ever;" for though his knee got free from pain after abstaining from walking for some weeks, yet no sooner did he put his foot to the ground, than the pain and swelling

returned. Local applications were recommended to be applied to the joint, which produced beneficial results, and mechanical supports on the same plan of moulding a leather bucket to the thigh, with steel uprights curved to the leg, with the addition of a knee-cap to bring the knee towards the outer support, so as to produce a straighter position of the leg, and relieve the knee of all weight of the upper part of the body. He walked away after it was applied with the limb very much straighter, and when he returned to the country he wrote to Mr. Pratt, observing, "As you took so much pains in fitting the support for my knee, I think I ought to report progress. It answers capitally and the swelling is much reduced." In another letter, writing about a different subject, he mentions: "The knee apparatus you made for me does admirably, and the leg is much straighter."

The Ancle-Joint.

The ancle-joint is the connecting medium between the bones of the foot and leg, and nature has built an elastic arch for the bones of the leg to rest upon. The foot is made up of seven Tarsal bones, five Metatarsal, and fourteen Phalanges. The heel (Os Calcis) constitutes the back of the arch, and the ball of the great toe and four first joints of the other toes constitute the front of the arch. The bone of the leg, the tibia, rests upon this arch in such a manner that any sudden force placed upon it yields to the

weight, and if a person comes suddenly to the ground, the expansion of the arch prevents the shock being conveyed to the other parts; this gives ease, grace, and symmetry to the ancle, and a degree of elegance in its shape and movements, when free from deformity and unnatural enlargement. The ancle-joint is simple, although strong in its formation, formed of three bones, the under part of the tibia resting upon the astragalus, and the outer ancle (the lower part of the fibula) protects it externally; a process of the tibia (the inner ancle) protecting it internally. The bones are bound together by ligaments, strengthened by the tendons passing round the joint. The ligaments consist of an internal one, and three external (termed lateral), and a general synovial investing membrane. The motions of the ancle are flexion, and extension of the foot, with a degree of action in the lateral direction, which is less limited externally, so that we can bend the foot inwards to a greater degree than outwards, and this may be accounted for by the external ancle being lower down. It may be as well to mention the tendons that surround the joint, as the division of one or more is essential in some cases of deformity. Behind the joint is situated the largest tendon in the body (Tendo Achillis), which is inserted into the Os Calcis; it is the continuation of the Gastrocnemius and Soleus muscles, together with the Plantaris. Round the inner ancle passes, the Tibialis Posticus, Flexor longus Digitorum, Flexor longus Pollicis. Round the outer ancle, the Peroneus longus

and brevis. In front of the joint, Tibialis Anticus, Extensor longus Pollicis, Extensor longus Digitorum. These tendons are bound down and kept in their situations by the annular ligaments, and most of them pass through distinct grooves; by these means the tendons are prevented from losing their relative situations, and the strength of the ancle-joint is increased.

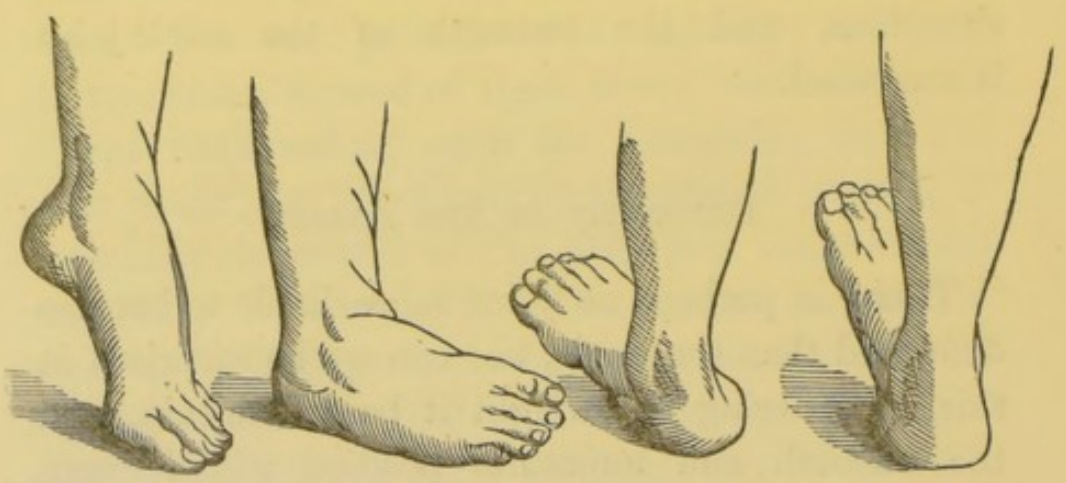
Deformity of the Ancle.

There is perhaps no joint more liable to become deformed than the ancle, nor can we be surprised at this, considering the weight it has to sustain, and the uncouth and unnatural position which many children place their feet in, thus tending to develope one set of muscles more than the other, so that sometimes the flexors acquire a power which establishes the deformity, and tends to keep the foot in an unnatural position. At birth, the bones of the foot are nearly in a cartilaginous state, and so are the bones of the hands; but the bones of the feet are a longer time in becoming ossified, because the child uses the hands before the feet, and the bones which are primarily called into action are the first to become fully developed.

There are various modifications of deformity of the ancle, but we shall first direct our attention to the most common, which is called club-foot, and there are several varieties of this deformity of the ancle-joint, the foot assuming various positions.

Club-Foot.

Club-foot has been employed to designate certain deformities of the ancle-joint, and there are four kinds, namely, Talipes Equinus, Talipes Varus, Talipes Valgus, Talipes Calcaneus.



In each of the first three kinds of club-foot the surgeon may, in a majority of cases, be enabled, by gently using counter-action to the muscles that tend to distort the foot, bring it into a more normal position, and such are more favourable for treatment; but in those cases of long standing, where the bones and ligaments have become too rigid, there is less chance of a favourable result from any means that may be employed.

Club-foot is frequently congenital, although it may be produced afterwards by the manner in which the children use their feet; also it may make its appearance during the period of dentition, and remain much in the same state, although the deformity is predisposed to increase by the gradual contraction of those muscles which pull the bones out of their natural position.

In examining a distortion of the foot, the situation and condition of the bones should be primarily ascertained, and afterwards the contracted muscles. Their situation may be easily distinguished by an anatomist, and the muscles occasioning the mischief readily ascertained. Much has been said in many works respecting the division of the Calcaneo-cuboid ligament, but any contraction of that ligament may be overcome by proper care and attention, if the muscles are but free which have caused the contraction of this ligamentous band, as the expansion of ligamentous textures has been on several occasions mentioned.

Sometimes club-foot will be the result of paralysis of one set of muscles, while their antagonists are in full force; and, of course, where their resisting power has been completely destroyed, the active muscles will naturally contract, and cause the deformity. Although the tendons of the contracted muscles have been divided with successful results, it must be owned that every endeavour should be made to restore the use of the paralysed set of muscles prior to the division of the tendons, and no means are more useful for this purpose than electro-galvanism; and while we mention this agent it will be as well for me here to remark that, in many contractions that have fallen under my own notice, the deformity has, in a variety of instances, completely disappeared when the patient has been under its influence. Contracted joints become relaxed and restored to a better shape under its agency; and this has been

most useful in assisting us in the application of artificial means, while the joint has been under the influence of electro-galvanism.

Mechanical support to the spine may also prove beneficial, as witness the case of F——P——, related previously.

The leading feature that first led to the cure of club-foot by the division of tendons and instrumental means was, that the astragalus was but little, if anything, altered in its appearance, and as that bone is the only one of the tarsal that enters into the formation of the ancle-joint, it was but reasonable to suppose, that as that bone was not malformed, nor the articular surfaces of the tibia or fibula, that a cure was very fairly to be expected. The anatomical correctness of this remark was borne out by French authorities as well as our English anatomists, but I am not aware that anything has been mentioned in respect to the astragalus being free from any muscular attachment, or that it was successfully removed in a case of accident by Sir Astley Cooper, and since that time by several other surgeons; so all these points should be properly considered.

In all cases of club-foot, whether the tendons have been divided or not, everything will depend upon the treatment. It is not simply the division of the tendons that will cause the cure, but it is the subsequent judicious management that will justify the anticipation of a successful result, and this will necessarily involve a certain time for its perform-

ance. It is only after diligently watching the case that the surgeon can form a correct notion when such mechanical means may be discontinued. Several cases have fallen under my notice where the deformity was not completely eradicated, on account of leaving off the treatment at too early a period.

In all cases of club-foot, before we think of the division of the tendons, every plan should be employed to bring the foot into its natural position, and if this can be accomplished, mechanical means should be resorted to, to keep it in a normal state; by persevering in this plan, and by stimulating the muscles that are deficient in activity, a successful result may be fairly anticipated.

There are other deformities of the ancle-joint besides club-foot, which call attention to them, which have been termed analogous distortions, and will require such treatment as the nature of the case demands. It is quite impossible to form any notion of what should be the treatment without strictly investigating the case, its cause, and mode of increase, but it is presumed that sufficient has been said already to enable the reader to form some judgment of a proper plan of treatment, after we have cited a few cases.

A little boy, three years of age, was admitted into the Middlesex Hospital under my care, in the year 1843, with club-foot. The mother of the child stated that the child was born with the foot contracted, but that it had increased in its deformed appearance of late; she was very anxious to have

something done to relieve it, was very willing to allow any operation to be performed upon it that was likely to restore the use of the ancle and foot. My friend Mr. Edward Lonsdale requested permission to divide the tendon of the Tibialis Posticus, to which I readily consented. This tendon he took an early opportunity of cutting through in a very expert manner, but in doing so, the artery was also divided, a matter of no consequence, as it was very easily compressed. This case was perfectly successful, but the success was mainly owing to the considerable interest taken in it by Mr. Lonsdale, who was unceasing in his attention to the treatment. He clearly pointed out to the students how the tendon could be stretched, after union had occurred to a certain extent.

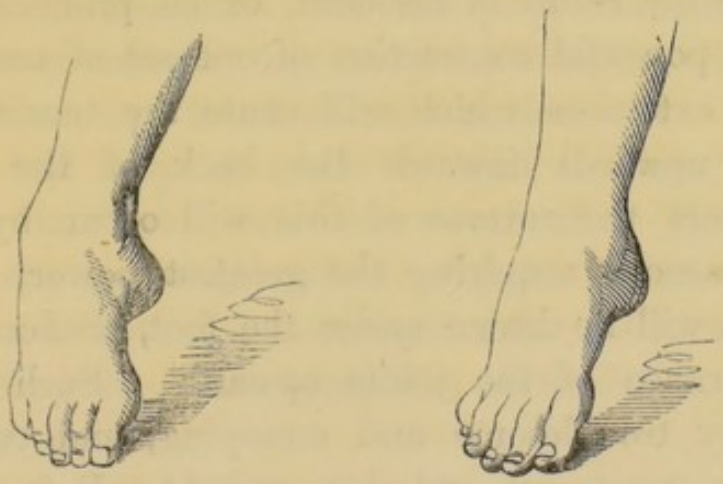
Another case was admitted under my care, which was equally successful, where I divided the Tendo Achillis, but the after-treatment of this case required very great care and much perseverance, but by continued assiduity the cure was accomplished.

Miss C——, a young lady twenty-four years of age, when two years and a half old, lost the use of her left leg and foot from teething, and ever since it has been weak and almost useless, she having no strength in the foot or ancle. Two years and a half since the Tendo Achillis was divided, and the foot was brought in a better position by the use of instruments, which have been worn in walking ever since. April 3rd, 1849, she presented herself for my opinion, and when I examined the foot, I found it

cold with a languid and very feeble circulation. She said she had no perspiration in it. She could feel anything when it touched the foot, so that sensation was complete, and some degree of mobility, but the ancle felt very flabby and loose. Upon examination, the muscles of the calf were soft, pappy, and much higher than their natural situation, and the whole of the leg below the knee had a soft and unhealthy feel. When the electro-galvanic spark was applied she could not at first feel it in the foot or leg, and it was only after the sparks were passed from the hands and arms that she found any effect from it in the leg. At the end of the first week the leg was measured, it had increased in size to the extent of half an inch at the calf, three-eighths of an inch at the centre of the leg between the calf and ancle, and two-eighths of an inch at the foot. The leg was much changed in its whole appearance—it had lost its flabbiness, and the muscles could be distinctly felt to be firm, giving a degree of healthy resistance to the application of pressure. The electro-galvanic spark produced convulsive involuntary action over all the muscles; but the extensors appeared to resist the action of the sparks. The ancle had improved in many respects —it was firmer, the ligaments had contracted, and there was less disposition to flexion of the foot; but the extensor tendons could not be distinguished by the fingers. The sparks were therefore principally passed through those muscles, which produced con-

vulsive action of the flexors nearly to the same degree as if the sparks were directed along the course of the nerves that supply those muscles. The heat of the leg and foot had increased, and she felt some pain in it, which she had not done before for some time. At the end of the second week there was not so great an improvement in the leg, in regard to the increase of size, and this was more perceptible at the upper part; but a greater improvement had taken place below the calf and in the foot; but still the foot hung down when she attempted to walk. A bandage was now applied round the ancle, which caused her to feel a greater degree of support. At the end of the third week, and after twenty applications of the electro-galvanism, the size of the leg had increased at the calf nearly to the extent of an inch, and between the calf and ancle a full inch; the foot had also increased to the same extent, and the ancle improved; but still the extensor muscles could not be observed to act by the strongest force that she could bear of the electric spark. Electro-galvanism was now daily applied, and its strength increased to a degree that she could bear; but still the tendons of the extensor muscles could be felt indistinctly, and there was a convulsive action of the extensor muscles to be noticed at the upper part of the leg, in the Peronei muscles particularly, but the Tibialis Anticus could not be seen to act, nor could its tendon be at all satisfactorily felt. The heat of the

foot had considerably increased, and perspiration was observed on the plate, after the application of the electro-galvanic current. The whole want of power and the turning out of the foot, clearly appeared to result from the want of action of the extensor muscles; so that my object was to excite them to a proper power, by directing the sparks through those nerves that were distributed upon them. She had complained of much pain and weakness in the hip, not in the joint, but above it, at the Sacro-iliac Syncondrosis, also a grating sensation in the ancle, and the latter could be detected by moving it; but both these inconveniences were removed a few days afterwards, the sensation in the ancle no doubt resulting from insufficient synovia. The power of the extensor muscles gradually increased, and she could walk to my house and back, a distance of a mile and a half, without any instrument.



This plate represents the foot of this patient before and after treatment.

The interesting part of this case, was the paralysis of a single set of muscles, and the power the electro-galvanism had over the flexors when the sparks were applied to their antagonists; it was also interesting to watch the gradual progress of the muscular contraction of this set of muscles during the period when the current passed through them; at first the convulsive action was feeble, but this gradually increased, and a daily improvement was evident. It was some time before the power of the extensor muscles could be acquired; but then, when we consider these muscles had never acted for twenty-two years, it ought not to excite astonishment that it required some time to repair, or bring into action, a set of muscles and nerves that had been dormant for so long a period.

Contraction of the toes and the distortion of the great or other toes, sometimes cause considerable inconvenience to patients, and such contractions may be the result of accident, or be produced by the too powerful contraction of one set of muscles, as the extensors, which will cause the toes to be drawn upwards towards the back of the foot. Sometimes the reverse of this will occur by the flexor muscles acquiring the greatest power, when the toes will be drawn under the foot, producing a protuberance of the joints upwards. Such cases are very troublesome and annoying, and require judicious treatment and management. Before any plan be recommended, the cause of the abnormal condition of the part should be fully investigated,

as its removal will considerably influence the position of the toes.

Case of contraction of the great toe, relieved immediately by spinal support.

J. B——, aged about fifty-six, 1860, butler in a gentleman's family, had a contraction of the great toe of the right foot when walking, which had existed for two years. His history of the case was, that having an attack of sickness, he one night got out of bed and stood at a sink on a stone or brick floor; the next morning the great toe was very much inflamed and excessively painful. It continued to be much swollen for some time, and was treated with hot fomentations until the swelling disappeared. At first he could scarcely stand on that foot; but when he began to walk, the first phalanx of the great toe was drawn up and nearly doubled under the second. He could, however, put his foot flat on the ground when he stood upright. It may be imagined that the pain endured must have been excruciating, and from being a stout man he became very much reduced in size.

He had a splint made to bind the toe firmly on to it, but could not wear it. He tried electricity and galvanism without effect. He also took several electro-galvanic baths without succeeding in overcoming the contraction of the joint of the toe.

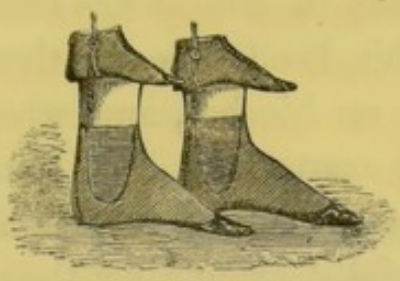
On examining the spine, there was no apparent departure from the natural form when he stood erect; but in walking he stooped very much and

leaned over to the right side. It was merely as an experiment that the spinal support was tried, and immediately it was adjusted he could walk with perfect ease without any contraction of the toe.

In speaking of deformities of the lower extremities, we must not omit to mention the non-development of the legs in dwarfish persons, and the relief that may be afforded them. In the *Lancet*, of February 27th, 1858, the following case is reported, and is of great interest, as the plan has been followed by others, and the lady mentioned has been heard to declare that "she would not return to her former height for the world."

A Pair of Artificial Feet to make a Woman Taller.

The lady for whom the above were made, being only three feet ten inches high, whose legs and feet have never grown since an accident in childhood, but in other respects being perfectly formed, long had the wish to appear of more natural height, to escape the too general observation which her low stature caused. She applied to several mechanicians at home and on the Continent without effect, and came at last to Mr. Pratt, the instrument-maker, of Oxford Street, who has succeeded in adding nearly eight inches to her height, making her appear, in fact, four feet six inches, and which accords with her figure admirably.



The engraving represents the manner in which the lady's feet are disposed of, the boots being rivetted on to a steel plate, to which is attached two steel supports, with joint at the toes to keep them off the ground in walking, the supports being filled in with cork, and fashioned to represent the natural feet, on which a pair of boots or shoes can be put at pleasure. After walking on the supports nearly three months, the lady writes—"I am more and more pleased with the supports every day I wear them. I can walk or ride on horseback the same as ever."

Tumours.

It has already been stated that deformity consists of a loss of the symmetry of any part of the body, and, as tumours generally cause the external parts to become deranged in their shape or natural appearance, the formation of a tumour will occasion deformity. Our limits will not permit us here to enter into the variety of these preternatural enlargements or growths, but we shall merely consider the mode of relieving such morbid productions.

Encysted Tumours frequently make their appearance upon the scalp, and as they are generally unattended with pain, they do not call the attention of the person to them until they occasion some inconvenience.

A gentleman consulted me in the year 1845, respecting five tumours on his head, one of these prevented him from putting on his hat, and when he succeeded in doing so, it occasioned him some little pain, he therefore wished my advice respecting them. I told him upon carefully examining them, that the only successful plan would be to remove them by excision, and as he consented to remain in town, they were dissected away, and he was quite well in a week afterwards, having submitted to the inconvenience for eleven years previously.

Another gentleman consulted me, with a tumour on the outer part of the upper eyelid, which was completely cured by the application of the nitrate of silver.

A gentleman consulted me with a tumour behind his ear, which was also completely dislodged with the nitrate of silver, by the suppurative process.

A gentleman had one of these encysted tumours on the upper part of the forehead, about the size of a pigeon's egg. Nitrate of silver was applied to it, which produced ulceration, and in a short time he was quite cured.

A gentleman had one of these encysted tumours on the upper part of his foot, which was very troublesome, and prevented him walking. I employed nitrate of silver to this swelling, and completely cured it by absorption.

Successful results have followed in several other cases by the application of escharotics to tumours upon other parts of the body, and several of these

swellings have been removed by applications of the preparations of iodine, accompanied with the use of electro-galvanism. It is far better to cure these swellings without an operation, than by the aid of the knife; but on this point I have had to contend with the opinions of several of my professional brethren, who have entertained different views, and who, even after the tumours have been cured by local applications, have not been convinced of the justice of my remark.

A gentleman had a tumour on the upper part of the pectoral muscle, which rapidly increased, and he was anxious to get rid of it as quickly as possible. It was extirpated, while he was under the influence of chloroform, and healed rapidly.

The formation of Nævi may be removed very frequently by pressure, particularly if they are situated upon the scalp.

A young lady, three years of age, had a nævus cured by the application of a piece of lead on the swelling, and afterwards by a ring placed around it, which caused it to ulcerate; the pressure of the ring cut off the nourishing vessels, and so cured the tumour.

A little child had two nævi, one on the forehead and another on the back of the occiput. Two pieces of lead were applied to these, and kept on by an elastic band, until they were quite well; this case was seen by my friend Mr. Horton, of Fulham.

The application of equal parts of sulphate of zinc and flour, made into a paste with water, applied over

the swelling, will be found most useful. Where tumours are of a soft character this paste dries them up, when a poultice will remove the hardened texture and the wound be healed. Cancerous growths may in this manner be destroyed, and should the first application of the paste not remove the whole of the diseased structure, the paste may be applied again, until all the disease be eradicated; the ulcer may then be dressed with the Stramonium Ointment until it becomes cicatrized. Should the cancerous disease again make its appearance, the same application will destroy the malignant structure, and the wound may be again healed. Cancerous disease has been in this manner successfully healed on more than two successive reappearances of the cancer. The application of the Stramonium Ointment gives ease, and tends to heal all ulcerated surfaces quicker than any other ointment, and is a most valuable preparation.

In conclusion, permit me to state that I am fully sensible of having omitted many cases of deformity to which the human frame is subject, and some have been added that perhaps do not agree with the title of this work—viz., in the relation they bear to spinal debility. Yet, as the cases recorded possess features of novelty and interest, I could not refrain

from inserting them; hoping, by their relation, that some poor sufferer may be benefited, and conscious that our Profession seek eagerly the best means to relieve pain and suffering, wherever it may be presented.

THE END.

H. SILVERLOCK, PRINTER, WARDROBE TERRACE, DOCTORS' COMMONS.

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