

Pathological and practical observations on spinal diseases / by F.P.B. Pickthorn.

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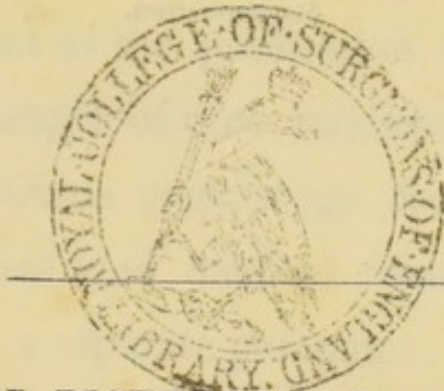




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PATHOLOGICAL
AND
PRACTICAL OBSERVATIONS
ON
SPINAL DISEASES.



By F. P. B. PICKTHORN, Esq., SURGEON.

LONDON:
PUBLISHED BY J. CHURCHILL, 10, CARLTON-STREET,
WATERLOO-PLACE.

MDCCCXXXI.

PHYSIOLOGICAL
PRACTICAL OBSERVATIONS

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LONDON:
PUBLISHED BY J. JOHNSON, ST. PAUL'S CHURCH-YARD.
1825.

P R E F A C E.

THE following remarks, or facts and observations, form part of the introduction to a work upon Spinal Diseases, which the Author has long been preparing for the press ; but as the publication is unavoidably delayed by the length of time required for the production of the various engravings, &c., he has been solicited by several kind medical friends to publish these remarks in a separate pamphlet ; and the haste with which they have been prepared for the press, it is hoped, will be some excuse for the inaccuracies and crudities which it is feared abound in them. As the intention of the Author is to show that a class of diseases, as yet considered intractable, almost exclusively treated by means of machinery (subjecting its victims to most unwarrantable processes), may be removed without the aid of such measures, it was thought that the sooner the treatment was made

known, the earlier would benefit accrue to those most concerned; and if, by this hasty sketch (although the Author prove his own incompetency as a writer), one individual be prevented from becoming the victim of the quackery exposed, he will not have written in vain.

June, 1831,

5, *Suffolk-Place, St. James's.*

PATHOLOGICAL AND PRACTICAL
OBSERVATIONS,

&c.

OF all the deviations from health incidental to the animal frame, none are of more importance, whether considered immediately or remotely, than the diseases of the spinal column. These maladies have, within the last half century, increased so alarmingly, that practitioners are now constantly called upon to point out the mode of their prevention and cure; but although of every-day occurrence, the subject has as yet been but partially considered by the profession. Innumerable works are published on every other branch of surgery, but to this day there is not any standard work of reference which clearly defines these various and important maladies. On the contrary, no two even of the few publications on this subject, agree either in the de-

scriptions of the diseases, or in the modes of cure. On a bien étudié quelques-unes des maladies qui lui sont propres, mais on n'a pas jeté un coup-d'œil sur leur ensemble; et c'est là précisément ce que je me propose de faire dans cette ouvrage.

Meanwhile this neglect by the profession has (as might have been expected) allowed a fair field for the daring empiric to reap a plentiful harvest. This state of things is said to be the result of the deference paid to the opinions of the late Mr. Pott. Fortunately for the cause of science and humanity, the devotion to great names and authorities is fast fading away, and, with an 'enlightened public opinion,' more cheering results may be expected. But although a great outcry has been raised against Mr. Pott, a candid examination of his opinions will satisfactorily prove, that he made a very proper distinction between the disease which he described and those arising from different causes, which, however, have been confounded by his censurers, as I shall have occasion to prove. Mr. Pott, in describing disease of the spine, merely mentioned one species, namely—curvature and loss of power in the lower limbs, from '*caries*,' or de-

struction of bone and cartilage; and his mode of treatment was well calculated to obtain the object he had in view, namely— ankylosis, and, of a consequence, confirmed and unalterable deformity. But although this gentleman made use of caustic issues, &c. in the frightful complaint which he so well described, he at the same time distinctly pointed out the difference between caries and curvatures, from other and less terrible causes. That innumerable cases of distortion have been treated after Mr. Pott's plan, where not the slightest disease of bone or cartilage existed, there remains not a doubt; but if so, to the persons using such means, to their want of discrimination, must the blame be attached, and not to Mr. Pott, who, as by his own relation I shall prove, merely pointed out a plan of cure, which he had found successful in paralysis of the lower limbs, the effect of destruction of the bones of the spine, and producing one peculiar kind of distortion! Now, as the gist of the matter depends on a marked distinction between the disease described by Mr. Pott and the curvatures from other causes, I shall here insert at length his opinions, in order to allow the reader to judge

for himself, from the evidence before him. Thus he says when describing the disease :—
‘ To this complaint both sexes and *all* ages
‘ are equally liable.

‘ If the patient be an infant, it becomes an
‘ object of constant though unavailing distress
‘ to its parents; if an adult, he is rendered
‘ perfectly helpless to himself and useless to
‘ all others.

‘ The disease of which I mean to speak, is
‘ generally called a palsy, as it consists in a
‘ total or partial abolition of the power of
‘ using, and sometimes of even moving the
‘ lower limbs, in consequence, as is generally
‘ supposed, of a curvature of some part of the
‘ spine.

‘ Thus the patient complains of being very
‘ soon tired, is languid, listless, and unwilling
‘ to move much, or at all briskly; in no great
‘ time after may be observed frequently to
‘ trip and stumble, although there be no im-
‘ pediment in his way; and whenever he at-
‘ tempts to move briskly, he finds that his
‘ legs involuntarily cross each other, by which
‘ he is frequently thrown down, and that
‘ without stumbling. Upon endeavouring to
‘ stand erect without support, even for a few

‘ minutes, his knees give way and bend forward, &c.’

‘ I have, in *compliance to custom*, called the disease a palsy; but it should be observed that notwithstanding the lower limbs be rendered almost totally useless, yet there are some essential circumstances, in which this affection differs from a common nervous palsy.

‘ While the curvature of the spine remains undiscovered or unattended to, the case is generally supposed to be nervous, and medicines so called, with warm liniments, embrocations, and blisters to the parts affected, are used; and when the true cause is known, recourse is had to *steel stays*, the *swing screw chair*, &c., and the general health of the patient *does not seem at first to be at all affected*; but when the disease has lasted some time and the curvature increased, many inconveniences and complaints come on, such as difficulty of respiration, indigestion, pain, and what they call tightness of the stomach, obstinate constipations, purgings, involuntary flux of urine and fœces, with nervous complaints, some of which are caused by the

‘ alteration of the cavity of the thorax, and
 ‘ others seem to arise from impression made
 ‘ on the abdominal viscera.’

After describing ‘ caries ’ most minutely, he further states :—

‘ That he had never seen this paralytic ef-
 ‘ fect in the legs from a malformation of the
 ‘ spine, however crooked such malformation
 ‘ might have rendered it, or whether such
 ‘ crookedness had been from time of birth, or
 ‘ had come on at any time afterwards.

‘ That none of those *strange twists and de-*
 ‘ *viations* which the majority of European
 ‘ women get in their shapes, from the very
 ‘ absurd custom of dressing them in stays
 ‘ during *their infancy*, and which put them
 ‘ in all directions but the right, ever caused
 ‘ anything of this kind, however great the
 ‘ deformity might be’ !!!

And again,—‘ That the curvature of the
 ‘ spine, which is accompanied by this affection
 ‘ of the limbs, whatever may be its degree or
 ‘ extent, is at first almost always the same,
 ‘ that is always *from within, outward, and sel-*
 ‘ *dom or never to either side*’ !!

‘ That the smallest curvature, in which

‘ only two or three of the vertebræ were con-
‘ cerned, was always at first attended by the
‘ same symptoms as the largest.

‘ That although it sometimes happened
‘ that a smart blow or a violent sprain had
‘ immediately preceded the appearance of the
‘ curve, and might be supposed to have given
‘ rise to it, yet in many more adults it hap-
‘ pened that no such cause was fairly assign-
‘ able, and that they began to stoop and to
‘ falter in their walking, before they thought
‘ at all of their back, or of any violence of-
‘ fered to it,’ &c. From this description it
is evident that Mr. Pott not only expressly
described ‘ caries’ of the spine and its conse-
quences, but that he pointed out the difference
between the symptoms attending it, and these
twists or deviations from other causes. Again,
upon examination of the bodies of persons
dying from the complaint described, he also
found that the ‘ corpora vertebrarium were
‘ completely carious, the intervening carti-
‘ lages destroyed, and a quantity of sanies
‘ lodged between the rotten bones.’ And
further he says—‘ All these circumstances put
‘ together, induce me to suspect that when we
‘ attribute the whole of this mischief to the

‘ mere *accidental curvature of the spine*, in
‘ consequence of violence, we mistake an ef-
‘ fect for a cause,’ and that previous to the
symptoms described there was a predisposing
cause.

Thus Mr. Pott made a just pathological
distinction; not so his followers: we shall find
them censuring this eminent surgeon, but
applying indiscriminately their methods of
cure to diseases arising from totally different
causes. This fact was observed and recorded
by Mr. Brodie*. ‘ Nevertheless I am satis-
‘ fied that these different kinds of curvatures,
‘ arising from totally different causes, have
‘ frequently been confounded with each other;
‘ and that some of the cases which have been
‘ published as examples of caries of the spine,
‘ and in which it may at first be a matter of
‘ surprise that so complete and so speedy a
‘ cure has been effected, have, in reality, been
‘ cases of an entirely different malady.’

There remains not a doubt, as I shall have
occasion to prove, that diseases of totally dif-
ferent character *have been* confounded, and
of necessity the treatment indiscriminate, and
often extremely injurious; a short history of

* See Brodie on Diseases of the Joints.

the different modes and opinions may answer a useful purpose. For many years Mr. Chesher, of Hinkley, engrossed the greater share of this practice; this gentleman applied *indiscriminately* to his patients a cumbrous steel apparatus, of about fourteen pounds weight, with the avowed object of lengthening the spinal column, and thus removing the distortion, from whatever cause arising. This instrument, called a 'collar,' was constructed so as to allow of great extension and elongation of the spinal joints; he also ordered partial recumbency and exercises of different kinds; but his main dependence was upon the *extending apparatus*, which, as I shall most clearly prove, he applied indiscriminately and injudiciously to most of his patients. One of this gentleman's failures came under my notice, and in relating the case hereafter, it will be seen that he was completely ignorant of the pathological distinctions of the diseases which he treated, and had overlooked Mr. Pott's diagnostic symptoms. Again, we have Sir James Earle publishing his opinions, and advocating the use of machinery; and Mr. Baynton, of Bristol, who published the results of thirteen cases,

which he treated in a particular manner, namely, by undeviating recumbency. This gentleman appears to be consistent, as his cases were all species of caries, to which he confined himself; but it is to be lamented that he did not point out the distinction between these cases and distortions from other causes. The profession, however, are indebted to Mr. Baynton for a great improvement in the treatment of caries; and it has been since proved that one part of his method is very useful in the treatment of other, but less terrible distortions. Thus he says—
‘ Resting in the horizontal position is as effectual in improving circulation, favouring the *deposition of bone*, and promoting absorption, as it is *in preventing pressure*, and allaying pain.’

This gentleman attributed all his success to confining his patients to *undeviating recumbency*, which was persevered in till the cure was complete. And in the treatment of ‘caries’ it appears to be one of the best auxiliaries for the relief of that formidable disease; at the same time it is amusing to find Sir James Earle publishing to the world directly opposite notions. Thus, he says—

‘ I need not observe how irksome this must
‘ be (the horizontal position), how it must
‘ tend to relax and weaken the patient, and
‘ consequently to retard the cure; seeing it
‘ only in this light, it must be acknowledged
‘ that any means which would render unne-
‘ cessary this severe and unhealthy process,
‘ must be desirable and advantageous.’

Thus, if these authors are describing the treatment of the same diseases, the one cures all his patients by a process which the other affirms only *retards* their cure. As we proceed in the inquiry the same mystification prevails; and to this undefined state of things we may look for the practice falling into the hands of stiff-stay and instrument-makers, and quackery of the worst description. I shall make extracts from the published works on the subject, in order that the reader, by a *coup-d’œil*, may see the diversity of opinions existing on this very interesting subject.

The profession are indebted to Mr. Cope-land for some remarks on these diseases. In describing the disease, we find him saying that—‘ The diseased spine is to be consi-
‘ dered as a complaint of bone or ligament,
‘ with respect to its cure; but most of its

‘ symptoms are derived from a disturbance to
‘ the functions of the nerves, which are de-
‘ pendent on the spinal marrow for their in-
‘ fluence*.’ Again, we have Mr. Ward, in
describing lateral curvature of the spine,
informing us that the ligaments are in fault;
thus—‘ That the disease which forms the
‘ subject of my present inquiry does not af-
‘ fect the bony structure of the vertebræ, from
‘ which I shall hereafter distinguish it, but
‘ is *confined to the parts connecting them*, and
‘ is in its consequences no less injurious to
‘ the general health and happiness of the in-
‘ dividual.’†

We have also a physician engrossing a large share of this practice, and who claims to himself the invention and introduction of a novel plan. As one of this gentleman’s failures was the cause of my devoting my attention to spinal maladies, I shall give three of his best published cases at length, and shall leave the inquirer to judge for himself. The first case published is of a lady, about twenty-six years of age when she applied, who had,

* Observations on the Diseased Spine, by T. Copeland, Esq. 1815.

† Practical Observations on Distortion of the Spine, &c., by W. T. Ward, Esq. 1822.

in the year 1817, spent six weeks in a constant round of fashionable amusements, and complained of great and long-continued weakness and uneasiness in her back; upon examination, the third, fourth, fifth, and sixth dorsal vertebræ were much displaced, and *projecting backwards* in the form of an arch: on slightly touching the skin on the right side near the projection, she suffered a painful sensation, which, however, left when greater pressure was used; and with other troublesome sensations, such as 'tightness across the chest, fainting from slight exertions,' &c. Had first discovered the disease of the spine, about six years previously. In 1817, from the dissipation above mentioned, all the symptoms increased. A physician and surgeon of the greatest eminence in London were consulted, who advised caustic issues, in order to obtain ankylosis, and afterwards the recumbent plan of Mr. Baynton (which, however, was not strictly followed), for fourteen months. The physician alluded to was led to suppose, in these cases, that neither disease of bone nor cartilage existed, but that the disease was '*wholly confined to the connecting ligaments of the vertebræ.*' In this

case, recumbency, frictions, manipulations, &c. from about November 1818, to September 1819, produced so much improvement, that the patient was allowed to walk about the room for half an hour daily, and her general health extremely good; but is afterwards said to have had severe illnesses, and in March, 1827, *from 'inattention to the prescribed rules, the vertebræ protruded again' !!!*

I pursued, says this gentleman, the same practice with four others, and was eminently serviceable to them all, (we are not told if they were cured.) In other cases—*'The following spring I had a stuffed wooden shield placed upon the back and under the belt, to increase the pressure; about this time I began to operate on the projecting vertebræ with a metallic instrument, imbedded in soft leather, to prevent the skin from being bruised; over and above these contrivances I now employed a steel machine, constructed upon the principle of a windlass, to draw out the spinal chain, and place the vertebræ further apart from each other. Steel shields have lately superseded, in many instances, those formerly in use, because metal can be fashioned with greater exactness than wood,*

‘ is firmer, and sits closer to the parts intended to be acted upon’ !!

The next case published as successful, and where this treatment alone was used, is of a female, of the age of thirty-six, who applied for advice, having, ‘ *twelve years before, fallen down stairs, and to which she attributed her malady.* Upon examination, all the ‘ dorsal and lumbar vertebræ, more or less, ‘ were found out of their proper places ; the ‘ dorsal and all the lumbar bones combining to ‘ form a considerable *posterior and lateral curvature* towards the right. This person, ‘ we are told, submitted to the treatment,’ viz.—undeviating recumbency, with frictions, elongations, and manipulations, &c. &c., from December 1821, to August 1822. At the end of this time, she was allowed to walk a short time every day, was taller and much improved in appearance, and subsequently got quite well. The next case, *also published as a successful one*, came under my notice in the following way :—About three years ago, having been called in to attend a servant in a family, who had been seized with apoplexy, the case having been successfully treated, and the patient soon restored, the author

was, in consequence, requested to see a lady who was lodging in the house, who had for many years been afflicted with a spinal disease, and I was, accordingly, introduced to a lady about thirty-nine or forty years of age. She informed him that she was afflicted with a lateral curvature of the spine, which had been observed since the age of ten years, when her right shoulder was perceived to be higher than the other; and, upon examination, a slight lateral curve was perceived: she had never had symptoms of diseased bone or cartilage, but merely the curve from other causes. At the age of sixteen, when enjoying good health, she became Mr. Chessher's patient, and commenced wearing the 'steel collar,' which conveyed the weight of the head upon the hips, and acted with pressure below the loins by means of various steel plates attached to the lower division of the collar. This practice, with occasional recumbency, the use of the neck swing, reclining bed, &c., were used to the age of thirty, without avail, the distortion having gradually increased. Sometime after, in 1824, she said she had consulted the physician alluded to; and, under this gentleman, had

submitted to perpetual recumbency for several years, and had, in fact, followed implicitly his directions. As the author was not then aware of the plan adopted by this gentleman, he begged of her to explain the mode of treatment, which she did in the following way :—

The treatment consists in the daily use of frictions applied to the spine and parts adjoining, added to which operations are performed in the following manner :—‘ Being thrown over on the face, my shoulders are fastened by means of strong straps to the head of the crib; a sort of gaiter is then fastened to either ankle, and, by means of strong straps, are made to communicate with an *iron windlass*, which is fixed to the lower end of the crib, and by means of which *great extension and elongation of the spinal joints is produced*. Over and above this extension, the operator, with an iron instrument resembling a boot-hook, makes pressure against the curvature during the time the elongating process is continued; and these processes are continued for an hour or more when I can bear them. After the operations are concluded, I am thrown over again, and lie upon

a *steel shield, fashioned to my deformity*, which is fastened by a tight bandage. I also wear a bag containing several pounds of shot on my right shoulder ! I have also taken every sort of medicine, and the result, said I, is that my spine is lengthened four inches.' And the reason for the author being consulted? The reason for my being called in, she said, was to consult me as to what could be done for the extreme debility which had been produced by these processes ; more especially as the gentleman who had been attending her now appeared to consider her case hopeless, and seldom visited her. Her appearance at this interview defies description ; to such extent had the debility gone, that the eye-lashes had ulcerated away, and the gums receded from the teeth, reduced to skin and bone, with frequent fits of syncope, bilious attacks, extreme torpidity of bowels, distressing cramps, and aching pains in the lower extremities, which were constantly cold, and bathed in a clammy moisture,—without appetite, sleepless nights, and a train of distressing nervous symptoms past description : she merely existed, and appeared, as was considered by her friends and relations,

sinking rapidly into the grave; indeed she said, that so many and so great were her sufferings, that she prayed heartily for relief, by a removal from this world to a better—that, after submitting to this treatment for twelve months, she had been prevailed upon to write her case in consequence of being led to believe that her deformity would eventually be quite cured; but that she now regretted extremely having done so, fearing some fellow-sufferer might be induced, from its perusal, to submit, and be disappointed as she was. After two years' determined and assiduous attention, but not till after extreme difficulty, this lady was sufficiently recovered in general health to be enabled to leave her couch, and rejoin her family circle (and being the daughter of a highly respectable medical man, she still has the best advice), but remains deformed, and is obliged constantly to wear a support of about ten ounces weight, which was made for her to prevent nervous pressure, in consequence of the debility of the spinal joints. I merely state facts as they were stated to me, and as I found them, and shall make no further comment upon this mode of practice at present, but leave

the profession to judge whether the same treatment is likely to be proper in a case where debility, from early childhood, was the sole cause of the deformity, as in a case such as the one enumerated before this, where external violence, namely, 'falling down stairs,' was avowedly the cause.

That any one plan of treatment may be applicable to all distortions of the spine, is a most dangerous error to fall into. For instance, there is an appearance of distortion produced by paralysis of that part of the trapezius muscle which supports the shoulder, and where the shoulder drops and an apparent distortion of the spine is remarkable. There may be also distortion produced by destruction of one lung, &c. It sometimes happens from a rheumatic attack, &c. (but it is unnecessary to multiply instances) ; but surely we should not have recourse to the pulley and the windlass in such cases, nor to undeviating recumbency, &c. Upon proceeding in the inquiry, we shall find the most opposite opinions expressed by writers on this subject. The late Mr. Shaw devoted much of his valuable time to the consideration of these diseases. Mr. Shaw's notions are published, and

from them we may gather much valuable information. If this gentleman had been spared, doubtless he would have gone on to describe the diseases of the spine more fully. Mr. Shaw almost confined himself to the description of lateral curvature, his description of which I believe to be the best extant; but up to the time of Mr. Shaw's publication, the most conflicting opinions existed:—for instance, we have been told by one that the disease must 'be considered as of bone and ligament;' by another, that the disease is 'wholly confined to the ligaments;' and by a third, 'that the parts connecting the bones are in fault;' and by Mr. Shaw, that 'the change in the state of the ligaments is rather the consequence than the cause of the complaint;' and by others, that to muscular debility alone are we to ascribe the cause of the malady, &c. With such varied opinions respecting the causes of the disease, it is not perhaps to be wondered at that the modes of treatment are equally opposite; for instance, the author has a patient now under his care who was first advised (for a lateral curvature) the use of the iron stays, and the frequent use of the warm bath, which was to effect the

cure: finding but little benefit, she applied to another gentleman, who has much of this practice, and who recommended that she should not even wear the common stays, but wear a very loose dress, and avoid anything tight, to use dumb bells, and various exercises, &c.* Finding the deformity increase, she applied to the late Mr. Shaw, who recommended her to lie down several hours daily, on an inclined plane, with weights attached to her person, so as to allow of considerable extension, with exercise of the muscles of the concave side, which was to be effected by rubbing tables, &c. and the use of an instrument calculated to support the trunk. Not perceiving much alteration under any of the plans enumerated, she, in despair, applied to the author, and is at present under his care; and as the history of the case is extremely interesting, it will be an-

* Under the name of Calisthenic Exercises various evolutions have been practised, which tend rather to the producing deformity than to lessen or prevent it. These exercises, however, when first introduced, and as they are now taught by Mrs. Georgi, are well calculated to develop due muscular power, and have only to be seen to be admired and approved of; but not content with this, there has been a rage for evolutions rather calculated to elucidate the work of the wrestler, as described by Celsus, than fitted for the pursuit of reasonable beings: thus we hear of young ladies being taught to spring at weights, &c. &c.

nexed. But here it should be remarked, that three of the most opposite modes of treatment were had recourse to on the same patient: the one, casing the muscles, and rendering them useless, by the iron stays; the second, endeavouring to strengthen the muscles, forbidding stays of any sort, but at the same time hanging a weight (the dumb bells) upon a spine unable to bear the superincumbent pressure of the head and upper extremities, &c.; and the third combining the use of machinery, extension, and recumbency. Again, another young lady, after trying several plans, sought the advice of an eminent surgeon in London, in consultation with the author: recumbency had been ordered, and stiff stays. This gentleman trusted to the use of the shower-bath, tonic medicines, and the use of warm liniments applied to the back: although some benefit to the general health was derived from this plan, she was obliged to have recourse to other means, which eventually had the desired effect. In enumerating these cases, the object is to impress upon the profession the necessity that exists for a revision of the opinions on this subject. For the anxious

parent, ignorant of the cause of the deformity, anxiously consults the usual medical attendant; but from the diversity of opinions existing he is cautious of giving advice, for on one side he hears such a plan is useful, while on the other a totally opposite plan is recommended.

While such inconsistency prevails, it is not to be wondered at that the treatment of these maladies is almost confined to a host of machinists, &c.; and until more definite notions prevail respecting the pathological distinctions of the different diseases, little alteration may be expected*.

The baneful effects produced by the indiscriminate use of machinery, which may be traced to the institutions in France, are now but too well known and appreciated, and a desire to find out a mode of cure which would render the use of such means unnecessary, induced the author to undertake the treatment of a very bad case of lateral distortion,

* The author having heard that some exercises which are taught in the metropolis were useful in the prevention and cure of these maladies, requested the opinions of three eminent practitioners in surgery in the metropolis: by the first he was assured that they (the exercises) were most admirable; by the second, that they were extremely pernicious; and by the last, that they were entirely useless.

with a determination to avoid the use of machinery of any sort in the treatment of the case. The result was the most complete success, upon a plan the most simple. The treatment of the case, and the facts and observations gathered in its progress, will best explain the author's notions; and in concluding this part of the inquiry, it will be remembered that no discovery has ever been made in science but what has been simple, so simple indeed that we wonder it was not made before.

INQUIRY INTO SOME OF THE CAUSES OF
DISTORTION.

As it would be impossible, in the limits of a pamphlet of this description, to enlarge upon the anatomical peculiarities of the numerous parts, structures, and functions concerned and implicated in these maladies, and as, moreover, their relative importance is familiar to professional readers, an anatomical display at best, in these days, but a compilation, will not be expected. Suffice it, then, in this place, that we bear in mind that the twenty-four bones called vertebræ, forming the spinal chain with their peculiar forms and character, and beautifully constructed joints, so well supplied with powerful ligaments, &c., are, in a healthy subject, admirably calculated for the important duties imposed upon them; in truth, the work of an 'unerring Creator.' Hence we have this beautiful pyramid supporting on its summit the bony brain-case, with its massy contents, forming a safe and commodious channel for the elongation of the brain, called spinal marrow, allowing safe egress to the numerous pairs of nerves issuing

through appropriate foramina, with bony channels for important blood-vessels, which pass to the seat of sensation ; articulating surfaces for the twenty-four ribs, from which hang the weighty superior extremities, inferiorly connected with the sacrum, and connecting the bones of the pelvis ; and lastly, the numerous and important sets of muscles so wonderfully adapted for performing the various movements and attitudes over which they have control ; besides which, it should be borne in mind, that from the spinal column hang the important contents of thoracic and abdominal cavities, including the heart, lungs, blood-vessels, nerves, and voluminous abdominal viscera, &c. ; but although these duties, so varied and so important, are to be performed, the Creator, in forming man after ' his own image,' made him perfect and capable of performing with ease the various functions of his body.

Hence, many of the diseases from which we suffer, and particularly those affecting the spinal column, are found to be the result of the changes produced upon our bodies by the reputed usages of society or civilization ; and, upon examination, it will be seen, that the

usual modes of education in civilized countries are more instrumental in the production of bodily and moral evil, than a state of ruder nature ; and the first link in the chain of causes is the dereliction of bodily exercise. For example, in a ruder state of nature, youth of both sexes, from their earliest days, were accustomed to bodily exercise in the open air ; and, with the due exercise of their muscular powers, so beautifully constructed for action, grew up in health and strength, their various functions ‘growing with their growth, and strengthening with their strength ;’ but, by the usages of society, a directly opposite state of things is inculcated : instead of gambolling in the open air, youth of both sexes (but more especially the higher class of females) are confined, during the greater number of hours in the day, to wearying, sedentary pursuits, and physical restraint ; and, in the few hours allotted to exercise, are to be seen parading in files, or lolling in carriages. If allowed to walk, merely using the muscles absolutely required for locomotion—for, being cased in tightly-laced stiff stays, with the idea of supporting the body, (the males in these days make use of these baneful contrivances),

the muscles of the back, and chief muscles of respiration, from disuse, become comparatively useless, for the stays and belts compressing the upper part of the abdomen prevent the descent of the diaphragm, and consequently compel the performance of the important function of respiration by the thoracic muscles only. I shall here insert a few extracts from the valuable work of Professor Bell on Respiratory Muscles.

Of the Muscles of the Trunk which are brought in aid of the Common Respiratory Muscles.

‘THESE muscles, in effect, we see powerfully influenced in deep inspiration, however excited. They are the mastoid muscle, the trapezius, the serratus magnus, and the diaphragm. They operate in a circle, and all would be useless in the act of respiration were one to be wanting.

‘The serratus magnus expands the ribs, but this it does only when the scapula to which it is attached is fixed ; and unless the scapula be fixed, this muscle has no operation on the breathing.

‘The trapezius fixes the scapula, by draw-

ing it backwards and upwards. These two muscles must always correspond in action, in order to expand the chest.

‘ The mastoid muscle elevates the sternum, but only when the head is fixed, which is done by the action of the trapezius on the back of the head and neck. To this train of connexions we may join the diaphragm itself, since, without the action of the serratus, the margins of the thorax would sink in by the action of the diaphragm, and the force of that muscle be consequently lost.

More exteriorly Sterno-cleido Mastoideus.

‘ This muscle, by its attachment to the sternum or breast-bone, and to the clavicle, raises or heaves the chest.

‘ When the head is fixed, it becomes a muscle to raise the chest ; and its operation is very evident in all excited states of respiration, in speaking, and still more in singing, coughing, and sneezing.

2. The trapezius must fix the head, or pull it backwards, before the mastoideus can act as a respiratory muscle: thus the position of the head of the asthmatic, during the fit,

as well as the position of the wounded or the dying, prove the influence of the upper part of the trapezius in excited respiration ; that is to say, when the shoulders are fixed, this muscle, usually described as a muscle of the superior extremity, becomes a muscle fixing the head. The trapezius has a still more powerful and important influence in respiration when the action rises above the ordinary condition, and that is, by drawing back the scapula, to give the necessary effect to the action of the serratus magnus on the ribs.

‘ 3. The serratus magnus anticus being extended over the whole side of the chest, and attached in all the extent from the second to the eighth rib, is very powerful in raising the ribs, and holding out the margins of the chest, which would be otherwise drawn in by the diaphragm ; and to this effort the intercostal muscles alone would be insufficient in the high or excited state of respiration.

But it cannot exert this power independently of the trapezius, since, without the combination explained above, its force would be exerted in its more common office of moving the scapula, and not the ribs. Unless

the scapula be fixed or pulled back by the trapezius, the serratus is not a muscle of respiration.

‘ These three powerful muscles hold together in their action, combining with the diaphragm to enlarge the cavity of the chest in all its diameters. These external muscles do not interfere with the gentle actions of breathing; but if the apparatus of respiration is to be employed in any excess of action, in passion, in speaking, singing, coughing, yawning, &c., they become powerful instruments.

‘ The muscles of the neck are also necessary to respiration and circulation.

‘ When the sterno-cleido mastoideus lifts the sternum and clavicle in inspiration, it takes off pressure from the great veins of the neck, so that the blood from the head descends freely at this time; when the thorax descends again, these veins are compressed, and in this manner does the act of respiration assist the circulation through the head.

‘ The platysma myoides is a muscle of respiration, and acts in aid of the mastoideus, not only assisting it in all conditions of excited respiration, but acting in a more par-

ticular manner, in alternately taking off the pressure from the veins of the neck, and again compressing them, and urging the blood into the heart, &c.

Mr. Bell also found that there are nerves coming from the *medulla oblongata* (the precise part which is proved to hold a control over the actions of respiration), and that these nerves, accumulated in a narrow space at their origins, do in fact diverge, and expand out on these muscles, and on these muscles only; and, further, that these muscles, so commonly combined in action, so necessary to each other, and abundantly supplied with nerves of ‘sensation and volition, ‘have respiratory nerves in addition distributed to them; and, moreover, that the ‘nerves going to the diaphragm, larynx, ‘pharynx, lips, and face, are associated with ‘these, and diverge from the same source.’

These extracts from the valuable work of Mr. Bell, show the important functions implicated in the diseases of the spinal column; but to go into the interesting details of Mr. Bell’s work would be impossible in the limits of a pamphlet of this description. Enough has been said to show that to the impedi-

ments offered to growth, health, and strength, induced by impeded respiration*, and to the general neglect of due bodily exercise, is attributable the disposition to deformity so remarkably prevalent in these times. In countries where civilization has not effected such changes, the truth of these observations is exemplified. The author (and others before him) has remarked, during a residence in India, that the untutored natives, who wear but little clothing, to whom the use of stays is unknown, and whose necessities require active pursuits, are remarkable for the beauty of their figures, and graceful carriage.

The more remote causes of these and various other diseases will be traced to the disposition apparent from the earliest periods of infancy to attempt, by every means in our power, the gratification of every real and fancied want and desire, and the removal of every present inconvenience. Now, although this may be termed 'self-preservation,' the first law of nature, &c., and to a certain ex-

* For a further description of the respiratory nerves, and the muscles which aid in performing this important function, see Exposition of the Nervous System, by Professor Bell, F. R. S.

tent inherent, the abuse of such law produces innumerable moral and bodily evils. Thus, after this species of self-indulgence adverted to has been for some time practised, we are apt to consider ourselves unable and unfitted for the performance of our functions, and torpidity of mind and body results: hence we have, besides indigestion, gout, dropsy, &c., the whole train of nervous diseases, as hysteria, epilepsy, mania, paralysis, apoplexy, &c., and the heart, like the muscles of voluntary motion, suffers from the slightest causes, whether from exercise or mental emotion, and is thrown into inordinate action, and consequently, the due balance of the circulation disturbed, producing alteration in the qualities of the blood from defective decarbonization; and of necessity the various secretions and excretions are correspondingly either diminished on the one hand, or more or less excessively increased on the other, or vitiated in quality. The evils resulting from neglect of exercise, and the benefit accruing to those who prefer active pursuits, is forcibly described and impressed by Celsus. Thus he says—‘*Sanus homo, qui et bene valet, et suæ spontis est; nullis obligare se legibus debet:*

‘ ac neque medico, neque iatralipta* egere. . .
 ‘ . . . Hunc oportet varium habere vitæ
 ‘ genus, modo ruri esse, modo in urbe, sæpius-
 ‘ que in agro : navigari, venari, quiescere in-
 ‘ terdum—*sed frequentius se exercere ; si-*
 ‘ quidem ignavia corpus habetat, labor firmat :
 ‘ illa maturam senectutem, hic longam ado-
 ‘ lescentiam reddit†.’ But although exer-
 cises such as Celsus describes are so beneficial,
 he pointed out the distinction between the
 pursuits necessary for the preservation of
 health, and those for particular purposes.
 Thus he says in the same book, that although
 we should strengthen our muscles, we need
 not, for health, work like the wrestler ; but
 the consequence of the condemnation of se-
 dentary pursuits has been, to introduce an
 opposite mode of education, and which was
 condemned by Celsus so very discriminately,
 namely, the gymnastic evolutions, calis-
 thenics, &c., all of which are calculated to
 produce unnatural disproportion in the mus-
 cular strength of the body, as is seen strik-
 ingly in the legs of the opera dancer, &c.
 Again, with regard to the use of stays, these

* The *Iatralipta*, or *Frictioner*, was a separate profession.

† See Celsus, lib. prim. p. 16.

contrivances, when carried so far as to prevent the due action of the muscles of the trunk, must prove most injurious. This fact is strikingly illustrated by the usages of a class of beggars in India. The author has seen groups of these people in the streets of Calcutta, who obtain their living, from early age, by begging, being in fact a 'caste' of themselves, and called the 'Beggars caste.' These persons, in order to excite commiseration, produce various distortions, viz. in one the right arm is fastened over the head for a length of time, until a permanent and unalterable deformity is produced by *anchylosis* of the shoulder and elbow-joints; another will be seen with the fore-arm bent upon the arm, the points of the fingers resting upon the shoulder, while the nails of the fingers are allowed to grow into the skin; a third will have the leg bent upon the thigh, and unalterably fixed in that position, with various other distortions, &c. Upon questioning these people as to the manner in which they effected these distortions, they informed the author that, by confining the muscles, and fixing the limb so as to render it immovable for some time, the desired object was obtained; and in all of

them, the muscles of the distorted limb were so shrunk from disuse, that there appeared merely skin and bone. In a less degree, but no less certainly, a similar effect is produced by the tight stiff stays used in this country; for in weakly females, in particular, it has been considered necessary to apply some support to assist them in bearing the weight of their own bodies, and for this purpose various contrivances are made use of; but the tendency of such machines is in reality to increase the very weakness which they are intended to remove, by rendering the muscles (already weakened by other causes) still more useless, and hence we have one species of deformity. When the species of deformity alluded to is first observed, recourse is had to more complicated machinery for its removal: hence, in most cases, increased distortion; and now if inquiry is made upon what grounds such practices are adopted, the only explanation obtained is, 'that others, suffering from deformity, have been amended in shape by adopting these means, or using such an instrument.' That in 'congenital distortion' such instruments may have rendered the appearance of cripples less unsightly, is not to be denied;

and let such unfortunate individuals continue to have recourse to such measures: but to argue that the same treatment is necessary for a delicate girl, who was born in healthy proportion, but who from debility, from whatever cause arising, has been perceived to have one shoulder higher than its fellow, with some trifling protuberance of one breast, and a slight alteration in the appearance of the spinal column, which however had been so insidious that it had been scarcely noticed until considerable distortion was produced, will scarcely be credited, but so it is; the same means are had recourse to in the one as were found useful in the other. Now, although the practice of savages leaves not a doubt that considerable alteration in the figure may be produced by artificial means, and which may be sufficient argument in favour of the practice of amending the figures of born cripples by means of machinery, yet the application of such measures for the removal of distortion produced by other causes, is an error which has been attended by the most terrible results. Added to the contrivances in this country (the weight alone of some of them, it would appear, is sufficient to produce

deformity, even in a healthy person, being from two pounds to twenty-four,)* are now the methods pursued in the *Orthopédique* establishments in Paris. The complex machinery made use of in these establishments is applied alike, indiscriminately, to congenital and to accidental deformities. Upon examining upon what grounds such measures have been tolerated, it will be found to be the effect of the ignorance of pathological peculiarities of the diseases producing distortion. Now distortion may be congenital, as in the born cripple, the gibbous deformity; it may be the effect of external violence, unaccompanied by debility or disease of bone or cartilage; it is an effect of 'caries,' or destruction of bone and cartilage, whether produced by the accidental pressure of a tumour or other cause, or from *mollities ossium*, from scrofula and rickets; it is sometimes produced by rheumatism, but most commonly is the effect of local and general debility, preceded and accompanied by a flabby condition of the muscles generally, and of the trunk in particular. Now each of these distortions

* The Whitworth doctors used an instrument of 24 lbs. weight. Mr. Chesher's was from 10 to 14 lbs.

(and there are numerous others which need not be adverted to here) requires a different and appropriate method of treatment, founded upon just pathological discrimination; but the anxious inquirer will find that, to this day, the treatment which has been found useful for one species, is resorted to in another, the effect of a totally different cause.

This fact is evident from the history of the case which first drew the author's attention to these cases. There it was seen that a young lady, about the age of ten, was first perceived to have one shoulder a little higher than its fellow, with a trifling alteration in the spinal column resembling the italic *f*. In this case the same treatment was applied as to the deformities which are produced by directly opposite causes, such as falling down stairs, off a coach, &c. and consisted of machinery to cause extension, namely the 'collar,*' and subsequently the 'iron windlass and bag of shot,' 'iron shield,' &c. &c.; and since, several other cases, equally monstrous, have come within the author's notice, of the injurious effects produced by the indiscriminate use of machinery.

* This instrument weighed 10 lbs. in the case alluded to.

The arguments against its application, with the conclusions drawn in favour of an opposite mode of treatment, will, with the narration of cases in illustration, be more fully discussed in the subsequent pages.

LIGAMENTS OF THE SPINE,

&c. &c.

As the ligaments of the spine are considerably implicated in diseases affecting the spinal column, it will be necessary to give a concise description of them here. The twenty-four vertebræ, cervical, dorsal, and lumbar, are very strongly connected by articular processes, and firmly joined by an elastic substance, which proceeds from the broad surface of the body of one vertebra to the other. The spinous processes of many of the vertebræ, and those particularly nearest the centre of the column, are locked together by one being admitted into a depression of the other. The bodies of the vertebræ being united by a ligamento-cartilaginous substance, extremely elastic, and composed of concentric lamellæ, connected by oblique fibres, which decussate each other, and in the centre

become mucous, so as to form a pivot, which supports the central line of the vertebræ, whilst the elasticity and compressibility of the outer edge of this uniting medium allows the vertebræ to move upon this centre in all directions.

There is also an anterior spinal ligament connecting the column, proceeding from the dentata to the sacrum, and united to all the bodies of the vertebræ in its course; a posterior spinal ligament, situated within the canal of the spinal marrow, proceeding from the dentata intermixed with the perpendicular ligament descending to the sacrum, and sending out lateral processes to the superior and inferior edges of the bodies of the vertebræ.

Intervertebral ligaments passing conically from vertebra to vertebra.

The articular processes, united by capsular ligaments, and the transverse processes, have ligaments passing from one to the other.

Between the arches of the roots of the spinous processes is the elastic ligament called ligamentum subclavum, which allows of considerable separation of the spinous processes, and by its elasticity approximates

them, rendering muscular support for the erect position less necessary.

The ligamentum nuchæ, uniting the spinous processes of the cervical bones.

The capsular ligament, connecting the head to the spinal column, and inclosing the condyles of the occipital bone, and the articular processes of the atlas.

The circular ligament, proceeding from the foramen magnum, to the edge of the aperture of the first vertebra.

The perpendicular ligament from the anterior part of foramen magnum to the dentiform process of the second cervical.

Lateral ligaments, proceeding from the edge of the foramen magnum and atlas on each side, to the dentiform process of the second cervical, limiting the lateral motions of the head.

And the atlas is united to the dentata by a transverse ligament, &c.

This simple description of the ligaments will be sufficient, it is hoped, in this place; more especially, as in the work which is preparing for the press on the various diseases of the column, the anatomical, physiological, and pathological peculiarities of the parts

concerned, with such therapeutical or extraneous measures as appear best calculated for the prevention and cure of spinal diseases, will be fully described and illustrated, by numerous cases and engravings; therefore in this introduction to the cases treated without the aid of machinery, it will only be necessary to show upon what grounds the treatment is founded, it having been already proved that diseases of totally different character have been confounded. Thus then, it having been found, from a careful examination of several cases of considerable distortion, which are to be seen in the different collections in the metropolis and elsewhere, that in such specimens, although considerable deformity was apparent, that upon examination neither the *bones, cartilages, nor ligaments were diseased*, although there was an *alteration* in the forms of the vertebræ and intervening substances corresponding with the direction of the pressure; yet it was evident, that the deviations in the form of the whole column, and in parts in particular, might be referred to other causes, than disease of bone, cartilage or ligament; and these notions are corroborated by the late Mr. Shaw, who says, ‘it is well known that

‘ the shape of the vertebræ is much altered,
‘ in cases where the spine is much distorted ;
‘ but as no mark of disease is discovered when
‘ a section of the bones so mis-shapen is
‘ made, we may infer that the change of form is
‘ a consequence that may be produced, inde-
‘ pendent of any specific disease existing in
‘ the bones, especially as it is found to corre-
‘ spond to the direction in which the pressure
‘ has been made.’ But, upon inquiry, we
have been told by one author that the ma-
lady must be considered as *disease of bone
and ligament!* by another, that the parts
connecting the bones are diseased!—by a
third, that the disease was wholly confined
to the ligaments! and, by Mr. Shaw, that the
alteration in the state of the ligaments was
rather an effect than the cause of the dis-
tortion: Mr. Shaw’s notions were founded
upon a careful examination of the specimens
alluded to; and his opinion is entitled to,
and deserving of, much attention. But whe-
ther the alteration in the state of the liga-
ments be cause or effect, remains to be
proved. That elongation of ligament, admit-
ting distortion from various maladies, does
occur in other joints, cannot be denied: for

instance, during dentition, it is not uncommon for a child to have a partial attack of paralysis of the muscles of a limb, as in a case now under the author's care, which happened to a young medical friend, who has, by such an attack, one leg (the right) considerably longer than the other; and admitting extraordinary motion, quite incompatible with the healthy capacity of the joint, the muscles in this case are shrunk, being rendered useless from the lengthened state of the ligaments of the joint; and a curve has lately made its appearance in the ankle similar to the second curve in the distorted spine, in order that in this, as well as the other case, the centre of gravity may be preserved, which is known to be a physical necessity, which accounts for the situation of the second curve which happens to spinal patients.

Thus there may be elongation or alteration in form of ligament sufficient to allow of considerable distortion in other joints of the body without *disease** of bone, cartilage, or ligament. Now, whether this altered state of ligament be a cause or an effect of distortion, the inference drawn from the modes intended

* Specific Disease.

for the relief of these maladies as described (by means of machinery), is, that they do not appear calculated, upon principle, to be discriminatedly applied; and, upon further considering the subject, we shall find that such measures are, indeed, and must be, productive of greater evil than that which it is intended to remove; for it having been proved, that, in various distortions of the spine, and more particularly in the species called lateral curvature, neither disease of bone, cartilage, nor ligament, exists sufficient to account for the curve, we are naturally led to inquire to what causes such effect be referrible: to muscular debility, we are told by some: but this must also be referrible to a cause like the debilitated elongated ligament—consequently, there must be another, and primary, or predisposing cause, to which, in fact, these effects, namely, muscular debility, elongation and debility of ligament, and consequent distortion of figure, is to be traced; and the author is confident that this cause of so many and so varied disastrous effects is attributable to the impediments offered to growth, health, and strength, which *impeded respiration*, effect of the usages of society, as a predispos-

ing cause ; and to the dereliction of bodily exercise as the next link in the chain. For instance, in illustration—it has been remarked that in cases where distortion has been of long continuance, and been treated by machinery, there has been discovered a tendency to ankylosis, and, upon examination, a spreading of the vertebræ is observed ; and we are told, that, under such circumstances, our hope is small, and our labour in vain, in attempting to remove the malady. This fact, which Mr. Shaw thought worth recording, namely, that we must not attempt to cure a stiff joint—the mere relation of the fact, viz. that there is a disposition to ankylosis in these cases, proves, as in the ‘*caste*’ of beggars described, that *disuse* of muscle is sufficient not only to allow, but to produce such distortion ; consequently the contrivances alluded to are calculated not only to produce ankylosis by disuse of muscles, but also, by impeding the function of respiration, they are, in reality, favouring and forming the disease which it is intended to remove.

The subserviency of free respiration to the growth, health, and strength of the animal frame, is well known to physiologists ; and we

can therefore readily understand how much the dereliction of exercise, aided by mechanical impediments, (stays, machines,) thus wilfully contributed by fashion, must tend to counteract those blessings, and to prevent or destroy that beauty which, without them, cannot exist.*

Hence, if the predisposing cause of many distortions be found to consist in the impediments offered to growth, health, and strength, effect of impeded respiration and neglect of bodily exercise, which causes allow of considerable deviation in the form of the spinal column, without, however, apparent disease of bone, cartilage or ligament, it follows that in the treatment of such deviation, we must not overlook the origin of the evil in our attempt to relieve its symptoms; but, upon examining the notions of the authors who have advocated the use of machinery in the cure of distorted spine, we shall find, upon their own admissions, that they have treated symptoms, indiscriminately overlooking causes, and consequently have increased that which it was intended to remove.

* For much valuable information, see *Elements of Pathology and Therapeutics*, by Caleb Hillier Parry, M.D.

For instance, in the case of elongated leg adverted to, there was a lengthened limb, effect of elongation of ligament; now the mode of extension must of necessity increase this gentleman's malady; and the same argument holds with regard to the distorted spine, supposing even that the disease is confined to the ligaments. Whether the alteration in them be in the nature of a cause or an effect of distortion, such a case cannot be benefited by means directly intended to increase, in the one instance, either all the causes, or, in the other, all the effects.

Again, that to muscular debility alone are we to attribute deformity. The advocates for this theory inform us that the disease has been the effect of muscular debility, and their modes of treatment are intended to strengthen the muscles by increasing muscular exertion. That increased muscular power is the effect of increased muscular exertion cannot be denied for a moment; but that by removing one of the symptoms alone, without attending to the most stubborn of the effects, namely, the distortion, we are in reality throwing away otherwise valuable time in removing the symptoms in detail, instead of boldly

meeting the origin of all the mischief. This notion was made known by the German surgeons, but the advocates of muscular exercises also have recourse to other means, namely, extension by machinery, hanging weights upon the spine by means of dumb bells, &c., and various contrivances which, while acting in removing one set of symptoms, are as surely confirming and increasing others; and there is no evidence to show that, by increasing muscular exertion, we are remedying the deviations in the spinal column, although the effect of dereliction of exercise as one of its causes, because it has been found that the muscles of the concave side, with the nerves, are shrunk and more unhealthy from disuse, consequently these measures cannot be applied, except to parts in the opposite situations of disease and health.

These considerations, together with the constant opportunities afforded of witnessing the evils of machinery, as applied for the relief of these maladies, led the author to conclude that in various distortions, but particularly in lateral curve where symptoms of disease of bone or cartilage were not present, but where weakness, elonga-

tion, or alteration of ligament was inferred, together with muscular debility, that the best arguments against the use of elongating machinery were to be found in the admissions of those using such means; and the result of his cases will incontrovertibly prove that all the benefits which have been supposed to be obtained by such contrivances may be obtained by means at once simple, harmless and easily attainable.

At the same time, with the advantage of avoiding the innumerable inconveniencies and miseries attending the application of machinery, this advantage must be considered of no mean importance in the treatment of these maladies, when it is remembered that the alteration produced in the figure of the distorted, by means of elongating processes, is, in reality, increasing all the symptoms of the complaint, except the distortion; but which last and most terrible effect is merely masked until the operations are discontinued, when the patient invariably sinks back, not only to the original deformity, but to a state risking fatal terminations, from pressure on the spinal marrow, with the additional mortification of having been led to hope for

restoration, only to be suddenly reduced to a situation in which sudden death or fearful paralysis is always to be feared.

Thus, then, the apparent good which is obtained by machinery may be effected by simple means, while the horrors, martyrdom, and distressing and mortifying results of its use are avoided.

The general health of the patient invariably suffers under the use of extension, and it is not uncommon for such measures to be superseded by the necessity of attending to numerous diseases, and of the lungs in particular, which appear during its application; but the author has adduced but a few facts which might be urged against the use of machinery. The dreadful state to which the patient was reduced whose case has been narrated, where machinery had been tried in all its complications, so completely disgusted him, that to avoid even any modification of it, he has devoted several years to the consideration of these maladies, and by the successful cases it will be seen that the desired object may be obtained without the slightest injury to the general health.

It has been considered by many eminent practitioners, that, as the complaint called lateral curve is preceded and accompanied by gradual diminution and loss of general health, it would be sufficient for the cure to restore this loss of health; but although this is a very natural conclusion, it fails except in the very slight form of the disease, like the strengthening of muscles, being in truth merely removing minor symptoms or effects. In the earliest stage of the complaint success may attend means alone calculated to amend the general health of the patient, for doubtless one of the chief objects in view in the treatment of severe distortions is the restoring, by every means in our power, the healthy condition of the body; but as far as the author's experience goes, he is convinced that, in the severe lateral distortions, (and his opinion is corroborated by those who have given most attention to the subject,) these means are not sufficient to remove distortion, but, on the contrary, that the severer the distortion the more certain is the fact, that in alone restoring the general health, (provided it can be done,) without first removing the distortion, we are in truth confirming

the disease which it was intended to remove ; and that although it is absolutely necessary to preserve in every way the general health, that this alone is insufficient for the cure of these maladies ; because it has been found that, in improving general health, and of course thereby in strengthening the muscles, such causes are acting on parts rendered by the disease incapable of receiving equal benefit ; or, in other words, that it having been shown that the nerves and muscles of the concave side become by disuse shrunk and unhealthy, that the treatment which will restore one set of muscles will be thrown away upon those in the opposite direction, and an undue balance of power exist sufficient to confirm instead of altering the deformity. Three remarkable cases, in illustration, came lately under the author's notice: The parents of a Miss D—t, of Camden Town, consulted the author, in consultation with one of the most eminent surgeons in this metropolis ; the opinions expressed by the gentleman alluded to, and the author, completely differed on the mode of treatment, although not as to the cause of the disease, or the objects to be attained. As the emi-

nent practitioner was positive, the patient relied upon his opinion in preference, and assiduously set about the restoration of her general health, with but very partial attempts to remove the distortion. Having succeeded in a great measure, from pursuing the plan advised by the surgeon alluded to, in restoring the general health, this young lady was surprised that there was not a corresponding improvement in her figure. The parents now had recourse to the means advised by the author, although without again consulting him or requesting his advice, and the patient was speedily restored to her proper figure. The same fact was proved strikingly in the two other cases adverted to: the one a daughter of a highly respectable medical gentleman, who wished to continue the author's plan of treatment, but was prevented. This young lady visited the sea-side, and her general health was much improved, but without any good effects in improving her figure.—The third had recourse, in spite of the author's admonition, to the use of an instrument, with great attention to general health: here, also, although a trifling improvement in health was obtained, the distortion remained unal-

tered. Notwithstanding, from these and various other cases, it is evident that, although it is most advisable to pay the strictest attention to the state of the general health, in the cure of these maladies, this alone will not be sufficient for the restoration of the figure, and therefore that the plan must consist in means to amend the distorted figure, before any beneficial effect may be hoped from other auxiliary methods of treatment.

LATERAL CURVATURE FROM DEBILITY.

THIS curvature is the most frequent of the spinal distortions, and has been called lateral from its direction, and to distinguish it from curves, effect of other causes. It is insidious in its approach, never sudden*, is said to be either to the right or left side, as the patient is right or left handed, unaccompanied by pain on pressure, or other symptoms denoting *disease* of bone or cartilage, most frequently occurring in delicate females, appearing early in life, and gradually increasing, the inconveniencies attending its commencement being often so trifling, that the complaint is allowed to gain considerable progress before measures are resorted to for its removal†. Upon ex-

* If ever congenital? doubtful; certainly a very rare occurrence.

† This distortion differs so remarkably from that effect of *caries*, that they can never be confounded. In *caries* the curve being sharp, angular, posterior, or projecting backwards, and appearing suddenly after pain, emaciation, and other distressing symptoms, effect often of pressure produced by abscesses, tumors, &c. &c., causing absorption and destruction of bone and cartilage.

The ravages this disease (*caries*) can produce before destroy-

amination (when perceived at the age of from nine or ten years to fourteen, or later) it is found, that one shoulder is higher than its fellow, most frequently the right, which also appears larger than the other, with some alteration in the size and appearance of one breast (according to the direction of the curve), but the most remarkable appearance is the difference between the relative position of the spinal column with regard to the shoulder bones, a considerable portion of the cervical spine and upper dorsal being frequently hid beneath the scapula of the right or left side, as the direction of the curve may be, or in other words, the spine lying hid on one side, instead of appearing equally distant from either scapula. The curve is said to commence in the loins, and the upper curve is known to be the effect of the physical necessity, viz., that the centre of gravity may be immediately over the base; but this law

ing life is most remarkable. A striking specimen is to be seen in the Museum of the Ecole de Médecin of Paris, in which the whole of the lumbar vertebræ and several of the lower dorsal are entirely destroyed, while several of the cervical and upper dorsal are partially removed. There is also in this Museum, amongst many other interesting specimens of diseased bone, a case of distortion, accompanied by universal ankylosis of the whole of the joints of the body.

applies, of course, equally to the second curve, should the disease commence above; there is, moreover, a trifling difference in the appearance of the hips. With a bulging of the right side, and a corresponding contraction of the left, or *vice versá*, the ribs approximating, with also a bulging of the loin on one side, and a corresponding depression of its fellow. When the complaint has lasted some years with injudicious attempts for its removal, the column takes a posterior as well as lateral direction, with the appearance of hideous deformity.

When the disease has gone to this extent, various distressing effects are produced, rendering the life of the sufferer a burden almost insupportable, commencing with capricious or total loss of appetite, constipation of the most obstinate form, pallid appearance, menstrual obstruction, torturing cramps and aching pains in the extremities, fatigue from the slightest exertion, with inordinate action of the heart, sleeplessness, coughs, lowness of spirits, loss of sensation, and voluntary motion of the lower extremities apparently effect of

Nervous Pressure.

These symptoms, or (more strictly speaking) effects, appear to depend upon impediments offered to the healthy function of the spinal nerves from pressure. The important offices of the spinal nerves are too well known to need comment. Upon their healthful condition depend many of the most important functions of life; the experiments of Bichat, Bell, and others, have thrown a new light on this truly interesting subject, and as the nerves and muscles of *respiration* are chiefly implicated in these maladies, the description of the spinal marrow by Professor Bell may be consulted with advantage.

Spinal Marrow.

Taking the spinal marrow as a whole, its offices are of a double order. First, in relation to the brain. Secondly, as having powers emanating from itself, or independent of the brain.

The spinal marrow is peculiar to vertebral animals; it will suffice for superficial obser-

vers to say, that it must be so, because the spine is necessary to conceal and protect the spinal marrow, but there is much more than this in the established relationship. The spine formed by vertebræ is necessary to such a constitution of the thorax, as shall be capable of the motion of respiration; and the spinal marrow is equally necessary to that form and distribution of the nervous system, which is required for associating and combining the muscles of respiration. Without the machinery of the spine and ribs, the thorax and abdomen could not rise and fall in *respiration*, and without the spinal marrow, that arrangement of nerves would be wanting which is necessary to regulate the motions of the trunk in respiration. Thus the spinal marrow, the spine and ribs, and the muscles of respiration, are *essential* to each other, as constituting the several parts of a grand design subservient to *respiration*, &c. &c.

Each lateral portion of the spinal marrow contains three tracts or columns, one for voluntary motion, one for sensation, and one for the act of *respiration*. This is quite obvious at the upper part or medulla oblongata. With respect to the lower part of the spinal mar-

row, the reasoning is more hypothetical or analogical*. So that the spinal marrow comprehends in all six rods, intimately bound together, but distinct in office, and the capital of this compound column is the medulla oblongata.

The anterior column of each lateral division of the spinal marrow is for motion—the posterior column is for sensation, and the middle one is for *respiration*. The two former extend up into the brain, and are dispersed or lost in it, for their functions stand related to the sensorium; but the latter stops short in the medulla oblongata, being in function independent of reason, and capable of its office independently of the brain, or when separated from it.

It is the introduction of the middle column of the three, viz., that for *respiration*, which constitutes the spinal marrow as distinct from the long central nerve of animals without vertebræ, and which is attended with the necessity for that form of the trunk which

* This view of the constitution of the spinal marrow led Mr. Bell to institute experiments, which were followed by the discovery of the distinct functions performed by the several roots of the spinal nerves.

admits of the respiratory motions. An injury to the brain sufficient to destroy sensation and volition, leaves the spinal marrow in possession of its function, and commanding the actions of respiration. Injury to the spinal marrow low in the neck, cutting off the sensation and voluntary motions of the body, leaves the body in possession of the powers of respiration.

The spinal nerves are perfectly regular in origin and distribution, and are thirty on each side.

Each nerve has two distinct series of roots coming out in packets or fasces, one from the posterior column, and one from the anterior column of the spinal marrow*. That all the nerves arising in the line from the crus cerebri to the cauda equina are muscular nerves. That the anterior column of the spinal marrow, and the anterior roots of the spinal nerves, are for motion; and the posterior column and posterior roots are for sensibility. That when the posterior column

* From experiments, Mr. Bell came to the conclusion 'that the different roots and different columns from whence these roots arose were devoted to distinct offices,' and that the notions drawn from the anatomy were correct.

of the spinal marrow is irritated, an animal evinces sensibility to pain ; but no apparent effect is produced when the anterior column is touched *. That there is a dependence of connexion between the mind and the organs of voluntary motion existing in the nerves is certain ; for, being cut, or in a certain degree compressed, the conscious power of the mind over the muscles which they supply immediately ceases. That the nerves are the media of sensation is also certain ; for it is well known, that if all the nerves leading to any part be divided, or strongly compressed, the mind is rendered incapable of perceiving any injury whatever offered to the part †. On the other hand, the capacity of sensation in man may be impaired or destroyed by cer-

* For much valuable matter on respiration, see ‘Of the action of the chest, neck, and face, in respiration ; of the nerves which combine these parts, and control their actions, and of the offices performed by these organs of respiration in subservience to other purposes than the conversion of nervous into arterial blood ; being a continuation of the paper on the structure and functions of the nerves, from the Philosophical Transactions of 1822, by Charles Bell, F.R.S.’ See also in this paper all the actions of the muscles of respiration.

† See Pary’s Elements of Pathology, &c. This is frequently seen in advanced stages of lateral distortion. In the case which was treated by machinery adverted to, at one period a needle passed into the skin was unattended by pain.

tain injuries inflicted on the brain itself, and this is the case, although the nerves of the part remain uninjured throughout their whole course ; consequently a nerve, therefore, or any part which it supplies, cannot strictly be termed sensible, but merely the medium or vehicle by which sensation is conveyed to the brain, the nerve having the capacity of transmitting to the brain such impressions as excite sensation*.

One of the most distressing effects of distortion and nervous pressure is Paraplegia. This disorder sometimes affects the hands, but more frequently the lower extremities, and consists of more or less of diminution of sensation or voluntary motion, or both ; to which are superadded tinglings, pains shooting down the thighs and legs to the feet, with spasmodic startings of the limbs, &c. &c. When the disease has continued for some time, the recti femoris and tibiales antici muscles, with the other extensors, become

* Young children, whose judgment is incomplete from the absence of concurrent evidence, are incapable of locating the seat of injury. It is also remarkable in adults after amputation. The author was once requested by a friend and patient (whose thigh had been amputated) to support his knee, after it had been some time removed from his body.

weakened, the toes drop, and in order to advance the legs, the patient is obliged to assist them, by endeavouring to keep the whole limb straight, and throwing the thigh forwards with a jerk, by means of the abdominal muscles. As the malady advances, the power of voluntary motion is often wholly lost, the disorder extending even half way or more up the trunk of the body, rendering the sufferer so helpless as to require fixing to the chair, (and in some instances the hands and fore arms become similarly affected) with spasmodic twitchings, involuntary discharges of fœces and urine, or difficulty of passing them. *Curvature* of the spine is the most frequent forerunner of Paraplegia, but it is said to be effect also of other causes, such as exposure to cold and moisture; but as to inquire further into the peculiarities of these maladies, would be a digression on nervous diseases, which the limits of this pamphlet would not allow of, it is my intention to offer a few remarks on prevention and cure, with the description of the mode now adopted in France in the *Etablissements Orthopédique*.

FEMALE EDUCATION,

&c. &c.

THE mode of rearing or nursing children exerts a most powerful influence on their after life. Although the plan pursued in this country is on some points objectionable, yet it is superior to the modes or usages of most other *civilized countries*. In France, for example, the infant, from its birth, is swathed and bound up so as to entirely prevent its using its limbs, through the medium of its own muscles, and the consequence is, that up to the age of twelve months little growth or strength is obtained. Children at ten and eleven months do not appear larger or stronger than at birth*. This may be one of the predisposing causes of deformity so remarkably prevalent amongst our Gallic neighbours. It is well known that an edifice, which, instead of having a solid basis,

* The French ladies stare with astonishment at an English child which is allowed to roll and tumble, and make use of its limbs from early infancy.

is deficient therein, will not, nor cannot, be made to bear any corresponding superstructure, but gives way. The bones of the human body may be considered the groundwork or foundation on which the muscular superstructure is to act ; consequently, if they are prevented by *impeded respiration*, effect of bandaging, from obtaining that solidity which is requisite, it follows, that even should muscular power be developed, that it will be acting on a fabric which is incompetent to support its superstructure, and will, like the building, sink or give way in some of its parts. This is precisely what takes place in the animal economy. The child, by the usages of society from early life, is confined to its numerous studies, instead of spending its time in obtaining a foundation of health, which should serve in after life. Nature has provided, that during early life the action of the heart should be very great in providing for growth, health, and strength. Hence the accelerated pulse of all young animals and corresponding increased action of the *respiratory* function is necessary, in order to prepare the blood sent to the different parts of the system, and in order, for due respiration, it is neces-

sary that the lungs be allowed to respire fully and freely of the purest aerial fluid ; but this is not to be obtained by binding the muscles which are intended for this process until they are comparatively useless ; nor is it to be obtained by confining youth, thus laced, in close rooms, where impure air, or at least air not so well calculated for respiration is to be alone respired. Hence exercise in the open air, and *freedom* of respiration, appear to be the desiderata in early life. As to infringe upon the notions existing upon education would be considered presumptuous, it will merely be sufficient as a faithful chronicler to state, that the modes and usages of female education in civilized countries appear to be exceedingly detrimental to bodily strength, however it may conduce in producing elevated mental acquirements.

The abuse of the study of music has been justly condemned. In order to excel in this delightful pursuit, it is necessary to give up the time which is required for the preservation of health by means of exercise, &c. &c., to severe study ; and it is remarkable that those who have obtained most celebrity in this art have destroyed

their health in the pursuit*. This is an extreme, it will be said; but when it is remembered that in the education of female youth in these days, severe study of music is often combined with determined assiduity to other literary pursuits, and when it is found that the complaint of which I treat affects most commonly those whose minds are most apt for study; moreover, when it is found to be almost confined to those who, from early life, have been devoted to the attainment of a polished education, it will scarcely be denied that education, unless discriminately obtained, is a source of embittering, as well as of elevating, the periods of after life. The *modus operandi* of excessive mental exercises, as acting on the functions of the body, is a metaphysical inquiry, into which it will not be necessary to enter

* Paganini—this celebrated violinist, the most astonishing genius of the day, whom the author lately heard in Paris, at the Academie Royale de Musique, play several of the most difficult airs in music, with exuberant and astonishing variations, upon a *seul cordé*, thus proving his complete command of the most difficult instrument in music, and who challenged the greatest female favourite of the musical world at Paris, that he would produce upon *one string* every note which she could sing in the most difficult air which she was master of—this gentleman is now, from his extreme study, an object of compassion, as well as of admiration, being reduced to a mere spectre.

here, but that severe mental exercise tends at the same time to strengthen the powers of the mind, and to weaken the powers of the body, is evident and acknowledged. However this may be, the fact is undeniable, that the more frequent distortions of the spine arise, and are found in persons whose mental faculties have been cultivated at the expense of their bodily strength; and the worst cases which have come under the author's notice have been attributable to the *severe study of music*. For instance, in order to attain any eminence, it is necessary that the greater number of hours of the day be devoted to practice; consequently, if the student sit at home in this pursuit, and especially if cased up in the tight stays now in use, impeded respiration, disuse and relaxation of muscles must follow, and it is most easy to trace the consequent distortions to these all-sufficient causes; and as has been remarked by an elegant writer*,—‘The musical mania engenders the desire, and indeed creates the necessity for a constant round of concerts, operas, and festivals, by which the health of

* Pursuit of Health, by Dr. James Johnson, 1831.

' the body is enfeebled—the energies of the
 ' soul paralyzed—and the moral principle it-
 ' self undermined. Again, what but evil can
 ' be expected from a system of education
 ' which enervates the mind and enfeebles the
 ' body—which polishes the external senses
 ' and leaves the intellect a prey to rust and
 ' moth?'

TREATMENT OF DISTORTION.

Etablissement Orthopédique.

THE treatment of these maladies in the institutions and establishments in France consists in placing the patients who suffer from distortion, from whatever cause arising, on a crib or couch, which is made either as an inclined plane, or as a horizontal, at pleasure of the 'Directeur.' At the commencement of the treatment, the head is incased in a species of casque, which is fixed to the head of the crib, and which makes pressure on each jaw, while extension is constantly made by machinery acting from the hips, the patient being clasped by a firm bandage (communicating with the means of making extension), which is attached to the lower end of the couch, thus combining extension and counter extension. The apparatus by which this extension is made is so constructed, that the patients may release themselves from its action when it produces much uneasiness, and it has the advantage of elasticity. Over and

above this *extension* and counter *extension*, there is made *pressure* and counter *pressure*, by means of steel rods fixed to either side of the couch, from which pass bandages attached to pads, which are placed in contact with the curvature, and to the counter curvature.

The process was described to the author by Docteur Bouvier, Professeur Agrégé à la Faculté de Médecine de Paris, whose establishment he visited during a stay in the French capital, for the express purpose and intention of examining these establishments or Maisons de Santé, which are very numerous. Docteur Bouvier's establishment may be considered as an hospital in which the patients are rich instead of poor; it is admirably conducted, and the Docteur a very sensible and intelligent person. The patients are not constantly confined to the beds or couches, but rise to dinner for exercise and other purposes, at which times they are placed on crutches which also are constructed for extension. Docteur Bouvier, however, acknowledged that his chief dependance was on the *position*, although the extension is made to appear the sheet anchor. The processes as practised in these establishments

(they are nearly all the same, and the author visited several) are condemned by the most eminent surgeons in Paris as prejudicial. Although the author was shown the contrivances and several patients under treatment, he was not made acquainted with any *one* case of *cure*, although in one of the establishments adverted to there were twenty-five patients. Here, as in the modes practised in England, the same treatment is applied to distortions arising from totally different causes.

It must be evident how mischievous these extensions must prove to patients where ankylosis has taken place. The opinions of several of the first surgeons in the metropolis of France was obtained by the author on this subject, and he was much gratified to find that they completely coincided with him in believing, that any benefits which may be obtained in these cases by the means of machinery, may be obtained by measures much less objectionable, and without danger to the general health.

The treatment of these maladies in Paris, then, is subject to the same objections as in the modes of extension used in this country,

except that, in the former, the extension is gained by less violent measures, and therefore less prejudicial; but even the most sanguine machinists allow, when closely pressed, that the main dependance is upon the position of the patient, of which I think there can be no doubt. The grand object in the treatment of these maladies must be, to obtain amended health and figure by carefully removing the causes of the distortion. When the cause or origin of mischief is discovered, the means of relief present themselves according to the peculiar circumstances of the case.

After sending the preceding pages to press, a patient called the author's attention to the following instance of gross ignorance and want of discrimination in the use of machinery, as adopted at this moment in London. A child of a Mr. O—— of Duke-street, St. James's, being perceived to be weak in its joints, the parents applied to a surgeon of eminence in London, who directed it to be taken to an instrument-maker, which was done, and an iron or steel apparatus accordingly fixed to the child's legs, *to strengthen its joints*. At the time the instrument was applied, the

bones were *straight*, or of their *natural figure*, and the complaint consisted in *weakness of joints alone*. The consequence was just such as might have been predicted; the patient growing taller, and there being no direction to lengthen the instruments, its *bones became bowed, or crooked, to suit* the form of the *irons!!* and upon making some exertions, a *fracture of one thigh* took place * !!! A highly respectable surgeon † was called in, and after much difficulty, succeeded in setting the limb, and getting adhesion of the ends of the bone,—a matter of some difficulty, and requiring much care and ingenuity, in consequence of the bowed state of the bones. This case is narrated, because the author can vouch for its truth, the child being attended by the gentleman named, and residing in the house with one of the author's patients:—so much for machinery.

* A natural consequence.

† Mr. Parnell, of Bennett-street, St. James's.

CASE FIRST.

DEAR SIR,

In compliance with your request, I send you the particulars of my case. About the age of eleven I was first perceived to be a little crooked, one shoulder being higher than the other, and upon examining my spine, it was found that I had what is called a *lateral curvature* (which my parents, as well as myself, consider to have arisen from my being too strictly confined to the study of music, which I commenced at the age of six years, intending to make it my profession). When the complaint was first discovered, I was taken to a surgeon in London, who devotes all his time to the treatment of distortion. He advised that I should discontinue the use of stays, and recommended a *dumb bell*, with strong exercise and attention to general health, &c. This plan I pursued for some time without any good effect,—in truth, I gradually got worse. My kind parents then sent me into the country (and I had the care of a medical gentleman, one of my relations). While in the country I took strong exercises,

and attended strictly to the state of my general health, but without any good effect on my spine, which gradually got worse, to the age of between fourteen and fifteen, when I was placed under your care. You attended me about eighteen months, but in justice to you, I think it right to state, *that your plan was only strictly followed about twelve months.* At the end of that time you pronounced me cured, and your first successful case *without the aid of Machinery.* My amended health and figure I now enjoy, and I shall be happy to testify to any of your professional friends, or others whom it may concern, what I have above stated, and shall ever remain,

Dear Sir,

Your grateful patient,

E. B—R.

5, Southampton Row, Russell Square,

May 1831.

* The parents of this young lady, who are most respectable and intelligent persons, objected to the use of any sort of machinery, and it was only upon a pledge to avoid machines of any sort, that the author was allowed to attend to the case.

CASE SECOND.

SIR,

You solicited me to note down the particulars of my case, which I have as follows :

At nine years of age one shoulder was noticed to be a trifle higher than the other from that time I had *stiff stays*, for *fear any deformity should ensue* ; at twelve the curvature of the spine was first perceived. My mother was recommended to take me to an eminent surgeon, he sent me to a celebrated instrument-maker, who ordered me to take a warm bath three times a week ; after bathing, to be rubbed with pomatum for two hours, and then to lie on an inclined plane. These remedies were pursued for some time, but very little benefit received from them. Dr. Armstrong came to see me ; he advised me to stand as much as possible, and to have my dress tied very loose. At the age of thirteen I went to Mr. Shaw ; he said it was a *bad case*,—*he could not promise there would be any alteration for the better, but there would be none for the worse, if I would submit to be exercised on an inclined plane, with heavy*

weights drawn up and down by pulleys, and to wear a steel support day and night, except the time I was being exercised; he also advised me to rub tables with my left hand, and to have as much exercise as possible. There was a great deal of improvement the first year, but after that I began to be neglectful, having other things to take up my attention. At sixteen I went to a gentleman who cures distortion; he recommended me to exercise with dumb bells, and hang on a bar, until I was tired, and then lie down, three times a day, but I received no benefit; indeed, I was getting worse from that time, until I was under your care and attention, for which I shall always feel grateful.

ELIZABETH MARY CARD.

98, *Quadrant, Regent Street.*

The two cases here enumerated were chosen as the best test of the author's notions on this

* At nine years the shoulder was perceived (to use the words of this young lady, a *trifle* higher), and at the age of twelve the spine was first perceived to be *curved*; at the age of thirteen it had so much increased, that Mr. Shaw pronounced it a bad case. After this, the other practitioner had recourse to dumb bells, &c. &c.

subject. In the first, although the plans pursued were not beneficial, they were not very injurious (as from the dislike of the parents) to machinery, the patient, although she became very crooked, had not any disposition to *anchylosis* produced, which invariably attends the use of machines which confine and destroy muscular action. In the second, which Mr. Shaw justly pronounced a *bad case*, although some improvement has been effected, yet from the *early use of instruments*, a disposition to anchylosis or stiff joint is evident, sufficient to confirm unalterably this distortion, therefore it is given rather as a case showing the evils of machinery, *as contrasted with the successful case where such contrivances were avoided with the most complete success* *.

* In the work which is preparing for the press, the various diseases of the spine will be illustrated by cases and engravings, commencing with 'caries.'

subject. In the first, although the pain
 pointed out not essential, they were not
 very frequent (as from the dislike of the
 quantity of machinery, the patient al-
 though she became very exhausted, had not
 any disposition to multiply her pain, which
 however attended the use of machines which
 would not have been necessary. In the
 second which Mr. Shaw first presented a
 had not, although some important
 had not, but the only use of it.

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point to be made, that in the course of
 only this situation, the disease is given
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 when such machines were applied with
 the great weight of the
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 machinery, which will be attended to



