Observations on the causes and early symptoms of defects in the form of the spine, chest and shoulders, and on the means of correcting them: with remarks on the different methods pursued in this country and on the continent, in the treatment of distortions ... / By John Shaw.

OBSERVATIONS

ON

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FORM OF THE SPINE,

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AND

ON THE MEANS OF CORRECTING THEM:

WITH REMARKS

ON THE DIFFERENT METHODS PURSUED IN THIS COUNTRY AND ON THE CONTINENT,

IN THE

TREATMENT OF DISTORTIONS;

BEING

AN ENLARGED EDITION OF THE PAPERS LATELY PUBLISHED IN THE LONDON MEDICAL JOURNAL.

By JOHN SHAW,

SURGEON OF THE MIDDLESEX HOSPITAL; AND FORMERLY LECTURER ON ANATOMY.

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PREFACE.

THE desire to investigate a department of surgery which, although curious, and of great practical importance, had not sufficiently engaged the attention of the profession, gave the volumes I formerly published on Distortion more the character of anatomical and pathological disquisitions than of practical treatises. I have endeavoured to make the present work strictly practical, by confining my observations to the principal questions which arise during the treatment of the various kinds of distortion.

To many of my friends, but especially to Sir Astley Cooper, Mr. Charles Bell, and

Mr. Brodie, I am much indebted for the assistance they have afforded me, while endeavouring to establish the treatment of distortions on principles deduced from anatomy and pathology.*

65. *Berner's Street, April* 6. 1827.

* The physiology and pathology of the spine are fully entered into in the preceding volumes, for the purpose of proving that the lateral or serpentine twist does not depend so often on specific or constitutional diseases (as scrophula and rickets) as upon causes which may be counteracted. The folio volume of plates exhibits many varieties of curvature, with sketches from the living body in illustration of the changes produced by the different degrees of distortion.

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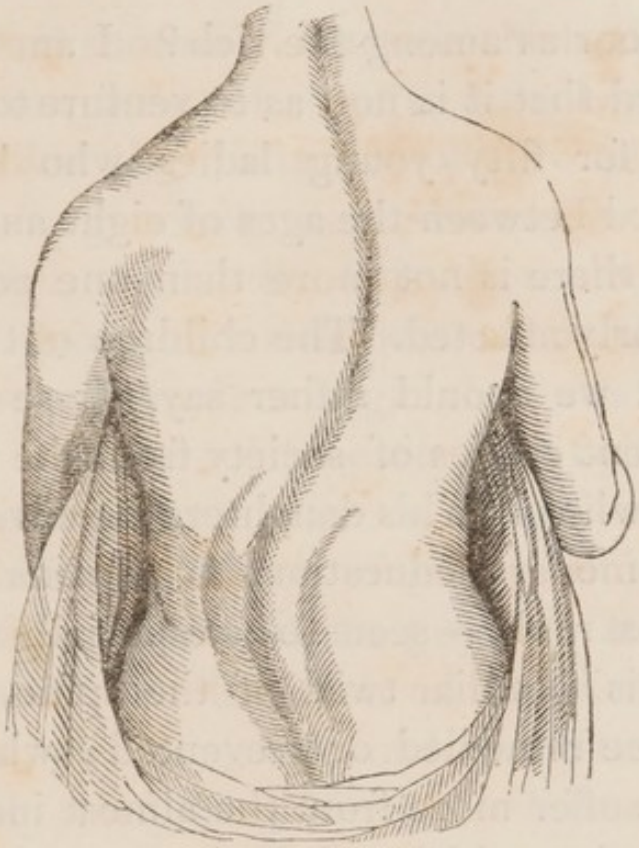

In these papers I shall not enter into any discussions on pathology, but endeavour to give a short account of the several theories which prevail on the causes of the *lateral* or *serpentine* twist of the spine, with descriptions of the different modes of practice pursued in England, Germany, and France.

The first question which naturally occurs is, whether the species of distortion represented in the wood-cut be as common among

the poor as among the rich? I am so persuaded that it is not, as to venture to assert that, for fifty young ladies who become twisted between the ages of eight and fourteen, there is not more than one *poor* girl similarly affected. The children of the rich —or, we should rather say, those in the different classes of society from the tradesman, who gives his daughters the advantages of a modern education, to persons in the highest rank,—seem to be especially subject to this peculiar twist of the spine, which may be remedied or prevented; while the poor suffer more from the almost incurable deformity which arises from rickets or a scrofulous disease of the vertebræ.

As to the comparative frequency of deformity among boys and girls, I should say that for one hundred young ladies who are twisted, there is not one young gentleman; while, among the poor, there are at least as many boys as girls deformed. Indeed, if we were to judge from the appearance of the people in the streets of London, we should believe that there are more crooked men than women in this class.

There is another distinction which, though important, does not seem to have been noticed: that the distortion of the spine in the poor generally commences in early childhood, while the twist is seldom observed among the rich before the children are sent to school, or begin their studies.

The question of how far this twist depends on bad health, or on a peculiarity of constitution, has been often the subject of discussion. Mothers are generally anxious to persuade us that their children, though twisted, are strong and healthy. There are certainly many girls who have slight curvature of the spine, in whom we can discover no signs of previous ill health, or of a weak constitution; but, in the greater proportion, we may observe one or more of the following circumstances:

Enlargement of the tonsils, or swellings of the glands of the neck; occasional discharge from the ears; fretted eyelids; the nostrils, cheeks, and lips, chopped or scurfy; the teeth bad, or small and irregular in form; the skin in different parts of the body affected with slight psoriasis, and not easily

made to perspire, or so thin and transparent that the small veins are visible; the palms of the hands clammy and cold, or rough and arid; the fingers long and tapering; the nails badly formed, and of a peculiar colour; the hands and feet red and cold, and very subject to chilblains. All these symptoms are seldom presented in the same individual, but any two are sufficiently indicative of the system being torpid, especially if the girl is listless and unwilling to join in active games; or, while walking, lifts the feet heavily from the ground, and rests on the heels, instead of rising with a springy and elastic action from the toes.

Without due consideration, it might be alleged that this torpidity of the system causes the distortion. But, although a girl with such symptoms is in more danger than another of becoming crooked, the peculiarity of constitution indicated by them is seldom the sole cause; if it were so, the poor should be the most liable to be twisted, since the symptoms enumerated above are more common among them than among the rich, and are aggravated by the want of

warm clothing, by bad food, and bad air; yet the children of the poor, after the age of ten, rarely become deformed, while those of the rich, although they have enjoyed every comfort and attention that a kind parent can bestow, and have been even remarkable for the beauty of their form, become twisted about this time. It seems, therefore, just to conclude that, although young ladies whose figures are twisted may have a weak constitution, they would not have become crooked in other circumstances of life.

This is a difficult question*, but the more it is considered, the more shall we be con-

* When only one of three or four sisters brought up on the same system becomes twisted, we must believe that she is of a weaker constitution than the others. I have generally been able to discover a difference in the constitution, or to trace the deformity to some peculiarity in the habits, or to a more than usual degree of weakness following measles or scarlet fever. When the distortion is observed at so early an age as from two to six, I suspect that it proceeds from a decided fault in the constitution, and is consequently almost irremediable; and, when it occurs in a boy, at any age, I believe it is also from this cause, unless he has been brought up under the same restraints as a girl.

vinced that the present system of education, and especially the means generally resorted to for preventing or curing a deformity at its commencement, are such that a girl, even of the best constitution, is in danger of becoming twisted; while those who have the symptoms already described, seldom escape. How else can we account for the healthy girls of the poor never being distorted in the same manner, or for the weakly rarely becoming so, after they have attained a certain age. Indeed, I have scarcely ever seen the serpentine twist among the poorer classes of society, except where girls have been engaged many hours during the day in needle-work, or in occupations which rendered their muscles inactive: in several, the natural change in the constitution had not appeared until a late period, — not before the age of seventeen. Under the latter circumstances distortion seems (in every class of society) to come on suddenly, and to increase rapidly.

The symptoms of the serpentine twist of the spine are generally observed by a parent in the following order:

1st. The frequent attempts of the child, when nine or ten years old, to prevent the dress falling off one shoulder.

2d. One shoulder appearing higher or larger than the other.

3d. One of the collar-bones, or one side of the breast-bone, or the breast itself, appearing fuller than the other.

4th. A thickness of one side, and a sinking-in of the other.

5th. One hip appearing to project, or, as the mother expresses herself, "growing out."

6th. One leg appearing shorter, and the habit of standing on one leg, with a hand behind the back catching the opposite elbow.

7th. A peculiarity in the manner of walking; one foot being swung round, and the shoulder thrown forward. This habit of walking sideways is particularly observable when the girl is entering a room, or going up to a stranger.

When the girl reaches the age of twelve or thirteen, her figure is so evidently twisted, that the mother consults a surgeon, and

he points out a curve of the spine from side to side, or rather of a serpentine form. Although this curve was probably never before observed, it has been gradually forming from the time the difficulty of keeping the clothes on one shoulder was first noticed.

The following is an outline of the view I have been led to form on the immediate cause of this yielding of the spine:

A girl of nine or ten years of age, although apparently in good health, is liable to some of the symptoms enumerated at pp. 3, 4., or a strong and healthy girl is sent to school, where for a great part of the day she is cooped up in a long, narrow, and perhaps cold room, with a number of girls; sleeps in the same room with several others; is not so well fed as at home; and the only exercise she is allowed to take is a formal and weary walk. A child of the strongest constitution, under such restraints, soon becomes as liable to be crooked as those who are originally weak.*

* It ought in justice to be stated, that there are many schools where the method of managing the children is so good, that girls, even of a weakly constitution, become

Children thus exposed to have their natural functions disturbed are liable to distortion, and from their generally appearing weakly and dejected, before it is discovered that the spine is twisted, a lurking and insidious disease of the vertebræ is often supposed to be the cause of the apparent ill health, and also of the yielding of the column. But the most popular theory is, that the curvature is the consequence of sitting awry, of standing on one leg, of the habit of stooping, and of sitting carelessly while writing, drawing, or playing.

Such habits may assist in producing distortion, and will certainly increase it when once formed; but I suspect that the anxiety to prevent girls sitting negligently is one of

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strong and healthy; while the discipline in private families, and even in those who live in the country, is sometimes so strict, and so badly calculated, that the children are as likely to have their constitutions deranged as in the worst-managed schools. I particularly allude to the exercise consisting in *walks* at stated hours under the eye of a formal governess; the poor children, although shivering with cold, are not even allowed to make their blood circulate by running; this would be viewed as a great breach of decorum.

the most fertile sources of distortion: I mean the frequent injunctions to a girl of ten or twelve years old, to "hold herself up." When we try to sit erect and stiff, as the little girl is ordered to do, only for a few minutes, we feel a weariness and pain at the loins, which we remove by stooping forwards or lying back. Were a girl to do so, it would be observed, and she would be reproved; but, as it is not in her power to keep herself in the desired posture, she must relieve herself in some way, and she generally does so by allowing the lower part of the spine to sink to one side, which is not so much observed as stooping or lying back. If the chair is so formed that it affords scarcely any support, or if she be placed on a music-stool or bench, it is cruel to blame her, because the position is that into which the column naturally falls, if she is not allowed to stoop or lie back; as may be proved by placing a well-formed girl, of ten or twelve years old, on a music-stool. If the lower part of the spine be observed after she has attempted to sit erect for a quarter of an hour, or even for a few

minutes, it will be found to sink to one side.

A girl gradually gets the habit of sitting in this way, until it is remarked that her shoulders are uneven, and that the clothes slip off one of them.* As the mother is not aware that the cause of the inequality in the height of the shoulders is the yielding of the base of the column, she begs the child to keep her shoulders straight, and perhaps puts on braces or a back-board to keep them even. In this way the bend at the lower part of the spine is overlooked, and, the ligaments gradually yielding, it increases to such an extent that the child, to preserve its balance, makes a second curve in the spine: and now the mother is puzzled, for she finds that there is not so much inequality in the height of the shoul-

* In the greater proportion of cases, the lower curve is to the left side, and the clothes at first slip off the right shoulder (*i. e.* from the left shoulder being the highest); but when the second curve takes place to the right side, the right shoulder projects and gradually becomes higher, while the upper part of the left hip appears to "be out."

ders, but that one appears larger than the other.

When this has taken place, the serpentine curve and the perpendicular twist are fully established; the ligaments, the intervertebral substances, the bones themselves, are all, to a certain degree, altered in form; and the muscles are not only daily becoming weaker, but more irregular in their actions, from the situation of their origins and insertions being changed. The girl is now in a critical condition. If the mother follows the advice which has been but too frequently given by men of eminence, to attend only to the general health *,—or if she

* I know that I shall stand excused for this expression by my professional brethren, who have done me the honour to consult me on the cases of their own children: they have been but too well convinced of the danger of trusting to the advice of attending to the state of the bowels, and of using tonics, shower-bath, spunging, friction, &c. When the spine is once curved, it is as little likely to be remedied by such means, as a crooked tree is to be made to grow straight by merely manuring and watering it. But, notwithstanding this apparently obvious conclusion, nine in ten of the girls who are much distorted have gone on for years, in

be induced to entrust her child to the care of a machinist or stay-maker, the distortion will get rapidly worse, and all the symptoms described at page 7. will appear in quick succession.

Several distinct modes of treating this species of distortion prevail in England. One patient is rigorously confined for months to the same position; another performs certain violent exercises for years; a third is rubbed and shampooed; a fourth wears artificial supports, such as stays, collars, &c.; a fifth submits to attempts to replace bones alleged to be dislocated; a sixth is treated by leeches and blisters, or by caustic and moxa; and many are advised to trust merely to attention to the general health.

Although the plans mentioned above are directly opposite, both in principle and prac-

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the hopes that such means will be sufficient to restore the figure. The general health should, in all the stages of distortion, be particularly attended to: this may prevent distortion, or may perhaps be the means of checking a slight degree; but, when the curves are fairly formed, I believe that attention to the health, although necessary, will not prevent the rapid increase of the deformity.

tice, so many testimonies are offered in their favour, that we are almost bound to believe they have been each attended with a certain degree of success.

The only way we can reconcile such conflicting statements is by supposing that they who have reported the success have not been aware that there are many kinds of distortion, each depending on a different cause *; or that the proposers of the several plans have deceived themselves by attaching importance to success in one or two instances, and in forgetting that there are

* The variety in distortion is so great, that there are many where none of the systems of treatment hitherto proposed have been successful, and for which probably no remedy will be discovered. We know of no plan of treatment which will remedy a distortion where there is anchylosis of the vertebræ or of the ribs; nor that will make the shape perfect where the deformity depends on a congenital deficiency in the size of one side, or on one that may be traced from the period of teething (a defect as common as a small eye or a diminutive arm or leg); nor has any mode of treatment been divulged that will restore the spine to its proper form, where a curvature is the consequence of a collapse or diminution in the size of the area of one side, from disease of the lungs. See further in the Explanation of the Plates.

so many distinct stages in the progress of a common case that every mode may at particular times be applicable. To me it has always appeared, that a judicious combination of the modes reported to be useful was the most likely way of remedying a distorted spine. Thus, since the serpentine curvature generally originates in weakness of the muscles of the back, it is best remedied at its commencement by appropriate exercises, and attention to the general health. In the second stage, the muscles, ligaments, and intervertebral substance acquire a certain form; the good effects of exercises are not so apparent, but the figure may be improved by artificial supports. In the third stage, the vertebræ themselves become altered in shape; the remedies proposed for the second degree are still useful, but that the bones may again *grow into a natural form*, the spine must be stretched, and kept so during the greater part of the day and night. When the ribs and sternum have become much displaced and mis-shapen, the distortion may be said to be in its fourth degree. All the means proposed for the

preceding stages must still be rigidly persevered in, but a variety of contrivances for compressing and remodelling the ribs must also be adopted. The fifth or last stage is anchylosis. In this, any one, or all the plans of treatment combined, are little more than palliatives, or preventives of further increase.

But, as far as I can learn, this system of combining and applying the means according to the nature of the case, is not generally pursued. One particular mode is trusted to; and this, I believe, proceeds from those who propose the several plans having theories of the causes of distortion peculiar to themselves. I shall endeavour to make a short analysis of these theories, and of the plans of treatment generally pursued.

PLAN OF TREATING DISTORTIONS BY CONFINEMENT TO THE HORIZONTAL OR INCLINED PLANE.

THE plan of *rigorous confinement to one position* is founded on the idea that the muscles of the spine are debilitated, and act irregularly, in consequence of irritation or disease of the vertebræ, and that repose is necessary to subdue this irritation, and to restore the muscles to a natural condition.

I believe that, in nineteen of twenty cases of lateral curvature, there is no disease of the vertebræ; that the pain in the back and shoulder, supposed to be indicative of disease, may be relieved sooner by other means than by rest; and that there is seldom or never that peculiar wasting or spasmodic affection of the muscles which is so frequently observed where the vertebræ or ligaments are diseased. In those cases where the muscles of the spine appear smaller than natural, it will be found that they either correspond with the con-

dition of the other muscles of the body, or that the patient has been in the habit of wearing stiff stays.

The effects produced by confining a girl to the inclined plane are often misunderstood. She may be relieved from a dull and weary pain, and at the end of three weeks or a month the spine may be found straighter; but if she be confined to the plane for some months, in the hope of improving the spine still more, or with the intention of preserving the improvement which has already taken place, all will go wrong: she will be reduced to such a state of weakness as to be scarcely able to walk or stand, and, when she attempts to sit up, will sink almost double, or into a state worse than she was when she first lay down; and there are few cases where the general health is not materially injured. But, notwithstanding these results, so much has been said by men of great eminence in favour of the theory on which this plan of practice is founded, that the confinement of girls with slight distortion of the spine, for months, and even years, is often recommended. It is argued

that, although the confinement to the plane is irksome at first, the patient soon gets accustomed to it, and is so much relieved from the uncomfortable feelings she experienced before she lay down, as even to beg that she may continue to use the plane. This, it is said, proves that the spine was in a state of irritation before the patient was laid down, and that it has been removed by the confinement; in short that the girl is gradually recovering, and her wish to continue in the position is thought to be a satisfactory proof that the irritation would return, if she were allowed to rise. As it necessarily happens that there is a recurrence of the uneasiness each time she attempts to sit up, these arguments have been supposed to be unanswerable, and the time considered proper to rise from the plane has been put off from month to month, and even from year to year. If there were disease of the bones or ligaments, the reasoning would be sound; but, when applied to cases of common distortion, the distinction between cause and effect seems to be overlooked.

PERFORMANCE OF VIOLENT EXERCISES, A PLAN OF TREATING DISTORTIONS FIRST PRACTISED IN PARIS.

THE attempt to cure distortions of the spine by climbing ropes*, and by other violent

* The wood-cut may give some idea of the class of muscles brought into action, when a young lady whose spine is distorted climbs a rope.

exertions, is founded on the supposition that curvature of the spine proceeds from the muscles of one side being so defective in strength as not to be able to counteract the influence of their more powerful antagonists.* This opinion has arisen from the appearance of the muscles on the concave side of the curvature, when exposed by dissection, being supposed to be indicative of their having been strong and contractile, while those on the convex side seem to have been elongated and relaxed. From this it was inferred, that the muscles of the concave side overpowered the others, and thus drew down the spine. This theory appears satisfactory, until it is recollected that the curvature to which young ladies, from eight to fourteen, are liable, is not a bend of the spine to one side, as the term *lateral* would

* Instances of irregular actions in muscles frequently occur, but they arise from disturbed functions of the nerves, and are attended with a peculiar class of symptoms. I have seen a few cases of this kind where there was distortion of the spine, but it was of a totally different character from the lateral or serpentine twist, and was merely temporary.

imply, but is of a serpentine and twisted form.

The spine represented here affords a good example of the serpentine twist, and also that violent exercises may not only be useless, but even dangerous. The projecting irregularities mark the points at which several of the vertebræ are united by bone. As every one who has studied this subject

must be aware that the curve is generally serpentine*, it is only necessary to refute the idea that the shortening of the muscles is the *cause* of the distortion. It may be easily proved that the state of the muscles, instead of being the *cause*, is the *consequence* of the sinking of the column; a distinction most important in a practical view.

The muscles, like the ligaments, *accommodate* themselves to the relative situation of their origins and insertions. When the bodies of the lower dorsal vertebræ are wasted, and the muscles of the abdomen only a few inches long, no one would argue that the sternum was drawn towards

* The lateral curve of the spine, or bend to one side, without a perpendicular twist of the column, is not nearly so common as the serpentine twist. There was lately a good example in our hospital, in consequence of the rheumatic affection of the muscles of one side; and I am now attending a young gentleman in a similar condition, which proceeds from his inclining to one side to relieve the irritation of a slight inflammation in some of the ligaments of the spine. When the spine yields, in consequence of disease of the hip, the curve is merely to one side: there is an example of this at present in Northumberland Ward. See the explanation of Plate III.

the pelvis by an irregular action of the abdominal muscles prevailing over those of the back; nor would it be said that, in cases where the upper dorsal vertebræ are diseased, the chin had been pulled down to the breast by the muscular fibres of the gullet, because this muscular tube is found under these circumstances to be not more than four inches long. The obvious and natural conclusion is, that the bony column has yielded and sunk in consequence either of disease of the vertebræ or of the ligaments, and that the muscles and other parts have accommodated their size and form to the necessary change in the relation of the different bones to each other. The condition of the muscles in serpentine curvature is analogous: those between the vertebræ, ribs, and scapulæ become gradually altered in length, and *accommodated* to the position into which these bones have fallen. One of the best proofs that the change in the form of the muscles is not from spasmodic contraction, but from a natural process of growth, is, that the skin also becomes

diminished in length, in proportion to the approximation of the bones.

However, it would be of little importance whether the theory were correct or not, if the treatment founded on it were successful. It is alleged to be so; but, so far as I can judge, exercises are equal only to the *cure* of the slightest cases of lateral curvature, although they are, when properly regulated, useful in almost every case. I may be mistaken in this, but I am positive that even a slight distortion will be more quickly remedied by combining various modes of stretching and supporting the ligaments and muscles, with exercises, than by exercises alone.

The immediate good effect of exercises in slight cases, the rapid increase of strength in those who are much distorted, and the consequent improvement in the form, deceive parents with the hope that a confirmed curvature may be removed by perseverance. But the result of the cases where I have fairly tried the effects of various forms of exercise, and the state I have found the spines of others on whose cases I have been

consulted after they had been climbing a rope for many months under the superintendence of a surgeon, have convinced me that, where the ligaments and bones are altered in form, exercises are inadequate to the restoration of the shape. The statement made by Dr. Collin of Paris corroborates this opinion: of ten patients whom he examined, not one had been cured by a long continuance in the performance of the exercises which have been since introduced into this country from France, viz. drawing up weights, climbing ropes, ladders, &c.

At one time, I over-rated the value of exercises in cases of distortion. Further experience has proved, that the only advantage gained by them is counteracting the debilitating effects of certain other necessary modes of treatment; this is indeed a great point to gain, but still exercises should be considered only as a part of the treatment, and as one which of itself is inefficient. When obliged to listen to the extraordinary histories of girls, who were distorted to the last degree, having been completely cured merely by exercises, we

cannot avoid thinking it strange, that many persons whose situation in life dooms them to active and laborious exercise of the muscles of the chest should continue to be as much or more deformed than weak and delicate girls. Such cases should, without any other proof, be sufficient to show that exercises alone will not cure distortion.

Since writing the above, I have been consulted on the case of a young lady, who, for the preceding eighteen months, had every day, excepting Sundays and during the holidays, gone some distance to be shampooed, and climb a rope, and pull up a weight by a strap fixed round her neck. Her friends stated that she had become much stronger. This I can readily believe; but the condition of her spine, after eighteen months' trial of these exercises, may be judged of from the plan given in the plate containing the impressions made by dotting the skin over the spinous processes.

The twist might have been originally of a different character, but when I examined the spine, the curve was such as would be rather increased than diminished by climb-

ing ropes, hanging on poles, &c. No artificial supports had been worn, nor had any plan been pursued to keep the upper part of the spine extended; — if such means had been combined with exercises appropriate to the curve, there would have been considerable improvement even in the upper part, in less than eighteen months. But this young lady laboured under other disadvantages; for, instead of doing the exercises at home, where she might have had the advantage of lying down in a position calculated to restore the ligaments to a proper form, after they had been extended by the exercises, she was obliged to go home. To permit a girl to walk, or even to ride some distance, and without any means of supporting the spine after the power of the muscles has been worn out by three or four hours' severe exertion, and while the ligaments are relaxed and lengthened, seems to be a most excellent invention to undo nearly all that has been done by the exercises. It is true, that this young lady was desired to lie on the carpet when she reached home, but even this most

inefficacious mode of preserving the bones in their proper relation to each other is but seldom attended to. The exercises alluded to, do not even appear to be applicable to the common cases of lateral curvature. The wood-cut shows the class of muscles which are principally brought into action; indeed any one who tries to climb a rope hand over hand as these young ladies do, will be conscious that the upper part of his spine is bent, and that long-continued efforts may develope the muscles of the back of the neck, so as to produce a form similar to that of a sailor-boy.

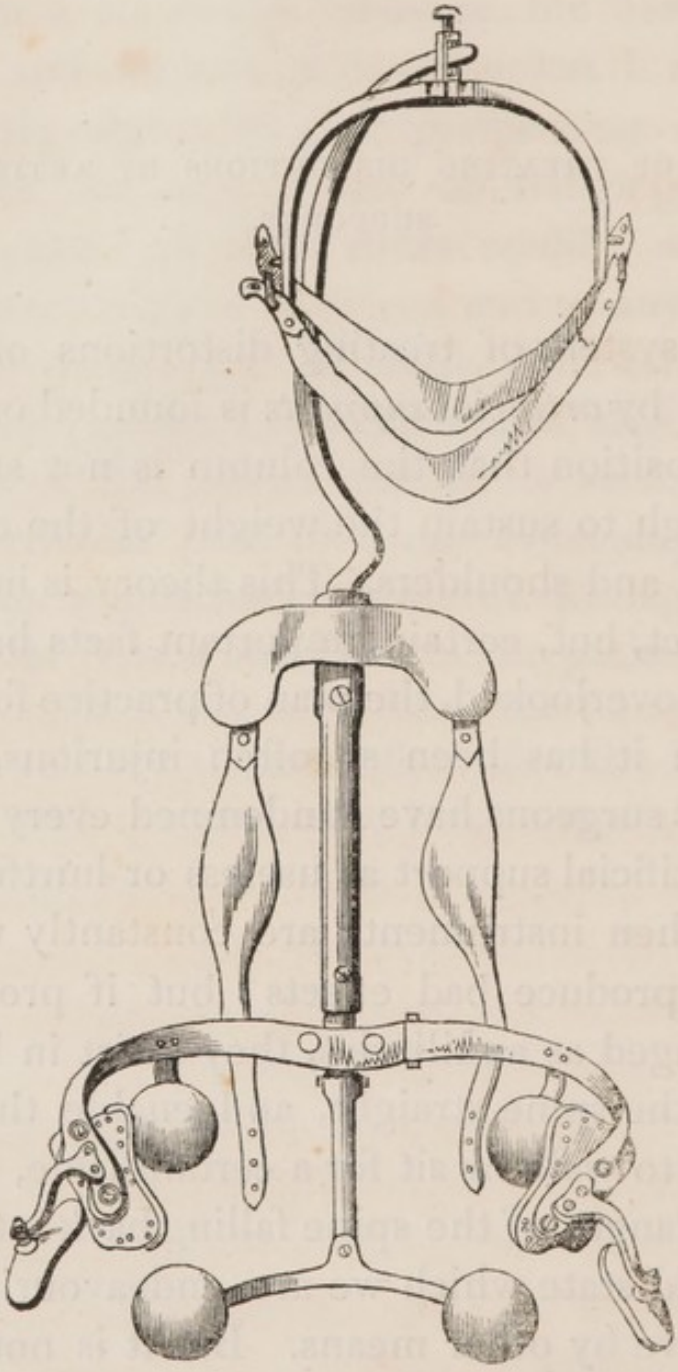
Independently of the danger of falling, there are very serious evils to be apprehended from such rude exercises; the greater number of girls may become stronger, but if a child of a high spirit, although of a delicate form, be permitted to do them, she may over exert herself, and either become stinted in her growth, or her muscles or ligaments may be strained, so as to render her miserable for life. I was lately consulted by a person (a strong man) who was ruptured on both sides by the performance of similar feats of strength.

I am a strenuous advocate for certain forms and degrees of exercise, but I most distinctly object to girls performing such feats as climbing ropes, or hanging by poles; and I do it the more readily, as almost every kind of exercise, and to any degree of power, can be easily done on the moveable frame, and without the slightest danger of the patient falling, or straining any particular part, or even of developing any class of muscles in an inordinate degree. This contrivance also enables the patient to rest in such a way as to keep the bones in proper relation to each other after the ligaments and muscles have been suppled by the exercises.

PLAN OF TREATING DISTORTIONS BY ARTIFICIAL SUPPORTS.

THE system of treating distortions of the spine by *artificial supports* is founded on the supposition that the column is not strong enough to sustain the weight of the chest, head, and shoulders. This theory is in part correct, but, certain important facts having been overlooked, the plan of practice founded on it has been so often injurious, that many surgeons have condemned every form of artificial support as useless or hurtful.

When instruments are constantly worn, they produce bad effects; but if properly managed as auxiliaries, they assist in keeping the spine straight, and enable the patient to walk or sit for a certain time, without danger of the spine falling back into the curved state which we are endeavouring to remove by other means. But it is not surprising that prejudice should have arisen against the tremendous engines generally employed for this purpose.



The wood-cut represents the apparatus called Chesher's Collar: an instrument called an improvement on this, by a machinist in Bath, is even more complicated.

However, although the appearance of many of these machines is sufficient to alarm a mother, the assurances of their being the only means of cure have overcome their scruples, and delicate girls, regardless of pain, have submitted to wear them until many distressing consequences have ensued.

The shape of the bones of the face is often altered, and the teeth displaced; or the muscles of the cheeks are wasted by the pressure of the chin-straps, so as to increase the peculiar character of the countenance sometimes observed in deformed persons; and many are marked for life by the scars of ulcers under the chin.

But independently of those effects, which are nearly as bad as the deformity proposed to be remedied, other consequences equally distressing ensue. By the pressure of the heavy complicated iron-work on the hips, back, and shoulders, many of the muscular fibres are absorbed; and the muscles by which the column should be supported gradually become so weak, from want of use, that the patient must either submit always to wear an artificial support, or, after en-

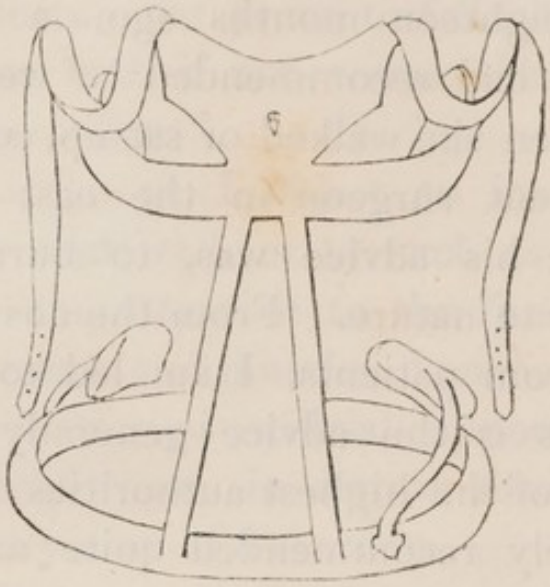
during torture for years, to fall into a state nearly as bad if not worse than before using the collar. *

But, although I object to instruments clumsily contrived, or to such as are used without due attention to the functions of the ligaments and muscles, I am so satisfied of the necessity of artificial supports, that I recommend them, in certain forms, in almost every case of distortion.

The discrepancy of opinion on this question is a source of great difficulty to the friends of patients, and especially to those from the country, who are "anxious to take all the advice London can afford." By one eminent surgeon they are told all supports are injurious in lateral curvature; by another, that perseverance in the use of them will certainly cure this deformity.

* The principal objection formerly made to such instruments was, that the pelvis might be distorted by them; but I trust it has been satisfactorily shown that there is no danger of this except in rickets. A case showing some curious effects on the muscles of the neck by a long perseverance in the use of one of these instruments, is given in the Supplement to my work on Distortion.

About eighteen months ago, a patient, whom I had recommended to wear supports when she walked or sat up, consulted an eminent surgeon in the east end of London: his advice was, to burn them, and trust to nature. From the answers received from patients, I am led to believe that this is the advice generally given: but one of the highest authorities in London lately recommended quite an opposite mode of treatment for a young lady, who had also been a patient of mine. However, notwithstanding the deference due to a senior of great merit, I would venture to allege that his advice was too much in the opposite extreme to that of trusting to nature; for the effect of encasing a girl in a machine from morning to night must be to debilitate the muscles of the trunk, and thus to add to the original cause of the distortion. The machine recommended in this instance was that represented in the woodcut, and which is generally known by the name of the "Invisible Back." It was invented by Callam, the truss-maker, in Great Queen Street, who died lately. When

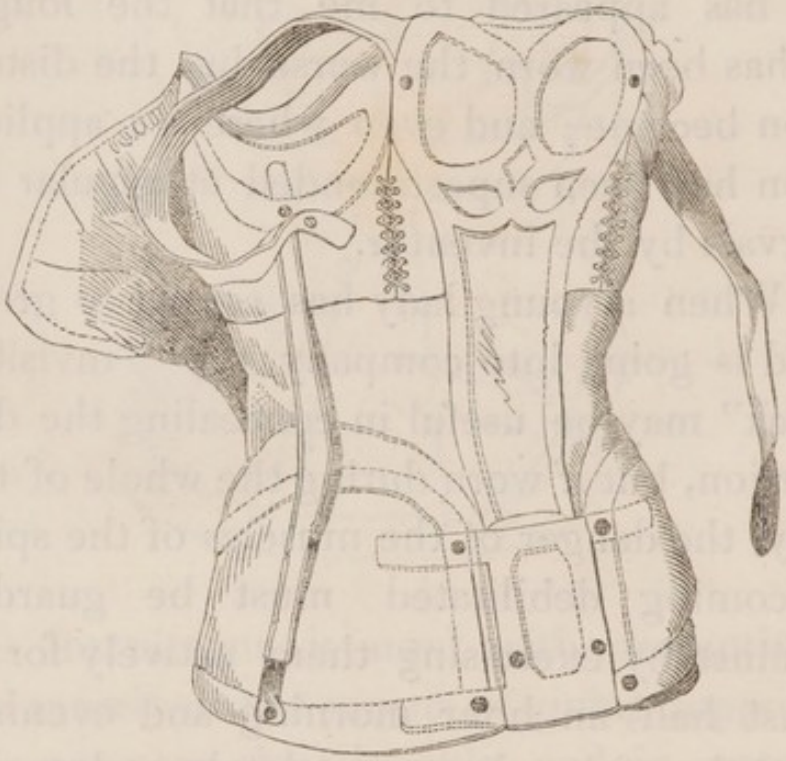


this instrument is used with precaution, and merely as the means of giving support, it is not very objectionable, and in certain conditions of the spine, even if worn all day for a short period, may be of marked benefit; but from the lamentable effects produced by it in several cases of the common serpentine twist, I have been led to consider it full of danger, and chiefly because it conceals the deformity, so as to deceive the friends of the patient. In some instances it produces so much pain, that it is thrown aside after a short time. It is, however, often submitted to for years. I have known it worn as long as seven years:

it has appeared to me that the longer it has been worn the worse has the distortion become; and even where its application had been superintended at regular intervals by the inventor.

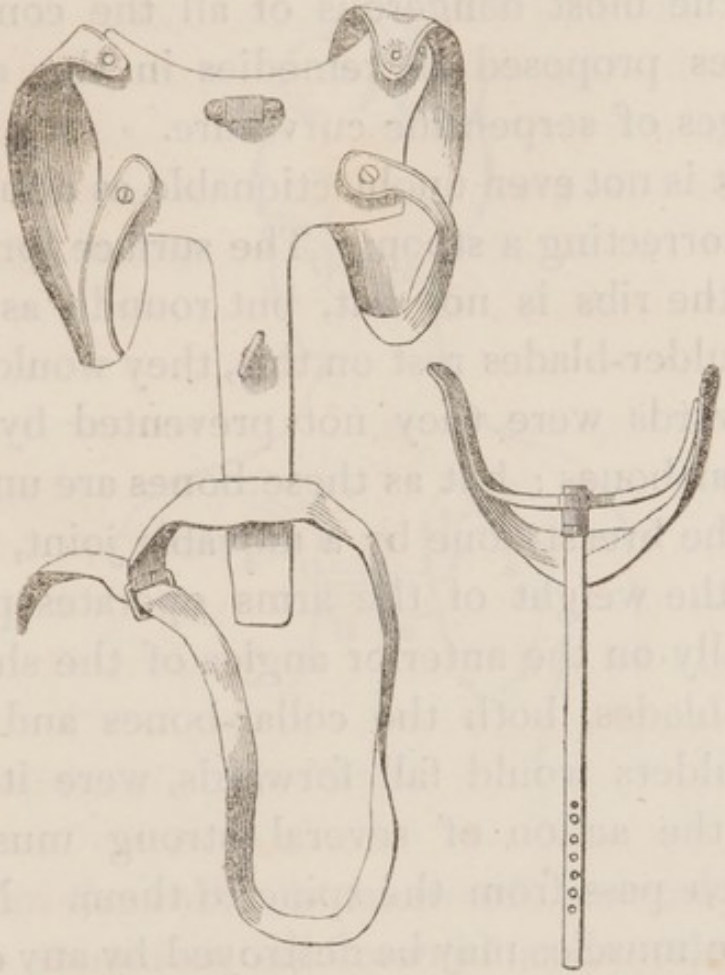
When a young lady has ceased to grow, and is going into company, the "invisible back" may be useful in concealing the distortion, but if worn during the whole of the day, the danger of the muscles of the spine becoming debilitated must be guarded against by exercising them actively for at least half an hour morning and evening. How hurtful or how completely useless one of these instruments may become in a few months is shown by the change which took place in the size of the chest and shoulders of the girl who was a patient in the Middlesex Hospital. See the plate.

Instruments similar to that represented in the wood-cut in the next page are made in London, but it is copied from a machine made in Edinburgh. It is often used there as a means of remedying the common serpentine curvature; but I am fully persuaded, from the cases I have seen, that it is de-



cidedly bad, even as an auxiliary. However, it is an excellent contrivance for supporting the spine and chest in certain cases of debility. The principal objection to its application in young persons is, that it does not admit of the natural growth of the chest: as it covers the spine, shoulder-blades, and ribs, and may be made of any shape, it will probably be often used as a means of concealing deformity.

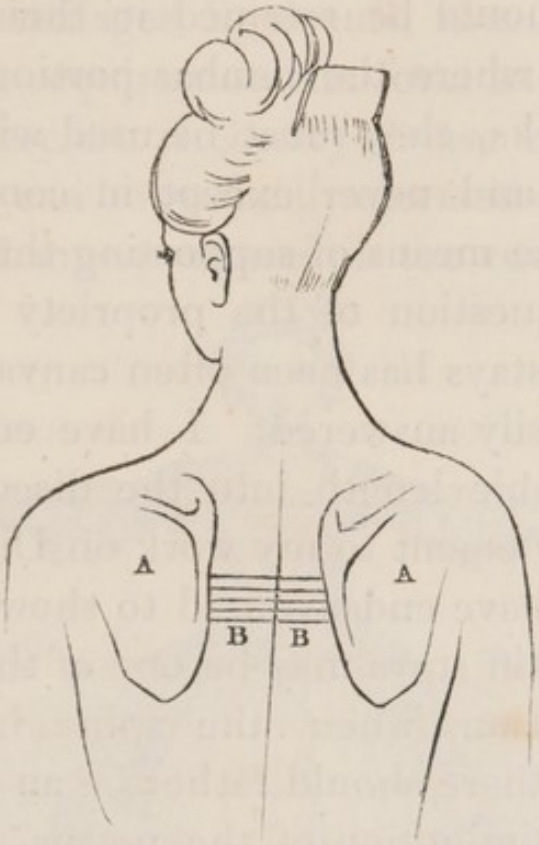
This is the common back collar; it is generally used to push in the projection of



the shoulder, described at p. 7. It appears to do good for a time; but as the loins are not supported, the lower curve rapidly increases, and then the shoulder, notwithstanding the pressure of the collar, seems to grow larger. As this does not depend on any change in the size of the shoulder, but in the alteration in the position of the spine and ribs, this instrument may be considered

as the most dangerous of all the contrivances proposed as remedies in the early stages of serpentine curvature.

It is not even unobjectionable as a means of correcting a stoop. The surface formed by the ribs is not flat, but round; as the shoulder-blades rest on this, they would fall forwards were they not prevented by the collar-bones; but as these bones are united to the breast-bone by a movable joint, and as the weight of the arms operates principally on the anterior angles of the shoulder-blades, both the collar-bones and the shoulders would fall forwards, were it not for the action of several strong muscles which pass from the spine to them. Now these muscles may be destroyed by any contrivance which supersedes their use. For example, let A A be the shoulder-blades, and B B the muscles which support them. If the scapulæ be brought close to the spine by the straps of the collar, and kept constantly so, there can be no use for the muscles B B. They must consequently waste, while those on the fore-part of the chest, being excited to resist the straps, will become increased in power; and hence,



when the collar is taken off, not only will the shoulders fall forward as in a delicate person, but the muscles on the fore-part of the chest will predominate over those by which the scapulæ should be held back, and *pull* the shoulders forwards.

But collars, back boards, and the riband in the form of the spider, may be all used with advantage to the figure of girls who are round-shouldered and stoop, if care be at the same time taken to keep up the tone of the muscles by which the shoulder-

blades should be retained in their places. In cases where the lumbar portion of the spine sinks, they must be used with great caution, and never except in conjunction with some means of supporting that part.

The question of the propriety of girls wearing stays has been often canvassed: it is not easily answered. I have entered at considerable length into the discussion in the Supplement to my work on Distortion, where I have endeavoured to show that although stiff stays may be one of the causes of distortion, when the spine has once yielded, there should rather be an addition than a diminution of the means of artificial support, until the natural powers, by which the spine is enabled to sustain the superincumbent weight, are restored.

But, although stiff stays may for a time prevent a curvature from getting worse, and even for the first few weeks appear to improve the figure, they are not calculated to correct the curve; because they do not afford the means of gradually elevating the spine, but only of preventing it from sinking. It is hence often found that, if stays of the same size be worn for some months, the

bones, cartilages, ligaments, muscles, even the skin, acquire a certain form and length; it is therefore necessary to use such supports as can be gradually elevated according to the change produced in the curve.*

* In a young lady twelve years old, from the 25th of November to the 3d of January, the curve was so much straightened that she measured two inches taller. In another, between seventeen and eighteen, where the curvature was much greater, the difference in three months was four inches. I had gradually, during that time, raised the supports four inches. The increase which

When stays, similar to those represented in the wood-cut, were recommended as the means of improving the figures of children, we cannot be surprised that objections were made by anatomists to their use. The following is rather a curious anecdote in relation to this question: "An edict was passed by the Emperor Joseph the Second, to restrain the use and fashion of stays: in the preamble, it set forth that they impaired the health and growth of the fair sex. In all orphan-houses, nunneries, and other places of public education, they were strictly forbidden; and young ladies of the court still persisting in the fashion, were threatened with the loss of the 'customary indulgencies and countenances' bestowed on their class. Thus the use of stays was made a sort of immorality. The College of Physicians was enjoined to draw up a Dissertation in support of the royal edict, which was distributed gratis. But what can a monarch do against fashion? The liberty of the corset was soon re-established in Austria in its full severity."

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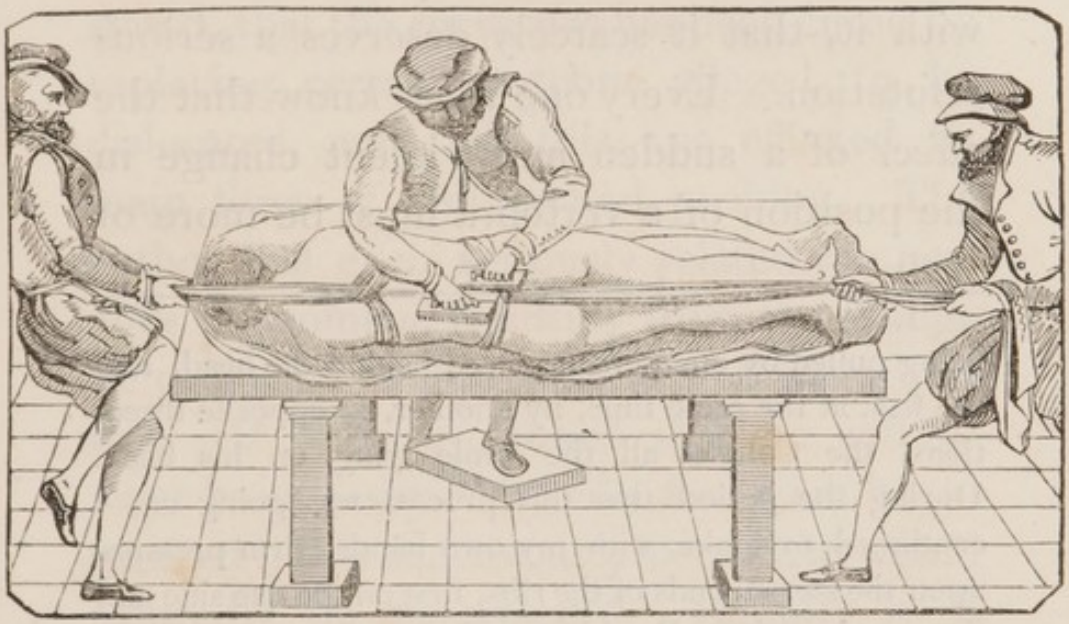
also takes place in the breadth of the chest makes stays still more objectionable.

PLAN OF TREATING DISTORTIONS BY ATTEMPTING TO REPLACE BY MAIN FORCE VERTEBRÆ ALLEGED TO BE DISLOCATED.



THIS is copied from the works of Ambrose Paree, but it does not give a more formidable idea of the modern invention than the description given by the operator of the manner he attempts to reduce dislocated vertebræ. *

* "I caused the spine to be stretched daily, for an hour at a time, in order to draw out, and, in some degree, to separate the vertebræ from each other. This operation was performed by means of the shoulders

The proposal to cure distortions by replacing vertebræ alleged to be dislocated, is founded on so mistaken a notion of the structure and physiology of the spine, and of the functions of the parts connected with it, that it scarcely deserves a serious refutation. Every one must know that the effect of a sudden and violent change in the position of a vertebra must be more or

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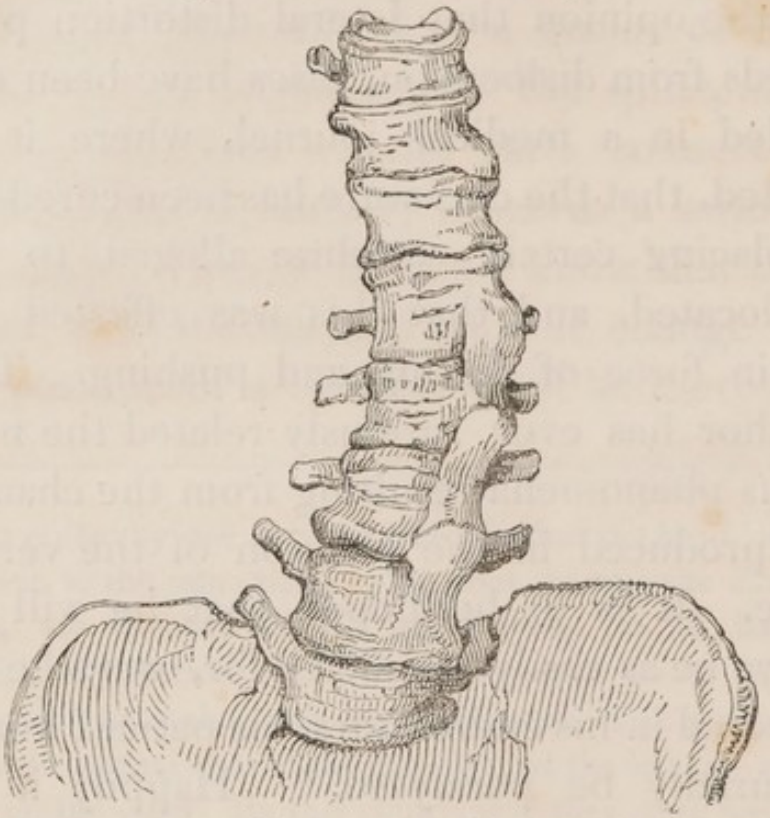
being pulled by one person placed behind the head, and the feet, at the same time, by another, in opposite directions, the Colonel all the while lying on his back. During the period that this process was going on, I continued to make, with my own hands, firm pressure upon the sternal ends of the ribs, first on the one side and then on the other. By this contrivance they were forced to act powerfully, at the other end, upon the depressed vertebræ. This was done to drive them outwards, and towards their proper situation in the column." — *Medical and Physical Journal*, vol. xliv.

This mode of operating on the spine, although on the person of a colonel, is sufficiently alarming, but still is not so frightful a means as that of fixing a patient by the feet to the bottom of a bed-frame, and by a windlass (sufficient to raise half a ton) fixed to the other end stretching the spine in the hopes of reducing bones (never dislocated). I have not witnessed the operation, but have seen the apparatus, and had the operation described to me by the patient.

less an injury of the spinal marrow. But, notwithstanding the demonstrable fallacy of the opinion that lateral distortion proceeds from dislocation, cases have been detailed in a medical journal, where it is stated, that the curvature has been cured by replacing certain vertebræ alleged to be dislocated, and that this was effected by main force of pulling and pushing. The author has even seriously related the nervous phenomena resulting from the change he produced in the position of the vertebræ. It is to be hoped that he will always be as easily satisfied; for, were he to succeed in his endeavours, his patient would assuredly be paralysed.* Happily it is scarcely possible to alter the position of a vertebra without a degree of violence that is not likely to be used; and, therefore, notwithstanding the application of a *windlass* to pull the bones into their proper

* While I am writing, there are two patients in the Middlesex Hospital, in whom some of the dorsal vertebræ have been partially displaced by violence. In both, the lower part of the body and the legs are paralysed.

places, there is little danger of the spinal marrow being torn across or squeezed.



There is sufficient evidence before us that all who propose to treat distortions of the spine should be fully acquainted with the natural structure of the body, and with the changes which take place in it, before they can be safe practitioners. The wood-cut above represents a spine distorted in the ordinary manner, but anchylosed. If any violent attempt were made to change the position of the bones in such a case as this,

or in one similar to that represented at p. 22., the spine might be broken across, because the column is rendered weak instead of being made stronger by the deposition of the bony matter. It is to be hoped that a degree of force sufficient to break the anchylosis will never be applied, but the mere attempt to stretch the spine by a person ignorant of the existence of anchylosis might so disturb the bony adhesions as to excite a dangerous degree of inflammation.

The description given by patients of the manner they have been pulled for the purpose of reducing the dislocated bones, is sufficiently alarming; but in cases of simple lateral curvature, the *attempt at replacement* is not so injurious as the confinement to the horizontal position for months, under the pretence of preventing the *replaced vertebræ* from slipping out of their places.

I have seen several patients who had submitted for a long time to this treatment: each of them had become miserably weak. One young lady had been confined for three years, until a short time

before I saw her. On my first visit, I requested her to lie down on the sofa, that I might examine her spine; but she said that she was afraid to lie down, and had not done so for three years without having one person to keep her head steady, and another to her feet, that the bones might not again be displaced. On assuring her that she need not be afraid, she eagerly asked if she might turn in bed without any risk of the bones slipping out? for she had been strictly cautioned against indulging even in this degree of motion.

This young lady had been reduced to such a state of weakness by this system of restraint, that her parents became alarmed for her life, and changed the plan of treatment so far as to incase her in a machine like a cuirass. While supported by this, she could walk; but, although I was told that she had become stronger, the muscles of her back were like shreds of ligaments, and the spine was so stiff and unyielding, that anchylosis seemed to have taken place. However, I proposed to try what could be

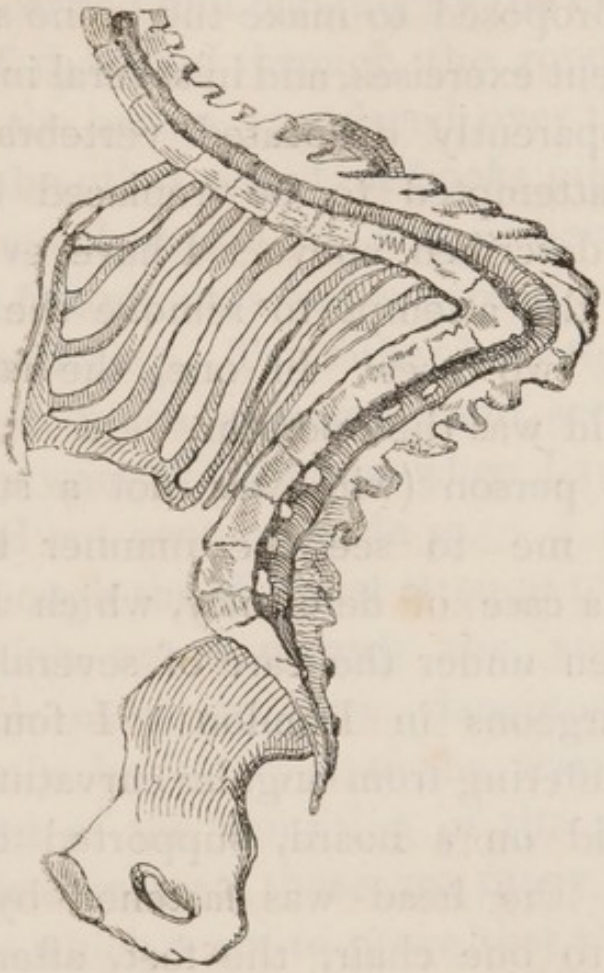
done by combining gentle exercises of the muscles of the back with proper rest and support. By persevering in this plan, she became in a few months strong and muscular, and even gained nine pounds in weight, and the curvature of the spine was also considerably improved. The restoration of her health was a satisfactory proof that the symptoms of consumption, under which she was supposed to be sinking, depended entirely on the confinement. I do not hesitate to say that this young lady, who had been confined at home for years, and even carried on a litter to the sea-side, and laid out on the beach, should not have been at any time confined to the same position for twenty-four hours, nor prevented from taking daily and active exercise.

It is stated on good authority, that this system of reducing dislocated vertebræ has improved the curve ; but I have reason to believe, that the improvement has been only temporary. The process of stretching and pulling, (although done with the view of reducing bones said to be dislocated,) when combined with rest on the

plane, may make the spine much straighter, in eight or ten weeks. Indeed I know that the height has in some instances been increased two or three inches. But if the patient, instead of being strengthened by appropriate exercises, is confined to the same position for months or years, for the purpose of consolidating the spine, and preventing the bones, which the operator alleges he has reduced, from again slipping out, bad consequences, and particularly great debility, must assuredly follow.

The statement by the friends of patients is generally to the following effect. During the first three months, they were delighted with the change on the form, and even with the girl's appearance, as far as regarded health; but after this period, while flattering themselves that she would soon be able to rise quite recovered, they have observed her to become daily weaker, and gradually to fall into an alarming state of bad health. Being now obliged to abandon the plan of treatment, they have found that the spine soon became nearly as much curved as it was before the girl lay down.

In some instances I have been assured, that it rapidly became much worse.



This wood-cut represents the condition of the spine in the deformity commonly called Hump-Back. It is very different from that called Lateral or Serpentine Curvature. Although every one who knows the state of the vertebræ in this distortion will admit, that the spine cannot be re-

stored to its natural form, and that even the attempt to do so is highly dangerous, it is often proposed to make the spine straight by violent exercises, and in several instances the apparently dislocated vertebræ have been attempted to be replaced by the means described above. I have even witnessed the attempt to remove the curvature in two cases. In one, the father of the child was the operator.

This person (who was not a surgeon) invited me to see the manner he was curing a case of deformity, which he said had been under the care of several of the first surgeons in London. I found the child suffering from angular curvature. He was laid on a board, supported by two chairs; the head was fastened by chin-straps to one chair, the feet, after being pulled down, were fixed by bands to the other; the child was kept night and day in this position, with the exception of the time occupied in the following operation, which the father described as the principal part of the treatment. A common carpet broom was put through a loop attached to

the head-band, the father and mother each took one end, raised the boy from the chairs, carried him hanging by the chin and back of the head through the room; one end of the broom was placed over the fire-place, the other rested on books piled on a table, and there the boy was suspended for twenty-five minutes, and apparently without much suffering. The father held the "faculty" in much contempt, and seemed to pity my want of boldness, when I told him I would not venture to do so.

Although the slightest attempt to stretch the spine, or to disturb the anchylosis in such cases is very dangerous, and can only be resorted to by men totally ignorant of the condition of the spine in angular curvature, there are many circumstances which seem to prove that this state is not always necessarily attended with disease of the spinal marrow, nor even with such a diseased state of the bone, as to cause the formation of matter.

But this is a subject of so serious, nay of such vital importance, that I am unwill-

ing to enter upon the discussion of it, until I have had more experience; I shall notwithstanding venture to differ from the generally-received opinion, so far as to express a doubt of the propriety of applying blisters or caustics in cases where there are no symptoms of inflammation of the vertebræ or of the ligaments. These severe measures have often appeared to me to produce so much fever and general irritation in children already weak and prone to scrophulous inflammation, as to increase the bad health and debility on which the sinking of the column first depended, and even to be the means of bringing on abscess and caries of the bones. Where there is no pain, no paralysis, no swelling of the ligaments, I have been led to believe, that the best plan of practice is to trust to the effect of rest in the recumbent position, and attention to the general health. But if there should be any symptoms of inflammation, active measures must be resorted to.

When there are no alarming symptoms, we may safely try to *prevent the increase* of the curve, as this may be done

while the child lies in the horizontal position, but it is highly dangerous to endeavour to *diminish the deformity* by any attempt to make the curve straighter; even were we able to make the spine straighter, the back must still be stiff, and consequently the child would still appear deformed. All that could be attained is therefore too trifling to induce us to run any risk.

I trust it will not be supposed that I am here advocating any plan of treatment similar to that which is so useful in cases of lateral curvature. If the spine becomes curved in an angular form at any age, but more especially after the patient is ten years old, it should be considered a most serious case, although there be no symptoms of abscess or paralysis. Paralysis sometimes comes on long after the appearance of the distortion, and without there being any marked symptoms denoting its approach. Or an abscess may form and point at the loins as a lumbar abscess, or at the groin as a psoas abscess, without the accession of the inflammation

being marked by pain. The occurrence of such cases, and the fact universally admitted, that most important changes take place in a scrophulous constitution without their being denoted by precise symptoms, will necessarily make us cautious. But still the number of persons with hump-back, who may be seen in the streets of London, are sufficient evidences (independently of the cases which come more immediately under our observation) that in the great proportion of angular curvatures, the cause, whatever it may be, that leads to the yielding of the column, does not necessarily produce either abscess or paralysis. It is from reflecting on these cases, and on those I have had an opportunity of attending to particularly, that I am led to object to the system of bleeding and application of caustics or setons in every case of angular curvature. Such a plan of treatment is attended with the best effects in particular cases; but if indiscriminately followed, it may be as often the means of weakening and destroying the health, and thus exasperating the disease. It must not be forgotten, that

there are many instances of palsy of the lower limbs, and of psoas abscess in consequence of a disease of the spine, which is not marked by the angular curvature.

DESCRIPTION OF THE DIFFERENT METHODS OF TREATMENT AT PRESENT PURSUED IN PARIS.

WHILE in Paris, last August, my friend, M. Breschet, surgeon of the Hôtel Dieu, introduced me to the medical superintendents of several of the institutions lately established in Paris for the cure of distortions. Fortunately for the object I had in view, many of the patients cheerfully permitted me to examine them, and answered my questions with the greatest readiness.

I visited the three most celebrated institutions. The first in celebrity is in the splendid building, formerly the Hôtel Biron, in the Rue Varenne, but being now a *pension* under the management of the nuns of the order of Sacré Cœur, is called the convent of Sacré Cœur.*

I also visited the institution superintended by Dr. Maisonabbe, in the Rue

* Some idea may be formed of the rank of the patients treated in one of these Institutions, from each of them paying 6000 francs a year.

Chevreuse, near the Luxemburg, and that of MM. Lafond and Duval, in the Rue de Battailles, Chaillot. As I had thus an opportunity of examining the different modes in which about seventy patients were treated, I made no attempt to see the institution at Chaillot, superintended by M. Milli. The history of this person, who may be considered the founder of the system of treatment at present adopted in Paris, and in the provinces of France, affords a curious example of the avidity with which the public enter into the views of men who, though not educated to the medical profession, boldly declare they can cure the most desperate diseases by a certain and easy process.

M. Milli was a merchant* ; when twenty-three years of age, he consulted his family physician about a curve in his spine. The physician recommended him to M. D'Yver-

* See the "Journal Clinique, par C. A. Maisonabbe; Professeur Agrégé en Exercise à la Faculté de Médecine de Paris;" and "La Vérité sur les Progrès recens de l'Orthopédie, par un Docteur en Médecine de la Faculté de Paris."

NOIS, then famed in Paris for curing club-feet; who advised him to go to M. HEINE, at Wurtzburg in Germany. M. Milli remained for some time at Wurtzburg, and made drawings and models of the beds and other contrivances used in M. Heine's institution. On his return to Paris, he called on his friend the physician, and assured him that he had received great benefit from the plan pursued at Wurtzburg; but the physician declared, on examining him, that he saw little change in the state of his spine.* However, he complied with M. Milli's request, and certified that the beds, &c. of which he showed him the models, might be useful in the treatment of curvatures of the spine. M. Milli received similar certificates from other medical men in Paris. He then published a prospectus, in which he proclaimed that he was cured, and promised, by following a plan similar to that by which he had been relieved, to cure all diseases of the spine in

* See the communication from this physician to M. Maisonabbe, in the first number of the Journal Clinique.

an establishment he had formed at Paris, in the Quai de Billi, near the Champs Elysées.* This was so lately as the winter of 1823. The speculation succeeded so well, that there were several institutions established on the same plan, and even some mistresses of boarding-schools, finding they were losing their pupils, got beds made similar to those used by the young merchant, and took the treatment of the crooked into their own hands. It is stated in one of the French journals, that, of 140 young ladies in one school, twenty were found to require treatment.

* A son retour, M. Milli s'empressa de faire construire un lit semblable à ceux de Wurtzburg, et s'étant procuré l'attestation de quelques médecins et chirurgiens recommendables, qui crurent vraisemblablement, que les lits mécaniques pouvaient contribuer à corriger les courbures de la colonne vertebrale, il publia un prospectus anonyme, dans lequel il proclama hautement sa guerison, (quoi qu'il ait encore, assure-t'on, besoin de corset pour dissimuler l'inégalité des ses épaules,) et la promit sans scruple aux infirmes qui voudraient se rendre dans un établissement qu'il venait de fonder à Paris, Quai de Billi, près les Champs Elysées. (Hiver de 1823.)—See p. 5. of "La Vérité sur les Progrès recens de l'Orthopédie, par un Docteur en Médecine de la Faculté de Paris."

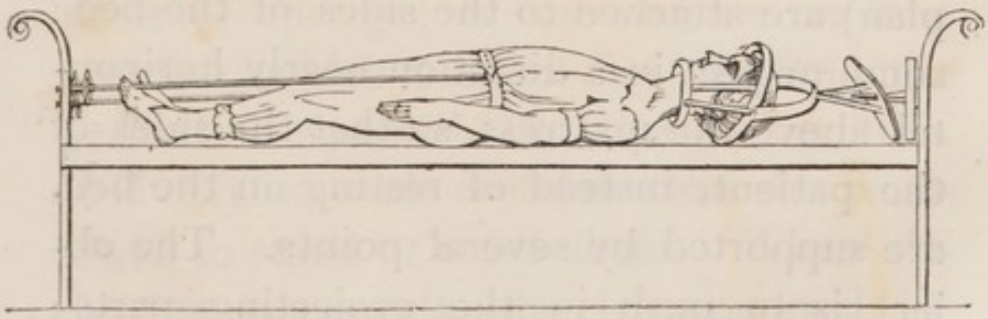
M. Heine, of Wurtzburg, in a paper on the instruments used in the Treatment of Distortions, (in the Jena, Allge. Literat. Zeitung, for December, 1825,) complains of M. Milli's conduct, and declares his disbelief in the statement that he was cured. He says that the apparatus M. Milli brought from Wurtzburg, however perfect in itself, is not sufficient for the cure of a person twenty-three years of age; and that, to cure any curved spine, a long and complicated treatment is necessary, &c. &c.

Without going further into the history, we should suppose, that M. Heine was the original inventor of the mechanical beds, &c.; but we find that Heine's method is nearly a copy of that used by Venel, who practised about fifty years ago at Orbe in Switzerland, and which is described in the Memoirs of the Physical Society of Lausanne. It is there stated that Venel used, during the day, a machine nearly similar to Levacher's, or to that known in this country by the name of Jones's collar; but that he made a grand improvement on Levacher's system, by con-

triving a means for fixing the patients in a state of extension during the night. The fifth plate in the second volume of the Memoirs represents the bed employed by Venel, and, if compared with that now generally used in Paris, and which is called the Wurtzburg bed, the difference between the two will be found so trifling, that we shall be inclined to agree with those who allege that Heine, who complains of Milli, is himself a mere copier of Venel.

Plan of Treatment at the Convent of Sacré Cœur.

In the convent at Sacré Cœur, the beds are formed after the model of those used by Milli, or after that of Heine of Wurtz-



burg. This sketch is on so small a scale, that it is difficult to represent accurately the form of the springs. In the last improvements by Martin, (the machinist of the institution,) there is a scale introduced upon which the elliptic springs act: he has also added a winch, or wheel, at the lower end of the bed, to act on the springs. The springs are very powerful, (being made on the same principle as those formerly used to try the strength of horses,) and, by communicating with the casque on the head and the girdle round the pelvis, are intended to keep the body on the stretch. The bed or mattress is stuffed very hard, and is so convex that the spine, or only the middle of the back, is supported: indeed, it is of such a shape that it would be impossible to remain on it if the body were not fixed. Several springs (not represented in the plan) are attached to the sides of the bed: some project in a direction nearly horizontal above the mattress, so that the sides of the patient, instead of resting on the bed, are supported by several points. The object is to push in the projecting parts;

while other springs pass over the body, and press upon the ribs in front.

The patient spends the night, and the greater part of the day, on this bed; a constant pull being kept on the head and the hips by the elliptic springs, while pressure is made on the protuberances by the horizontal *plaques*. On rising from bed, she is put into a strong arm-chair, furnished with a *minerve* and powerful springs, which may be brought forward by screws. Placed in the chair, she is first firmly strapped down, by a girdle round the hips, to the seat; her head is then elevated, and fixed to the minerve; then the springs are worked forward by screws to press on the projecting points: she has thus no power to move her body in any direction. When freed from the chair, she either puts on a strong corset or cuirass, also furnished with strong-pressure springs; or she mounts on long crutches, which prevent her touching the ground except with the tips of her toes. It is only on such crutches that she is allowed to stand or move about. When sitting at her meals, she is supported by

crutches attached to the chair. I cannot state the exact time spent in each of the machines: I saw all of them used, with the exception of the corset, and was told that there was not an hour, night or day, during which the patient was not engaged in one or other of the plans of treatment.*

That this description is not exaggerated, will appear by the following extract, from the Journal Complémentaire des Sciences Medicales for May, 1824, of a description by Professor Fodere of the method pursued in an institution lately established by M. Humbert:—

"Each patient was put into a separate bed. The placing them occupied us from nine until one in the morning (there were twenty patients). The beds had pulleys at the sides, and levers at both ends. Each patient, covered with a flannel gown, which

* All the machinery is beautifully executed and finely polished. The maker is Martin, who, like our machinists in London, also undertakes to cure diseases of the spine. As long as complicated machinery is recommended for the cure of distortions, such persons will generally become the advisers, instead of continuing to be merely the manufacturers of the instruments ordered.

opened behind, was laid on a hair-quilt, four inches thick, and without cushions or bolster. A large leathern belt, with rings for attaching the several cords, was pùt round the hips; and upon the head a cap, laced on the upper part, and fastened under the chin. This cap was attached to a long lever at the top of the bed. The patient being now laid at full length, the operator exposed the protuberance (*bosse*), worked it and kneaded it (*la masse et la petrit*), while he pushed it from the opposite side. He then insinuated a wedge of wood, prepared according to the form of the tumour, between it and the mattress, so as to push the swelling inward. If the curve was the shape of an S, the operation was done on both sides. On the side opposite the tumour, which is generally thin and wasted, dry friction, and even slight "*flagellations*," were used to excite the contractility of the muscles. After these processes were completed, the body was, by cords passing from the girdle round the hips, fixed to the sides and ends of the bed, so as forcibly to pull down the trunk and pelvis from the head, which con-

tinued attached by the cap to the lever at the top of the bed. ‘ Cela fait, on souhaite le bon soir à la patiente, et l’on passe à une autre.’

“ At four in the morning a new order of operations commenced. Each patient in rotation was placed in a vapour bath, where she remained an hour; after which her *bosse* was exposed to a water vapour douche (*de vapeur aqueuse*) for half an hour, it being *massé et petrit* at the same time, and the opposite side slightly *flagellé*. She was then taken to her chamber, and placed in a mechanical arm-chair, made on purpose for herself; a desk was added to it, to support her breakfast and writing or drawing apparatus, as she was to remain there four or five hours, without moving any part except her limbs; the chair being so contrived that the wedge called *debossoir*, and the continued extension of the neck and trunk, could be employed as in bed. The patient thus did not enjoy more than seven or eight hours of liberty: if, indeed, that can be called liberty where she was not allowed to quit her long crutches.”

The Professor continues: — " I confess that, in the three or four first instances, I was quite overpowered at this species of torture, but I was soon able to bear the sight unmoved; for, during all these operations the patients did not even change colour, and each, in reply to the questions I put, *avec l'air de m'appitoyer sur elle*, said, smilingly, she did not suffer; that she slept very well, although tied up; and was so accustomed to the wedge, that she felt a want when it was not applied. I also examined the pulse and respiration, but there was no change in them: ' tant est puissant chez les femmes le désir de paraître belles.' "

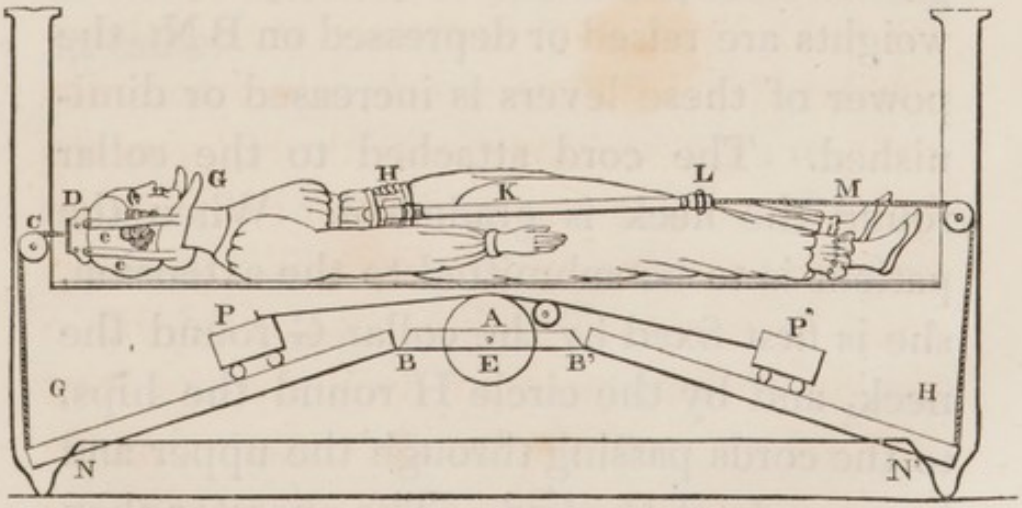
M. Humbert does not reside in Paris, but at Morley, a village near Bar le Duc. His system is highly praised by Professor Fodere, who says, that some girls have left the establishment cured, and several " notablement amendés." Of this there can be little doubt; but we at the same time suspect that the Professor is a little credulous, or he would not have seriously asserted that stretching the spine had improved a

case where there was distortion of the face and tongue, and paralysis of the upper extremities ; " et un autre qui par suite de la compression des nerfs operée par la deviation des vertebres cervicales et dorsales avait eu la visage contourné, la langue de coté, et les extremites superieures presque paralysées qui se trouvait deja dans in etat tres satisfaisant." It has been often remarked, that the more complicated and severe a plan of treatment was, and the more inconvenience it occasioned, the more was it held in estimation in this country. It is not many years since a small village in one of our midland counties was crowded with patients, who cheerfully submitted to remedies which left marks, in form of scars, for life. The public in France seem to have similar ideas : " Plusieurs de ces demoiselles sont en effet accompagnées de leurs meres qui se devouent a se renfermer dans ce lieu solitaire pour encourager leurs filles pendant toute la durée du traitement ; cette durée est de dixhuit mois au deux ans, au bout du quel temps si l'epine n'est pas redressée il n'y a plus d'espoir, j'ai vu un malade qui

y etait depuis dixsept mois, et dont la situation n'etait encore qu' amendée."

System pursued by Dr. Maisonabbe.

The plan of treatment proposed by M. Maisonabbe is nearly the same as that practised at the convent of Sacré Cœur; but the mechanism of his bed is different, and he trusts almost entirely to extension. The spine is extended by an ingenious though rather complicated apparatus, but M. Maisonabbe says he can regulate the

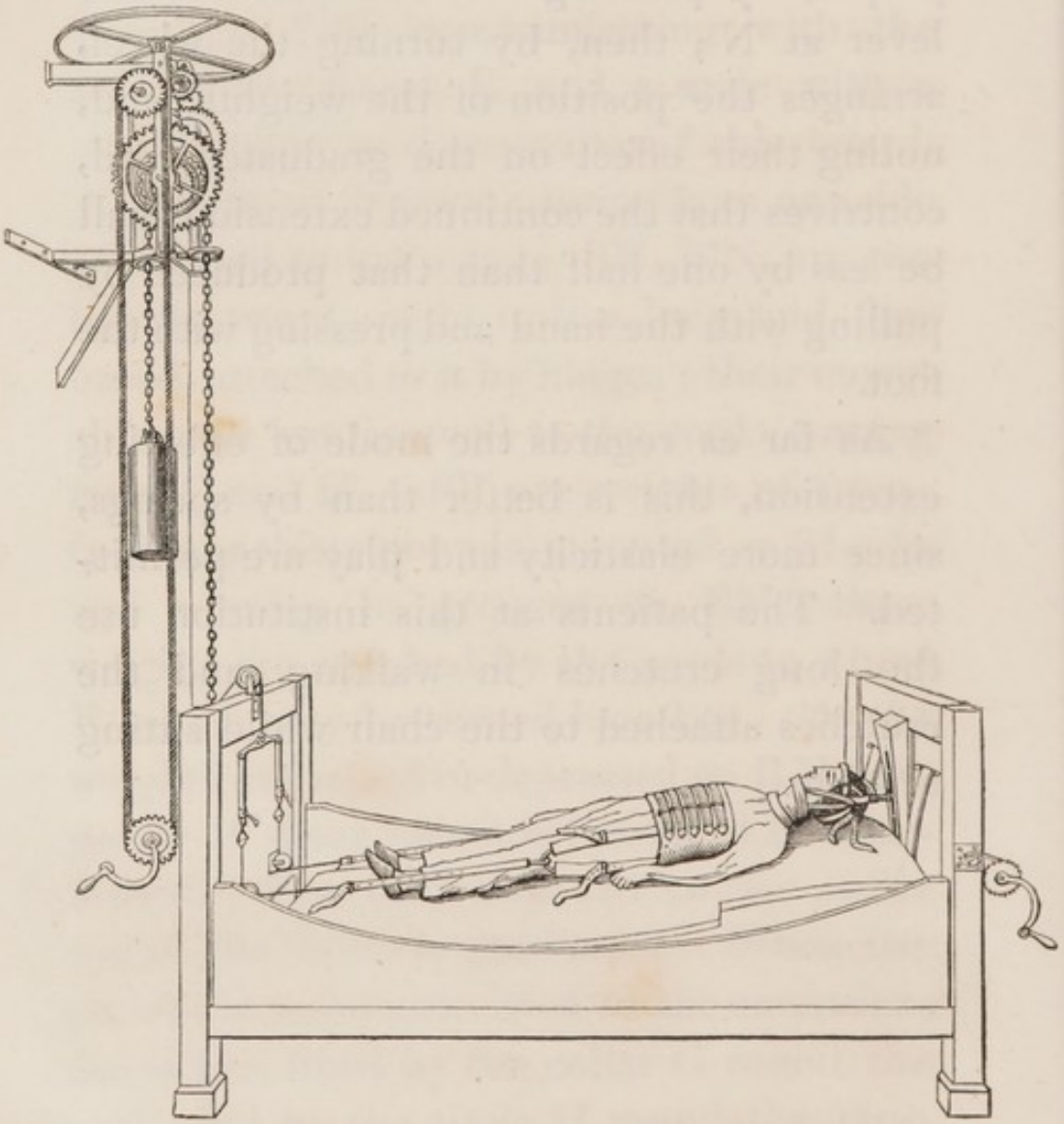


degree of power more easily by it than by the springs used in the beds at Chaillot, and at the convent of Sacré Cœur. The machinery is all concealed by a board; there is only a hole communicating with the axle of the wheel E, and a scale with a pointer seen on the outside of this board. A, is a piece of wood passing from one side of the bed to the other; BN, B'N, are two boards, twenty-eight inches long and four broad, attached to it by hinges; their moveable ends are fastened to the cords coming from D and H. PP' are weights of twenty-five or thirty pounds, mounted on wheels, and running in grooves on BN: these weights are attached by the cords to wheel E, which may be turned by a key. As the weights are raised or depressed on B N, the power of these levers is increased or diminished. The cord attached to the collar round the neck is graduated. When the patient is to be submitted to the extension, she is first fixed by the collar G round the neck, and by the circle H round the hips, to the cords passing through the upper and lower ends of the bed. The operator then

stands behind the upper end of the bed, and, taking hold of the patient's head, extends the vertebræ as much as he thinks proper, by pressing with his foot on the lever at N; then, by turning the wheel, arranges the position of the weights, and, noting their effect on the graduated cord, contrives that the continued extension shall be less by one half than that produced by pulling with the hand and pressing with the foot.

As far as regards the mode of effecting extension, this is better than by springs, since more elasticity and play are permitted. The patients at this institution use the long crutches in walking, and the crutches attached to the chair while sitting at table.

Plan of Treatment pursued by MM. Lafond and Duval.



In this formidable looking apparatus there is as much ingenuity displayed as in Ho-

garth's machine for drawing corks in the Rake's Progress. All the objects proposed might be attained by a very simple contrivance. The inventor, M. Lafond, who seems quite an enthusiast in his profession, conceived that there should not be a permanent extension kept upon the spine as in the machines at Sacré Cœur, or in that of M. Maisonabbe, but that there should be what he has called an oscillatory movement of the different parts of the column; that they should pass alternately from a state of rest to a state of extension. With the view of effecting this, the patient, after being fixed in the manner represented, is first wound up to a certain degree of tension by a ratch wheel, to which the cord seen passing over the pully at the foot of the bed is attached; an eccentric wheel, over which the extending cord passes, is then put into motion, with the intention of alternately increasing and diminishing the degree of extension. This attempt to produce an oscillatory motion may be understood by the diagrams.

Fig. 1.

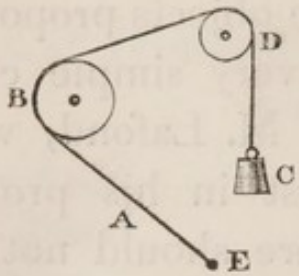
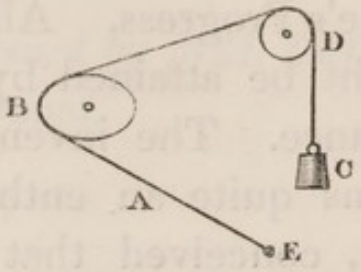


Fig. 2.



Let A, fig. 1., be a cord fixed at E, passing over a circular wheel B, and over the pully D, and supporting the weight C. When the wheel B revolves, the position of C continues the same; but if B, as in fig. 2., be made of the form of an eccentric wheel, when B is turned, C will rise or fall according as the long or short diameter of B is uppermost.

The eccentric wheel is intended to be kept in constant motion by the mechanism at the end of the bed, but this machinery was not in use when I visited the institution.* The oscillatory motion was produced by the patient turning a winch connected with a ratch-wheel, which communicated

* So great is the desire at present in Paris to do every thing by machinery, that a proposal was seriously made to erect a steam-engine for the purpose of making the extending forces more equable.

with the eccentric wheel by a chain. The turning of the wheel by the patient herself was supposed to be advantageous, as the right or left arm might be used according to the side that was defective: but to this alleged advantage I cannot assent, as the shoulder-joint only is exercised.

After having been fixed in the position represented in the plate, I tried the effect of the oscillatory movement. Before I could be made sensible of the tension being increased by the eccentric wheel, I had to request that the small windlass, by which the body is extended in the first instance, should be wound up to its utmost pitch. From this and other experiments it appeared that, unless the body is first forcibly extended, the effect of the eccentric wheel must be slight. Indeed, since the hips rest on the bed, there is scarcely any relaxation, and therefore the apparatus is little more than the means of increasing a force already considerable.

The long crutches and the chair-crutch were likewise employed in this institution; there were also hot and vapour baths. I

observed one of the beds used by Milli (the Wurtzburg bed): a patient was placed in it for the purpose of becoming accustomed to the continued extension, previous to the use of the oscillatory motion.

Although the apparatus employed at the several institutions is different in construction, the principle of action is nearly the same in all. The object is to extend the spine, and for this purpose bands, on which the forces operate, are fixed to the head and pelvis. When the spine is attempted to be extended in this way, the cervical portion is chiefly operated on, not only because it is less encumbered by connections than the dorsal or lumbar, but because it is the only part of the spine where the extending force is not impeded by friction. When the bands fixed to the pelvis are drawn so tight as to vibrate like harp-strings, there is apparently a great force operating directly on the lumbar and dorsal portions; but, in truth, they are little stretched by this power, for it is expended in over-

coming the friction and weight of the shoulders, arms, chest, hips, and legs.

I have myself tried the effect of the extending powers on a bed similar to that used at the convent of Sacré Cœur, and although I felt as if my neck would be pulled from my shoulders, the extension on the loins was very trifling. A physician in town came to the same conclusion on trying it, and the patient also admitted that there was not much pull on the lower part of the spine. On these grounds I think we are justified in concluding, that the inventors of the mechanical beds have deceived themselves by overlooking the impediments produced by the friction, and effect of the weight of the parts which are necessarily moved along with the spine; they seem also to have forgotten that a part of the spine* (the cervical) which scarcely

* I have had an opportunity of particularly examining the apparatus used by a young lady, who, for the last eight years, has been trying a variety of plans for the cure of a curvature in her spine. She submitted for the prescribed time to wear a machine similar to that represented at p. 32.; afterwards she suffered for some years

requires any extension is forcibly acted on, while a portion (the lumbar) which might be much benefited by such means is scarcely affected.

On first seeing the invention of M. Maisonabbe, it might be supposed, that since the head is not fixed in the same manner as it is at Sacré Cœur, the force operating

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the contrivance sketched at p. 36.; she then had the perseverance to go more than four miles every day, except Sundays, for many months, to climb the ropes and pull weights as described at p. 20.: but, being disappointed in the result of all these plans, she went to France, and brought back an apparatus like that used at the convent of Sacré Cœur, determined to try it for eighteen months. The physician who took me to see the apparatus tried the effect of extension by the collar on himself: he can best tell what he felt; my sensations were so alarming that, before I was stretched for a minute, I entreated to be released. I can now understand the feelings which cause such distress to patients who complain of fulness in the head; and knowing that the collar is sometimes fixed by a padlock during the night, I can believe that the worst effects may have happened. If patients who have witnessed these operations state the truth, as far as regards the suffusion of the eyes with blood, some estimate of the danger to the delicate vessels of the brain may be formed from their description.

on the neck may not be so great as that on the loins, but further examination will show that they are equal; the head and the hips are still the points on which the pull is made, and there is no provision to divide the forces, nor to diminish the friction caused by the hips and legs.

As it has, perhaps, been sufficiently demonstrated, that the springs used at the convent of Sacré Cœur, the ratch-wheel at Chaillot, and the weights and levers of M. Maisonabbe, are not calculated to operate on the different parts of the column, I will not enter into a more minute detail of the manner in which these forces act. The objections to the different modes of extending the spine will be more easily understood by comparing the French beds with a moveable plane, which I have been in the habit of recommending, and which is particularly described at p. 99.

We have still to enquire into the effects of the long crutches* on which the patients

* None of the machines proposed by Levacher or Portal are now used by the French; and the late fa-

are mounted, and into the means by which *compression* is applied.

The long crutches are used in order to prevent the spine from yielding when the patient rises, but as the head sinks between the shoulders immediately when the patient mounts on the crutches, the cervical portion, which has been shown to be the only part stretched by the mechanism in the bed, necessarily becomes much curved. In this view the crutches are useless, or even bad, but they are useful in a way which the inventors do not seem to have contemplated. They are the only means by which the lumbar part of the spine is stretched, since all the complicated machinery in the beds intended for this purpose is rendered useless by the friction of the body on the mattress. It is indeed matter of demonstration, that excepting in the rare cases where the curvature is confined to the portion of the spine above the sixth dorsal

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vourite plan of climbing ropes and ladders, and hanging on poles, seems to be entirely given up; the German system of extension and compression is all that is trusted to at present.

vertebræ, the mechanism of the beds is of little service. The crutches may perhaps be valuable in another view; they may be the means of exercise to the muscles of the trunk, and thus be not only conducive to general health, but prevent the patient from falling into the state of weakness which, I suspect, would be the consequence of confinement to the mechanical beds.

However, although patients treated according to the German or French system may be benefited by the crutches, I seldom employ them, because supports fixed to the pelvis are equally efficacious in keeping the lower part of the spine extended, and are more convenient. As means of exercise they are much inferior to the moveable plane.

Compression of the projecting parts is considered an important part of the treatment; it is used more frequently at the convent of Sacré Cœur than in the other institutions; it is not applied in the first instance, but the patient is placed for six months on the extending bed; and at the expiry of

this period the second stage of treatment—extension with pressure—is commenced.

Pressure is certainly often useful, but the nature of the distortion and the cause of the projections should be accurately ascertained before it is applied. When the angles of the ribs form a ridge like a second spine, any attempt to force in the shoulder will increase the deformity; if the difference in the size of the two sides arises from one lung being destroyed, the pressure on the projecting side may be very injurious.* I was surprised to see pressure applied in Paris, not only to the projecting ribs, but to the protuberance which is caused by the turning round of the transverse processes of the lumbar vertebræ (as seen in plate VI.), and in this instance the compressing pad was screwed forward, and pressed so strongly on the protuberance, that I could scarcely insinuate my fingers between them.

Pressure on this part cannot remedy the curve, but it may diminish the protuberance by causing absorption of the soft parts;

* The plates illustrate these views.

this has occasionally been shown to me by the friends of a patient, in proof of the good effect of certain instruments.

Much ingenuity is displayed by the French mechanists in their contrivances for making the pressure act in opposite directions. At one time I tried a variety of springs, screws, and weights for this purpose, but of late I have found that the broad belt, put round the ribs to fix the body when on the plane, is very effectual in remodelling the form of the ribs, except in particular cases ; it was the only means of pressure used during the treatment of Mary Anne Roach (see plate) ; and it has been equally beneficial in similar cases. But when an acute curve has taken place near the angles of the ribs, pressure, unless very carefully applied, will generally be injurious.

When there is apparently much ingenuity in the application of complicated machinery, and where the patients submit cheerfully to a rigorous and tedious system of treatment, it is natural for those unacquainted with

the subject of distortion to believe that such plans must be attended with success.

It is difficult to discover how far such a system has been efficacious, for the institutions have been so short a time established in Paris, that the proposers of the several plans have scarcely had time to form a correct estimate of their effects. No cases have yet been published in detail, and little reliance can be placed on the vague statements made by the allies of the rival institutions, nor even on the reports of strangers who have witnessed the operations; for although many of them may have been unprejudiced, they have been either ignorant of the nature of the disease, or have not entered into a critical examination of the important questions, and have allowed themselves to be astonished and pleased with the ingenuity displayed in the machinery, and with the devoted submission of the patients.

It is indeed difficult to avoid forming the most favourable opinion of the plan of treatment, on witnessing the patience and cheerfulness with which young ladies of six-

teen and eighteen submit to such an ordeal as that described at p. 67. When flying about on their crutches they seem really happy, and if we put questions, as Professor Foderé did to M. Humbert's patients, with an appearance of commiserating them, they answer gaily, and tell us that the beds are so comfortable, they sleep as easily as on a feather-bed ; but it will be often found, that although young ladies who are distorted will make many objections to a trifling inconvenience, they will patiently submit to months of continued suffering ; they imagine that the more they endure the more quickly will they be cured.

It may appear invidious to make any remarks on the results of the plans of treatment pursued in Paris, especially as I had not seen the progress of a case. On comparing the appearance of those patients who were shewn to me, and who had submitted for some time to the treatment, with the casts taken on their entrance into the institution, there was in all a considerable improvement. But after demonstrating the inefficiency of the means to produce the effects proposed,

I shall perhaps be excused for expressing an opinion, that had a different system been pursued, more good might have been done, at less expence of suffering and time. In one young lady, who had submitted to all the means proposed for more than two years, the improvement did not appear to be more than might have been made in six months.

Before going to Paris, I heard that many patients had been cured in the several institutions; the truth of this I do not mean to deny; but I am now convinced that these must have been slight cases, and that where a case is difficult of cure, a plan different from that pursued in Paris would be more efficient.

ON THE MEANS OF PREVENTING DISTORTION.

Before describing the plan of treatment which I have found useful in cases of serpentine curvature, I shall offer a few remarks on the means that seem likely to prevent distortion, or to check it on its first appearance.

When a girl is about eight or ten years old, she should not be much confined to the school-room; and instead of merely taking *a walk* twice a day, she should be induced, by amusing and romping games, to use active exercise, and especially such as bring the muscles of the trunk into play.

She should not be obliged to sit at the piano more than half an hour at a time, and her chair should be so made as to support her. The high-backed chair which is commonly used is not good, in so far as there is not a sufficient seat. A small bedroom chair, raised high enough, and having a foot-board on which the feet can rest comfortably, gives more support. If she

appears to sink to one side while learning her lessons, she should be allowed to lie down, rather than be constantly admonished to hold herself erect.

If the clothes should slip off one shoulder, and the girl appear listless, pallid, and unwilling to join in active games, and if she often lounges while sitting, and, when standing, rests on one leg, and appears awkward and heavy in her gait, there is reason to fear that the spine is becoming distorted. Great care must now be taken that she is not allowed to sit erect for even a quarter of an hour at a time, without using some artificial support. This may either be an arm-chair padded with cushions, or the chair crutch; and as the grand object now should be to prevent the lumbar part of the spine from yielding, all her lessons should be learnt while she is lying. When writing or drawing, or playing on the piano, either the arm-chair or the chair crutch is absolutely necessary. Stays should, if possible, be avoided; but if she has worn stays previously to her becoming twisted, it would be very imprudent to take them off; they

should rather be made stronger; but the safest plan is to have a belt made in the manner of a hunting belt, with such a number of bones as will give support to the loins. In this way the upper part of the chest will be left free. If one shoulder should still sink, a pair of small moveable steel crutches may easily be fixed in pockets attached to the belt.

No shoulder-straps, collars, nor backboards should be used to push in the projecting shoulder, unless a support be at the same time given to the loins, for they only conceal the mischief, and do not prevent the lumbar part from sinking, which, in nine out of ten cases, is the source of the inequality in the height of the shoulders.

But all these means, although they tend to support the spine when it is disposed to yield, do not give strength. For this purpose, the child should be in the open air for at least three hours in the day (not at once), and, while out, be skipping about and amusing herself, instead of walking sedately. When she comes into the house, she should not be allowed to rest herself

by lounging on a chair, but should lie down. When it is not possible to go out, she should play at battledore and shuttlecock, use the skipping rope, &c. When dancing, care should be taken that she learns such steps as make her spring from her toes; and this will tend to strengthen the ancles, which are generally weak. Those exercises and postures which have of late become fashionable in London, may, if properly superintended, be of some use. Balancing a weight on the head, or holding a basket above the head, (the arms being stretched out at full length,) while she marches on tip-toe, will also tend to increase her strength, and remove the disposition to curvature.

As a general rule, it should be remembered, that none of the exercises are to be carried so far as to jade or fatigue the child, and that after every exercise she should lie down for half an hour. It is of little consequence, whether she lies on an inclined plane or on the carpet; the object of lying is merely to give rest in the best position. A plane may be so far useful, that a child

who would not lie on the carpet would continue for a sufficient time on the plane, under the idea of its being the means of giving her a fine figure. But a process of reasoning nearly the same, viz. that there is some specific effect in a hard board on the shape, is often a source of great mischief. Many mothers and governesses are so impressed with the notion, that lying for a certain time every day on a plane will prevent distortion, that many more important circumstances are neglected. I have often heard ladies express surprise, that their children should have become crooked, as great care had been taken that they should lie for a certain time every day on the plane. We are also often told of young ladies who have remarkably fine figures having regularly used the plane; but it is not less true, that very many who have done the same thing have become twisted.

The child should sleep on a firm hair matrass, and with little or no pillow. She should have good nourishing food; and it is often useful to give a warm purgative once or twice a week, and occasionally tonics,

combined with alkalies. Cold bathing in the proper season, and, at other times, spunging and rubbing the back well afterwards, are useful. By following up such a plan, the general health is much improved, and the tendency to distortion is probably removed in a few weeks; but in many cases, although the deviation from the straight line may be very slight, constant care for months, and even years, is necessary to correct it, and to prevent it from getting worse; and it occasionally happens, that the child is so fretted by the necessary attentions, that little good is done. Under these circumstances, I have advised the mother to be satisfied with taking care that the distortion does not increase, until the girl arrives at that age when a little self-pride and vanity will induce her to bestow that attention on her own part which is almost always necessary to the restoration of even a slight degree of curvature.

When consulted in a case where the spine has become as much twisted as that represented in the wood-cut at p. 1., we must

insist on the necessity of a severe discipline, although there is no occasion for one so strict as that to which many young ladies are now cheerfully submitting.

It has been already stated (see p. 15.), that the most probable way of restoring a crooked spine is to take advantage of all that is good in each of the plans proposed, and to combine and apply them at the proper times. The results of proceeding on this system have been so successful, that I can with great confidence recommend it to the profession. But we shall often fail, even in favourable cases, of doing all the friends expect, for many hope that it is not only possible to remove the irregularities of the form, but even to mould the figure of a crooked girl to a more than usual fine shape. Yet, there have been few cases where the figure has not been made better; and it has only been under very peculiar circumstances that the deformity has not been prevented from getting worse. We can always safely promise, that the alarming symptoms of

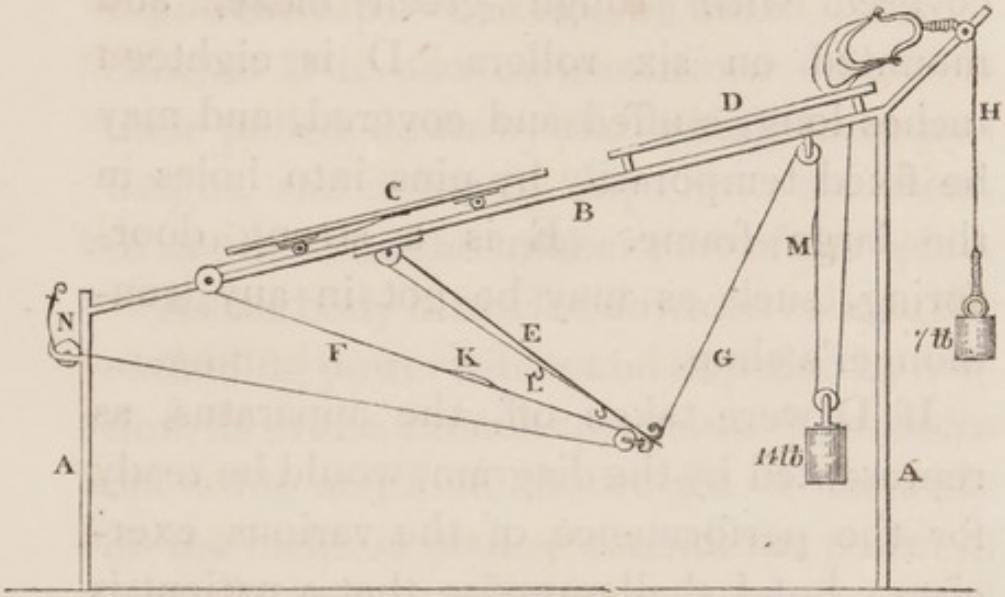
debility will be removed by the attempt to remedy the curvature.

The several objects in the treatment may be in a great measure attained by using the moveable plane, of which a diagram is given.

It affords the means of stretching the ligaments and muscles in whatever manner or degree we choose, and of retaining the vertebræ and ribs in their improved relations to each other. It also admits of the patient resting in particular positions, and of performing such a variety of exercises, that the weakening effects of the stretching, compressing, &c. are completely obviated.

The apparatus is nearly the same as one I contrived about eight years ago, but the drawing given in the folio edition of the Plates represents it as too complicated. At the time that drawing was made, I imagined that the additions were improvements, but I have been since induced to restore the machine to nearly its original form; and, therefore, although it is the

same in principle, it may appear to be a different instrument from that represented in the plate formerly published.



If this contrivance were merely for the purpose of extending the several parts of the spine, it would have been represented in a much simpler form; but as it can also be easily adapted for a variety of exercises, all the cords and pulleys necessary for performing them have been introduced into the diagram.

The frame-work is six feet long and twenty inches broad, and is like a small bed with one end higher than the other; the middle space is filled up with thin deal

instead of canvass, and there are ledges on the sides to confine the moveable frame. C is thirty-two inches long, stuffed and covered with rough green baize, and mounted on six rollers. D is eighteen inches long, stuffed and covered, and may be fixed temporarily by pins into holes in the large frame. E is a strong door-spring, such as may be got in any iron-monger's shop.

If D were taken off, the apparatus, as represented by the diagram, would be ready for the performance of the various exercises; but I shall suppose that a patient is to be put on it for the purpose of certain parts of the spine being kept in a state of extension. D being on, C is brought up close to D, and fixed there by slipping a ring on a brass stud in D. The loop K is to be put on the hook L, and the fourteen pound weight is to be hooked on the loop M. The patient now lies down on D and C: she should have on a dressing gown made of the nappy cloth called Bath coating, this, to a certain degree, prevents her slipping when the extending force is applied,

but it is not sufficient; therefore a broad belt, fastened by straps to D, is buckled round the waist, and another, fixed to C, is put round the hips. The ring by which C is held close to D is now to be thrown off; C is then pulled down by the spring lever and weight, and draws the hips from the chest, so as to extend the lumbar part of the spine.

As the body is carried down on rollers, the extending power will not be impeded by friction, as in the French apparatus. The forces operating are, first, the weight of the body on the inclined plane; second, the power of E as a spring; third, the fourteen pound as a weight; but, greater than all, is E as a lever, increased in power by the cord being fixed to L, and the fourteen pound to its extremity. It is unnecessary to describe the effect of this arrangement of the lever and weight; it will be sufficient to state that in this way we may have a force equal to sixty pounds, and which, as it separates C from D, necessarily operates on the lumbar part of the spine. This is certainly a great force, and although it may

be reduced in a moment to one of ten pounds, it ought to be used with caution. It is, however, the power with which I have operated on the lumbar part of the spine of many private patients, and of the girl in Handel's Ward, from whom the sketch was made. As this patient was seen almost every day by my colleagues and the pupils of the hospital, any bad effects, or even inconveniences, resulting from the force applied would have been immediately observed. It may be said that an apparatus of such power is more dangerous than the beds used by the Germans or French; but there is no useful surgical instrument, nor medicine, which may not be dangerous, if put into the hands of one unacquainted with the principles of our science.*

This power, acting on the lumbar part of the spine, does not in the slightest degree affect the cervical vertebræ. When it is necessary to operate on the upper portion

* Of seven patients who were in the hospital at that time with different diseases of the spine, there was only one for whom this practice was applicable: it would have been highly dangerous in the other cases.

of the spine, a new power is employed, and one so simple, that it may be regulated with the greatest nicety. A broad soft band is put under the occiput, another under the chin or over the forehead, according to the shape of the patient's head: these are hooked on a *spur*, to which a cord, H, with a weight, is attached. The head, after being drawn up by the operator's hands, so as to extend the cervical part of the spine, is laid on a small pillow on D: a weight of ten pounds will keep the head in its proper position. By following the same principle, we can operate, with different degrees of power, on any portion of the spine.

By merely lifting off D, taking K from the hook L, and the fourteen pound from M, leaving it attached to its pulley, we have the apparatus as represented in the diagram, and so arranged as to permit of the performance of a great variety of exercises. I shall only mention a few by way of example. The patient may lie on C, and pull herself up to the top of the plane by taking hold of pegs which project from the sides of the frame. The spring and weight will

pull her down; or she may imitate rowing, by sitting on C, and drawing herself up by a cross stick attached to cords in the upper part of the frame. By standing opposite to the bottom of the plane, she may, by hooking the cross stick to N, imitate the motions of a sawyer; or, by putting a band over her head, bring the long muscles of the spine more immediately into action. The resisting force in all these exercises is the combination of the spring and weight, which may be varied in power according to circumstances. Although the double pulleys diminish the force by one-half, they have been added for the purpose of admitting a greater latitude of motion.

As far as this apparatus is the means of extending the spine, it is not liable to the same objections as the French beds. There is no friction; the extending power may be modified, or applied to any part of the spine; the cervical may be extended in a slight degree, while a strong force is operating on the lumbar and lower dorsal vertebræ. There are also other advantages: the patient may immediately stop either

force or the whole, and be as completely at rest as on a common inclined plane; or she may, by taking hold of pegs at the top of the plane, relieve herself by alternating the stretching power with the exercise of pulling herself up; and, as the power, pulling her down, is always acting, the oscillatory motion might, by the introduction of two wheels, be made more complete than that produced by the complicated machinery represented at p. 76. By a trifling addition, we may have, at the same time, the means of applying different degrees of compression on the several projecting points.

But, independently of its being an apparatus for extending the different parts of the spine, it admits of the patient taking such a variety of powerful or gentle exercises as to obviate the necessity of any other contrivance for keeping the muscles in that state of excitement which is so important in the treatment of distortions.

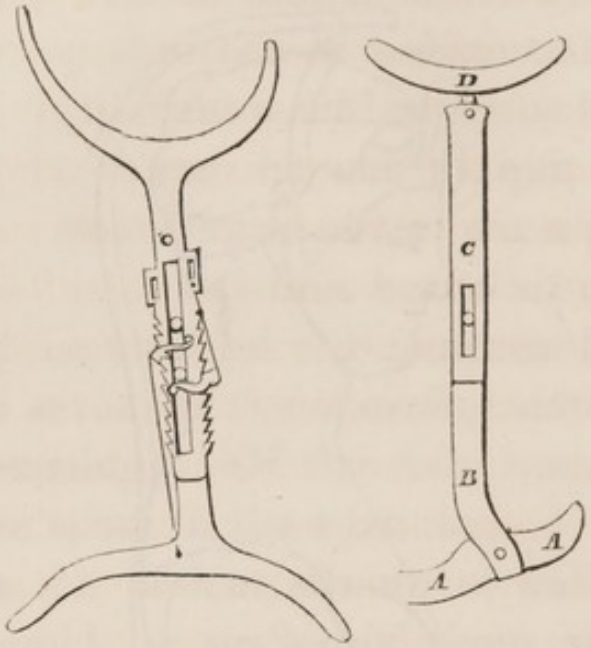
As so many objects may be attained by this contrivance, and especially as it admits of the combination of exercises, rest, and

support, I believe that it alone would be sufficient to the cure of a distorted spine, and that the patient would continue in good health even were she not to quit it for months. But I have never put a patient to such a trial. I permit her to sit up four hours at least out of the fourteen (counting from seven in the morning until nine in the evening). Of the four hours, two should be spent in the open air.

When the patient sits up or walks, the spine should be prevented from sinking. This is most conveniently done by the side supports fastened to a girdle round the hips. If it should be necessary to keep the cervical part extended, this can be accomplished by a small rod passing up from the girdle, or sometimes by a stiff neck collar, similar to that worn by soldiers.

When Chesher's or Jone's collar is worn, the head is supported in the manner represented here: but it may be almost as effectually supported by the additional rod to the back collar, (see p. 39.); and as the steel and straps can be easily concealed, it is not nearly so annoying to the patient.

The wood-cut below represents the side crutch proposed by Portal, and that which I have generally recommended. I have already given reasons for preferring it to the German crutch.



A A is part of the girdle; B and C are two portions united by screws; so that the support may be gradually raised. At one time D was put on a swivel; but as it was frequently broken, and was of little use, it is now rivetted to C.

It is generally necessary to wear a similar contrivance, to prevent the spine from relapsing into a curved state during the night. It should be longer than that worn during the day.

Pressure, when judiciously applied, is of great service; but the variety of distortions is so great, that it is not possible to point

out the precise manner of its application. Indeed, exercises, means of support, and pressure may be all useful or injurious, according to the manner they are employed. If the nature of the distortion were always the same, there would be no difficulty in laying down precise rules; but such is the variety, that it is only the principle on which the different cases are to be treated that can be pointed out. To assist in doing this, I have introduced a few of the drawings from the folio edition, in illustration of the condition of the vertebræ and ribs in the most common kinds of distortions.

As the treatment principally consists in directing the form of the several parts, it must be continued for a period proportionate to the growth of bone, and this being necessarily tedious, the surgeon has often difficulty in prevailing on the patient and her friends to persevere. If a girl is at school, and obliged to attend to the ordinary duties, or if she is indulged at home, little good can be done, and much time (very valuable to the patient) is lost. To

show how much may be effected, even in four months, when the surgeon has the complete management and direction of the patient's occupations, I have given two drawings from the casts of the back of a girl, (Mary Anne Roach) who was lately a patient in the Middlesex hospital, and who was treated on the principle I have endeavoured to illustrate. These sketches are given in preference to any from private patients, for various reasons, but chiefly because the process of treatment was, from her entering into the hospital, regularly seen by my colleagues and by the pupils, and frequently by visitors. The casts are now in Handel's Ward.

The case was very unfavourable, as the girl was of a short stinted form, and the natural change in her constitution had taken place eighteen months previously to her entering into the hospital: however, in four months she became more than three inches taller, and the increase in her muscular power may be judged of by comparing the drawings. There is still considerable difference in the size of the two sides, and

consequently in the appearance of the shoulders, but the improvement is very satisfactory, and is sufficient to show how much may sometimes be done in similar cases.* Although this girl was four months in the ward of an hospital, which is generally considered a bad atmosphere, she had only for two days a slight attack of what is commonly called bilious headach. The medicines she took were occasional purgatives, and the tincture of iodine with rhubarb.

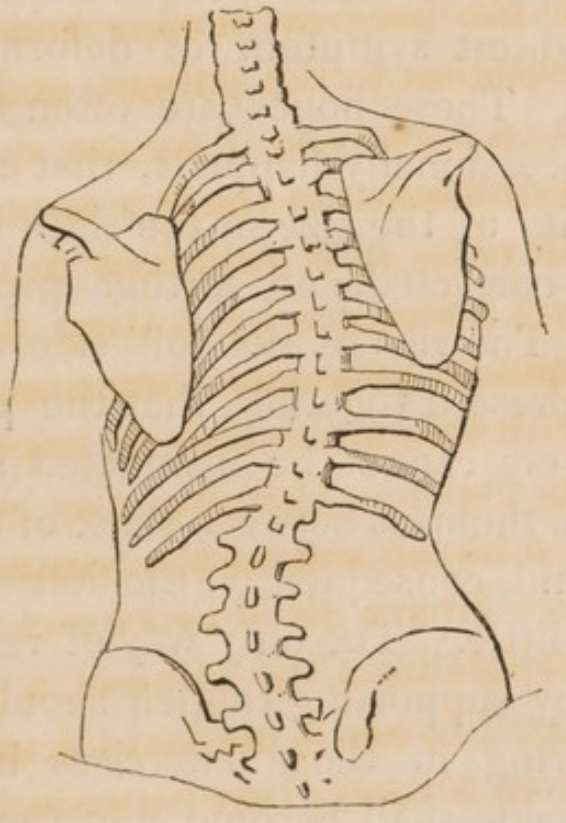
* Since writing the above, I have seen this patient: she is not so straight as when she left the hospital, and instead of having grown taller, has become rather shorter. This is not to be wondered at, since during the last two months, instead of doing any thing to improve her form, she has been engaged for seven hours a day at needlework, and has not even worn the support. As it is the lumbar part which has sunk, she could in a short time be made as straight as when she left the hospital. However, even now, her figure is so much improved, that the deformity is little observed. There is little danger of the spine yielding after the curve has been improved, if the patient continues to take active exercise, and wears for some time a slight artificial support, or even strong stays. Although I have failed in making a curved spine straight, I have not known, in my private practice, the curvature to return after it had been corrected. See p. 117., and explanation of Plate III.

Through the influence of these, and the combination of exercise and rest, she continued in strong and robust health; a bronchocele also nearly disappeared.

In all bad cases of serpentine curvature, where the patient is resolved to submit to the necessary treatment, it is desirable to take a cast of the figure in plaster of Paris before any thing is done, and to take a second in two or three months. In this way we not only have it in our power to observe the defects accurately, but we can mark the progress made; and it is a great satisfaction to the patient, and an inducement to persevere, if we can show her a decided difference in the two casts.

In slight cases it is sufficient to make a plan of the curvature by dotting the skin over the spinous processes, then completing the line with ink, and taking an impression on blotting paper. This may also be done at regular intervals during the treatment of every case. I have given two exact copies of these papers from the spine of a young lady between 17 and 18, marked 4.4. and 6.6. and two from a young lady between 11 and

12; see plate. In the first the ribs were much affected; the treatment was necessarily severe and tedious, but during all this time she enjoyed excellent health, and occasionally went to parties. The second was one of those cases which is easily improved by the moveable plane and the side supports. In two months the distortion was scarcely visible, and the girl was an inch and a half taller. It is not necessary to offer more examples: this wood-cut may be compared



with the lines, as it shows the effect which the different curves of the spine have on the ribs. The causes of the apparent enlargement of the right shoulder and of the left hip, the falling of the left shoulder and the sinking in of the right loin may also be easily understood from it.

Cases similar to that from which the lines last described were taken are rapidly improved; and the whole form and character of the girl is in a short time so changed, that the parents are induced to hope that not the slightest symptom of deformity will remain. These hopes are often fulfilled; but it occasionally happens, that after the inequality of the size in the sides has been almost corrected, no further progress is made. The ribs of the left side continue so compressed together, that the points of the fingers cannot be insinuated so easily between them, as between those of the right side; and, consequently, the left shoulder sinks a little. The only way of remedying this is by supporting the left shoulder, and persevering in those exercises by which the left side shall become more expanded.

However, even if we do not succeed in this, the defect in the form will be so trifling as to be scarcely perceptible. As the lumbar curve is probably removed, the girl will no longer have that peculiar gait, which is so characteristic of the distorted spine. This curve, even in a slight degree, has such an effect on the whole figure, as to make it almost impossible to conceal any inequality in the upper part of the chest; for a little deviation at the base of the column from the perpendicular affects the whole, while a bend near the top, although greater in degree, is scarcely perceived.

But it must not be forgotten, that there are cases where, notwithstanding the greatest care and attention, the curvature is not removed, and even some which become worse during the treatment.

If the distortion commenced at an early age, the case is unfavourable; but if it came on between 8 and 14, and after one of the exanthematous disorders, as measles or scarlet fever, it may be considered remediable.

If the curve is in a general waving line, it will be more easily remedied than where it is acute. Should the curve between the shoulders be greater in proportion than that at the loins, and the two first ribs so elevated as to produce a prominence on the side of the neck, it is very difficult to correct the deformity. When the convexity of the curve between the shoulders is to the left side, it is generally unfavourable. When the spine is twisted on its axis, so as to produce a prominence on one side, and a sinking and flattening on the other, it is very difficult to make both sides appear equal. If there be anchylosis of the vertebræ, as represented at p. 48., the curve is irremediable.

Should there be pain on pressure, it is of the first importance to discover whether this proceeds from inflammation, or merely from the entanglement of a nerve; if there be any symptoms of the scrophulous condition of the vertebræ, which may terminate in paralysis, we must proceed with great caution; and where there is the slightest appearance of the sinking of the

anterior part of the bodies from this cause, it will be safer to trust merely to the recumbent position, than to venture on the performance of any exercises, or even to elongate the spine.

When there is a greater difference between the size of the two sides than appears to arise from the falling of the ribs together, the case is unfavourable, and especially if there be at the same time an inequality in the size of the sides of the face.

If the patient has had, at an early age, cough and pain in the side which is diminished in size, and if there be a feeble respiration in this side, the nature of the case is still worse. (See Plate III.) The condition of the chest in these cases may be considered the *cause*, not the consequence of the yielding of the spine.

If the individual ribs are much bent and twisted, the difficulty of improving the form of the chest is much increased. If this occur in a patient whose limbs are bowed and rickety, pressure will probably do harm. If a ridge like a second spine be formed by

the angles of the ribs, the shape of the chest cannot be restored.

If the countenance has the peculiar character denoting deformity, and the bones of the limbs are at the same time enlarged at their extremities, and crooked in their cylinders, it will be safest to trust only to general constitutional treatment. The bones in a patient of such a habit are in danger of becoming distorted by the application of instruments.

Even in cases where there is no decided bad symptom, we should observe the character and general form of the patient, before we offer an opinion on the issue or the probable duration of the treatment. In some instances the curve is rapidly improved, while in others the progress is exceedingly slow. The cases of this nature most difficult to manage are of two kinds. In the first, although the bones are small, the child is strong for its size, and of an active and merry disposition; but there is more than the usual degree of the rotatory twist of the spine on its axis; and the bases of the scapulæ are not straight, but rather

concave; the sternum and ribs also appear to be affected independently of the spine. The skin is woolly and of a brown colour, and the small veins are so visible that there seems to be a deficiency in the secretion of the rete mucosum. Although exercises increase the strength and improve the health, they seem to have the effect of rendering the curves more fixed. The other case is quite opposite, and not uncommon: the girl has a heavy leucophlegmatic appearance, is square built, is often round shouldered, and strongly formed, but at the same time so slow in her movements, and so torpid, that it is scarcely possible to induce her to do any thing with life or animation. The ligaments of the spine seem so much firmer than usual, that scarcely any effect is produced by the common mode of stretching.

Note on the French System of Treatment.

Since the sheet containing the description of the mode of treatment pursued in Paris was printed, I have had an opportunity of more minutely examining an apparatus made by Martin, the mechanist employed at the Convent of Sacrè Cœur, and also the effects on a young lady, who had submitted to the treatment for many months.

My observations on the apparatus as a means of stretching the spine are not so severe as its inefficacy demanded. And with reference to the question of the propriety of using the *plaques* to produce compression, I have now no hesitation in saying they must be injurious, since the spine is not extended by the apparatus to which they are attached.

Part of the spine is stretched by the long crutches; but I made a great mistake in praising them as the means of performing such exercises as would counteract the

effects of the confinement to the bed; for the patient, after having used them for six months, instead of being made stronger, has gradually become so weak, that she cannot sit nor stand in consequence of a pain in the lower part of her back, which she describes as similar to the sensation produced by the foot being squeezed by a tight shoe. As this pain is immediately relieved by lying down, it must be caused by the vertebræ sinking and pressing on the lumbar nerves. At first it seemed strange that there was not sufficient muscular power to prevent the sinking, as she could move with great rapidity on her crutches. But I found that although the deltoid and pectoral muscles were much increased in size, the muscles on the loins were wasted and shrunk. This certainly arose from their not having been used; for, on putting my hands on them while the patient moved through the room on her crutches, there was not the slightest action perceived in them: the body was carried forwards merely by the muscles of the arms, all the rest were quite passive. Indeed I never before saw the consequences

of one class of muscles being exerted while another was left dormant so curiously exemplified : she was unable to do some of the exercises on the moveable plane, which a child of five years old could easily accomplish.

She had much difficulty in bending the spine, the attempt even gave pain : this was not surprising, as she had not stooped for many months ; one of the injunctions at the convent being, that if a patient should let any thing drop, she was on no account to stoop to pick it up.

The patients are led to believe, that after they have been stretched for three years, their bones will be made solid and their muscles strengthened by baths. This must be considered as a mere assertion, as there has not yet been time to try how the debilitating effects of three years' confinement are to be remedied. Milli's Institution, from which all the others were copied, was established only in the winter of 1823. However, although more faith is put in the efficacy of baths on the Continent than in this country, I suspect that the most

strenuous advocate of this plan of fortifying the constitution would not have considered it sufficient to restore the health and strength of the young lady whose state I have just described. From the debilitating effects six months of the treatment has had upon her, it is fair to conclude that those who submit to it for three years will be rendered so weak and so dependant on the crutches, that three months after they lay them aside they will become as crooked as before. The last account I received of another young lady, who has already submitted for twenty months to this treatment is, that her figure is thought to have been improved, and that she may return to this country six months hence; but it is also stated, that she must continue to use the bed and crutches for a long time after she returns. This is a sad prospect for a young girl who has already gone through much suffering.

Notwithstanding the proofs which have been given of the inefficacy of the modes at present pursued in Paris, we shall probably hear that many girls who were much dis-

torted have been completely cured. In answer to mere assertions, I shall only state, that on comparing the figure of the patient whose case I have alluded to, with the cast taken in Paris previously to the commencement of the treatment, I found, that although the spine could be easily stretched so as to make her appear nearly three inches taller, it immediately afterwards sunk into a curve worse than that marked by the cast.

Plate 2nd

P. III.

Plate 1st

P.I.

DESCRIPTION OF THE PLATES.

Description of Plate I.

When a girl has the slightest tendency to become twisted, the position represented in this plate should be carefully avoided, as the right shoulder is raised and the left depressed, while the ribs of the left side are compressed together, and those of the right expanded; a condition very similar to that represented in the sketch p. 113., which is a plan of the skeleton corresponding to the figure in page 1.

Description of Plate II.

The danger of a distortion being increased by a girl sleeping on a feather-bed, so as to allow the spine to sink, and by using a high pillow so as to raise the right shoulder, is shown by this sketch.

Such a position does not necessarily produce distortion; but it has the same, if not a worse effect, than sitting twisted.

If a person be long confined either to bed or to the sofa from any cause requiring rest, the spine may become curved. I have attended to two cases of this kind, but the curve was different from the serpentine twist, and was more easily remedied. Caustics had, unfortunately

for one of the patients, been used previously to my seeing her: the only reason assigned for this practice was, that the spine was affected.

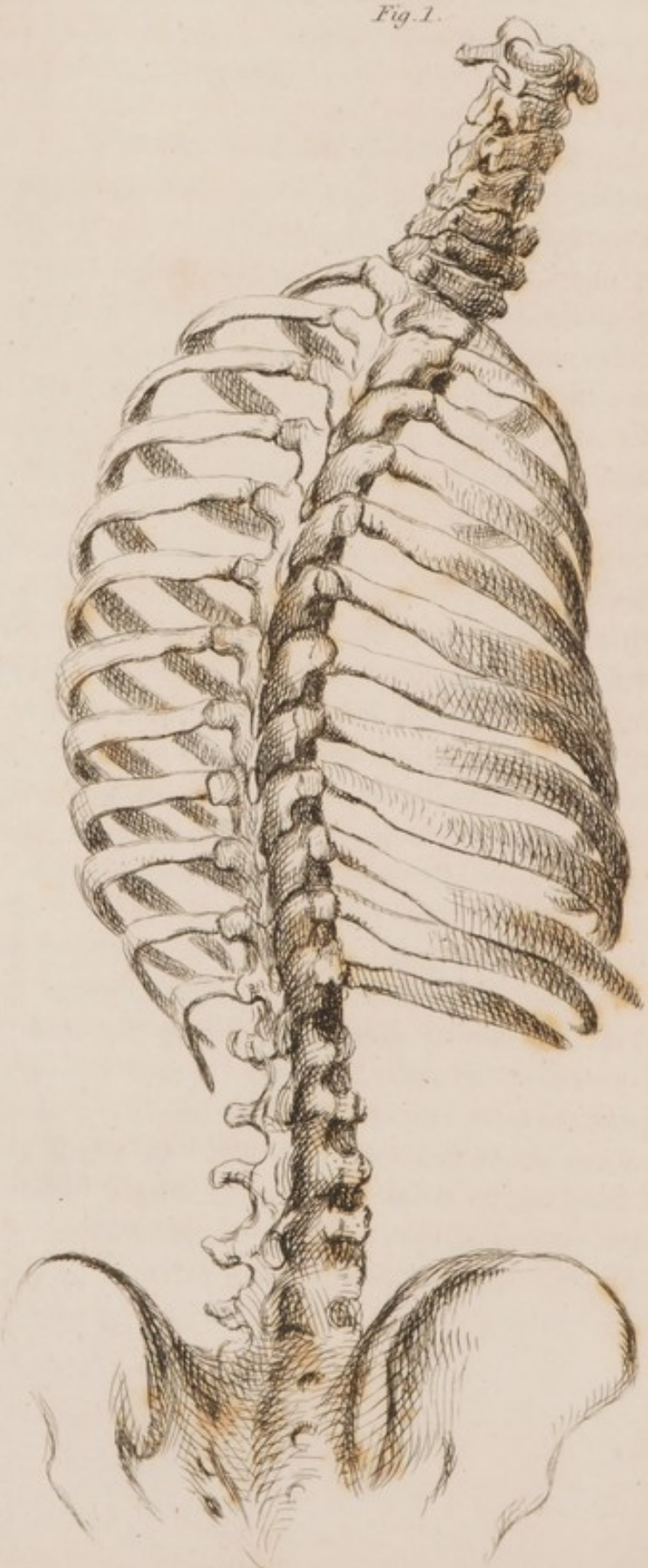
Description of Plate III.

The distortion represented here is a lateral curvature of the spine, but very different from the serpentine twist usually called lateral curvature. A condition similar to this might arise from an irregular action of the muscles, or from the contraction of those of one side, as occasionally occurs in rheumatism, or from one arm being more used than the other, as in certain trades; but in this instance it arose from the lung of the right side having been destroyed by disease. When the spine becomes affected from such a cause in early life, the deformity is generally very great, and quite irremediable. But few children survive the effects of an abscess in the lungs. There is a case of this kind given in the supplement to my work on Distortions, which was attended with some curious phenomena.

The sketch illustrates the condition of the spine and ribs in a more common, and consequently more interesting case — *the congenital deficiency in the size of one side.* When the spine becomes distorted from this cause, the deformity is almost irremediable, and even sometimes increases, notwithstanding the greatest care; the defective side does not grow in the same proportion as the other, although every means be taken to assist in its developement. These cases are similar to the congenital deficiency in the leg. It is a curious and important fact, that the defect is seldom observed either in the chest or leg before the child is two or three years old, and sometimes not until it is five or six, or even older. The disproportion seems to be more remarkable as the child

Plate 3rd

Fig. 1.



becomes older. It often happens that the mother insists that the defect was produced by an illness; it is perhaps so in some cases; but consequent emaciation may be the cause of the inequality being brought more distinctly into view. This condition of the limb or side does not appear to be similar to that called the *blight*, which occurs about the period of weaning. This is generally sudden and attended with partial or total paralysis of the limb; while in the case before us there are seldom any such symptoms, the limb being often perfect in its functions although small; but when it is very diminutive, the voluntary power is much impaired. There seems to be little doubt that the deficiency in the size of an eye, of one side of the chest, or of a limb, often takes place *in utero*.

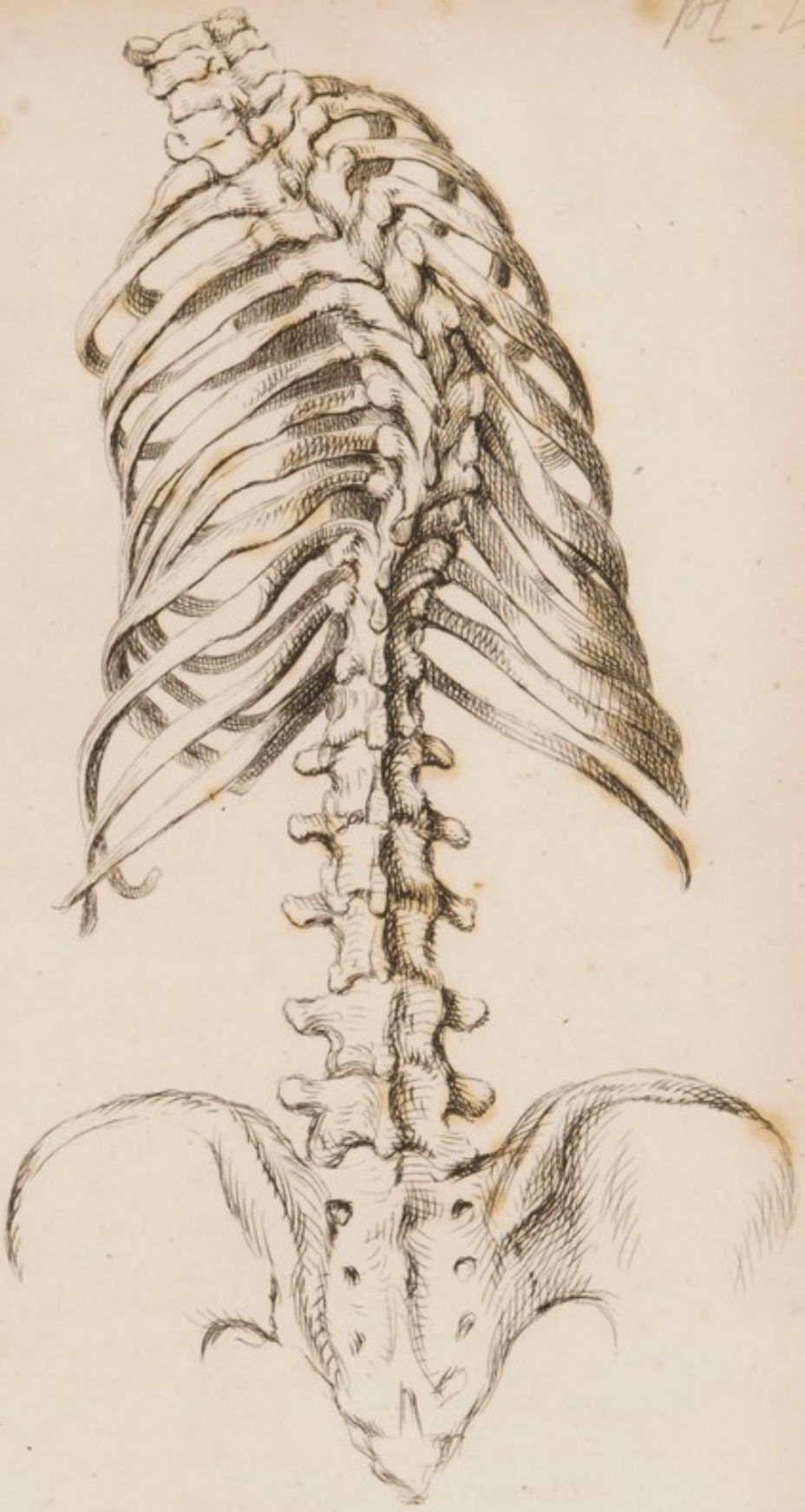
Can any thing be done to remedy the inequality, or to prevent greater deformity taking place? There are many different degrees of this deficiency: in some, it is at once obvious to the eye; in others, it is so slight that it is scarcely perceptible; and in some cases, when the spine is twisted, it is difficult to determine whether the smallness of the side depends on the ribs being compressed together, or on an actual defect of size. In cases where the difference is very great, little can be done, because the means calculated to increase the size of the small side have an equal or greater effect on the other. When the inequality is in a less degree, much may be done by such exercises as operate especially on the muscles of the small side, and by also taking care that the lumbar part of the spine does not sink; but it is as little to be expected that the two sides shall become equal in size as that a short and diminutive leg can be made equal in length to the other. To attain such a

result, the growth in the perfect limb, or in the larger side, should cease for a time.

In a young lady, whom I have seen at intervals during the last two years, the spine is nearly straight; but the two sides are so different that the back appears as if it were formed of two unequal halves joined together. In this, as in similar cases, the respiration is not so powerful on the small side as in the other. This fact is easily ascertained, either by placing the hands on both sides, or by examining the rush of air through the lungs by applying the ear to the side; in this instance, the shoulder resting on the small side sinks lower than the other. To prevent this, which would gradually produce distortion of the spine, she has worn artificial supports; and with the view of assisting in the developement of the side, and preventing the almost necessary consequences of neglect, certain exercises are performed, and more activity is attempted to be given to the actions of the respiratory muscles, by teaching her how to breathe occasionally, chiefly with the defective side.

Explanation of Plate IV.

A person whose spine is in the condition represented in Plates IV. and V. appears more deformed than where there is a serpentine twist: the figure is tall; the difference in the size of the shoulders is very great; and the head, instead of being nearly perpendicular to the pelvis, is directed to one side. On examining the condition of the bones in these examples, there can be little doubt that the upper part of the spine was at first affected nearly in the same manner as in the common serpentine distortion. The right side was, therefore, probably, more capacious than the left at first. But now its area



Published for

Mary Anne Roach, Dec.r 26th 1826

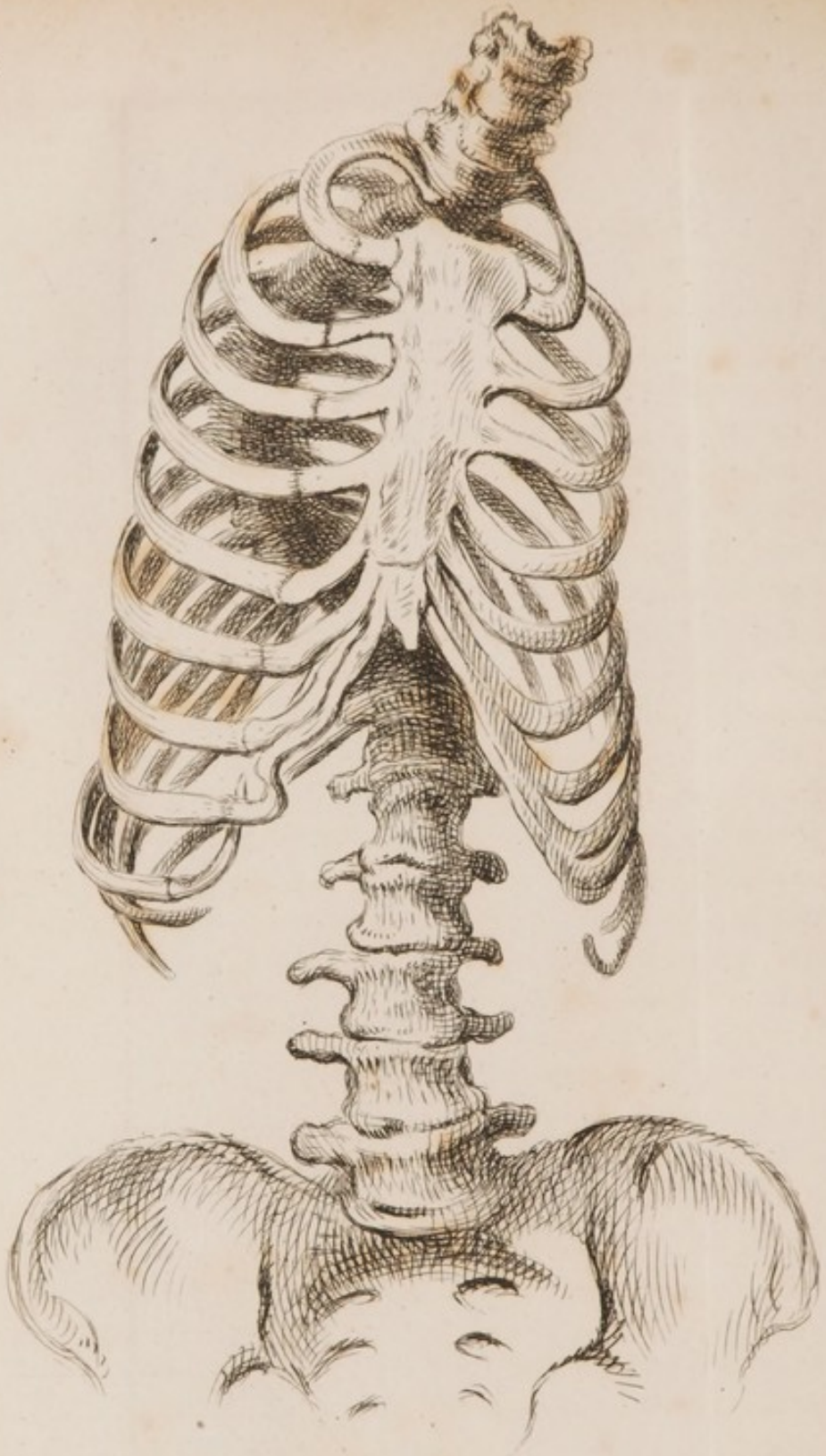
Mary Anne Roach, 6th Sept.r 1826

W. Day. Lith. 59 G.t Queen St.

Plate III.

Fig. 4.

P.V.



Engraved by T. Landseer.

t, Orme & Brown, 1823.

is much diminished. It is important to attend to this, for although it may be the consequence of the natural progress of the distortion, it may be produced by the misapplication of instruments used with the intention of pushing in the projecting shoulder. It is easy to demonstrate that the application of an instrument with this intent, not only diminishes the area of the chest, but increases the distortion; for the shoulder is pressed against the flat part of the ribs, and consequently the angle, which is formed even in cases of slight distortion, is increased. A similar effect is sometimes produced by confinement to the horizontal position, for the weight of the body on the growing ribs is equivalent to pressure made by instruments. It is almost unnecessary to say that the diminution in the projection, which to a parent's eye may appear an improvement when effected in this way, is in reality the reverse, and tends to make the case quite incurable.

Explanation of Plate V.

Plate V. is from the fore-part of the same skeleton; it gives a more distinct view of the diminution in the area of the right side. In this case the heart was drawn towards the right side. We can understand how distortions may sometimes give rise to the suspicion that the patient has disease of the heart. Had the left side been diminished instead of the right, the actions of the heart would have been much impeded.

Explanation of Plate VI.

A distortion, such as is represented in this sketch, is incurable, but certain questions of practice are illustrated by it. As, for instance, the impropriety of attempting to remedy the projection of the right shoulder,

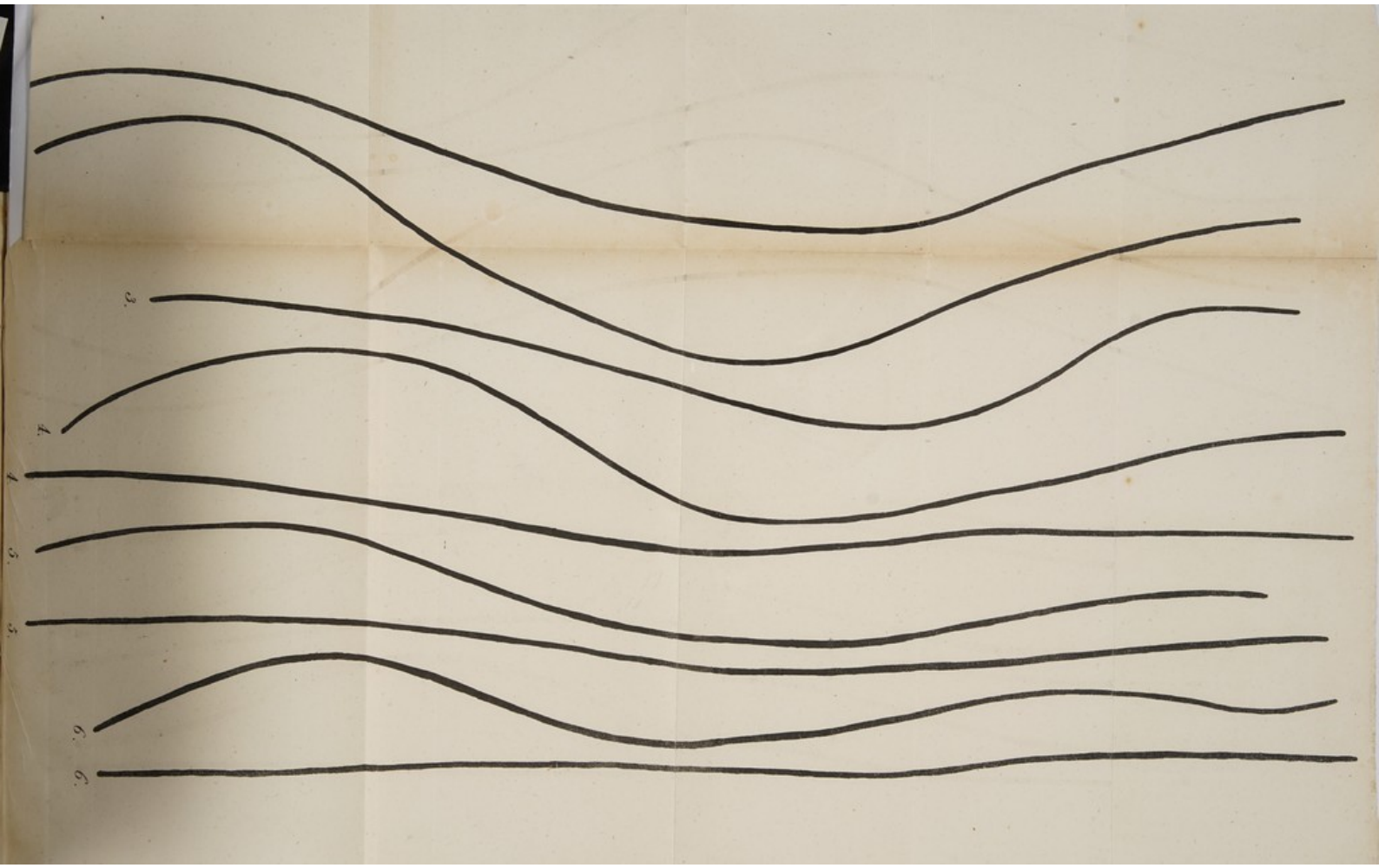
or the prominence in the left loin, by pressure. See p. 86. As the spine is almost concealed by the projection of the ribs, and by the approximation of the shoulders, we can understand how a person ignorant of the changes which take place in the skeleton may fall into the error of supposing that the ridge formed by the angles of the ribs is the spine.

No one who is aware of the nature of such a case will promise to improve the figure. But I have seen patients who were distorted in this way, and suffered from difficulty of breathing, relieved by certain exercises; where the bones encroach on some of the viscera, or press on the nerves, artificial supports may be of service. I was lately consulted by two patients who were distorted nearly in this degree. As neither of them suffered from difficulty of breathing, or from pressure on the nerves, I advised them merely to endeavour to keep up their health and strength by exercise. In both, the distortion had gradually increased to an extent similar to that represented here in little more than two years.

Explanation of Plate VII.

These drawings were made from the casts taken from the patient, whose case is alluded to at p. 110. The lithographer had also the casts before him.

The improvement from the 7th September, the day on which the first cast was taken, to the 26th December, was progressive. The prominence on the left side, caused by the muscles being raised by the rotatory twist of the lumbar vertebræ, is seen to be much diminished. Great attention is necessary, even in apparently slight cases, to overcome this twist of the spine on its axis. The impression taken by dotting the skin over the spinous processes was on the 6th September as crooked as No. 2. in the next plate.


2.
4.
1.
3.
5.
6.
6.

This plate contains exact copies of the lines made by marking the skin over the spinous processes in the manner described at p. 112.

No. 1. Shows the curvature of the spine after the patient had submitted for several months to the French system of extension: on comparing this with the cast taken before the plan of treatment was commenced, the distortion appeared to have become worse instead of better. See p. 121.

2. Shows the state of the spine of a patient who had for several years worn the collar made by Callam, described at p. 36. The mother assured me that she was quite straight at ten years of age, and that there was only a little inequality in the size of the shoulders before the invisible back was put on. Implicit reliance had, unfortunately for the patient, been placed on the promises of the instrument-maker, that he would make the figure quite straight in due time.

Most absurd stories are often related regarding the success of certain plans of treatment, and even where the patients' names are given, the statements are often at variance with the facts. So flattering a description had been given of the good effects of this instrument on the young lady whose spine is here marked, that two patients whom I have since attended were induced to submit to it. One of them became so distorted and so weak, while wearing the instrument, that it was necessary to fix it on the thighs by two rods, in addition to the circle round the pelvis.

3. This is an exact copy of the impression taken from the spine of the young lady who was treated in the manner described at p. 27.

4. 4. The patient from whom these lines were taken was between seventeen and eighteen. The first was

taken in December, 1825, the second in December, 1826. She implicitly followed the plan of treatment described at p. 97. for twelve months. Although there is still a difference in the size of the two sides, a comparison of the lines shows that there was a great improvement in the figure. The patient continued in excellent health during the whole period of the treatment.

5. 5. The first figure exhibits the curve most frequently observed in girls of thirteen or fourteen. Such a state of the spine may be quickly improved, and often entirely removed. The second is a copy of the impression sent to me by the young lady's father (a surgeon) little more than two months after the first was made.

6. 6. The first is a good example of the curve, which occasionally follows measles or fever. It is truly a serpentine curve, and with very little of the rotatory twist or the curve on the axis. The second was taken about three months after the first. The shape was quite restored, the girl was much fatter, and two inches taller. The bend in the line near the fourth dorsal vertebra is from an irregularity in the form of the spinous processes; this is not uncommon, but is not of any consequence, as the bodies of the vertebræ are not affected.

A curve of this kind coming on immediately after fever or measles may be quickly removed by almost any plan of treatment, if tried a short time after the appearance of the twist. The success attendant in the treatment of such slight cases gives rise to many erroneous descriptions of the effects of certain modes of practice. This twist might have been rapidly improved, and perhaps cured by exercise alone; but the plan of treatment, the principles of which I have endeavoured to point out, was strictly followed.