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THE

PATHOLOGY AND TREATMENT

Books 156

OF

Lateral Curvature of the Spine.

BY

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THE
PATHOLOGY AND TREATMENT
OF
LATERAL CURVATURE OF THE SPINE.

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March 18, 1868.

THE PATHOLOGY OF LATERAL CURVATURE OF THE SPINE.

MR. PRESIDENT—The lateral curvature of the spine is the most frequent deformity to be met with among the higher classes of civilized society. It is not an organic or fatal disease, but it produces a very unsightly deformity, injurious to the patient's future prospects in life, and often lowers the tone of the general health much below the normal standard.

Those who have written on the lateral curvature have suggested various theories as to its cause or causes. Some of these theories are plausible, and many far-fetched; but without stopping to enumerate these, or to discuss the subject of the impossibility of accounting for this deformity upon a single hypothesis, my purpose is to present briefly my own convictions of the pathology of this affection. I need hardly say that these views are the result of much experience. What I shall say will be but the established facts of my experience.

1. In the first place, a lateral curvature may be induced by many causes. There are not less than six or eight different classes of lateral distortion of the spine; and although some of these are relatively infrequent, they are all liable to occur, and no one can properly pretend to a knowledge of these cases who is not familiar with every form which may exist. The lateral curvature is not an irregular curving of the spine; an indefinite sigmoid or simple curve which some who have paid but slight attention to the subject seem to imagine. But it is very positive and uniform in its characteristics, varying only in types as causes vary, and depending in most cases on causes extraneous to the spinal

column itself. In fact, there is not one case in a hundred where a lateral curvature is caused by any disease of the spine itself. On the contrary, the spinal column is acted on and distorted by distant causes. Hence we need not look for pathological symptoms in the spine itself, or for symptoms relating to the spine. For the spinal column is distorted, not diseased, and to attribute to the spine the symptoms which may happen to occur in conjunction with a lateral curvature is a serious confusion of symptoms. If physiological disturbance should happen to exist at the same time with a lateral curvature, it would depend on other causes, and the so-called spinal symptoms and the curvature have only an accidental relation to each other.

I will first call your attention to that form of lateral distortion which is caused by a difference in the lengths of the lower extremities. I do not allude, in this connection, to the distortion of the spine caused by serious impairment of one lower extremity, or lameness; in such a case the cause would be sufficiently apparent. But there is a form of lateral distortion, easily detected by its peculiar aspect, depending on a considerable normal difference in the lengths of the two lower extremities. When one leg is

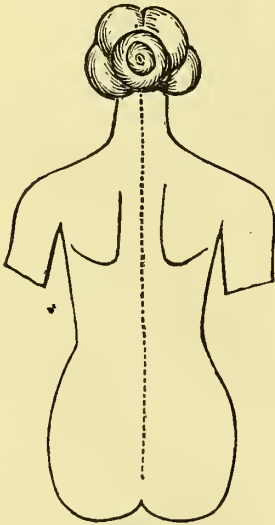


FIG. 1.

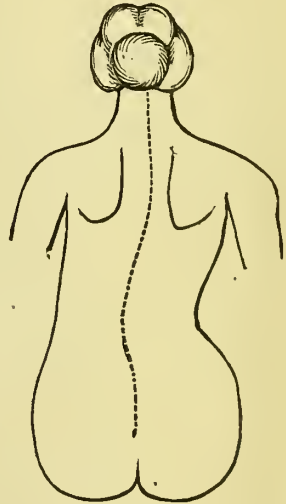


FIG. 2.

considerably longer than the other, one side of the pelvis must be lifted higher than the other with the effect of throwing the spinal column out of its vertical position in a lateral direction. In this case the principal deformity is in the lumbar region, the chest being but slightly affected. I have endeavored to give you an idea of this form of lateral curvature by the drawing, Fig. 2; Fig. 1 representing the natural form.

This is by no means a rare deformity. Among the abnormalities of the body, a difference of the lengths of the arms and legs from unequal developments is frequently met with by any one accustomed to making careful personal examinations. Of course no treatment directed to the spine itself can have the slightest effect on this distortion.

2. Another deformity—in this case affecting the shoulders principally, and the spinal column but slightly—arises from quite a different source. If you will refer to figure 3, you will observe a remarkable unevenness of the shoulders. Now this deformity of the shoulders is not due to a distortion of the spine, as might be supposed and is really true in other cases; but it is owing to unequal tonic strength of the trapezii muscles, which allows one scapula to slide down below the other. There is at the same time a want of muscular fulness in the belly of the muscle; which, when contrasted with the other side, makes an apparent curve of the spine in the upper dorsal and cervical regions. The lower angle of the displaced scapula also presents below the level of the other, and altogether make the deformity very considerable, and all the worse because it is wholly in sight. Of course a tonic spasm of the trapezius muscle on one side would have the same general effect of displacing the scapulæ, and making them uneven, that relaxation or feebleness of the other would do.

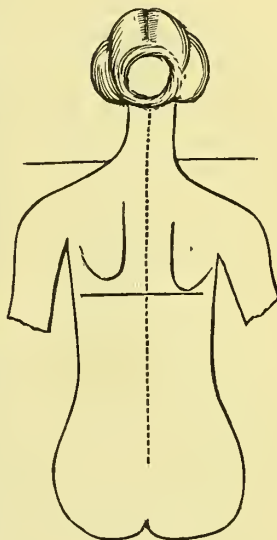


FIG. 3.

Unequal tonic action of correlated muscles is not unfrequent, and in certain situations, as in the present instance, a deformity must follow. And here again no treatment directed only to the spinal column could have the remotest influence on the deformity. It is evident that the same influence may be acting in other locations than the muscles which elevate the shoulder-blades; but I present that example which best illustrates the class to which it belongs.

3. The next class of spinal distortions to which I invite your attention has its origin within the pulmonary cavity. There has been much controversy and many speculations as to what constitutes the difference, and what causes the difference, between the single and the double or triple forms of lateral curvatures. Such speculations could only be indulged in by persons not sufficiently familiar with the appearance and history of these cases. There is really nothing to excite comparison with each other. I shall expect to show, by and by, that the common legitimate curvature always

is, and always must be, multiple; that is, it must be composed of two or more curves. All the rest are *irregular distortions* of the spine, as the column is forced in one direction or another by the action of special causes. I never yet saw a single curve which could not be traced to some special cause; while I shall show further on, that only one class of cases, and that the double or triple curve, depends on a *general* condition of the system.

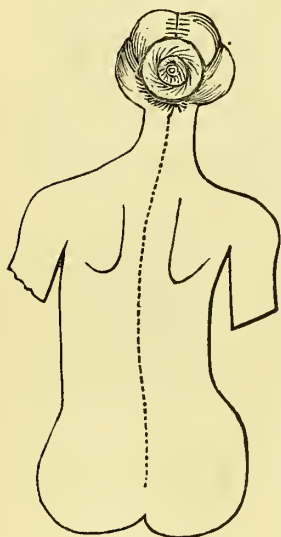
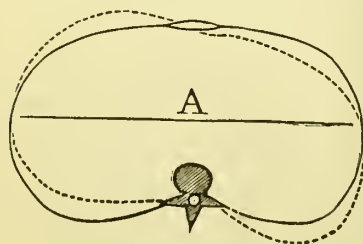


FIG. 4.

The most common cause of the single curve—such as is represented in figure 4—is found within the chest. Unequal play of the lungs begets difference in the muscular power and the size of the sides of the chest. If this begins at an early day, and continues for a long time, unequal development of the upper portion of the trunk takes place, and distortion of the spinal column must follow.

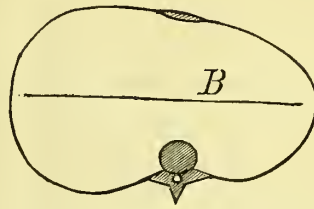
The history of a large proportion of these cases can be traced to long-continued partial occlusion of one lung, from which the patient ultimately recovered, so far as regards the pulmonary disease, but with a certain amount of physical damage remaining, as shown in the unequal capacity of the two sides of the chest, with the necessary spinal distortion. In this class of cases there is always such a marked difference in the form of the chest, when compared with the legitimate lateral curvature, that I do not see how it has hitherto failed to attract attention. In the legitimate curvature, the long diameter of the chest is changed from the lateral to the diagonal position; while in the class now under consideration the long diameter of the chest is not changed, but one side of the chest remains partially undeveloped, the chest on one side appearing compressed both anteriorly and posteriorly. This will be seen by reference to Figures A and B, where A



presents a transverse section of the chest in legitimate curvature, and B a section in distortion from unequal development of the two sides of the chest.

4. There is one class of cases—that which I shall next consider—in which the distortion has its origin in the osseous structures themselves. A defective nutrition of the bony

framework of a rachitic nature produces a very characteristic deformity. This I have endeavored to show in Fig. 5 of the drawings. The deformity is often very great. It generally begins to develop itself at an early age. This deformity has nothing to confound it with any other deformity of the frame—even if the history of the case were not sufficient to indicate its pathology.



5. This must not be confounded with the distortion caused by muscular spasm on one side of the body, as shown in Fig. 6. This was the case of a young girl who was an unfortunate victim of masturbation. She was drawn down much more than I have

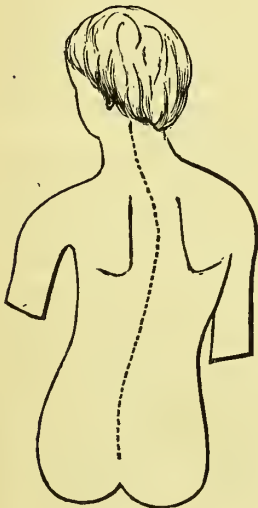


FIG. 5.

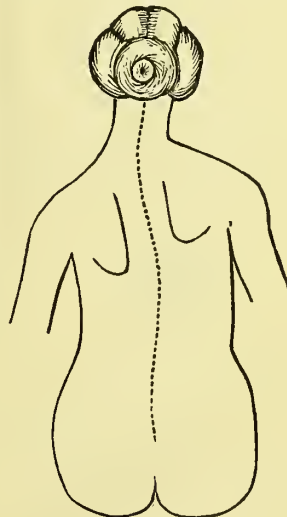


FIG. 6.

been able to represent in the drawing; but I give it as conveying an idea of deformity from muscular spasm. For all deformities, how much soever they may differ in particular details, have a characteristic aspect imparted to them by the inducing causes which are never absent in any given type of cases.

I do not propose to weary the Academy with a description of every distinct variety of lateral distortion of the spinal column which is ever seen, nor to enter into extended particulars in regard to the pathology of even those forms already enumerated. My object will have been accomplished when I have called your

attention to those forms of spinal distortion depending on special causes. Although taken together, they do not embrace a third of all curvatures of the spine, it should never be lost sight of that such cases do exist, and that it requires a clear and particular knowledge of their characteristics to be able to make a reliable diagnosis in any case of spinal deformity.

6. You will now be able to follow me with clearer appreciation in discussing the *legitimate* lateral curvature of the spine. I say legitimate, for the sake of greater distinction only. This class embraces not less than two-thirds of all cases, and comprises the only cases which are not produced by particular local causes. The origin of this deformity is simply the lack of sufficient muscular power to sustain the trunk at a period when there is also a want of firmness in the bones of the chest and spinal column. Mark well what I say. Muscular weakness alone will not produce a curvature of the spine. Let it occur at any time after the sixteenth year, and no lateral distortion will follow the longest-continued absence of the ordinary muscular support. Lateral curvatures of any forms do not originate after the sixteenth year, and, if previously formed, increase but slowly after that period. In fact, nearly all the first-mentioned forms of curvatures originate in early life; the last-named, the legitimate curvature, being latest of all to make its appearance.

Not often before the eleventh year, and more frequently during the twelfth or thirteenth year, a slight curve of the spine is

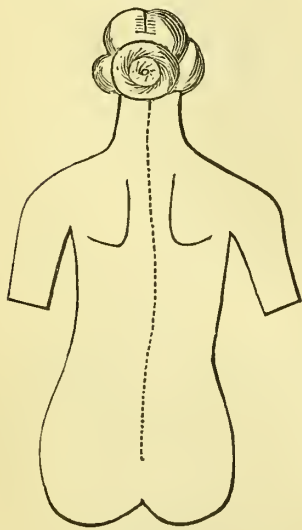


FIG. 7.

observed, resembling somewhat that which is shown in figure 7 of the drawings. During the first stages it appears as often apparently toward one side as the other. When the young girl is brought to the physician, there not seldom arises a spirited dispute between mother and daughter as to which shoulder is the higher, or to which side the spine bends. The physician may be equally puzzled—he certainly will be if he has not studied these cases as they deserve—for at one visit the curvature and the prominent shoulder will appear on the side opposite to that which they were on the previous visit. At another time he may be surprised at not being able to find any curvature at all. This must be in the earlier stages. There is nothing wonderful in the fact that the

curvature shifts from side to side, or temporarily disappears, at this

stage of the difficulty. The fact is, the curvature occurs only when the muscles are weak; and it appears toward that side where the most fatigued or weakest muscles are situated. If there are intervals when there is sufficient tone to the muscles, then at those times there will be no curvature. Or, if from various causes the tonic force of the muscles of the different sides of the body is made to vary, then the curvature must also vary.

After a while, the curvature is seen more frequently presenting toward one side, till, if the tendency is not arrested, it becomes habitually on one side. It is now a real curvature; before, it had only been a tendency to a curvature. This all must take place at a time when the osseous tissue is soft and impressible; a period lasting generally not over three years at the longest, and usually occupying a much shorter time. After a while—at fifteen or sixteen, sometimes a year or two earlier, but always coinciding with the period of individual development—there supervenes a more rigid state of the osseous tissue; the bones are no longer easily impressed, and the curvature ceases to rapidly increase, in most cases ceases to increase at all, and the case has arrived at the last stage, or the stage of complete formation of the curvature. There may in some cases be a slow increase of deformity once formed, especially if the patient be very weak and poorly nourished, but these are the exceptions and not the rule. As to the formation of a legitimate lateral curvature after the age of twenty or thirty years, it is simply impossible. I am often called upon by patients of the latter class, under the impression that a lateral curvature is just appearing. But I never failed to detect an error of this nature: the patient has been getting thin in flesh, and weak, perhaps accompanied with back-ache, when on examination a slight curvature is discovered. This discovery, under the impression that it has but just formed, is often the cause of great distress and alarm. Sometimes the patient will say that she had a curvature at fourteen, and was cured, but that it has reappeared. Now the truth is that the curvature did indeed form at the only age when this legitimate curvature can form; but that with the development of the womanly form and accumulation of adipose, the slight deformity was covered up and forgotten, to reappear when, with the rearing of children and advanced years, the rotundity disappears, and the curvature, which has existed all the time, comes to light again. I need not say that to connect the constitutional symptoms common to that period of life with a slight distortion of the spine which has existed all the time, during all degrees and phases of bodily health and bodily ailment, displays a lamentable want of knowledge.

It is at the age of puberty when the legitimate lateral curvature is formed. It is a deformity essentially peculiar to the higher civilizations. The other forms of lateral curvature we may find among all classes; but the one now under consideration is almost exclusively confined to the higher classes of society. Peculiar

combinations of circumstances are required in the production of this deformity, and we have the necessary conditions in greatest perfection among the higher classes. And these are the conditions: It is a period of the most rapid bodily growth, the vegetative processes are in greatest activity, and there is accumulation of quantity rather than firmness of tissue. Indeed, it often happens that the rapid increase of size is temporarily at the expense of strength; so that the strength and endurance of a fast-growing girl is less than it would be if she grew less rapidly, or than that of others of the same age of a slower growth. In a word, growth considered alone is an exhausting process; and very rapid growth may be, for the time, very exhausting. This we all see and know in the case of young animals. But with the young girl at this very period of rapid and often exhausting bodily growth, another process starts into controlling activity; ovulation and menstruation are establishing themselves. So overwhelming are these combined influences in controlling the girl's nature, that in the country, removed from the stimulating influences of city life—a forced intellectual effort which excites the mind to undue activity—there is at this time a period of very marked mental sluggishness. This is natural, and as it should be. It is well that nature has thus provided for complete and perfect development by temporarily subordinating mental activity to the increased demands of organic development. And if we did not thwart nature in these her conservative efforts by the habits of society, we should have none of this class of lateral curvatures.

But unfortunately, just at this period, when all the organic activities are in the completest exercise, the development of size, form, and the capacity to assume the maternal functions are demanding a paramount importance, and the functions of the brain and nervous system are naturally in temporary subordination, the habits of society step in to thwart this natural, easy, and successful process, by causing the brain to be in superior activity, and the organic processes to be held in subordination. The girl is allowed no period of intellectual sluggishness during which bodily development may become perfected. The nutrition which is destined for the body is diverted to the brain, and the bones and muscles starve. Hence people reared in cities do not attain, on an average, to the same physical stature of those reared in the country, nor are their bones and muscles so well developed in firmness and strength. So the muscles being deprived of both blood and innervation by the preponderating activity of the brain and nervous system, while the spinal column and all the osseous tissues are soft and yielding from the same cause, a curvature is the natural and inevitable consequence in a certain number of cases. The whole matter is simple enough. I have already remarked that these curvatures appear in the first stages on one side or the other, or temporarily disappear altogether, according to the accidental circumstance of partial, local, or complete temporary recovery of

muscular tone. But the muscular tone varies with that of the brain and nervous systems, and is entirely subordinated to it. So that in reality the large majority of lateral curvatures of the

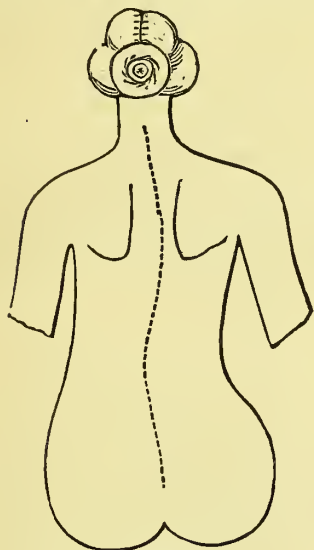


FIG. 8.

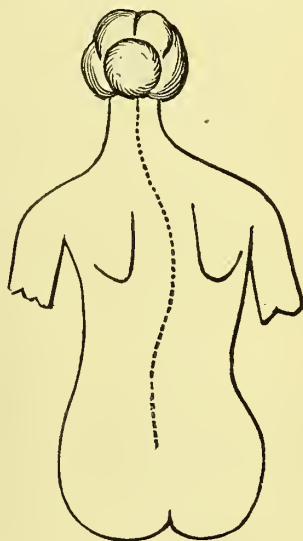


FIG. 9.

spine have their origin in the brain. It is the cumulative evidence of all my experience, that when we can control the action of the brain we immediately arrest, and if a state of mental repose is persisted in, we permanently cure this form of lateral curvature of the spine!

Figures 8 and 9 represent different cases of this curvature, after it has become permanently fixed towards one side; generally to the right. Figure 10 presents a front view of a rather severe case of lateral curvature, showing the usual marked difference in the development of the breasts. The breast on the flattened side of the chest is always much smaller than the one on the protruding side. I do not attempt to account for it. I present it as a singular and constant fact.

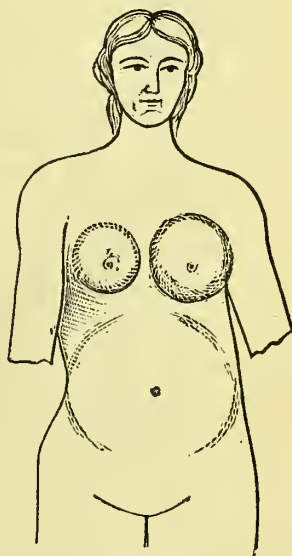


FIG. 10.

In insisting on recognising the fact that lateral distortions of

the spine must be regarded, not as pathological conditions, nor as evidence of morbid change in the spine itself, but as deformities alone so far as the spine is concerned, depending on special local extraneous causes, or on a general combination of causes, at a particular stage of development, I would by no means underestimate its influence on the general health of the patient. But it is by having definite and correct ideas that we are enabled to apply remedies.

The lateral curvature is a deformity which diminishes the bodily vigor in many ways. The health is impaired, the form is rendered unsightly, and the patient, who is generally a female, has many of the pleasures of life destroyed by it. We cannot apply ourselves to a more worthy study, or one which will bring more joy to grateful hearts, than to seek to understand and remedy this all-pervading, spirit-crushing deformity.

TREATMENT OF LATERAL CURVATURE OF THE SPINE.

MR. PRESIDENT—Before entering upon the subject of the treatment of lateral curvature of the spine, which, in obedience to requests of the Academy, I now intend briefly to discuss, I desire a brief indulgence of the Academy while I make a passing allusion of great importance in the matter of diagnosis. It not unfrequently happens that cases present themselves with a lateral distortion, resembling more or less that represented in Fig. 11.

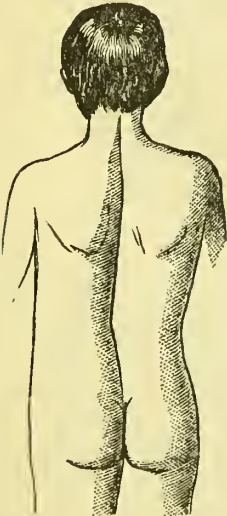


FIG. 11.

Now this illustration does not represent a true lateral curvature. It is an example of the usual lateral deviation which nearly always accompanies the first stages of Pott's disease, and is nothing more than an effort to relieve the spinal column of shock, and thus save the diseased vertebræ from injury. It is a temporary distortion, always passing off with the progress of the case, towards either recovery or increased deformity, and it requires no treatment whatever.

As a symptom of the first stages of Pott's disease, it is very important; but it is not a lateral curvature in the sense of a permanent deformity, and there should be care not to mistake the one for the other. I have known serious injury to result from recommending exercise and gymnastics to such cases, under the impression—which could only be the result of carelessness—that an ordinary lateral curvature was being prescribed for. It will be seen by referring

to the figure (11), that this lateral distortion is not a *curve* after all, but an almost angular deviation to one side, terminating at some definite point of the spinal column, which portion of the spine will be found to be the point of disease. If there is a curve at some other point, it is simply a compensating curve. The only treatment this form of lateral distortion requires is that which is necessary for the cure of the diseased vertebræ. At best it is but a temporary incident in the course of Pott's disease.

In discussing the treatment of lateral curvature, I shall dismiss the numerous varieties with a few passing remarks at the close; confining what I shall say principally to the single but most common kind, which I have already designated by the term "legitimate" lateral curvature.

It will be remembered that we found that the most common form of lateral curvature occurs only at a certain period of existence; that this period embraces about three years, more or less, about the age of puberty; commencing a year or two before, and the liability continuing not later than the sixteenth year, and often ending much earlier; after which time the formation of the lateral curvature is impossible. I pointed out also that the immediate cause of this deformity is relaxation or weakness of the muscles at a time when all the tissues are in a soft and yielding stage of development; and I showed, at considerable length, that this weakness of the muscles occurring at this particular period is not due to any defect in the muscles themselves, but to several sources of *nervous* exhaustion acting at one time. These sources of nervous exhaustion were seen to be rapid bodily growth during the development of ovulation and menstruation; and the simultaneous abnormal activity of the brain and nervous system. And I stated the well-known fact that when persons grow up removed from mental excitements and stimulants—as of children reared in the country—there was a very distinct epoch of mental sluggishness at the age of puberty. We then traced the *real* cause of lateral curvature, through the loss of muscular tone, to nervous exhaustion by reason of abnormal activity of brain at a certain period of development.

This being the pathology of these cases, the diagnostic inference is irresistible. Our treatment in the first or formation stage must have reference, not to the spine, but to the strengthening of the nervous tone by arresting the abnormal waste of force through the brain and nervous system. If we would arrest the formation of a deformity of the spine, we must diminish the action of the brain. We must stop the study and emulation; the excitements; the feverish irritability of the girl's brain and mind; we must, by all means, save her nervous strength. Let it never be forgotten that we are dealing with a case of *actual exhaustion*; and that the remedy for exhaustion is *rest*. We must be careful of muscular as well as of mental exercise. There is no truth in the idea that exercise of the muscles will compensate for weariness of brain. We cannot remove the effects of overdoing by extra labor. The

constitution fails to recognize any difference in the avenues through which the vital force is let out. I repeat: overwork of brain is not repaired by overwork of muscles. When the system is exhausted we ought to recognize simply *that* fact, and at once secure rest as the only corrective of exhaustion, no matter how the exhaustion has been produced. Hence I must reject, as contrary to reason and all my experience, the idea of prescribing physical exercise for young, fast-growing girls, as a remedy for *incipient* lateral curvatures. The only remedy required to cure any ordinary case of this form of lateral curvature, in its first stages, is *absolute mental and physical repose*. They do not need exercise; they do not need apparatus; they do not need anything but to keep the brain inactive, the nervous system in repose, and the muscles still. Saving the nervous strength, which is usually wasted in premature activity of brain, is quite sufficient—at *this early stage*—to restore tone to the muscles, and thus to restore the form to the spine.

I may say in entire truth, that with all our large number of patients with this deformity, our very best cases, the most successful and the completest cures, do not receive any actual treatment whatever. If they can be made to obey directions, they are sure to recover. I am speaking of the first or formative stages. But a little later in the progress of the case, the circumstances become very much altered. The osseous tissues assume

more firmness and begin to resist the action of the muscles. At this second stage a simple apparatus like the one figured in the 12th illustration, will be found to answer a good purpose in assisting the muscles in their action against the spinal column. It is at this stage and afterward that the "localized movements," so called, for developing certain muscles, or groups of muscles, are found to be almost indispensable to complete success. It may be still possible to cure the deformity without resort to any other mechanical treatment. With the assistance of this simple apparatus, the action of which must be apparent without further description, the spine is kept in position till the muscles, recovering their tone, are able to hold it erect without assistance. But as time passes, with the deformity not removed, the

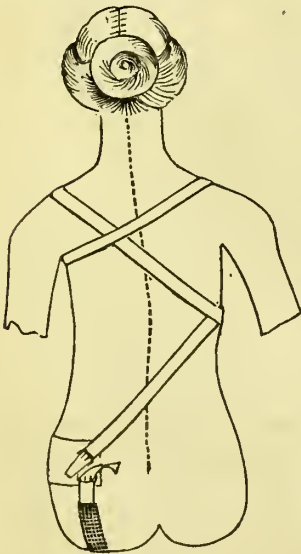


FIG. 12.

muscles do indeed recover their tone, but the osseous tissues have

also become rigid and fixed in their distorted position, and we are confronted with a deformity which might have been easily prevented, which might even have been removed a little time before; but which now will tax all our resources to modify and mitigate, but which we seldom hope to *entirely* cure, as we could have done a little earlier. We can do much to relieve at any stage; we can diminish and ameliorate; but the precious months have passed unimproved during which we could have saved her form, and sent the young girl out into the world in *perfect* symmetry.

From this moment we are confronted with an absolute *deformity*, resisting reduction, and against which *force* must be used. We have two means through which we may endeavor to accomplish the reduction of the deformity. We may endeavor to diminish the distortion by apparatus which act with sufficient force against it; and then we strive to retain the spine in a more perfect position by increasing the power of the various muscles which act upon it.

Figs. 13 and 14 represent different varieties of apparatus used for the legitimate lateral curvature; while figure 15 shows one form which is very efficient in some of the other forms of curvature, especially where the distortion is high between the shoulders. These instruments are intended to effect a certain definite object, and they are made with such an action as will accomplish that object. They are made strong enough, so that acting in a certain direction against the spinal column, the latter and not the instrument must yield. They are perfectly adjustable, and are made to reduce rather than to cover up and hide the deformity. And it is astonishing what wonderful results may often be obtained in apparently the worst cases. I speak with entire exactness. While it is certainly true that *perfection* of form can scarcely be hoped for after the case has passed into the second or rigid stage, yet we can often almost attain it in a large proportion of cases by perseverance in the *right* direction.

Acting in the same direction and on the same mechanical principles, but still more powerfully, are the stationary apparatus, illustrated in figures 16 and 17, while figures 18, 19, and 20 are intended to represent some means of securing the local exercise

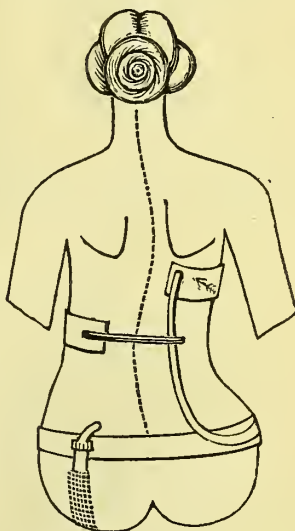


FIG. 13.

of certain muscles, or groups of muscles. This is a necessary part of the treatment in all cases of lateral curvature, after the incipi-

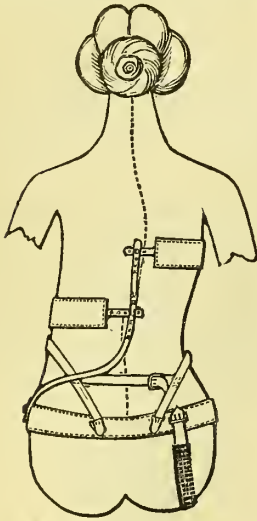


FIG. 14.

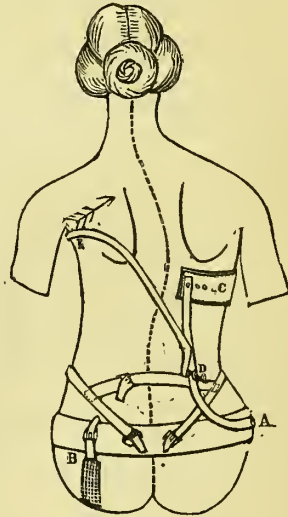


FIG. 15.

ent stage is passed. The loss of harmony in the action of the muscles induced by malposition must be overcome by direct local

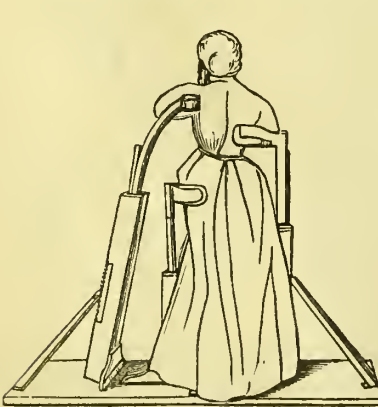


FIG. 16.

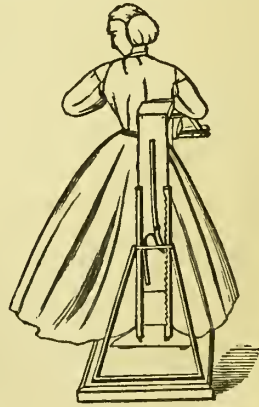


FIG. 17.

regulation of the action. Not only the bony framework must be restored, as near as may be possible, to its natural shape, but the muscles must be restored to their normal action. To strengthen

them where weak and relaxed, and to develop and extend where shortened and atrophied, involves a system of exercise or "movements" for the purpose. Several illustrations are given.

The exercise illustrated in Fig. 18 is calculated to strengthen the muscles of either or both lateral parts of the trunk, while Fig.

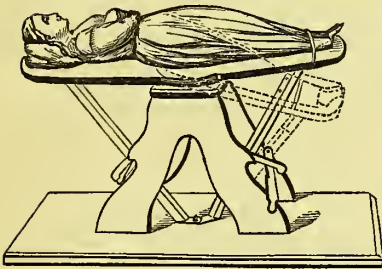


FIG. 18.

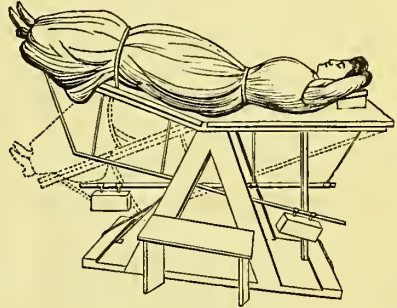


FIG. 19.

19 shows how the spinal muscles alone may be put into separate action or exercise. Fig. 20 represents the method of extending the contracted muscles of one side in certain forms of lateral distortion, while at the same time the spinal column is extended, as a

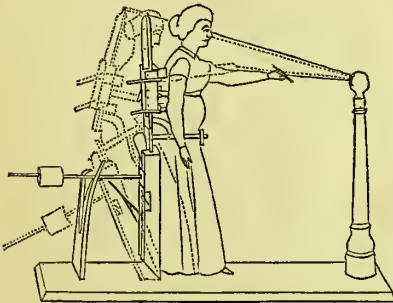


FIG. 20.



FIG. 21.

glance at the figure will show. Fig. 21 represents a complicated action of different portions of the spinal muscles, at the same

time. I may be allowed to remark that these last figures serve as examples of what is sometimes called *localized movements*.

I shall not weary the attention of the Academy by entering into minute details of treatment, deeming it only necessary to suggest general principles; the special applications of these general principles constitute the *tact* of experience. I may remark that the apparatus used always contemplates purely *lateral* action, never longitudinal extension; and that an important and characteristic feature of the instruments is, they are levers deriving their power from a perineal strap, which *secures a definite unchangeable point of action* for whatever force it may be necessary to employ. The apparatus on the table and the numerous drawings will sufficiently suggest the main ideas of the treatment, without further verbal illustration. I do not intend to weary you with minute descriptions of what ought to be sufficiently obvious without.

With regard to the numerous varieties of the least common forms of lateral distortion, the treatment is more or less successful, according to the circumstances of each case; but these exceptional cases are not those in which the general practitioner will be likely to have much success, should he undertake them. And even the legitimate lateral curvature, after it has become a fixed deformity, will be likely to resist all but very vigorous attempts at reduction. It is only at the initial stage of this deformity that the general practitioner will find himself sustaining responsibilities which he is capable of discharging, and these he can discharge with the most perfect success. But after the first stage the treatment requires more facilities than he generally has at his command.

I commend, therefore, these views of the pathology and treatment of lateral curvature of the spine to the serious consideration of every conscientious physician, believing that if faithfully carried out they will be the means, with others as with me, of saving many persons from deformity and distress, as well as being the source of much personal satisfaction to both patient and practitioner.