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The Treatment of Lateral Curvature of the Spine.

BY

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NEW YORK.

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THE TREATMENT OF LATERAL CURVATURE OF THE SPINE.*

By HENRY LING TAYLOR, M. D.,
NEW YORK.

In spite of untold labor devoted to the subject of lateral curvature by able men, we still seem to lack, for the ordinary forms of this affection, a scientifically observed and well-digested clinical history, a satisfactory theory of pathogeny, and a thoroughly rational treatment.

There are, no doubt, diversity, multiplicity, and complexity of causation in these cases, but the theories so far advanced either fail to explain or conflict with observed facts, such as the following:

1. Most delicate children with weak spinal muscles, leading a sedentary, precocious, and intense life, and habitually assuming faulty attitudes, do not develop lateral curvature.

2. Some vigorous children, leading an active, outdoor life, and whose spinal muscles seem as strong as or stronger than the average, do develop lateral curvature.

3. Right-handed people sometimes develop scoliosis, with the dorsal convexity to the left.

* Read at the meeting of the American Orthopædic Association, Philadelphia, September 17, 1890.

4. Most children with considerable differences in the length of the lower extremities and consequent pelvic obliquity do not develop a rotary lateral curvature.

5. A patient with shortness of the right leg (without joint or muscle trouble) and with the pelvis sloping to the right may develop a curve, with the convexity to the left, in the lumbar region.

6. Lateral curvature with extreme rotation may develop with the spine in the horizontal position. (See specimen of mammalian spine in the Museum of the College of Physicians and Surgeons, New York.)

What is the reason that, out of a hundred pale, flabby, undertrained and overstrained children who assume faulty attitudes, and some of whom have flat feet or crural asymmetry, only a few develop scoliosis?

In estimating the effects of treatment it is necessary to know that many cases of lateral curvature are self-limited, or at least do not progress very far even without treatment. I am constantly discovering mild or moderate forms of scoliosis in adults in the course of examination for other troubles, and some of them have never suspected the existence of the spinal affection. On the other hand, it is even more important to know that very many cases do grow worse unless carefully managed, and some have a strong tendency to go on to extreme deformity, even under persistent treatment.

When beginning cases are brought for an opinion, certain data—such as the height, chest expansion, and Roth's horizontal dorsal contour—should be noted, and the patients should be examined once in a few months to see if the deformity increases. In the mean time explicit directions are given for the regulation of the mental, physical, and social life. It seems clear that regular habits, moderate exercise, stated complete rests in the daytime, plenty of

fresh air, and an open-air life, with the avoidance of physical, mental, and emotional forcing and strain, are a vast help to these patients, and I believe that the rational employment of these rational means does arrest the progress of the curvature in many cases.

I have observed several instances of city school-children with moderate osseous curves, but who had never worn braces, who improved notably during a three months' sojourn in the country, with a natural open-air life. On the other hand, I have seen severe curvatures develop in sturdy children brought up in the country under apparently just as favorable conditions. Attention to these points, however, is always imperative and often sufficient in the earlier and milder cases.

The backache and spinal tenderness so sedulously sought by the inexpert are not properly symptoms of lateral curvature. They may be symptoms of a system below par, or of nervous or spinal weakness, and are often accompanied by headaches and other local and general symptoms. A few of these patients have lateral curvature in addition, and a moderate proportion of scoliotics have headache and backache as an expression of their general condition of health. The rib pains and other pains of some of the extreme cases belong to a different category. These patients with backache —usually anæmic and with impaired digestion, nutrition, and elimination, and a faulty nervous and blood distribution— are much benefited by systematic attention to mode of life, general and special exercise, rest, diet, bathing, and mental and moral hygiene, and, if they at the same time happen to be suffering from scoliosis, these indications are all the more clear and urgent. While lateral curvature is not caused by general lack of vigor, it is much more apt to develop in such constitutions when the other necessary factors are present; when it is developed, it acts as a constant drag

and strain upon the economy through imperfect equilibrium, overworked muscles, and crowded viscera, according to the grade of the affection. By careful attention to the measures mentioned, for which it is necessary to give specific directions and to secure the co-operation of the patient and her family, and the use of special exercises, we are nearly always able to improve the general health and vigor

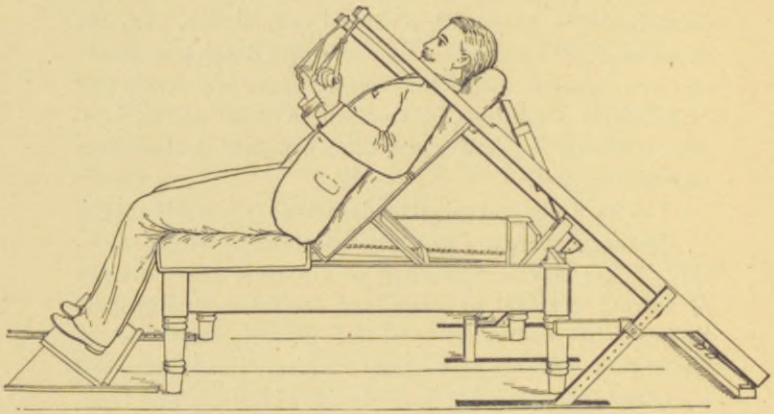

Fig. 1.

of our patients, give tone to the muscles, relieve backache when present, increase endurance, and often improve the attitude and carriage of the body.

As chest power and capacity are threatened or already encroached upon, we give special attention to respiratory exercises, by which means we also favor oxygenation of the blood and improvement of nutrition and circulation, but are careful to avoid overtaxing a system in many instances already delicate and tired. To fulfill these indications we have found nothing so useful as certain specific exercises, mainly passive, adapted by Dr. C. Fayette Taylor from the

system of Ling. The apparatus called the respirator (Figs. 1 and 2), elsewhere described,* actuated by steam-power, and giving sixteen deep respiratory movements a minute, is prescribed for nearly all our scoliotic cases requiring special treatment.

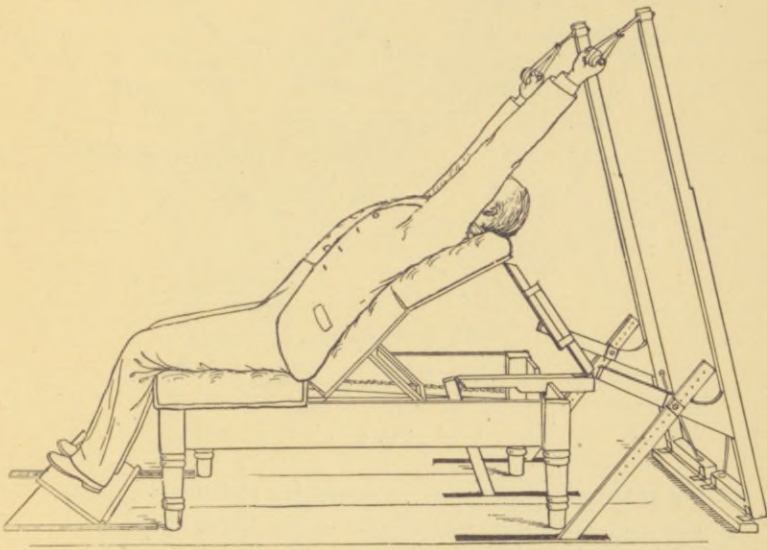

FIG. 2.

By means of another power apparatus we give alternate right and left lateral flexion, forty-six times a minute, of the trunk through the loins, the patient lying on the back. This increases lumbar flexibility, strengthens the muscles about the waist, and acts on the abdominal viscera.

Another useful exercise is taken while the patient lies on a couch made of two halves hinged in the middle, and

* The Therapeutic Value of Systematic Passive Respiratory Movements. *Medical Record*, May 4, 1889.

so contrived that the body may be flexed and extended at the waist against a balancing weight, the upper and lower half being fixed at choice (Fig. 3).* This and the preced-

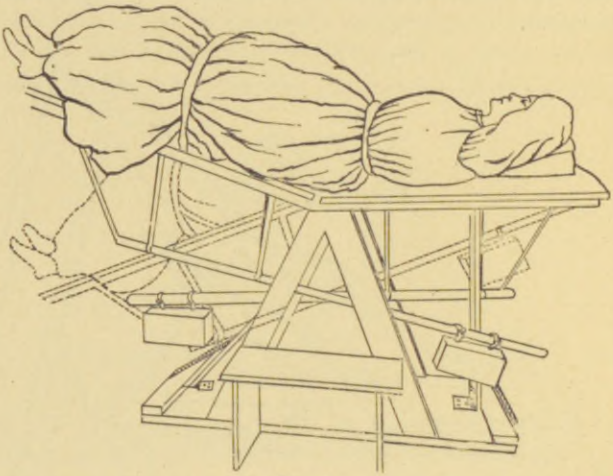

Fig. 3.

ing are excellent exercises for improving abdominal circulation and increasing peristalsis, and the latter strengthens the back and abdominal muscles.

To attack the deformity directly, we use lateral suspension from the hands in an apparatus consisting of a vertical, adjustable upright, hinged near the middle and carrying a reversible pad for pressure upon the convexity of the main curve, and a hand-piece for grasping. When the upper part of the apparatus is drawn over to the side, the patient is lifted from the floor, and the weight of the body forces the pad against the projecting ribs in the direction of the

* From *Spinal Irritation*, by Dr. C. Fayette Taylor, p. 23. W. Wood, 1870.

longest diagonal of the chest. At the same time the concave or contracted side of the chest is expanded by the wider excursion of the corresponding arm (Fig. 4).*

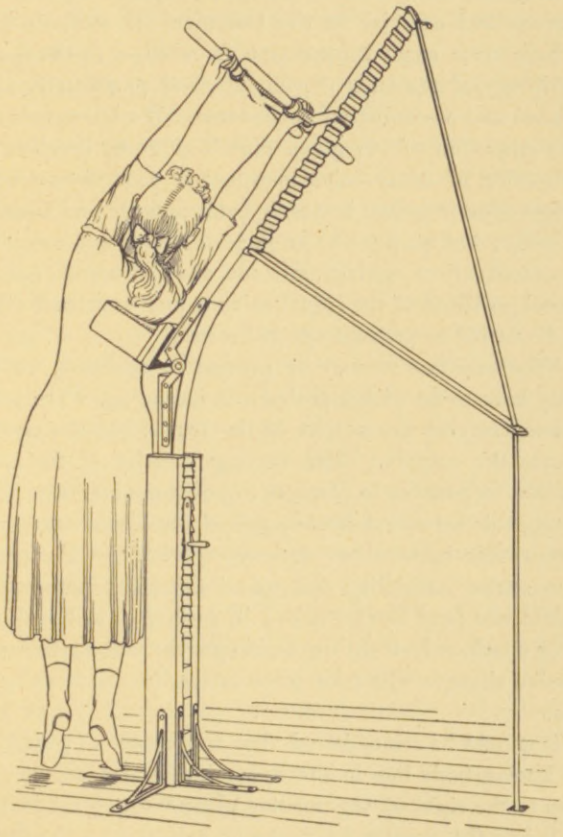

FIG. 4.

* Described and figured on page 98 in *Theory and Practice of the Movement Cure*, by Dr. C. Fayette Taylor, 1860.

In addition to these movements, I have lately given to some of my patients certain active free exercises similar to those recommended by Roth.

We shall be in a better position to judge of the value of prescribed exercise in the treatment of scoliosis when we have more exact information in relation to the special physiology of muscular movements, and particularly of associated and co-ordinated movements. We know well that the contraction of any given muscle or group involves the contraction of many other muscles; in fact, determines a change greater or less in nearly every muscle and tissue of the body; but we need to know how simple and combined movements affect carriage, attitude, and the normal and abnormal positions of the spinal column, and how these effects can be varied to produce specific results.

Whatever factors may be present in addition, we certainly have to do with a problem in balancing. The spinal column sustains the weight of the trunk, but the muscles balance the column. The varying tonicity of the trunk muscles, responsive to changes in position and strain, keep the unstable column delicately poised, but slight causes may destroy this harmonious action, especially in the period of muscular instability and spinal flexibility common in adolescence (and more marked in girls than in boys), and throw continued strain on feeble parts; and further progressive changes will take place in the lines of least resistance.

It should be remembered that the center of gravity of the human body lies in the upper lumbar region, in most cases to the right of the median plane,* which might help to explain the greater frequency of primary lumbar curves and the preponderance of the left lumbar and right dorsal

* *Vide* a paper by Dr. John Struthers, *Edinburgh Med. Journal*, June, 1863, p. 1086.

position, since in balancing the body there would be a tendency to bring the upper lumbar vertebræ to the left of the median plane, in order to place the center of gravity over the middle of the base line.

The observation has been made * that scoliosis is rarely seen among people who have been trained from childhood to carry loads on the head, like the peasants of some parts of Europe and of some of the West India Islands. I have been struck with the firm, erect carriage of fencers. Both fencing and the carrying of loads on the head are, in part, exercises in the fine and diffused muscular adjustments of balancing, and contain hints for the training of these cases.

Is it not possible that scoliosis, pre-eminently, so far as we are informed, an affection of civilized countries and cultivated classes so called, is fundamentally but one expression of the faulty, one-sided training of certain areas, with corresponding starvation and atrophy of others that these conditions impose upon muscles and mind?

As to mechanical support to the spine, in addition to the measures already spoken of, my position is that it is of substantial benefit when properly managed in selected cases, and my aim is never to employ it whenever the patient can do as well without it. This is a matter for observation and judgment, but in practice only a certain proportion of the severer cases are so treated. The aim of mechanical support should be not only to correct or hold the spinal deformity, but also to relieve cramped, stretched, and atrophied parts of undue strain by the restoration, so far as may be, of a more normal dynamical equilibrium.

For this purpose we use a light steel apparatus acting on the principle of lateral leverage, and worn only during

* By Dr. C. Fayette Taylor.

the daytime, while the weight of the body is acting upon the spine.

The details vary in each case according to the indications, but a general idea of a common form employed and its action may be gathered from the cuts (Figs. 5 and 6), which were taken, with slight modifications, from photographs of the same patient, and within a few minutes.

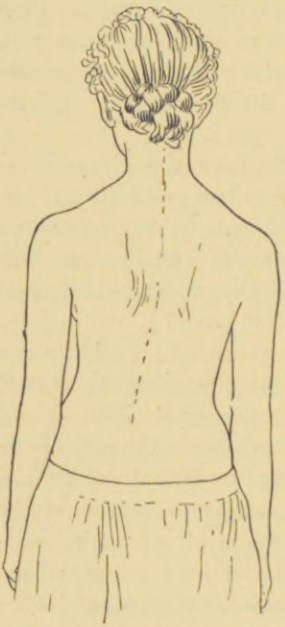

FIG. 5.

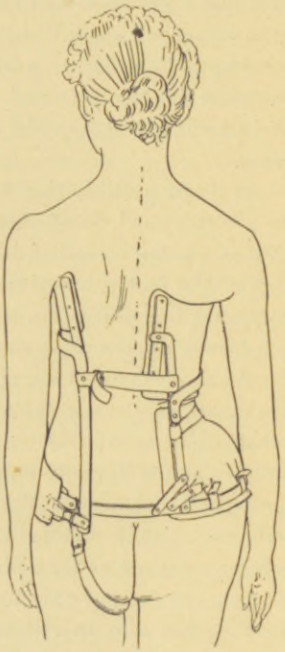

FIG. 6.

A light steel band, closed at one side by a strap and buckle, passes around the hips above the level of the trochanters. To this an H-shaped, braced steel upright, which carries a broad band of leather on its upper end for pressure

against the projecting ribs of the convexity, is fixed at right angles, and the whole is held in position by a flexible hip-piece fitted over the ilium of the side of the prominent curve, and buckled to the hip-band. This hip-piece serves as a fulcrum when leverage is applied by the perineal strap, which unites the two ends of the hip-band, passes under the leg on the side opposite the main curve, and is regulated at the buckle behind. The counter pressure on the side of the trunk opposite the main curve, higher or lower, as is mechanically more advantageous in the particular case in hand, is given by a similar firm leather band supported on the upper ends of a separate steel H-piece, which is completed below by a strap over the hip. The two H-shaped side-pieces are fastened together in front by an adjustable bowed steel U-piece, with a key-hole at each end which slips over a screw head about half way up the front bars of the H-piece (Fig. 7); behind, by a strap and buckle, by which the pressure of the apparatus is adjusted. By working from fixed points on the pelvis (hip-piece and perineal strap), the swaying to one side of the trunk *en masse*, which is often one of the main difficulties, is directly opposed (Figs. 5 and 6). This apparatus requires the nicest judgment in design and the greatest care in its adaptation, and must be modified from time to time to meet special requirements, as the case progresses. It is only a tool, like a violin, which is capable of being manipulated to produce definite results by one who is skilled in its use. Here, as everywhere in orthopædy, it is a question of method not means, principles not rules, and men not machines.

Fig. 7.

I have but briefly mentioned some of the methods we have found useful, fully realizing that there is much more

to learn than we now know in regard to this difficult and important subject; but, in spite of our defective knowledge on many points, we expect good results in the milder and earlier cases, and gratifying amelioration in all but the worst of the more advanced cases, provided we can secure hearty and full co-operation.

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