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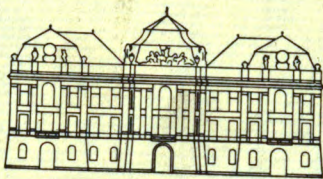
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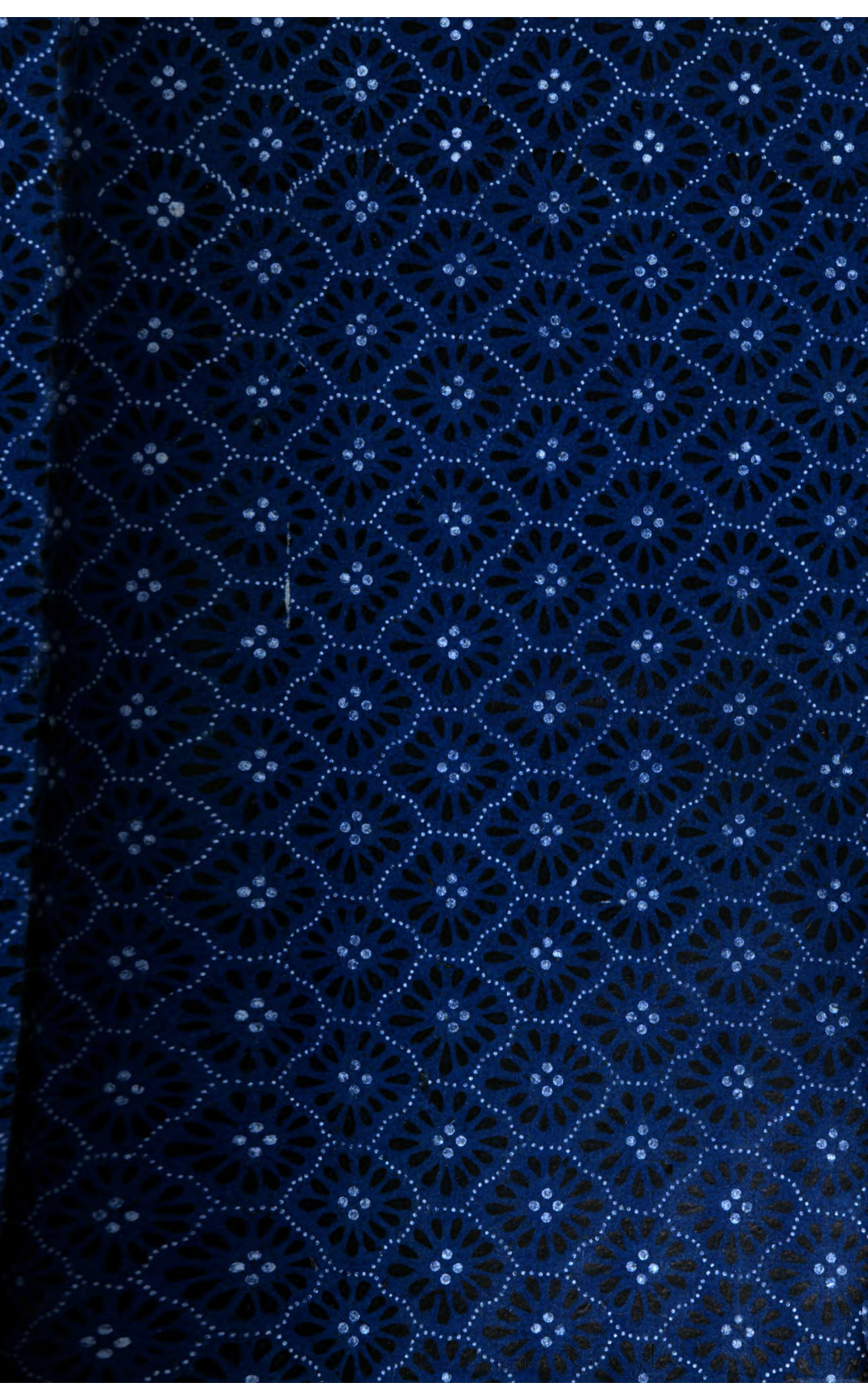
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PATHOLOGICAL
AND
PRACTICAL OBSERVATIONS
ON
SPINAL DISEASES:

ILLUSTRATED WITH
CASES AND ENGRAVINGS.

ALSO,
AN INQUIRY
INTO THE
ORIGIN AND CURE OF DISTORTED LIMBS.

BY
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PREFACE.

THE human body is so liable to suffer in all its parts, and from such a variety of causes, that we have less reason to be surprised at its being frequently disordered, than that it should for an instant remain in perfect health. Some organs of this complex machinery have been carefully investigated in every condition, and under all possible contingencies; while others of the greatest moment have been most unaccountably overlooked. Of these the vertebral column and its subtile contents deserve to be particularly noticed. From an erroneous opinion entertained of their uses, and subordination to the brain, as well as difficulty of examination, many opportunities for detecting their morbid changes have been neglected, so that their anatomical structure and peculiar laws are less perfectly understood than their importance require. This is

the more to be lamented, because it is an indisputable truth, that spinal complaints, under one form or other, are very prevalent among us. My chief attention had not long been devoted to these maladies before I was convinced that they occupy a much more extensive, important, and varied range in the catalogue of diseases than had ever been assigned to them. A little consideration will be sufficient to shew that the spine constitutes an essential portion of many animals, and that in the human body a greater variety of complicated sufferings arise out of its derangements than from those of any other organ. It affords support to the head, ribs, arms, and internal viscera. Numerous nerves issue out of its cavity, to be distributed over the skull, trunk, and limbs. Others strike inwards to the internal structures, and regulate their vital functions. It follows that the disorder of an organ, which directs the motions of so many members, and is besides destined to control such numerous, complicated, and diversified operations, must be capable of producing the most distressing effects. Whether it be true, as many assert, that these maladies have in reality, of late years, considerably increased, or that from greater attention

having been paid to them, such is conceived to be the case, I shall not at present inquire. Be that as it may, I have little hesitation in asserting, that in our cold and variable climate few delicate girls are wholly exempt from their influence. Not being desirous, upon the present occasion, of entering into all the bearings of this extensive and complicated research, I shall confine my observations almost entirely to the nature and treatment of spinal distortions from constitutional causes. These are become so almost universally prevalent, that we meet with but few females above the condition of laborious servitude, whose backs are perfectly straight. The right shoulder is found to be enlarged, and its top projects forwards, with a contrary disposition of the opposite acromion.

In the loins the spine has an opposite bend towards the left, to preserve the centre of gravity and maintain the erect figure: this is the most common deviation. The outer projection, the hump back, or, as it is usually denominated, the curved spine of Mr. Pott, constitutes another very distressing example. It occurs between the shoulders, immediately below them, and in the loins. The trunk, in these unhappy instances, is

always visibly shortened, and increased in circumference, giving to the whole figure a disproportioned shape and displeasing appearance.

The spine also sinks inwards, forming the anterior or forward curve. The seat of this deformity is sometimes between the shoulders; and at others in the loins. Persons so afflicted have always a stiff and formal carriage, with a disagreeable rotundity of body. When the lumbar vertebræ are extruded, the trunk cannot be raised up and placed erect: it constantly inclines forward. The person thus afflicted is said to poke. Besides these varieties, we frequently find single vertebræ displaced from the column. They are sometimes too prominent; they also sink below the line, or assume a lateral direction. These are the usual irregularities of the vertebral chain, but they are scarcely ever pure and unmixed. The spine seldom or never protrudes directly backwards, or sideways, owing to the direction of its processes, and of the ligamentary bands by which the several joints are tied together. The deformities are generally compounded; and it is curious to observe the endless varieties which the experienced practitioner may discover. It may be truly said that no two of

them are alike in every respect. These varieties in external appearance have led practitioners to imagine that a great difference obtains in their nature and essential qualities. Such conclusions do not follow of necessity. A striking difference of outer form is often produced by accidental and unimportant occurrences. Viewing matters in this light, I have ventured to maintain, that where the organisation remains sound the several examples of spinal distortion are occasioned by the ligaments giving way irregularly, and suffering the vertebræ to slide from their proper stations in the column.

Whatever occasions the ligaments to elongate, may, at the same time, permit them to stretch unequally. Where this happens, the joints will be likely to be protruded in that direction, because they will there encounter the least resistance.

It is to this simple principle alone, as I conceive, that the various constitutional distortions owe their form. If the protrusion be backward, a gibbous swelling or hump back will follow. The curve is anterior or forward when the spinal column sinks inwards. The sigmoidal, lateral, or

serpentine deflection, is occasioned by the ligaments allowing the vertebræ to make a deviation generally towards the right, between the shoulders, and another towards the left, in the loins. These, though the usual, are not the only forms of spinal distortion, as will be shewn in another place.

My researches have been almost entirely confined to that species of spinal complaints which originates in constitutional debility. Had they been extended to the varieties, which proceed from hurts, the destruction of parts, and other causes, I should have qualified my observations accordingly.

Circumscribed as my investigations have hitherto been within narrower limits, and having repeatedly laid the outlines of my plan before the Profession, I was not prepared to encounter objections founded on its incompatibility with descriptions of the complaint to which it was never meant to apply. Adversaries, possessed of a little charity, indeed of common honesty, would take the trouble to make themselves acquainted with the sentiments of an author, before criticising his works. In my case it has been other-

wise. Several writers have thought fit to set up doctrines as mine which never entered into my thoughts.

My view of spinal complaints being, in several respects, new, I determined to confine my observations, in the first instance, to the faculty exclusively: for which reason, my ideas have hitherto been principally communicated through the medium of medical journals. I was desirous not to obtrude my notions upon the public at large until I had extended my experience by the treatment of a more numerous collection of cases, with the advantage, at the same time, of more leisure to mature my opinions. Having been already engaged, for a considerable period, in a large share of practice in this particular department, and having had more time for reflection, I now venture upon a bolder flight, by addressing myself to the general reader.

It is become necessary, as it appears to me, to adopt this measure, without further loss of time, in order to secure to myself my just claims to the technical phraseology I have employed, and the particular doctrines I have promulgated, during the last seven years; both of which have

been freely adopted by various writers, without even alluding to my name or my prior claims.

I consider it, therefore, a duty which I owe to my own character and reputation, to state what I have already effected towards disentangling spinal pathology from erroneous theories, and placing it upon a more stable and scientific foundation. Had I unreservedly disclosed my thoughts in an earlier stage, I should probably have been stigmatised as a presumptuous innovator. A more cautious and guarded proceeding has not entirely secured me from the sarcasms and obloquy of certain members of the Faculty, who, having formed their opinions on other rules, were probably unwilling to revise their notions, or to think themselves in error. Since the subject has been brought more under consideration, it appears to me that less authority is given to former opinions, and that our ideas concerning spinal disorders have undergone a sudden and very material revolution. This change, to which I presume to think that I have led the way, emboldens me now to come forward with less reserve.

Having observed with regret the discordant

sentiments of medical men concerning spinal complaints, and thinking it more desirable to increase the stock of facts, than to proceed too hastily to draw inferences, I have conceived that I might do no unacceptable service by publishing a series of cases, in order that the Faculty, by being furnished with a greater body of materials, may be better prepared to arrive at just and legitimate conclusions.

In pursuing this humble course, my ambition has been faithfully to detail symptoms and record facts, in the hope of leading to a clear understanding of the true principles of spinal pathology, and to a better method of curing a class of diseases which have hitherto been intractable enough to deserve to be ranked among the opprobria medicorum.

Complaints originating in the spinal column exhibit such a diversity of symptoms, and modify the condition of so many other disorders, that they deserve to be considered with the greatest attention, as will more clearly appear from the following elucidation. Suppose any patient to be afflicted with a large spinal curvature between the shoulders, either outwards, sideways, or inwards, much inconvenience will necessarily attach

to him, at all times, from the mere mechanical derangement of the organs, and his constitution will be less able to resist the attacks to which it may be exposed in the progress of life. The vessels confined to the fore part of the vertebræ will transmit the fluids with increased efforts along their canals. These, distended in some parts with the enclosed fluid, will gradually give way to its pressure, and lay the foundation of aneurisms in the arteries, and varicous enlargements in the veins. The circulating mass, impeded in its approach and departure from the heart and lungs, will have to encounter additional difficulties in its passage through them. In consequence of displacement, their parietes will also be unduly approximated in the contracted chest. To the operation of these causes may be traced several mortal diseases, and the inveteracy of others. Nor is this all; the spinal nerves of the carotid and pulmonary plexuses, affected at their source, become less fit to execute their peculiar offices in the heart and lungs. Where so many powerful agents conspire to disturb the regular movements of the most important organs, they will gradually lay the foundation of numerous complaints, and increase

the severity of all the rest. The same line of argument might be continued to shew the deleterious effects of these pernicious maladies upon the muscular system, the viscera of the abdomen, pelvis, &c. But enough has already been said to prove their extensive, if not universal, influence over the countless affections of our susceptible nature, and how difficult it would be, in the present state of our knowledge, to subject them to any nosological arrangements. In order to enable the reader to enter more fully into my views, and to appreciate my prior claims to doctrines and practices which have been assumed by others, without any reference to my name or pretensions, I have likewise reprinted some introductory papers.

More than eight years have already passed away since I first imbibed my present opinions, and began to treat spinal complaints upon the plan which I continue to follow. In the lapse of this period I have, as already stated, freely submitted my opinions to the searching ordeal of the Faculty, in conversation, by correspondence, and in medical journals; so that my peculiar notions have been extensively circulated among the members of the Profession. For a short

time my doctrines and practice remained unnoticed. In this interval both Mr. Lloyd and the late Mr. Wilson promulgated their opinions in separate publications. The old notions were so fully maintained by these writers, that nothing new, or of moment, was added by either to our former stock of knowledge. I have introduced their names out of no disrespect, but principally to shew the real state of the question, when I first advanced my pathological principles; and, moreover, to point out how little the medical world was prepared at that time to countenance innovations.

The authority of Mr. Pott still preserved an undiminished sway, and his practice was generally followed throughout the united kingdom. I had the satisfaction to perceive, soon after the appearance of the works above named, that my writings began to attract attention, both among my own countrymen and foreigners who came to England. I may add with truth, they have already produced a marked change, if not a complete revolution, in this department of the healing art, as will be seen in the various treatises which have subsequently appeared in this and other countries.

I now beg leave, without further introduction, to tender to the Profession, and to the Public, the fruits of my observations, which have been derived, as already stated, from a large share of experience. I hope, and doubt not, they will be received with the candour in which they were written. In drawing up the cases, I have generally confined myself to a short exposition of facts; and when I have diverged into the field of theory, I have carefully separated doctrinal disquisitions from the historical details. Every case has particular features of its own, while the general character remains the same. These I have attempted severally to delineate, and to add to each case such remarks as appeared necessary to elucidate its peculiarities.

I have made it a constant rule to refrain from the mention of names, when I had occasion to censure; but I have not failed to animadvert freely upon the distressing consequences of ignorance and presumption, or to warn the rash and inexperienced of hidden danger, with a view to prevent their rushing headlong into similar errors.

PATHOLOGICAL AND PRACTICAL
OBSERVATIONS
ON
SPINAL DISEASES.

CHAPTER I.

*Remarks upon the different Appearances of the Back, Breast, and Ribs, in Persons affected with Spinal Diseases, and on the injurious Effects of Spinal Distortion upon the Nervous System, the Sanguineous Circulation, and the Internal Viscera.**

THE human fabric consists of different structures and substances, to fit it for the various occasions of life. Some are for the purpose of locomotion; others, for supplying us with needful food, or removing what is noxious; others, again, are intended to sustain the weight and preserve the form of the body. The skull-

* This Chapter is the Essay alluded to in the Preface, and was first published in the Medical and Physical Journal for November 1820.

cap is made strong and round, to defend the tender brain. The spinal marrow is guarded and secured by curious mechanism of great thickness, and by strong ligaments, to prevent injury to its delicate texture. For the same reason, the heart, lungs, and contiguous vessels, are placed within a bony case, to protect them from injurious compression in the performance of their complicated operations. The enclosed lungs require a capacious chest for their full expansion, and to permit the blood in them to undergo its proper changes in the pulmonary cells. When they are compressed and impeded in their motions, by the bony frame being squeezed and thrust out of shape, cough, dyspnœa, and dangerous congestions, ensue from slight causes. These lead to the formation of tubercles, to inflammation, suppuration, and fatal consumption.

Unless room be allowed in the chest for the heart freely to admit and expel the blood sent to it, accumulations form in the several cavities. The heart, in struggling to free itself from the oppressive load, is thrown into violent agitations; and thus is laid the foundation of organic derangements in its several cavities, in the valves, and in the neighbouring blood-vessels.

Crookedness in the dorsal spine not only affects the back, but leads to a derangement of the sternum

and ribs, highly prejudicial, in many ways, to the subject of it.

The ribs are firmly joined to the vertebræ, by a double articulation at one end, and to the sternum, by a single one at the other. When we examine this curious mechanism, it is discovered immediately, that the ribs, fixed and bound by ligamentous attachments, can only be moved upwards and downwards. In this direction they slide gently, at every respiration, over the thoracic viscera, neither inducing pressure, irritation, nor squeezing. The ribs become very differently affected in respect to these organs, when the vertebræ, forced from their natural places, drag them into new situations. The direction of the ribs being thus changed, the sides of the chest become flatter, or their edges are turned towards the costal pleuræ. The sternum is likewise driven from its original station, in consequence of its connexion with the ribs. In this manner the thorax often gets disgustingly misshapen, and dangerously contracted within.* The fore-part, instead of preserving its beautiful rotundity and capacious extension, so indispensable to the easy and uninterrupted performance of the complicated internal functions, becomes peaked, or what is called chicken-breasted. The tops of the shoulders are of unequal height, and project irre-

* See Cases in Med. and Phys. Journal for 1820 and 1821, as well as in this Work.

gularly forward. The right scapula, standing outwards, forms a disagreeable swelling, or tuberosity; while the left, sunk down, is nearly invisible. A posterior curve of the cervical or superior dorsal vertebræ shortens the back, and constitutes that unsightly gibbosity usually denominated the hump-back. Persons so unhappily shaped move about objects of aversion to the timid, and of terror to young wives. Nor is this all; these unfortunate fellow-creatures, feeling themselves exposed to the shafts of ridicule, tormented too with their numerous infirmities, and disqualified from occupying any useful station, become irritable, pœvish, and malevolent. Thus a deformed body is made the habitation of a distempered mind.

“ It is not always necessary that, to the disorders which are found in the situation of the bones of the sternum, and of the ribs that are connected therewith, a depraved situation of the vertebræ of the back should also correspond; which is confirmed by my observations, and particularly in a certain woman, and partly in an old man: to which you may add what was observed in a rickety child, of which the Act. Nat. Cur. just now quoted, give the history; and what the celebrated Haller has described from another little child very accurately.

“ However, we must confess, with Severinus, that Cardanus has, as in most other things, taught what

is true: and even that the vitiated posture of the vertebræ is the much more frequent cause that a perverted situation of the ribs and of the sternum follow, is demonstrated by other of my observations, and by those of others; among which, if you will read one in particular that I have given in the fourth letter, you will at once understand, that, not a perverted and incongruous situation of the ribs and sternum was the consequence of a distortion in the spine, but *a perverted situation of the viscera and vessels of the belly* also; and will at the same time conjecture how much, of course, not only the smaller vessels, among which is, in particular, the thoracic duct, but also the greater part of the nerves and other parts of the like kind, must have been disturbed from their natural situations; which considerations neither time nor place, nor the principal design we had then in view, suffered us to prosecute.

“Moreover, even the celebrated Helwich will teach us how much all the *thoracic viscera were forced into a very narrow compass*, and confined by the spine being distorted anteriorly, in a certain matron; and the illustrious Haller will inform you how far the *great artery* was removed from its proper seat in another woman, whose spine had been forced into serpentine inflections, different from what we see in a natural state, by carrying heavy burthens on her back, which was her method of earning her live-

lihood. And that this kind of life is, at other times, among the external causes of gibbosity, especially in young bodies, is not only demonstrated by reason, but by the observation of the celebrated Nebellius.”*

Many functions are occasionally suspended without injury or inconvenience.

Those of the heart and lungs always go on, whether we are awake or asleep. Stop either of them only for a few minutes, and death, which no art can prevent, certainly follows.

Every deviation of the human thorax from its natural form and dimensions, occasions, as we have already observed, some impediment to breathing and the circulation of the blood. The vital fluid, in consequence, does not fully undergo its accustomed changes in the lungs; nor is it properly carried through the vessels, to repair the losses which are constantly taking place in the body.

Of all the maladies which affect the constitution, such as arise from malformation in the bones of the chest and spine are the most distressingly stubborn, because they are occasioned by distortions hitherto deemed incurable, and impede some of the most im-

* Morgagni, Epist. 27, Art. 32.

portant functions. Of course, no two individuals are similarly affected; the curves upon which they depend vary so much in situation, extent, and direction. The neck, back, and loins, are all subject to them. The cervical bones, admitting of great flexion, are most liable to luxations from violent means.* They are also particularly subject to dislocations slowly and gradually introduced, because, for the several purposes of easy motion, their articulating surfaces are smaller, and their connecting ligaments more pliable, than in the back and loins.

We are told by experienced practitioners, that luxations of the dorsal and lumbar vertebræ are impossible under any circumstances. They found their opinion upon the large surfaces by which these bones correspond, the number and thickness of the connecting ligaments, the strength of the muscles employed, the small motion of each vertebra, and the vertical direction of the articulating apophyses. I am ready to admit, that, owing to the protection given, vertebral dislocations seldom appear in these parts; but that they sometimes occur in the loins from external violence, I am enabled to assert from my own experience.† I am unacquainted with any case of luxation in the dorsal vertebræ, from injuries

* Boyer, vol. ii. ch. 6.

† See Case VI. Med. and Phys. Journal, Nov. 1820; and Case III. in the same Journal for 1821.

received; but I have met with many examples from a gradual enlargement of the articulating fibres.* Nature, which cannot bear sudden alterations, is habituated to them gradually and insensibly. An inconsiderable disturbance of the spinal marrow, suddenly produced, totally deranges its substance, though it is not sensibly injured when the changes operate by slow degrees. Sometimes one vertebra only is affected, sometimes more, by which the magnitude of the curvature is determined. The disposition of the spine becomes lateral, posterior, or anterior, according to circumstances.

1st. When the head, shoulders, and arms, become heavier than the spine is capable of sustaining with impunity, it is encouraged to bend towards the right side, because the great use which is made of the right hand determines the spine to assume that direction in preference to every other. In this manner then, arises the lateral incurvation, which is by far the most common variety of spinal distortions.†

2d. The spine seldom protrudes directly backwards of itself: and when it assumes that deviation, it has been forced into it by some corporeal exertion, in pulling, lifting, or carrying.

* See Cases II., III., and V. in *Med. and Phys. Journal*, for 1820, 1821; and *Boyer's Lectures on Luxations*.

† *Morgag. Epist.*

3d. The anterior or inward curve from constitutional causes most commonly shews itself either in the lower cervical and upper dorsal, or in the inferior lumbar, vertebræ. The former protrusion is attended with very distressing and injurious effects upon the lungs and heart. In the latter, the rectum, bladder, and uterus, are thrust out of their natural situations, and prevented from freely performing their respective offices. These sufferings, however great, are by no means the most formidable or distressing. The trying and perplexing difficulties present themselves during the progress of labour. At this time, from the brim and back of the pelvis being forced inwards, the entrance is reduced, so as to arrest the progress of the child, and render the best efforts of the mother unavailing. In many cases of lingering parturition, the obstacles are gradually surmounted by the inherent powers of the female. On this interesting occasion her exertions are unavailing, because the impediment ~~depends~~ upon a fixed and immovable resistance. All that art can perform under such unhappy circumstances, is to relieve the parent by reducing the bulk of her child. A labour thus conducted necessarily causes the death of the infant, to afford the chance of saving an unfortunate mother.

When the disorder depends upon a wasting in the bodies of the vertebræ, these have, after death, been found entirely removed, leaving the cartilages sound

and entire. The loss of substance is thought to arise from absorption, occasioned by the action of abscesses,* aneurisms,† and other tumours, upon the bones. The spine, deprived in this manner of its natural support, sinks inwards; and the anterior curve is produced. The column, though unsupported where the vertebræ are wanting, is generally preserved nearly erect by the resistance it meets with from the contiguous viscera. In this form of caries, paraplegia is seldom induced, because no pressure ‡ falls upon the cord, as in other cases, to intercept the free and unrestrained operations of the medulla spinalis.

Besides the three species of incurvation mentioned above, single bones, or a few contiguous ones, are liable to be protruded a little, and rise with roundish heads above their fellows, in the neck and loins. The dorsal, and not unfrequently the lumbar, vertebræ, also stand forward in a continued line, and make an elevated ridge, which may include the whole, or only part of the bones. These several protrusions, or incomplete luxations, are easily understood, by attending to the varying forms of the spinous processes, their connexion with the muscles, and the costal articulations.

* Morgag., Lieutaud.

† Morg. Ep. xvii. Art. 17; Ep. xxi. Art. 17.

‡ Lieut. vol. ii. lib. 4. Lecat, Blanchard, Hildanus.

A small irregularity in the height, distance, and lineal direction of particular vertebræ in respect to others, is perceptible, on examination, in most delicate females. This disorderly arrangement and disposition of the component parts of the spinal column, though hitherto overlooked and wholly neglected, are, I am persuaded, of great consequence to future health. The effects of this subluxation not being distinguishable by the symptoms, have never been traced to their origin in the spine. A very slight and partial compression of the cord, or some of its nerves at their origin, will disturb the organs to which they run. If we admit the operation of this cause upon the several vertebræ of the neck, back, and loins, in different persons, we shall be at no loss to account for the almost infinite variety and endless complication of nervous symptoms, which harass many individuals through life, and baffle the most eminent of the faculty. When we take into account the number, the size, and the distribution of the spinal nerves among the viscera and muscles, we are led to conclude that scarcely a complaint can arise in which they do not participate. Even tetanus, in several instances, has been lately traced to this fertile source of human miseries.* But the affections of the nervous system display such a wide field for inquiry and discussion, that we must defer their further consideration to

* Professor Dupuytren, Med. and Phys. Journal, April 1819.

another opportunity, and confine ourselves at present to the vascular system. In recent cases these subluxations are easily replaced: parents will therefore best consult the health and comfort of their children, by having the spinal column frequently examined, and taking the earliest opportunity of counteracting its defects. In doing this, the longitudinal direction, the relative height, and exact distances of the vertebræ, and of their spinal processes from each other, must be carefully observed by some medical practitioner well acquainted with the anatomy of the spine and its various connexions, as well as with that particular knowledge which can only be fully acquired by frequent examinations of healthy and diseased spines. In prominent instances the malady is self-evident. It is in the early and nascent stage, that a nice and discriminating eye and touch are especially required to detect the presence of incipient disease. The sooner this disclosure is made, and suitable means are adopted, the speedier will be the cure, and the consequent restoration of good health.

I am aware that the foregoing explanation of the origin of spinal incurvations is at variance with former opinions. Glisson and others contend, that the bones being unequally nourished, and one side growing faster than the other, a curvature is produced by the different thickness of the two sides. In this manner, according to them, arises every deviation of the spine

from its natural figure. The extent and magnitude of the projection depends, of course, upon the number of the affected bones. Thus, the back becomes bent because the vertebræ are unequally nourished, and their sides of different degrees of thickness. If we admit that a single vertebra increases in this manner, it is difficult to believe that many of them could be brought to participate in this same irregularity; yet, without admitting a common process to be going on among the bones, I cannot understand how the extensive curvatures which we daily witness could have been produced. Still, with these admissions, the difficulties are not by any means removed, because a counter-curvature is always formed in another part of the column. In such cases, the exuberant growth must necessarily take place on opposite sides of the spine: otherwise, according to this doctrine, the two curves could not be growing together; and it surely requires more than an ordinary share of credulity to suppose that two such extraordinary processes should be acting in opposition to each other, at the same time, in different parts of the same spine. The second opinion, originally proposed by Mayow, leads to a belief that one set of muscles, acting more vigorously than another, bend or draw the bones out of their proper stations, and induce the curves which take place. We have, in the extremities, flexors and extensors, to move the limbs in different ways. These, from their employment, have been denominated an-

tagonist muscles; but to suppose that a constant struggle takes place between them, is, in my judgment, to entertain a very erroneous idea of what really does occur in the animal economy. When not called into action by the will, they remain quiescent; and when movements require to be performed, certain muscles are brought into play, to effect the intended purpose, but no more are actively employed than the occasion demands; the rest are wholly inactive and unoccupied; no conflicting struggles or counterpoising exertions ever take place among them.

Were it to be proved, that in the extremities two sets of muscles are acting in constant opposition to each other, it would not follow in course that those in the trunk are similarly employed; indeed, there is no such provision, as far as I know, in the structure of the back. The muscles situated there, are, most of them, too large to be concerned in forming the two lateral or sigmoid flexions of the spine, without supposing them to produce a different action at one end from what they do at the other. Moreover, such an admission is altogether improbable, and is in direct opposition to every principle of muscular motion in other parts of the human body. We have strong muscles to raise and bend the trunk; but they proceed in unison with one another, and are never placed in opposition. These two motions, the principal ones of which the spine is susceptible, are not synchronous;

they interchange with each other, and consequently do not interfere. The muscles destined to move the spine, are attached to the articulating fibrous structure, and not to the vertebræ which it encloses. This substance is stretched by them, and in weakly habits becomes preternaturally elongated, partly by the muscular force pulling it, partly by the bones being pushed against it in the various turns and gesticulations of the body. As these parts gradually give way, the joints slowly enlarge, and admit of greater motion. A slight luxation is first produced in one joint, and afterwards in several. If the further progress of the complaint be arrested in this early stage, the person is said to have got round shoulders, or to have acquired an awkward carriage; but the real state of the spinal column, on which these appearances depend, is not in the least suspected.

Were spinal distortions to originate in the muscles, as some experienced practitioners affirm, we should find them most prevalent among the agricultural youth of both sexes, who, in carrying heavy burdens, and performing other laborious works, bring their muscles into the most vigorous and long-continued contractions; yet it is well known that the disorder seldom appears among them, and, when it does shew itself, can be traced to some obvious cause. It follows from this exemption among our brawny labourers, that spinal maladies are seldom produced by muscular

action alone, unless where existing infirmity in the vertebral column favours its operation.

The practice to which this principle leads is inefficacious and injudicious. The sufferer, placed upon an inclined plane, is confined, and prevented from sliding downwards, by a band fixed under the chin. In this situation he is directed to work and twist the muscles of his back, to increase their tone and action. But let us here stop to inquire, whether an individual has ever been made straight by this operation, protracted as it has been to five, six, and more years?

Has the vertebral column been restored, in a single instance, to its natural shape during this treatment? Has the cure been rendered more perfect, or been finished in less time, with these auxiliaries, than by adopting the horizontal position and resting contrivances of Mr. Baynton? According to my observations, the result has always been unfavourable, both in time and all other respects. Nor should this excite surprise: the disorder is situated in the articulating structure below the muscles; their motions, at every turn and change, necessarily agitate and disturb the vertebral joints, through their tendinous attachments, and the cure is impeded, rendered less certain, and less perfect, than if the treatment had been restricted to rest alone.

Highly as I approve of Mr. Baynton's plan, in taking off the incumbent weight, in giving the muscles and tendinous fibres an opportunity to adapt themselves to their new situations, I think it is extremely defective, because it encourages no trials to replace the luxated vertebræ in their former positions. It therefore leaves the patient in a state of deformity, and, as an unavoidable consequence of it, in bad health. In all other dislocations, whether great or small, practitioners endeavour, in the first instance, to replace the bones, and never think their duty performed until they have fully accomplished their object. When a failure takes place in either extremity, the joint remains weak, deformed, and inadequate to its appointed offices. If, then, such distressing inconveniences spring out of a single dislocation in the limbs, may we not reasonably suppose, that disadvantages equally numerous and incapacitating will arise from the luxation of any one of the vertebræ? They certainly are not immediately concerned with locomotion, but they afford a bony tube for the safe custody of the spinal marrow, and canals for the easy passage of its nerves; they give support to the abdominal and thoracic viscera, and room for the performance of their important functions in the living body. Surely offices like these deserve to be guarded and protected with the utmost vigilance. Happily, these vertebral dislocations, from internal causes, may be easily removed in every recent, and in many old

cases, so as to leave no traces in the appearance of the back, or in the health of the individual.* I do not mean to include in this statement those extraordinary dislocations in which the vertebræ are flexible and yielding. They have in some gibbous persons been found soft enough to be moulded like wax.† This disposition generally takes place at an early age. Between it and the healthy state are several grades, which have not been marked with sufficient care. It is, however, of importance to observe, that softness is distinct from caries, and must not be confounded with it.

The luxated vertebræ have in some old cases been found united together, and consolidated into an irregular and indistinct mass.‡ Such occurrences have been met with in practice, and are upon record; but they take place much less frequently than some of our countrymen have been led to imagine. We must not suffer ourselves to be deceived by them into a hasty belief that the bones are generally diseased, and that therefore nothing effectual can be done for the removal of spinal distortions. Such an erroneous

* See Cases II. and III. ; also the rest.

† Morg. Ep. xxvii. art. 33. Hildan. Observat. de Lux. et Fract. Oss. ; Ruysch, Observ.

‡ Morg. Ep. lxvi. art. 37; Fallop. Anatom. Chirurg. ; Lieut. vol. ii.

conclusion would paralyze our efforts in the cause of humanity, and lead us to perpetuate the misery of our fellow-creatures, by neglecting the means of relief on every occasion. A disturbance in the circulating system occasioned by deformity, leads to many kinds of indisposition, as the offending cause varies in situation, in extent, and in degree. Luxations in the cervical vertebræ, by impeding the current of blood in the carotid and vertebral arteries, occasion, in many instances, a diminished quantity of it to flow to the head. A scanty supply of arterial blood must necessarily have great influence upon the operations of the mind and body,* because the generation and uniform production of nervous power, the chief regulating principle of animal life, is greatly dependant upon the constant renewal and successive applications of the vital fluid to the brain. From this deficiency we may reasonably conclude, that, as the body will be debilitated, the intellectual faculties will also be weakened in their perceptions and determinations, as well as in the exercise of them, by this state and condition of the blood within the skull. Ignorant as we are of the nature of the human mind, and of its mysterious connexion with the corporeal frame, every day's experience shews that a very intimate communication is kept up between them. To this intercourse the brain forms the most immediate and essential link.

* Broussais, *Journal Universel des Sciences Médicales*, tom. xii.

No wonder, then, that the dispositions, the affections, and the operations of the mind should be to a certain degree under its influence. The quantity of blood destined to nourish the lower part of the body, or some particular organ, may in like manner be diminished by the displaced vertebræ in the back and loins pressing upon the descending aorta, or its ramifying branches. From the nutritious materials being in this way withdrawn, extenuation and emaciation take place in all the parts from which they are withheld. The scanty supply of blood to the abdominal organs must necessarily interfere with their complicated operations, and lead to the establishment of various diseases. A deficiency of it in the uterus may be reasonably expected to suspend its periodical movements, and induce amenorrhœa in single, and sterility in married, women.

Matters are differently circumstanced above the obstruction. The action of the heart and pulsatory motion of the artery drive the blood against the contracted sides of the vessel.* Here the stream is retarded, and the artery, gradually giving way to the force employed, slowly enlarges, and degenerates into a true aneurism.

“ An old woman, who had an incurvation of the

* Morgag. Epist. lxii. art. 11.

spine, and was lame, died in the hospital at Padua, about the middle of March, in the year 1747. She had been lately brought thither on account of a disorder of the apoplectic kind, which did not appear to have injured any other faculty but that of her speech. In the belly, the trunk of the great artery began, almost immediately after giving off the emulgents, to dilate itself gradually more and more the more it descended, till, a little above the division, it expanded itself wholly into an aneurism, which was of two inches diameter in every direction. From thence it was again gradually contracted; yet, in such a manner, that the iliacs themselves appeared to be much wider than they naturally are, to a considerable extent. The internal surface of these vessels was unequal, but the internal surface of the aneurism still more so; where not only polypous concretions were found, but in one part of the coats bony concretions also. I should be inclined to suppose, that the cause of these disorders of the aorta had, in great measure, consisted in the distorted figure of the spine; which having a convexity in the thorax on the right side, had another on the left side, in the loins, which carried away the aorta along with it.”*

When the arterial blood becomes in this manner diverted in its course, the circulation in the lower

* Morg. Epist. xxxviii. art. 40.

parts is diminished, and more of it flows upwards: hence arise apoplexies and palsies.

“ In proportion as this depraved figure of the spine, which I have described, made an infliction upon the great artery that adhered thereto, so much did it resist the ready and easy flux of blood towards the inferior parts of the body. The consequence of this therefore was, that a greater quantity was sent from thence to the brain, whereby a disposition to a sanguineous apoplexy was brought on.”*

Luxations of the dorsal and lumbar vertebræ operate in the same way. They force the protruded bones upon the descending aorta, and squeeze its sides together, as we have already explained. This pressure, while it impedes the motion of the blood towards the lower parts, drives an increase of it into other organs. In them the blood accumulates, the vessels are unduly distended, and their functions, whatever they may be, are alarmingly oppressed. This preternatural fulness lays the foundation of organic derangements, of an obstinate and dangerous character, in the head, chest, abdomen, and pelvis, according as the offending cause occupies a higher or lower station. A slight change in the direction of the luxated bones gives them a tendency towards the jugular veins; and thus, by interposing obstacles

* Morgag. Epist. lxii. art. 12.

between the returning blood and the heart, a free course of the refluent stream is impeded. From this cause alone proceeds a most inveterate headach,* which is equally felt within and on the outside of the skull. When the impediment is of long continuance, or operates severely, the blood-vessels of the brain become preternaturally distended: hence arise sanguineous apoplexy, paralytic seizures, epilepsy, lunacy, and various anomalous complaints in the head.

Luxations towards the right side of the back bring the dorsal and lumbar vertebræ into contact with the vena cava ascendens, the sides of which are pressed together, and in consequence all the superficial veins are seen to be turgid with blood. Morgagni relates the case of a mason, who, "falling from the upper story of a house, and receiving a blow upon his loins, began to lose the sense of feeling in his feet, and to discharge the contents of the intestines and bladder involuntarily, and to have the other symptoms that are described. As this man died after four days, the three uppermost vertebræ of the loins were found to be so luxated as to be prominent a finger's breadth into the cavity of the belly, and thereby to compress the large trunks of the vessels in such a manner as to bring their opposite parietes into mutual contact; from which it happened, amongst other things, that

* Cases III. and IV. Med. and Phys. Journal, for 1820 and 1821.

all the veins, from both extremities of the feet quite to the luxation, were turgid with blood, and hard, just as if they had been stuffed by force."* The limbs feel stiff and uneasy in these cases. Soon afterwards, if the patient survive the accident, dropsical swellings take place, and keep gradually increasing. Persons of both sexes, in less violent attacks, and where the vertebral dislocation is slowly produced, become liable to hæmorrhoids, and females to profuse menstruation and constant leucorrhœa.

A curvature in the dorsal vertebræ, whether protuberant or lateral, generally displaces the liver and deranges its secretions. The ribs are forced upwards, and carry the liver along with them. This dislodgment is known by a hollowness in the back. The ribs become flat; the upper part of them is thrown outwards; and the liver can be distinctly felt below their under-edge. The blood, having to rise higher, and perform a longer passage in the vena portarum, to reach the liver, is impeded in its advance, and circulates through it with difficulty. The biliary secretion is defective in quantity, and pale-coloured. The countenance assumes a sallow hue, the appetite fails, and the food is not properly digested. The difficulty which is felt in transmitting the blood through the liver causes an accumulation of it in the whole system

* Mergag. book iv. letter 56, art. 35.

of the vena portarum. In consequence, the abdomen is tumid and painful;* the bowels are obstinately constipated, and hæmorrhoids often prevail to a great degree.

A dislodgment of the other abdominal viscera disturbs their respective functions, and lays the foundation of bad health. An extraordinary and untenable opinion seems to prevail among the British faculty in regard to lateral curvatures: according to them, persons labouring under this species of deformity are not to be reputed diseased, or to be supposed to suffer under any complaint in consequence of their shape. But a closer attention to the subject would have fully shewn, that not only delicate health, but a great variety of very obstinate and highly dangerous disorders proceed directly from this source alone. The largest vessels of the human body are firmly tied and bound closely down to the spine, within the neck, chest, and abdomen, so as to be forced to obey and follow every change of the vertebral column. Now, the first incurvation generally begins between the shoulders, because, in our different occupations, the right hand is chiefly employed. An obliquity of the spine in that particular part not only necessarily displaces these vessels, but ~~interferes~~ directly and dangerously with the san-

* Case IV. Med. and Phys. Journal, for 1820, 1821.

guineous circulation through the lungs and heart.* The returning blood, in the natural condition of the vena cava ascendens and descendens, glides along with an easy progression to the right auricle of the heart. From thence it makes the circuit of the lungs in the pulmonary vessels, and having undergone its peculiar changes, is received into the left auricle and ventricle. It is driven from the latter into the aorta ascendens and descendens, to be distributed through every part of the body. The vigorous contractions of the heart to impel the blood may be distinctly felt, and the pulsatory vibrations of the arteries, at a great distance from the fountain of motion, shew that the blood had been propelled into them with no small degree of effort. In the ordinary distribution of these vessels, the blood meets with no impediments in its course, and circulates freely; but when the aorta and its dependant branches have been forced from their natural situation, things become very different. The blood, having to pass along distorted tubes, and encounter angles and prominences in its course, becomes interrupted and hindered. To overcome these impediments, the heart produces greater exertions, and palpitates violently. The circulation becomes forced, unnatural, irregular, and is carried on at an expense and effort of the heart, which wastes its energies, and lays the foundation of the most

* Cases II., III., and IV., Med. and Phys. Journal, for 1820, 1821.

untractable disorders. The unusual force employed drives the blood with additional impulse into the arteries. These become preternaturally distended, and the blood is driven with increased momentum against the tortuous sides of the canal, which gradually give way to the force employed, enlarge in their dimensions, and a portion of the blood is permanently retained in the vessel. This is a common origin of aneurismal swellings and of vascular dilatations. In consequence of this interruption, the blood passes with increased difficulty out of the heart, which, from a curious provision of nature, increases in size and thickness, to be enabled to surmount the new obstacle. For the same reason, the pulmonary circulation is disturbed, and the blood accumulates in the vessels, because it cannot get freely into the left auricle and ventricle. Nor is this all; the curvature between the shoulders diminishes the capacity of the thorax, and, by its connexion with the ribs, forces them and the sternum out of their proper situations.

In this way the form of the chest is disturbed. The sides are unusually flat, and the breast-bone gets peaked. These alterations in the bony case reduce the internal dimensions of the chest; less room is allowed for the important functions of the heart and lungs; they are squeezed and compressed by firm and immovable parietes, in consequence of which the circulation is difficult and irregular. The lungs are

imperfectly dilated, and a reduced supply of air is admitted into them at every inspiration. To compensate for a diminution in quantity, the respirations are quickened,* and the slightest exertions produce violent pantings, with a tickling cough, suffused countenance, and copious perspirations about the face and breast. This very dangerous state of things gives rise to tubercles and hemoptysis, which generally terminate in fatal consumptions.† Should the delicate invalid arrive at middle age, he is teased with coughs, dyspnoea,‡ spasmodic asthma, and other distressing maladies, arising from thoracic compression, and an interrupted circulation in the lungs and heart. Persons so situated are characterised by a haggard, contracted countenance, and look older than their years warrant. Perpetually assaulted by one train of symptoms or another, they are soon worn out, and sink into the grave at an early age.

The inferior bend is generally fixed in the loins, and occupies a greater or smaller extent in different persons. The obliquity is usually towards the left side.§ By retarding the arterial stream, it gives rise to aneurismal enlargements in a higher part of the aorta. When the progress of the blood is diminished in the internal iliac arteries, amenorrhœa is a natural

* De Haën.

† Lieutaud, De Haën.

‡ Lieutaud.

§ Case IV. Med. and Phys. Journ. &c.

consequence.* The obstruction sometimes inclines towards the right side, and interrupts the reflux stream; thus giving rise to varicose veins, hæmorrhoids, profuse menstruation, and uninterrupted leucorrhœa.† The lower curvature produces an obliquity in the pelvis, which forces down the right acetabulum.‡ This makes the corresponding leg and thigh appear longer than their opposite fellows. The person becomes unsteady in his footsteps, and often stumbles in walking. This seeming difference in the length of the lower limbs, deceives superficial observers into a belief, that the patient labours under an affection of the hip joint, when the true seat of the disorder is in the spinal column.

When distortion is firmly established, the body generally ceases to grow in height or thickness: it either remains quite stationary, or actually gets more diminutive. The various progressive alterations which accompany its evolutions, and its advancement towards maturity, are consequently deferred. In males, the change of voice, the growth of beard, and other features of puberty, do not occur at the accustomed age. In females, though the menses burst forth prematurely and in abundance, the mammæ remain nearly stationary, the eye continues dull, and the countenance is characterised by languor. The

* Case IV. Ibid.

† Ibid.

‡ Ibid.

development of the constitution is equally marked in the change of pursuits, and of objects to which it gives rise. The pleasures and recreations of the child are voluntarily relinquished, at a certain period of expansion, for those of manhood; but, when the natural propensities are unduly retarded by the causes enumerated, the frame and disposition of the mind continue juvenile and puerile to a late season.

The malconformation and diminution of stature lead to the destruction of health, the loss of beauty, of personal attractions, and of symmetrical proportion among the component members of the body, so much as to outweigh all the advantages of great talents, high connexions, and redundant wealth.

CHAPTER II.

*Observations respecting the Nature and Origin of the common Species of Disorder of the Spine, with critical Remarks on the Opinions of former Authors.**

OF all the maladies by which mankind are assailed; none is more afflictive and distressing to relatives, or more deplorable and mortifying to the sufferers themselves, than spinal distortion. Persons so affected become objects of neglect or aversion; and, being rendered unfit to discharge with propriety the several duties of life, they remain burdens upon their friends. To a generous mind, nothing can be more painful and humiliating than to feel that in him the chief purposes of existence have been defeated, and that he is doomed to consume his days in wearisome inactivity, or in unproductive occupations.

That such must be the necessary consequences of this disease, will be evident, if we take a survey of the important offices of the spine, and of its influence

* This Chapter is the second Essay alluded to in the Preface, and was first published in the Medical and Physical Journal for Feb. 1821.

over the complicated functions of the thoracic, abdominal, and pelvic viscera. Curvatures in the cervical bones produce numbness and paralysis of the arms. Injuries received in any part of the spine induce loss of sensation and of power of voluntary motion in the lower limbs. Different internal organs are made to participate, according as the malady is seated higher or lower in the back. Pressure from dislocation of the cervical vertebræ impedes deglutition and respiration, by reducing the diameter of the œsophagus and trachea, as well as by disturbing the actions of their muscles and nerves. Diminished capacity of the chest, the unavoidable consequence of its deformity, gives rise, by displacing or squeezing the enclosed parts together, and preventing the convenient exercise of their functions, to palpitations of the heart, to dyspnoea, cough, and various distressing perceptions, which are followed, in process of time, by organic derangements of the heart and lungs, by consumption, asthma, hydrothorax, and other chronic disorders. When the luxated dorsal vertebræ compress the spinal cord, there is generally a constrictive uneasiness about the stomach, and a depraved secretion in some of the abdominal organs. Bony distortions of the thorax mechanically force the heart and lungs, but still more the liver, the stomach, and the contiguous viscera, out of their natural places: hence arise painful sensations in them, and irregularity in their functions. The impediments thus created are

followed by organic mischief in the parts, which terminates at length in the most distressing complaints. A displacement of the lumbar and sacral bones leads, in the same way, to very obstinate affections of the bladder, rectum, uterus, and external genital members.

Till the true nature of the disorder has been discovered in these cases, the most discordant opinions are advanced by the faculty, and the patients are tortured by the most opposite practices. A malady which is attended with such disgusting appearances, and produces such a variety of obstinate symptoms, cannot be too soon or too carefully resisted. A vigorous opposition to the very *dawn* of the complaint is of greater consequence, because no effectual means have hitherto been attempted to remove the deformity, to arrest its progress, or to avert the maladies which proceed from it. In order to shew the truth of these remarks, and prepare the reader for a more successful method of cure, I propose to give a short account of the principal writers who have delivered their sentiments upon this disorder, their respective opinions, and the different practices which they have employed to subdue it.

MR. POTT'S PLAN.

Society is under great obligations to the late Mr. Pott, for calling the attention of his brethren to an

investigation of the causes and treatment of this most obstinate and distressing complaint. The subject, though much agitated in the early ages of mankind,* had been unaccountably neglected in modern times. Mr. Pott brought it again before the public, in his valuable remarks on Palsy of the Lower Limbs.† So much deference was paid to his appeal, that he had the satisfaction immediately to succeed in rescuing several miserable victims out of the hands of unfeeling and rapacious quacks, who had till then engrossed to themselves the whole care and management of these unfortunate sufferers. The eminent station of this accomplished surgeon enabled him to treat many patients, and enrich his remarks with several dissections of persons who had sunk under the complaint.

“The true cause of the disease is,” he observes, “a morbid state of the spine and some of the parts connected with it; which distempered state of parts will, upon careful inquiry, be always found to have preceded the deformity some length of time.” “A morbid state of parts previous to deformity, caries or curve, must be allowed: every complaint of the living, and every appearance of the dead, prove it beyond contradiction or doubt. All the general complaints of persons afflicted with this disorder, will always,

* See Hippocrates, Galen, Avicenna, &c.

† Chirurgical Works of Percival Pott, Esq. vol. iii.

upon careful inquiry, be found to have preceded any degree of deformity, to have increased as the curve became apparent, and to have decreased as the means used for relief took place. The pain and tightness about the stomach, the indigestion, the want of appetite, the disturbed sleep, &c. gradually disappear, and the marks of returning health become observable before the limbs recover the smallest degree of their power of moving."

"That this curvature, which is always from within outward, is caused by the erosion or destruction of part of the body, or bodies, of one or more of the vertebræ; by which means, that immediately above the distemper, and that immediately below it, are brought nearer to each other than they should be; the body of the patient bends forward, the spine is curved from within outward, and the tuberosity appears behind, occasioned by the protrusion of the spinal processes of the distempered vertebræ."

"That, without this erosive destruction of the bodies of the vertebræ, there can be no curvature of the kind which I am speaking of,—or, in other words, that erosion is the *sine quâ non* of this disease; that although there can be no true curve without caries, yet there is, and that not unfrequently, caries without curve."*

* Pott on the Palsy, &c. vol. iii. pp. 427, 457, 486, 493.

These passages might be confirmed by reference to several others. Having extracted them from his last essay on spinal maladies, it is reasonable to conclude that they contain a faithful record of his latest sentiments on the subject. Had any subsequent change of opinion taken place, it would doubtless have been recorded in the "Notes and Observations" of his respectable editor and relative, Sir James Earle.

It appears from these extracts, and from the spirit of Mr. Pott's writings, that in his estimation, caries formed a necessary and essential part of this formidable malady. I will take other opportunities to prove that this opinion, the foundation of all his reasoning and practice, is not only founded in error, but has led to the general introduction of a cruel and mischievous treatment. It rests on the most respectable authorities, that paraplegia can appear in its most complete form, independently of caries; and it is equally certain, that caries of the vertebræ* is frequently unaccompanied with paraplegia.

We are instructed in the foregoing passages, that spinal complaints affect three different textures,—the bones, ligaments, and cartilages. The last are brought

* Lieutaud, Morgagni, *Lond. Med. Observat.*, De Haën, Stork, Bacchinus, Lecat, Aubertus, Blanchard, Hildanus.

to participate during the progress, and cannot, therefore, be allowed any share in the original formation. Though Mr. Pott always found disease in the "ligaments,"* and "sometimes in them without any apparent affection of the bones,"† he unaccountably overlooked them, and limited his curative indications to the morbid state of the bones. In so doing, he reasoned upon a narrow basis. Admitting his own account in its full extent, I think we are still bound to pay some regard to the ligaments. It however appears from later dissections, that the vertebral bones are not always enlarged, or otherwise disordered, even when they are accompanied with a greater or less degree of deformity and crookedness of the spine.‡ Many skeletons, shewing lateral, posterior, and anterior curvatures, may be seen in the anatomical museums; several of them so exceedingly misshapen as to leave no doubt of their having occasioned death, by interfering with the functions of the spinal marrow and the internal viscera. In some, the vertebral bones and cartilages shew no other signs of disease than such as arise from unequal pressure: they are hard, firm, sound, and when free from pressure are of the natural size. In order to form a curvature, the bones and cartilages must necessarily be fuller on the outside, and compressed on

* Pott, vol. iii. p. 427, 428, 438.

† Vol. iii. p. 482.

‡ Vol. iii. p. 483.

the inside. The bones are even unnaturally separated in some parts of the external bow, yet nothing like ulceration had taken place.

According to this view of the subject, we must direct our attention to some other tissue, to discover the true cause of spinal complaints; and I am of opinion that we shall for the most part find it in the connecting ligaments, "which seem to have lost part of their power of holding the bones together."* These get relaxed, and suffer a single vertebra to become slightly displaced. The column now losing its natural firmness, other bones are pressed unduly upon the surrounding ligaments; they, in turn, become relaxed and elongated, by which the dislocation is increased, and the distortion permanently established. The direction becomes lateral, anterior, or posterior, according to circumstances; but the malady has in every instance, where the ligaments are the affected parts, the same origin, and requires the same mode of cure.

It appears to me, that when the spinal trunk is too infirm to maintain the weight of the head and shoulders, the distortion inclines to the lateral form, being encouraged to take that direction from the resistance given by the superior spinal ligament. The

* Pott, vol. iii. p. 438.

anterior or internal curve, as far as my experience extends, has always been confined to the lower cervical and upper dorsal, or to the lumbar, vertebræ. The spine is depressed in both instances, appearing to have sunk under and been crushed downwards by an oppressive and overwhelming burden. When this arises in a weakly constitution, from the exertion of pulling, lifting, or carrying, the protrusion, from the force employed, is nearly backward; and thus is laid the foundation of the posterior or outward curve. This is the simple and real origin of our spinal deformities, except in some rare instances, where they begin in the bony or cartilaginous structure. On this principle we can easily understand why people so often recover from spinal affections, and carry about with them the visible effects for many years. If the primary mischief always began in bone, as Mr. Pott teaches, or in cartilage, according to others, I think the affection would be very seldom cured, either by the unaided efforts of nature, or the best assistance of the healing art. "No degree of benefit or relief, nor any the smallest tendency towards a cure, is to be expected until the caries be stopped, and the rotten bones have begun to incarn: the larger the quantity of bones concerned, and the *greater* degree of waste and havoc committed by the caries, the greater must be the length of time required for the correction of it, and for restoring to a sound state so large a quantity

of distempered parts."* When any thing like this degree of caries and rottenness occurs in the living body, the matter generated can never be absorbed. Such a desirable determination is opposed to all our experience of the progress of simple abscesses, formed under the most favourable circumstances. It is, therefore, highly improbable, that a purulent deposition, of which the substance of bone constitutes an integral part, should be ever received into the blood-vessels, and expelled by the common outlets. In defiance of the best efforts of the constitution, it will most certainly burst forth, and lay the foundation of very tedious, if not fatal, drains from the back, groin, thighs, or hips.

The practice of Mr. Pott arose, by an obvious induction, from his own premises. His object was to excite inflammatory action by caustic issues, and thereby induce ankylosis, or union among the morbid bones. That such treatment is useful at an advanced period, after caries is actually formed, may be agreeable to sound practice, though it has never obtained the universal approbation of medical men. Professor Rust† remarks, that numerous observations and long experience have proved to him, that issues rarely produce the desired effect, and that they even fre-

* Pott, vol. iii. p. 474.

† *Arthroacology*.

quently accelerate the progress of the disease in a late stage. At an early period, while the disorder is confined to ligament alone, the practice of Mr. Pott is highly objectionable, because it prevents the application of other modes better calculated to restore the sufferer to his natural figure and former health.

It cannot be denied, nor do I wish to insinuate, that patients have not recovered upon this plan. Caustics, by stimulating, encourage the muscles and ligaments to act more energetically, by which they sooner regain their lost tone and vigour. The curative process is further expedited by the rest to which invalids must, to a certain degree, submit, while smarting under the pain of caustics. In many cases, Mr. Pott found it necessary to do more than employ caustic issues: he actually confined his patients to bed, or to a horizontal situation, during the greatest part of the cure, as they could not bear to remain in an upright position.* In all these recoveries, the subjects of them remain through life in puny health, because, the bones continuing displaced, and some of the viscera being necessarily subjected to injurious pressure, the important functions of the spinal cord are imperfectly discharged, owing to the difficulties it meets with from the altered form and direction of the medullary canal.

* *Observations on the Cure of the Curved Spine, &c.*, by James Earle, Esq. P. 28.

“The deformity remaining after recovery, is subject to great uncertainty and considerable variety, as it depends on the degree of caries, and the number of bones affected: in general it may be said, that where one vertebra only is affected, and the patient young, the curve will in length of time almost totally disappear; but where two or three are affected, this cannot be expected. The thing aimed at is the consolidation and union of the bones, which had been carious, and are now become sound. This is the *sine quâ non* of the cure, and this must, in such cases, render the curvature, and consequently the deformity, permanent. The issues will restore the use of the limbs, but not the lost figure of the spine.”

“That when two or more vertebræ are affected, forming a large curve, however perfect the success may be with regard to the restoration of health and limbs, yet the curvature will and must remain, in consequence of the union of the bones with each other.”*

It is clearly apparent, from the foregoing quotations, and the candid admissions of Mr. Pott, that he never attempted to restore the back to its natural figure. Such a happy result never came under contemplation; nor could it, consistently with his ideas,

* Pott, vol. iii. pp. 478, 491.

form part of the curative plan. Believing, as he did, that the mischief *always began* in the bodies of the vertèbræ, his efforts were confined to prevent ulceration, to cure it when present, and to join the bones permanently together in their curved form by an immovable union.

Had Mr. Pott attended carefully to the incipient stage, it is more than probable he would have found that the affection generally begins in the ligaments, and passes from them to the bones and cartilages. It is of the greatest importance to keep this distinction constantly in view, because the knowledge of it leads to a marked difference in practice. At this period, the complaint, according to my experience, is more certainly curable than many others; and, what is most encouraging, *the spinal column is made wholly to recover its natural form and powers*. Instead, therefore, of sustaining the miseries of an infirm constitution for the rest of life, and carrying deformity into all companies, the individual returns into society in as perfect health and shape as if he had never been afflicted. That such has been the pleasing result of the method which I have introduced, is abundantly proved by experience, and can be confirmed by many living witnesses. Had the disorder, in any of these examples, been attended with cures, very different must have been the result. The complaint, instead of submitting to the means employed, would either have gradually

increased, or, had a cure been at last obtained, there would, for obvious reasons, have been no reduction in the tuberosity. The inevitable consequences must have been a misshapen form, and its attendant evils.

A cure conducted agreeably to the foregoing principles leaves the patient in good health, and in the enjoyment of his natural shape. Where it has been produced by issues, how different is the result! In such instances, the curvature, and consequently the deformity, remain permanent.

“ These observations,”* says Sir James Earle, “ and others of the same tendency, added to the many melancholy instances which I have seen after a cure has been effected by issues alone, had long obtruded unpleasantly on my recollection. Prolonging life merely to lengthen out a miserable existence, and enable a wretched being to crawl a little longer on the earth, appears very unsatisfactory, and stopping short, if the idea be indulged, that, by any assistance from art, more may be done. I have often thought it would be a most happy circumstance could we go a step further, and cure the deformity as well as the disease: for, besides the disgusting appearance of the crookedness which remained, want of health, debility, and inactivity, usually accompanied it; and another

* *Observations on the Cure of the Curved Spine, &c.*

very material consequence resulted from it, — namely, that the largeness of the remaining curvature rendered the spine mechanically weak; which, probably, being added to a tendency to the same softness of bones as was the foundation of the original malady, was the efficient cause of the disease being liable to return. This was a very strong and additional reason why the improvement of the form of the spine should be equally the object of our attention with the cure of the disease.”

It does not excite surprise, that Mr. Pott, chiefly conversant with the worst and most obstinate cases, was led to believe that the disorder *always* commenced in the bones. These were, as he thought, enlarged, and pressed upon the cord. Having been induced, for reasons which he has not fully explained, to abandon this opinion, Mr. Pott did not afterwards attempt to account for loss of motion in the limbs: he contented himself with asserting, that it bore no resemblance to the true paralysis of the same parts. Sir J. Earle, in his anxiety to supply the defect, ventured to go no farther than to revive the discarded opinion of his preceptor. I mention this circumstance as a proof that little progress had been made, up to the present time, in the pathology or treatment of a formidable complaint of frequent occurrence. The great authority of the master seemed for a long time to over-awe and bear down opposition.

One of our latest writers imputes the disorder to pressure from an inflammatory increase of bulk in the fibro-ligamentous substances interposed between the vertebræ. He was induced to give up the opinion of Mr. Pott, because bony enlargements of the spine are seldom found in the dead subject.* I have little difficulty in joining my testimony to that of Mr. Copeland in cases of external violence. It is, however, uncertain whether in these instances the inflammation commences in bone, cartilage, or membrane. The species to which I wish to draw attention makes its attack so insidiously, as not to be discovered till a long time after its invasion. It exhibits none of the local characters of inflammation, nor is it accompanied with pyrexia. This, which is the common variety, seizes upon relaxed fibres, or persons accidentally debilitated. I am enabled, from the treatment of many such cases, to assert that they are wholly unconnected with inflammatory diathesis, and very seldom originate in a morbid condition of the vertebral cartilages or bones.

In order to understand the true origin and injurious effects of these disorders, we must premise a cursory survey of the operations which the spinal column and its contents are destined to perform in the living animal. The nine or ten pairs of nerves which issue immediately

* Copeland on *Diseased Spine*. Gortz de *Morbis Ligamentorum*.

from the skull, seem to be chiefly occupied with conveying perceptions to the sensorium commune. The twenty-nine or thirty pairs which arise out of the spinal marrow, communicate the power of feeling, and voluntary motion of the limbs and muscles of the trunk and head. They, in conjunction with the ganglions and great sympathetic nerve, supply the sanguiferous system, the thoracic and abdominal viscera, with the principal share of their nervous influence. By experiments performed upon living animals, we learn that these several organs continue to execute their appropriate functions after all connexion with the brain has been destroyed by decapitation, long enough to induce us to believe that they derive their predominant energy from a different source. This seems to be the spinal marrow; for when it is removed, the abdominal and thoracic organs soon cease to act. We are, therefore, led to conclude, that, although the animal functions are performed by the brainular nerves, those of organic life, or such as are only intended to support the machine, are executed by the spinal nerves. In this view of the subject, a healthy disposition of the spine is indispensable to the well-being of the individual. That the inference rests upon experience, we shall be able to prove, by taking a review of the principal symptoms which occur in this disorder. When it affects the superior cervical bones, deglutition is impaired, from pressure made upon the cervical nerves in their course to the pharynx and œsophagus.

For the same reason, a dry, teasing cough, and difficult breathing, are occasioned by pressure upon the nerves in their way to the larynx and trachea.

Projections in the cervical bones affect the arms with numbness, debility, spasmodic twitchings, and paralysis. They also produce uneasiness in respiration, with palpitations from slight causes. In the dorsal vertebræ they induce a girding sensation over the stomach, as if it were tied with cords. There is also indigestion, and oftentimes vitiated appetite. The secretion of bile becomes diminished, the countenance looks sallow, and the patient labours under many symptoms of jaundice. The belly is obstinately constipated, and the rectum refuses its office. The fæces are often slimy, whitish, or clay-coloured. The individual so affected gets feverish, is restless, emaciated, and affected with many symptoms which resemble consumption. The kidneys secrete little urine, and the bladder loses its expulsive faculty. In whatever part of the back the curvature is situated, the lower limbs are apt to be affected. Slight pressure upon the spinal cord produces debility and fatigue in walking. The legs cross each other; the patient is liable to stumble, and cannot go straight to any point. Greater pressure occasions muscular spasms, numbness, restlessness, and clammy sweats. A still greater pressure produces inability of motion and complete paralysis of the limbs.

The numerous, obstinate, and complicated maladies enumerated above are truly appalling. They exhibit spinal complaints in a new light, and claim for them an attention which they have not hitherto received. Whether we consider them as giving an unseemly appearance, and laying the foundation of delicate health, or regard them as a fruitful parent of many other formidable disorders, the subject is worthy of the most rigorous investigation. Happy will it be for our contemporaries and successors, if a complaint almost universally prevalent in the middle and higher classes can be cured, so as to leave behind it no vestige of its former existence. In order to accomplish this object, we must endeavour to make out the cause, by tracing the different and apparently unconnected symptoms to their true source. Difficult and intricate as the inquiry may seem at first sight, we are of opinion that it admits of explanation upon anatomical principles. In the natural form of the back, the nerves meet with no impediment in their passage from the chord through their proper foramina in the several vertebræ. Distortion of the spine produces an alteration in the canal, and the vertebral holes are necessarily forced into unnatural directions. In consequence of these changes, the tender substance of the cord gets pressed against the hard sides of its sheath. The nervous filaments which issue from it, having to travel over a longer course, become unduly stretched, and encounter angles and projections in

their way through the bony holes of the vertebræ, by which their energies are impaired, interrupted, and morbidly affected. We have already shewn, that the spinal nerves have been traced to all the abdominal and thoracic organs, to the sanguiferous system, to the upper and lower extremities, also to the trunk of the body, the neck, and outside of the head. When we contemplate this distribution upon anatomical and pathological principles, we cease to be surprised that luxations of the vertebræ should produce such an endless train and succession of perplexing symptoms. The extensive range of the spinal nerves, and momentous offices they are destined to perform in the animal fabric, afford an easy solution of our difficulties. Not that all the symptoms and sufferings enumerated were ever encountered by any individual.

It has been already declared, that the symptoms vary according to the situation of the curve. Organs supplied with nerves from a higher part of the spine than the seat of disease are seldom affected. In slight cases of pressure, even the thoracic and abdominal members, which derive their nervous influence from below the distortion, are but little disturbed. The symptoms, in all these instances, are chiefly confined to the lower extremities and the viscera, which receive their nerves immediately from the spinal curvature. In order more clearly to explain this part of our subject, we must premise, that the neck consists of seven flexible vertebræ; the back

contains twelve, and the loins five. From each of these bones issues a pair or bundle of nerves; one portion of which diverges to the right, another towards the left side, and the remainder run into the body. From the os sacrum arise five more pairs of nerves. It follows from this calculation, that *twenty-nine* pairs, or *fifty-eight* nervous cords, each including many distinct filaments, originate in the spinal marrow. Having passed through as many proper holes in the vertebræ, they separate into minute fibres, and are distributed over the greater part of the body, to regulate and control the most useful and necessary functions. When any of the vertebræ become displaced, or too prominent, the patient experiences inconvenience from a local derangement in the nerves of the part. He, in consequence, is tormented with a train of nervous symptoms, which are as obscure in their origin as they are stubborn in their nature: they have therefore been justly ranked among the *opprobria medicorum*. A sedulous examination into morbid anatomy having enabled us to disclose the latent sources of other ailments formerly concealed in impenetrable darkness, we may look forward with confidence to a similar result with regard to several nervous complaints, by directing our inquiry to the spinal column and its delicate contents.

According to this view of the subject, the obvious indication for the cure of spinal affections consists in

restoring the displaced bones to their natural situations, that the spinal chord and its nerves, relieved from injurious pressure and disturbance, may be re-instated in their former abilities. In all the cases which have admitted of being treated agreeably to these principles, the success has been complete. The affected organs to which they run, being no longer under the influence of diseased nerves, gradually and often suddenly recover their healthy state and proper functions.

MR. BAYNTON'S PLAN.

Mr. Baynton, having been frequently disappointed in the cure of these complaints, by treating them according to the ordinary modes, was led to devise another course. He has favoured us with his practice in twelve spinal cases: of these, one died; eleven recovered, and regained the use of their limbs. The process took up from seven to fifteen months, and the projection was, in several instances, somewhat reduced: in some it is asserted to have been removed. He imputes the want of success, where his treatment failed, to previous ankylosis of the displaced bones. These cases, partly drawn up by himself, and partly by unprofessional friends, are not sufficiently detailed and circumstantial to enable us to form a clear and satisfactory opinion, either in regard to the process adopted, its success in reducing the enlargement of the back, or the degree of constitutional health to

which the patients were afterwards restored. In all these particulars, the treatise is very defective and unsatisfactory; we are, however, under great obligations to the candid author for making us acquainted with a plan, which promises to be extremely advantageous in the management of these and other obstinate complaints. It consists in placing the patient horizontally upon a firm and unyielding mattress, where he is to remain constantly recumbent during the whole process. He is not accommodated with a pillow to support the head; nor is he to be moved in the least, for the most necessary occasions. All fears of the health suffering under this mode have been happily removed, by the successful issue in that respect of the different trials. In every case where it has been properly conducted, the patient soon became easy, cheerful, and regained his rest. Appetite and digestion improve under the confinement. In general, there is an increase of flesh, and a marked improvement of countenance.

The intention of the plan is to afford the "softened bones of the vertebræ" an opportunity to obtain their proper hardness, and make them able to support the weight of the parts above. So long as the column remains perpendicular, it is capable of bearing considerably more weight than after it has become oblique. In order to restore the strength of the spine, the person is to be laid flat, that the "softened bones" may recover themselves. Until the enfeebled

spine is relieved from its natural load, it cannot acquire tone, because the weight of the head, arms, and chest, prevents the benefit to be expected from any mode of treatment. A system of resting has effected benefit after the failure of drains and machinery. It may be observed, that Mr. Pott, though he takes little or no notice of the matter, thought it necessary to confine his patients in bed, or in the horizontal posture, during the greatest part of the treatment, as they could not bear to remain in an upright posture.* The length of time required to produce the cure, varies, as we have already stated, from seven to fifteen months. At the end of this limited period, the patients were allowed to rise, and take exercise, according to their ability. We have not been informed by the author of any relapses, but such occurrences are asserted from other quarters to have happened. They were probably owing to the want or neglect of proper directions in regard to the care and precautions which should be observed for some time after the reclining method has been discontinued. No means were used to remove the tenderness and pain of the back. These were soon subdued by rest alone. In no instance were external applications wanted. Internally, the liquor calcis muriatæ was administered to increase and consolidate

* See Sir James Earle's *Observations on the Cure of the Curved Spine.*

the ossific process. Besides this remedy, bark, and medicines to obviate costiveness, were also employed. It is difficult to say how long the resting should be continued; nor can we lay down any rules with confidence, till we have had greater experience. In the slightest cases, the recumbency must be continued five or six weeks after the removal of all tenderness. Where disorganization of the bodies of the vertebræ has taken place, the *rest* must be prolonged two or three months after every inconvenient symptom has disappeared.

Such is the plan recommended by Mr. Baynton. It consists, as we have already observed, in placing the patient horizontally upon a mattress, without bolster or other elevation, and continuing the same position till the spine shall have recovered firmness enough to support the head, arms, and chest. This is the whole object contemplated, and such are the simple means employed to attain it. When the process is finished, no measures of precaution are advised to prevent relapses. The patients arise from their couch, and thus ends the treatment. Mr. Earle, laudably solicitous to maintain the high character of his deceased ancestor, has for that purpose voluntarily entered the field of controversy with the Editors of the Edinburgh Medical and Surgical Journal.* In the re-

* Vol. xi. No. 41.

view of Mr. Baynton's essay,* they have taken occasion to extol his "humane" method, compared with the severity of Mr. Pott's treatment of spinal complaints. In order to bring the matter fairly before an impartial public, Mr. Earle was led to analyze Mr. Baynton's twelve cases, published in favour of the resting process, and to accompany each of them with remarks. He reports that only three are of the description alluded to by Mr. Pott; and in them the previous employment of caustic issues had, he thinks, removed the diseased condition of the bones. The merit of the resting plan was, therefore, limited to expedite the cure; for which intention he thinks it well adapted, where "softness prevails in the bones." In all the remainder, there was either no disease of the back, or it consisted of a muscular affection only. In confirmation of this assertion, he introduces three cases which fell under his own management. In them the spine was greatly bent, and the lower extremities more or less affected. One appeared to arise from hydrocephalus internus. The second occurred to a military officer.

"On the day after exposure to great fatigue, and being wet through for many hours, he had an attack of fever, and, on attempting to walk, he found stiffness in his legs, and inability to move them. Soon after-

* Vol. x. No. 39.

wards he was incapable of expelling his urine, and his fæces at times passed involuntarily. That these symptoms gradually increased, until the lower half of his body was completely palsied." He had suffered four years when Mr. Earle was consulted. "He was miserably helpless. His lower extremities were cold and benumbed, and he had lost all power of directing his steps. The whole vertebral column was slightly arched in the form of a half hoop, but no part was unnaturally exuberant. When supported, he could raise his body from its bent shape to an upright position. The form of the back, when reclined, was quite natural. This circumstance, contrasted with subsequent experience, induces me strongly to believe that there was no disease whatever in the vertebral column; and this arching of the body was purely the effect of deficient muscular action, rendering the muscles of the back incapable of supporting the weight of the head and trunk: and, from the result of the examination which I was enabled to make a short time after, in a case which I shall presently relate, I am firmly of opinion that the deficient nervous energy in this case depended either on some morbid affection of the brain or its membranes, which rendered it incapable of transmitting its influence to the extreme parts of the body, or some diseased affection of the medulla spinalis, wholly independent on any disease of the vertebræ."

The third patient was a common soldier, whose constitution had suffered from previous residence in hot climates. "In addition to the curved back, he had deficient muscular power in the lower limbs. There was a numbness and irregular action in the muscles of the fore-arms and hands; he was incapable of feeling any minute objects, and would often let things fall from his hands." On dissection, the liver, spleen, and lungs, were found to be diseased. "As I was most anxious to ascertain the state of the vertebræ and medulla spinalis, I did not pay much attention to these appearances, and, having cleared away the viscera, proceeded to make an accurate inspection of the vertebral column; and no disease being apparent externally, I removed all the bodies of the vertebræ, by sawing through the rings between the articular processes. By this plan I obtained a complete and very satisfactory view of the spinal marrow; but still no cause for the symptoms presented itself, and I was left to conjecture respecting the nature of the malady. On examining the head, however, the source of the mischief became apparent. The cellular structure of the pia mater was loaded with fluid, and the tunica arachnoidea was of a milky colour, and thickened, especially at the base of the brain, where it was firmly connected with the pia mater, forming together a tough, dense membrane. I am aware, that to many this may appear an insufficient cause for the violence

and extent of the symptoms ; but, having paid considerable attention to the morbid anatomy of the brain, and well knowing the infinite variety of symptoms produced in different individuals by the same morbid alteration of structure, I am satisfied in my own mind that all the phenomena were referable to this diseased state of the membranes.”

Whatever difference of opinion may arise in other respects, every one will, I think, admit Mr. Earle's two cases to be legitimate examples of paraplegia, though certainly not of the variety described by Mr. Pott.

The more we become acquainted with spinal pathology, the stronger is our conviction that paraplegia ought to constitute a generic term, and include under it numerous species. Of these, one, and that comparatively of rare occurrence, originates in a carious state of the bones. In others it takes place in the progress of the complaint ; but in the greater number it never appears, though the health be generally impaired and destroyed by the mischievous effects impressed upon the constitution. We find the most essential signs of the disorder clearly displayed in Mr. Baynton's cases. There is debility, numbness, a pricking sensation, and torpor of the lower extremities, with incapability of directing the motions. In some, the upper limbs were also affected, as well as

the internal viscera, giving to the malady a greater range of morbid action.

These phenomena having by all physiologists been referred to the nervous system, I do not think it necessary to produce any arguments in support of an admitted doctrine. The only question for discussion is, the seat of paraplegia. Is it ever in the brain, or is it always in the spinal marrow? In order to arrive at a more satisfactory conclusion, we may premise, that none of the cerebral nerves, with the exception of the eighth pair, and perhaps the great sympathetic, descend below the throat; and the spinal marrow is united to the brain by means of the medulla oblongata. The cerebral nerves are principally employed to convey impressions to the sensorium commune, and transmit the determinations of the will to the muscles of voluntary motion. By means of the spinal nerves, the offices of secretion and excretion are performed. They regulate the circulation of the blood, and impart energy to the extremities of the body. These nerves are chiefly independent of the brain; for if the head be cut off in certain warm-blooded animals, and respiration artificially carried on, the trunk will live for many hours: but destroy the spinal marrow, and the animal dies almost immediately. We are led from these experiments to conclude, that the nerves of the brain and spinal marrow discharge separate and distinct offices in the animal economy, though the

brain certainly exercises its control, through the spinal cord, over the voluntary muscles. The involuntary motions are executed by the spinal cord alone, and are wholly independent of the brain.

The difference between the two orders of nerves is very apparent in the paralysis which they occasion. Hemiplegia is confined to one side; paraplegia equally affects both. In the former, the diseased muscles are more flabby, soft, and unresisting, than in the latter. The mental faculties are always disturbed in hemiplegia; in paraplegia they remain free. The latter complaint deranges some of the internal functions; but in the former they are little impaired. By paying attention to these several distinguishing characters, a clear diagnosis may generally be established between these different forms of palsy.

If we examine Mr. Earle's first case according to the above rule, we shall find considerable derangement within the body, as well as in the lower extremities. I cannot, therefore, hesitate to consider it as a species of paraplegia, induced by compression of the spinal nerves. From the torpor of the bladder and rectum, together with the involuntary discharge of fæces, after taking purgative medicines, I am induced to place the seat of disease in the loins or sacrum. I have arrived at this conclusion, because the nerves distributed to the rectum and bladder issue from those

parts. Had the disorder occupied a higher station, some of the abdominal viscera would have participated in the complaint. I am of opinion that his fever, after exposure to wet and fatigue, proceeded from an attack of inflammatory rheumatism in the loins or sacrum.

The joints, the tendinous sheaths, bursæ mucosæ, and in general all parts furnished with fibrous structure, are liable to its invasion. The tendons of muscles are often attacked, but the fleshy bellies seldom or never suffer from this complaint. We find, on dissection, a glairy fluid effused, with increased thickness and morbid enlargement of the surrounding structure.

Rheumatism seizes indiscriminately upon the vertebral joints. The back is frequently the seat, because it is particularly exposed to the weather, and is moreover supplied with strong ligaments, to provide for the weight and motions of the body. It has likewise the usual articular provisions, and a tendinous expansion, the common posterior ligament of the vertebræ, enclosed within the theca spinalis. Rheumatic inflammation of these organs, by enlarging their bulk and dimensions, occasions compression upon the spinal cord, impedes its operations, and thus induces coldness, debility, numbness, loss of feeling and motion in the limbs, and the various sensations and inabilities complained of in the internal parts. In

agricultural districts, rheumatism is of frequent occurrence among the labouring poor, from their being thinly clothed and so much exposed to the changes of the weather. When it invades the back, symptomatic paraplegia often supervenes in the arms or legs. Many patients of this description were admitted into the Horncastle Dispensary, under my professional care. In some, the paraplegia was entirely removed with the primary complaint; in others, it continued to torment the sufferer during the rest of life.

It is for these several reasons, and from the suddenness of the attack, that I feel inclined to impute the origin of Mr. Earle's first case to lumbago, rather than to any other cause. Had the inflammation invaded bone or cartilage, I think its effects would not have appeared so early as the following day: I therefore coincide in the opinion, that the vertebræ and cartilages were wholly untouched. The disorder in process of time became chronic, and was then attended with muscular debility. Still, I think it began in membranous parts, and extended from them to the muscles. That the articulating organs of the vertebræ were relaxed and preternaturally elongated when Mr. Earle was consulted, must, I think, be conceded; from the arch or "half-hooped form" of the back in an erect posture, and its becoming straight upon lying down. To me it appears altogether impossible to distort the bones of the vertebral column in the

manner described, without stretching and hurting some of the articular connexions. So long as they remain firm and unyielding, the vertebræ continue fixed; but when they begin to lengthen, the vertebræ shew a disposition to slide out of the line: I therefore think it much more probable that the affection was situated in the ligaments than in the muscles, especially since fibrous texture possesses little inherent contractility. When once overstretched, it recovers its lost tone slowly, and with difficulty. In this respect it differs from muscles, which admit of considerable contraction and relaxation, without injury to their functions. The bent figure of the vertebral column, and consequent extension of the spinal marrow, would account for the symptoms under which the patient laboured when Mr. Earle saw him; but the commencement of disease on the morning after long exposure to wet and fatigue, cannot be referred to a circumstance which had not then taken place. The subsequent appearance of the same complaint in other vertebræ, is agreeable to an established law of the animal economy. Rheumatic inflammation passes successively from joint to joint, sometimes leaving the former whilst it invades the latter; more frequently it attacks the new organ without deserting the old one. It is no uncommon thing for sciatica to proceed to the knees, ancles, and superior extremities. After remaining in all of them for a certain period, it gradually disappears, or degenerates into

a protracted rheumatism. It is in this way that we account for the membranes and ligaments of the back becoming so generally and obstinately disordered in Mr. Earle's and Mr. Baynton's different cases.

An objection may be raised against this explanation, because, in the second case, Mr. Earle found no disease of the spinal marrow, after viewing it by "sawing through the rings between the articular processes." It is clear from the statement, that it never occurred to his mind to examine the articulating substance with any particular attention; otherwise he would have laid the joints open with greater care, and in a different manner. His eyes and thoughts were exclusively directed to the vertebral bones, their intermediate cartilages and the spinal cord; and, to get to the objects of research, he incautiously tore and mangled the articulating membranes with a coarse instrument. It could not be expected, after such treatment, that the parts would display any obvious marks of diseased structure; and, therefore, his finding no sufficient cause for the symptoms in the spinal marrow, does not convince me that none were present in the contiguous ligaments. The advocates for pressure generally would have examined the bones, cartilages, and membranes, which surround the spinal marrow or connect the parts together, under an idea that paraplegia derives its origin from disease,

situated sometimes in one tissue, and sometimes in another.

I have thus endeavoured, in controverting the hypothesis of Mr. Earle, to establish the phenomena on a basis ample enough to afford them support, and more conformable to the true principles of the animal economy.

Dr. Baillie has also favoured us with his sentiments on paraplegia, in the Transactions of the Royal College of Physicians.* It is much to be regretted, however, that he did not superintend the dissection of a patient whom he had occasionally visited during life, and whose case constitutes the basis of his paper: had he personally directed the investigation, I am convinced that the spinal marrow and membranes would not, under such circumstances, have escaped the notice of a physician intimately acquainted with morbid anatomy and the general principles of his profession. "This last form of paralytic affection" (the paraplegia), he observes, "has, as far as I can judge from individual experience, increased considerably in this country within the last fifteen or twenty years, although it be very difficult to assign any satisfactory reason for it. Paraplegia in adults

* Vol. vi. page-16.

has been considered by most medical men as being produced by some disease, either in the bones or ligaments of the spine, or in the cavity of the spine, most commonly at the loins, independently of any disease in the brain. The reason of this general opinion has probably been, that the lower part of the body, from the loins downwards, is, in this disease, affected with paralysis; and that, in children, a similar disease is often obviously dependent upon a morbid affection of the lumbar, or some other portion of the spine. In adults, however, where there has been no accident affecting the spine by outward violence, paraplegia, I believe, depends most commonly, in a great measure, upon a disease affecting the brain itself. This opinion I have entertained for several years, and some other medical men have likewise held the same opinion. It is, however, by no means general; and the chief object which I have in view in writing this paper, is to render this opinion more commonly known, that it may either be established, or be properly limited by the future observations of other practitioners."

The brain and its membranes, in the case recorded, exhibited strong marks of disease, though they were not, as I think, sufficiently distinguishing to account for the paraplegic symptoms. We are not informed how the mental faculties and organs of sense were exercised under the pressure of the dis-

ease, nor to what degree the feeling and motion of the arms were impaired, or in what manner the thoracic and abdominal viscera discharged their respective offices. These omissions are the more to be lamented, because, if the several functions remained undisturbed, we have little reason for imputing the disorder of the lower limbs to the cause assigned.

“ A considerable quantity of water,” we are told, “ was discharged during the inspection from within the theca of the spinal marrow.” When such an obvious source of the disease presented itself, we have surely more reason to refer the paraplegia to it, than to attempt to search for its origin in the deranged structure of a distant part. We have the authority of celebrated names* for maintaining, that when a fluid is found after death, both in the head and spinal tube, it sometimes begins in one part, and sometimes in the other. Since, then, the effused liquid may, in the case recited, have had a twofold commencement, it is impossible to determine, imperfectly as the inspection was conducted, where it was really formed. Had the surgeons examined the vertebral column with proper care, I think they would have discovered in it the origin of the disease, and that the malady in the skull either proceeded from

* Morgagni. *Epist.* xii. Art. 9. Willis. *Lieutaud*, lib. iv. p. 341. Bonetus, Magnetus, Coiterus on the Spinal Canal. E. A. Lloyd on *Scrofula*, p. 236.

the spine, or was only a co-existent and unconnected attendant. We feel more grieved that the state and condition of this organ and its contents should have been overlooked, because paraplegia has been very little elucidated by careful dissection, and appears to be much in want of further investigation.

We have thus given a brief analysis of the works of Mr. Pott and Mr. Baynton, the two chief practical authorities on this subject, interspersing our remarks with the observations of other writers.

MR. CHESSHER'S PLAN.

It did not occur to me while engaged in drawing out the preceding statement, that I had left the history of British spinal medicine incomplete, by omitting to give an account of the methods pursued by the celebrated Mr. Chessher, of Hinkley. During my residence in Lincolnshire, several young sufferers of my acquaintance applied for his professional assistance. By their means I had favourable opportunities of witnessing the progress and result of his exertions in this department of the curative art, before I made it a particular object of my attention. As he never communicated his practice through the medium of the press, his name did not occur to me while I was engaged in writing the history of spinal pathology, otherwise I should have endeavoured to describe his plan, and the

success of it, as far as I was able with the imperfect materials which I then possessed.

This gentleman, it is well known, introduced a method of his own, which was once so generally admired and adopted, that it gained for him a greater degree of reputation than has attached to any other individual in the same walk of practice. The little town of Hinkley, the theatre of his operations, was constantly filled with patients attracted to the spot by the high character of Mr. Chessher. Nor were they, as many have insinuated, confined to the low and ignorant. Persons in the highest ranks of life, and of the most eminent talents, did not hesitate to commit their children to the professional skill of this eminent surgeon. His plan was attractive, and never failed at first to please the credulous. While enveloped in steel machinery, the wearer was always from one to three inches taller than without it. Gratified with a sensible increase of stature, and a more agreeable appearance, he anticipated as the reward of his compliance, the permanent restoration of an amended figure. Still he had the mortification to find, whenever the protecting armour was laid aside, that his back shrunk to its former dimensions, and assumed every feature of its original deformity. However mortifying the change produced, he comforted himself with thinking it only a temporary check, and that the result would at last be satisfactory. In this pleasing

delusion he suffered himself to continue several years, carefully screwing on his defensive armour in the morning, and laying it aside at night. After enduring its cumbrous and oppressive weight, of from ten to sixteen pounds, in this manner, for several successive years, and always finding his hopes disappointed, he discovered at length that his deformity had been sensibly increasing, notwithstanding all his care and devotedness to the directions of his preceptor. This is no fanciful picture of my own creation; its truth has been confirmed by so many disappointed candidates, that I am inclined to believe Mr. C.'s plan has never succeeded in removing one case of considerable deformity. This, I am aware, is a bold assertion, and should not be hastily made; but as it has been my fortune to cure several of his disappointed patients, I am enabled to support my opinion with numerous witnesses. All my informers entertain a great respect for Mr. C., believing that he is actuated by the best intentions. They think him deceived in his expectations; but wholly incapable of obstinately supporting a practice which he had found to be ineffective or injurious. In this opinion I fully coincide. Though I have no personal knowledge of Mr. Chessher, many opportunities have enabled me to become acquainted with his character. I can safely declare, that I have found him in every instance so correct in his conduct and respectable in his demeanour, that I have been

led to think highly of his moral and gentlemanly dispositions. His professional reputation has now been many years before the public. The following case affords, I believe, a good specimen of his general success in spinal complaints.

It is written by a lady of a most amiable disposition, of great worth and intelligence. During her long connexion with Hinkley, she had many opportunities of conversing with other patients, and of observing the general success of Mr. Chessher's practice. She, like the rest, was for a long time captivated with the treatment employed, and buoyed up with the anticipation of ultimate success; but was at length convinced of its deleterious effects upon herself and all others with whom she had the opportunity of unrestrained communication.

The history begins as follows:—“ At the age of ten, my right shoulder was discovered to have a little enlarged, and my health from that time became impaired. With a view to lessen the spinal defect, I had recourse to a horizontal position three or four hours every day, by the advice of my kind father, who fills a respectable station in the medical profession. Before I attained the age of thirteen, my friends requested Mr. Chessher's opinion relative to the state of my spine. As the protuberance was only trivial,

he considered it best to continue the recumbent method previously adopted. This plan I pursued six years, without any apparent benefit.

“ At sixteen, when I enjoyed good bodily health, I first became Mr. Chessher's patient, and commenced to wear his steel collar, which conveyed the weight of the head upon the hips, and acted with pressure below the loins, by means of various steel plates attached to the lower division of the collar.

“ I continued to recline every day, wearing the steel apparatus; and in the morning, during the whole time of its being fitted to the body, I remained suspended in a neck-swing, which is merely a tackle and pulley fixed to the ceiling of the room: the pulley is hooked to the head-piece of the collar, and the whole person raised, so that the toes only touch the ground. Sometimes I used the reclining bed, which combines extension with the recumbent position. It consists of two boards, the uppermost of which is made to slide with rollers upon the lower. The patient is slung by the head to a hook fixed at the top of the under-board, and lying on her back on the sliding one, she allows it to run down by means of a cord held in the hand. Exercise in walking and riding was also recommended, which I continued, until debility compelled me to decline these muscular exertions. After having borne the collar nearly two years, weakness increased, and

frequent faintings ensued : this languid state of health was followed by a severe attack of fever. Three weeks after its seizure, and before it had subsided, an entire loss of motion of the lower limbs instantaneously took place, while I was in the act of rising from my seat with an intention to cross the room, and wholly unconscious of my unhappy condition. After taking me from the floor, upon which I had just fallen, and removing the steel collar from my person, I was carried to bed. The following day the fever returned. A wish, very natural in my situation, to ascertain how far paralysis had affected the limbs, induced me to pierce them through the skin with a sharp needle. The experiment, several times repeated, did not excite the smallest perception. I am convinced, from this and other circumstances, that they were totally deprived of feeling at the time of my fall.

“ This second attack continued twenty-eight days, and every other day deprived me of all recollection. As my faculties returned, I suffered much pain in the flesh where the collar had acted. These affected parts wore at first a livid appearance, and became insensible to the touch ; spirits of wine, with friction, were then applied, until the livid hue changed to a black colour ; finally, suppuration commenced, and the sores became gangrenous wounds. One of them, on the left side, extended to four inches and a half, by two and a half. The other, on the same hip, to nearly three inches

every way. On the right side I had only one sore, a little below the hip. It was three inches in length and width.

“ Besides these wounds, I had another at the bottom of my spine, two inches and a half in length, by more than one in breadth.

“ The ulcers were all situated in parts where the collar had rested, and owed their origin, as I think, to its oppressive weight. The anguish excited by the mortification, loss of substance, and new flesh forming, nearly excluded all sleep for one whole month, notwithstanding the use of strong opiates every night. The mortification, which penetrated to the bone, was subdued slowly, and with great difficulty. The virulence of my illness was such as to loosen my teeth, deprive me of my hair, and for a period weaken my sight.

“ These sufferings confined me to my bed four months, during which time the enlargement in my right shoulder had visibly increased; the spine had also taken a lateral curve. Three months after these severe attacks, my health and the use of my limbs were gradually restored. Upon the first return of feeling in the legs, they became unremittingly painful, and the knees were likewise contracted. These distressing maladies left me by degrees, as my strength

increased. At nineteen I again consulted Mr. Chessher, and by his advice resumed the steel collar. From that period to twenty-four my health remained pretty good. Still the spinal distortion continued to increase, notwithstanding every endeavour on my part to subdue it. My confidence under this discouragement was not lessened, because I found, from the very great elasticity of the spine, that it uniformly gained in length every morning, by the use of the neck-swing, from half to three quarters of an inch, and after having, in the course of the day, laid down according to my constant rule, two hours with the collar on, and screwing it up in that position, the spine always increased another inch. I was convinced of this stretching, so gratifying to my expectations, because the collar required to be drawn up a whole inch on rising from the reclining position. It was, therefore, usual for the back to gain two inches or more in the course of every day, and to lose them again at night upon removing the collar.

“ At twenty-five the debility returned with its former severity, and was followed by weakness in the loins, pains in the side, shortness of respiration, palpitations of the heart, and languid circulation in the lower limbs, attended at times with much pain in them. And at intervals the agony was so great, that I observed to a medical gentleman, I could cheerfully submit to amputation of the suffering members, were

I only assured that the operation would remove the distressing sensations under which I was then labouring. In order to alleviate the latter affliction, I tried electricity, galvanism, flagellation of the limbs with nettles; I also applied flour of mustard to them, with great friction, and, immediately afterwards, immersion in hot water.

“ With a wish to relieve the former complaints, I took various tonics, and resided where I could inhale the marine air, or occasionally use the tepid or cold sea baths; these remedies failed to produce permanent good. In short, my health rapidly gave way, in defiance of the means employed, until I found myself unequal to continue the exercise of walking or riding, both of which I had been advised to pursue, and which I had resumed on the return of my improved health. Languor and faintness, accompanied with cold perspirations, frequently seized me. The weakness was so great, that, after walking only a few steps, I lost my breath, became unable to stand erect, and I found it necessary to support my back by placing both hands firmly upon the hips. Talking soon fatigued, and produced difficult breathing. At length I was so much reduced, that I became unable to support the erect posture many minutes together.

“ At the age of thirty-six I entirely laid aside Mr. Chessher's steel collar, and remained upon an

inclined plane more than two-thirds of my time for one whole year and a half: yet this recourse, like the former ones, did not succeed; and from extreme weakness, my neck was unable to support the weight of my head. So great had my distortion become at this time, that from eighteen down to nearly thirty-eight, my spine in length had lost more than six inches.

“Just previous to the age of thirty-eight, I became thoroughly dissatisfied with the plan I had followed for so many years to no good purpose. I then resolved, Doctor Harrison, upon consulting yourself; and after having undergone your treatment twelve months, my spine has recovered in length three inches and three quarters. I can now say with truth, I have not for a single moment had cause to regret the determination I formed, as the improvement in my general health, and the change which has taken place in my spinal disorder, can fully testify.

“*March 30th, 1825.*”

“Since the former report, my general health has materially benefited. The distressing nervous sensations in the region of the spine, which had for many years severely tormented me, were entirely removed in the first three months. Soon afterwards I was released from the disagreeable tightness in breathing, and frequent pains of the left side. In the following

six months my constitution was in various ways essentially restored. Not only were appetite and digestion promoted, but my rest was more refreshing, and my nerves gained strength. The lungs now act freely, and I have not latterly suffered any return of palpitation. The former unceasing coldness in the lower limbs has entirely left me, and the pains in them are much abated, but not wholly subdued. These improvements have been progressive to the present time, although I have sustained frequent relapses from colds and bilious affections. The appearance of my spine is also greatly amended. It has, from the first, increased in length more than four inches, by adhering to a plan of cure, which was neither accompanied with pain, nor productive of other inconvenience.

“ These benefits constrain me to acknowledge, now that the spinal treatment has been sometime discontinued, that your system has alone been the only human means of mitigating a series of very distressing bodily sufferings, which afflicted me more or less through the whole course of my severe calamity.”

“ *March 25th, 1827.*”

Highly as I esteem the author of the preceding narrative, I should not have ventured to publish her case, could I not support its authenticity with many others. I have been consulted within the last few years by more than a score of Mr. Chessher's disap-

pointed patients, and received a confirmatory account from each of them. Several have subsequently recovered their natural figures, and good bodily health, from pursuing my methods, who had previously sustained no inconsiderable mischief from obeying Mr. Chessher's directions. I shall not hesitate, whenever I am properly called upon, to refer to the writer of the preceding statement, and to other authorities, for proofs of these assertions. The lady who communicated her case was dreadfully misshapen, as appears from the cast taken of her back when she first applied for my assistance.

She has already obtained essential relief both in her personal appearance and constitutional health. These improvements are strikingly apparent in an amended shape, in the alteration of her countenance, and the more regular performance of all her functions. The menstrual evacuations had never been satisfactorily established until she placed herself under my care, at the age of thirty-eight. Soon afterwards they proceeded regularly, and observed the usual periods. This remark, extraordinary as it may appear, is nevertheless true, and capable of confirmation in other instances. The complete restoration of this important function is another proof of the salutary tendency of well-conducted recumbency, with other proper means, in these particular cases.

The following inferences may, I think, be deduced from the statement of my ingenuous correspondent.

1st. That partial recumbency upon an inclined or flat plane cannot subdue, though either of them will retard the progress of spinal distortion. Sufficient trial was made in this case, if the object had been attainable. In other instances which have come to my knowledge, it has been submitted to and persevered in for three and four years. Nevertheless, it failed to remove the disorder; and with many of the invalids referred to, the swelling progressively increased. Sometimes the enlargement was partially reduced, and the parts acquired strength enough to resist further deviation. Persons restored to this degree of vigour are able to discharge the ordinary business of life, although they generally remain in delicate health, are tormented with nervous symptoms, and liable to suffer more than others from exposure to bodily or mental fatigue. Extraordinary as it may appear, I am of opinion, that the increase of nervous complaints in the present age is mainly to be attributed to the alarming frequency of spinal maladies.

2dly. The process adapted to their cure by Mr. Chessher, has a direct tendency to injure the frame, and increase the disorder which it was intended to relieve.

It will not be difficult to explain how Mr. C.'s mode of treatment augments distortion, and makes the constitution more susceptible of illness. The first thing that he does, as we have seen, is to construct a steel apparatus or collar, of from ten to sixteen pounds weight. This is fitted to the upper part of the pelvis, which has to bear the whole burden. By means of a rod, which extends along the back, and rises above the head, he can at pleasure stretch the vertebral column several inches, and keep it in that forced state for any length of time. The apparatus is put into use every morning, and continued until night. This is the plan followed through the whole process. As the spine gives way, the mechanism is enlarged, to keep it continually stretched. The column, as already observed, is often extended more than three inches, and the increased length, according to my calculations, is chiefly, if not wholly, acquired by acting upon the fibrous structure of the vertebral joints. Now, although the articulating ligaments are extensible, they possess little or no contractibility. It follows, that whenever the tormenting load is removed, the back feels weak and loose. The bearer, unable to remain erect, without his protecting armour, is obliged to lie down. In this posture he becomes easy; and on rising again from the bed, is compelled to buckle on his collar, before he can bear to sit up even for a few seconds. In this way he goes on supporting a tedious

existence for several years, gaining when dressed three inches, and at night always sinking down again to his former dimensions. During this time, the ligaments gradually lose their original firmness, and permit the vertebræ to slide more and more out of their line, by which means the deformity keeps increasing. At length the sufferer, wearied with continual disappointments, casts off his cumbrous machinery. He then becomes sensible of the full compass of his distressing infirmity, because he finds the spinal column unable to remain upright and support the incumbent weight. It slowly recovers its former strength. During this anxious period, the weakened fibres suffer the vertebræ to retire further and further from their natural positions. In consequence of the displacement, a rapid augmentation appears in the complaint, which he had taken so much pains to reduce. The conflict having ceased, the distortion is arrested, and remains stationary for the rest of life. In many instances, the constitution, unable to maintain the arduous struggle, becomes the prey of some mortal disorder.

Delicate females, especially young girls, are so much fatigued and oppressed with the heavy load which they are directed to carry, that they sink under the burden. Though the mechanical movements are changed to accommodate the apparatus to the progressive alterations of the human figure, the principle is carefully maintained. It will occasion

no surprise to hear, after what has been stated, that the instrument produces great and constant uneasiness wherever it is made to rest, and not unfrequently ulceration and gangrenous sores.

The harassing weight, and irritations from this cause, are frequent harbingers of sickly health; and when such a disposition has once formed, slight matters will suffice to produce actual disease. Accordingly, it has been said that scrofula and phthisis pulmonalis are often excited by Mr. Chessher's process. When patients remain well during the treatment, there is, nevertheless, too much reason to fear that they will be severely afflicted at some future period. The heavy weight placed upon the pelvis is sufficient to prevent its regular enlargement, though it may not alter the situation of the bones. But this oppressive load has in many instances produced distortion in parts where such consequences are most to be feared. The lumbar vertebræ and os sacrum having been driven inwards, the entrance into the pelvis is necessarily diminished. This want of capacity increases the difficulties of parturition, and sometimes obliges the practitioner, in the exercise of a sound discretion, to sacrifice the infant in order to save the mother.

The preceding narrative, with the exception of Mr. Chessher's plan, and my remarks upon it, was, as I have already observed, inserted in the Medical

and *Physical Journal* for Nov. 1820, and Feb. 1821. It contains, I believe, a true exposition of spinal pathology, as it was then taught and practised in this country at least. In the summer of the same year, 1820, the late Mr. Wilson, an eminent teacher of anatomy, delivered a series of lectures at the Royal College of Surgeons, which were not published until 1821.* In them he entered at considerable length into the nature and treatment of spinal diseases. The doctrines he advocated contain little of novelty. Like his predecessors, Mr. W. maintains that "incurvations of the vertebral column are of two kinds: one arising from rickets; in this form the bend is usually to the sides: the other from caries of the bodies of the vertebræ, the bend in which is forwards."

Mr. Lloyd has favoured the public with his sentiments in the following words. "It appears to me that there are two species of curvature of the spine depending on scrofulous disease; one occupying only a certain part, and being generally from within outwards, and what is known by the term **ANGULAR CURVATURE**; the other occupying a large part or the whole of the spine, and being generally from side to side, and what is therefore known by the term **LATERAL CURVATURE**. In the former there is

* Observations on the Incurvations of the Spine.

always *some destruction of some portion of the vertebral column*, and often, for a considerable time, progressive destruction of bone, cartilage, and ligament; and the vertebræ undergo precisely the same changes as the extremities of the other bones in scrofulous diseases of the joints: in the latter there is no destruction of parts, but merely an alteration of structure." Again; "the common species of angular curvature is occasioned by the spinous processes of such of the vertebræ, the bodies of which have been destroyed by caries, or absorbed, being thrust outwards by the approximation of the sound vertebræ. There may be only one of the vertebræ destroyed, or there may be nine or ten, or more, and yet the patient recover."

And further, he says, in reference to the lateral curvature: "What is the direct cause of this peculiar curvature, and of the wasting of the muscles, which always attends it, in a greater or less degree, it is impossible for me confidently to assert; but I believe the following will be found to be the most accurate explanation. It has been supposed by some authors, that the cause of the curvature is entirely in the action of the muscles: but although this may be, and most probably is, the immediate cause, I am much inclined to believe that the primary cause is in the vertebræ; that scrofulous action is set up in them, which increases their vascularity and softens their texture,

or, in the language of the old physiologists, diminishes the density of their fibres, relaxes their ligaments, and perhaps loosens their connexions,—so that the whole spine becomes weakened.”*

I have inserted these passages, and dates of the respective publications, to shew what little progress had been made up to February 1821, (when my two essays were in circulation,) to remove the obscurity, and improve the treatment, of this formidable complaint.

About this period a new era may be said to have commenced, which it requires not the gift of prophecy to foretell, is destined to operate a complete revolution, not only in the treatment of what are denominated spinal complaints, but in that of many others, which will be found to spring out of the same fountain. The spinal cord is already admitted to hold an independent station in the animal economy, to be endowed with inherent faculties, and to be liable to diseases peculiar to itself.

I shall recur to this interesting inquiry in its proper place. In the mean time I wish to observe, that the chronic pains and spasms, the numbness and paralytic debility in the muscular system of the

* Lloyd on Scrofula, ann. 1821, p. 214, 223.

trunk and limbs, are often dependent, when not suspected, upon some morbid condition of the spinal cord in the theca vertebralis, or of its nerves in the foramina vertebrarum.

The functions of all the internal viscera are, it is well known, severely affected in spinal complaints. We clearly perceive, from this circumstance, that a close and intimate connexion subsists between the cord and these different organs, through the medium of the great sympathetic. It may be safely affirmed, that wherever the spinal nerves are distributed, however distant from their origin, disease may be produced by a distempered condition of the column. In this consideration of the subject, which will, I doubt not, be fully confirmed by subsequent experience, the vertebral pillar constitutes, in a medical view, the most important organ of the human frame.

The faculty, roused from their long and deep sleep, to the real importance of an inquiry which I had the good fortune partly to excite, are already busily occupied with spinal pathology. Several valuable treatises have lately appeared on the subject. In them the blind deference formerly paid to celebrated names is not to be found. A spirit of free discussion has been substituted to servile acquiescence, from which the best results may be anticipated. I shall find other opportunities of referring to them. At

present I wish to confine my remarks to some assertions contained in Dr. Dods's work on the "Contorted Spine." Unwilling as I am at all times to enter into controversial argumentations, I feel myself called upon in this instance to defend my consistency against glaring misrepresentation. In his book I am reported to publish opinions that I never entertained, and to clothe them in language that I never meant to employ, without strict limitations. "Now it must be observed," says Dr. Dods, "that Dr. Harrison supports a particular theory. He ascribes *all* spinal complaints to one common cause, and is of opinion that we shall find it in the connecting ligaments of the vertebræ."

"These," he says, "get relaxed, and suffer a single vertebra to become slightly displaced. The column now losing its natural firmness, other bones begin to press unduly upon the surrounding ligaments; they in turn get relaxed and elongated, by which the dislocation is increased, and the distortion permanently established. The direction becomes lateral, anterior, or posterior, according to circumstances; but the malady has in every instance the same origin, and requires the same mode of cure."

For some time after I had published the foregoing sentences, the faculty thought only of structural disease. Mr. Pott denominated it caries; Mr. Baynton,

softness of the vertebræ. Some called it scrofula; others, rickets; and another set, mollities ossium,—according to the fancies of the different writers.

All the indications of cure were directed to subdue a distempered state of the bones, which, according to them, was always present. The whole scope of my reasoning, on the contrary, tended to prove, that besides organic mischief in the vertebræ, *which I never denied*, as clearly appears from my two essays,—* patients are also sometimes affected with suppuration of the intervertebral substance, the osseous portion of the column remaining sound and healthy. I communicated a strong example of this variety in the journal referred to, several years before Dr. Dods committed his strictures to the press. Though I freely admitted, with these authors, that a distempered condition of the vertebræ and of the intermediate cartilages, does occasionally produce spinal disorders,—I contended that the malady is more commonly situated in the connecting ligaments of the distorted joints.

In hazarding an assertion which has already gained many converts, I only intended to declare my firm conviction, that the cause of spinal maladies is not confined to any single portion of the vertebral column, but is to be looked for in different structures.

* See Med. and Phys. Journal for 1820, 1821.

Accordingly, in another part of my essay alluded to by Dr. Dods, I remarked, "The more we become acquainted with spinal pathology, the stronger is our conviction that paraplegia, the principal disorder of the spine, ought to constitute a generic term, and include under it numerous species: of these, one, and that comparatively of rare occurrence, originates in a carious state of the bones."* Again; "the *species* to which I wish to draw attention makes its attack so insidiously as not to be discovered till a long time after its invasion. It exhibits none of the local characters of inflammation, nor is it accompanied with pyrexia. This, which is a common variety, † seizes upon relaxed fibres, or persons accidentally debilitated. I am enabled, from the treatment of many such cases, to assert, that they are wholly unconnected with inflammatory diathesis, and very seldom originate in a morbid condition of the vertebræ." Here is such an unqualified confession on my part of the existence of caries, and of "numerous species" of spinal disorders, that I think it unnecessary to multiply examples, otherwise I might refer to the whole tenour of my writings, and in particular to the title of the very essay referred to by the doctor, for additional confirmations. Having purposely, and in express terms, declined to treat of the other species, I confined my remarks chiefly to that species de-

* Med. and Phys. Journal, ut supra.

† Ibid.

pendant upon the state of the ligaments. I had also observed, in a former paper,* that “of all the maladies which affect the constitution, such as arise from *malformation in the bones* of the chest and spine are most distressingly stubborn.”

Having previously limited my observations to distortions, arising from an affection of the ligaments, I say, “the disposition of the spine becomes lateral, posterior, or anterior, according to circumstances.”†

It therefore follows, that in animadverting upon my peculiar notions, the doctor should have examined the context, and not hastily drawn his conclusions from a single text. Had he conformed to this rule, I should have been spared the unpleasant task of exposing his misrepresentations, and of defending the consistency of my opinions.

I do not accuse the doctor of intentional misrepresentation, but I may, I think, complain of unjustifiable negligence on his part. Besides the method already pointed out, of gaining a knowledge of my peculiar notions, we had a great deal of unreserved conversation, when he did me the favour, some time

* Remarks upon the different Appearances of the Back, Breast, and Ribs, Med. and Phys. Journal, ut suprâ.

† Med. and Phys. Journal, ut suprâ.

before his book appeared, to dine at my house, along with his friend and father-in-law Dr. Pattison. I did not hesitate, though they were both totally unknown to me, when they called, to invite them the following morning to accompany me to several places, that they might judge for themselves of the personal appearance, of the state of health, and the degree of contentment, which my patients manifested under the treatment which I pursued. I am not aware that the doctor has made any *allusion to these visits*, though they probably constituted the only opportunities that he had ever enjoyed of seeing a spinal patient resting constantly in the horizontal position. I have come to this conclusion, because undeviating recumbency makes no part of his own or Mr. Chessher's plan. He could not, therefore, witness it at Hinkley, during his professional connexion with his former patron. All that the doctor has depicted in such glowing colours of the mischievous tendency of constant lying, upon the health and disposition, proceeds, I suspect, from the hypothetical suggestions of a heated and prejudiced imagination. Be that as it may, his remarks have not the slightest foundation in truth, as I can safely aver, from abundant experience. Had he only confined his animadversions to what he saw himself, or was told to him in conversation by myself and my patients, he would, I am persuaded, not only have drawn a different conclusion, but would have been led to advocate principles directly opposite to

his present ones. So many unequivocal proofs of a **contrary** tendency have occurred in my own practice, **that** I do not hesitate wholly to deny the unsupported deductions brought forward with so much confidence.

It may be sufficient for the present purpose to introduce a single example, though I could strengthen it with many others. Since undeviating recumbency makes an indispensable part of my practice, the reader will necessarily become acquainted with many instances of it in the course of this work. A young lady, who had been confined to the horizontal posture upon Bayton's crib upwards of six years, applied for my professional assistance. I found her easy, cheerful, and a little inclined to corpulence. Her health had been uniformly good, nor had she suffered any personal inconvenience, except when attempts were made to move her from the couch. She then became instantly convulsed in every member. Of this I had ocular demonstration at my first interview. The moment her back was slightly raised by her medical attendant, the countenance became distracted with most frightful agitations. Dreadful spasms immediately seized upon her face, trunk, and limbs. They continued unrelieved till she was replaced flat upon her couch, when they instantly ceased, as if arrested by some magical influence. She immediately recovered her former composure and accustomed cheerfulness. The suddenness of the transitions surprised

me, and almost overcame my resolution, wholly unprepared as I was for these distressing changes. I had never witnessed any thing like them on former occasions.

In six months, I had the pleasure to see the same lady, after having undergone my mode of treatment, walking about at her ease. Neither she, nor my other patients, have experienced from lying, any of those distressing consequences which have been depicted in such vivid and dazzling colours by Dr. Dods. If instances of the kind ever occurred in his own practice, they must therefore, I conceive, have been owing to mismanagement. I am so far from concurring in the same opinion, that I can safely affirm, upon no inconsiderable experience, that recumbency properly managed in spinal complaints, often improves, and never injures the health.

FIRST SPECIES
OF
SPINAL DISEASES,
OCCASIONED BY AN AFFECTION OF THE LIGAMENTS;
NAMELY,
THE BACKWARD, CONVEX, POSTERIOR, OR OUTWARD
CURVATURE OF THE SPINE.

H

INTRODUCTION TO THE CASES.

AFTER some preliminary remarks, and before I proceed to a consideration of the cases detailed in the succeeding chapters, I propose to give a brief anatomical and pathological description of the different parts which enter into the general composition of joints. A short description of them, and a more particular one of the vertebral articulations, will enable the reader to take a clearer view of the causes of spinal complaints, their origin, and the connexion of symptoms, as well as the means best adapted to their removal. This inquiry is the more necessary, because the occurrence of vertebral luxations, independently of external violence, appears to be commonly denied. I shall therefore premise a few of the reasons which have led me to entertain the affirmative. The vertebral column is a pillar of complicated and delicate mechanism. It is flexible, to provide for the motions of the trunk; and strong, to support the incumbent weight. The former intention is secured by its jointed structure: the latter, by numerous ligaments, of great strength. An organ thus constituted is liable to many

disorders, from the discordant nature of its materials and complexity of its functions.

It will be seen, from a consideration of the preceding details, that I place all vertebral distortions in the spinal column. But although I entertain this opinion of their nature and situation, I was never led to contend that they originate in the same tissue. On the contrary, I have always maintained that they commence in different portions, and require different methods of cure, according to the parts in which they are implanted. Some invade the bones, others the intervertebral substance, others, again, the articular compages. These several species are characterised by appropriate symptoms, and must be carefully distinguished from one another, because each of them requires a peculiar mode of treatment for its removal. First, When the vertebræ are the organs implicated, they are apt to become carious, and to lose some of their natural support, through the suppurative process. Disengaged, in this way, from a portion of their accustomed connexion, they are moved from their positions and propelled out of the column. The prominence thus exhibited is no unusual concomitant, and has been noticed in our earliest records.

This form of spinal suffering is of dangerous tendency, and frequently carries off the patient, by a lingering hectic. It has been so fully described in the

writings of Mr. Pott, that I refer the inquisitive reader to the works of that experienced surgeon.

Defective ossification seems to constitute another source of spinal complaints. This condition of the vertebræ may be the effect of increased absorption, or the scanty formation of osseous materials. In both cases the vertebræ are soft and light. Specimens of this distempered composition of the bones are to be found in anatomical museums, though the displaced vertebræ more frequently preserve their proper consistence. Even when they lose their natural figure from compression, what remains is generally hard and firm.

Secondly; The disorder sometimes commences in the fibro-cartilages. The case published by me in the *Med. and Phys. Journal*,* furnishes a striking example of this kind. It appeared, on dissection, that the material placed between the first and second lumbar vertebræ was wholly destroyed, and the vacancy contained only purulent sordes. The complaint was apparently ushered in with inflammatory symptoms, which terminated in suppuration, and destruction of the interstitial substance. It is highly probable, when this variety is better understood, that other instances of spinal suffering will be traced to the same

* *Ann.* 1823.

tissue. I shall, however, wave the further consideration, and proceed to the remaining division.

Thirdly; Having taken a cursory view of the two former heads, I propose to enter more fully into the consideration of this species, because it appears to me, not only to constitute the chief source of spinal complaints, but to have been too much neglected and overlooked by pathologists.

In my endeavour to trace the seat of spinal disorders to a new structure, and to exhibit them in a different point of view, I am aware that I have taken an adventurous flight, and one that has already exposed me to much prejudice and undeserved obloquy.

Encouraged, however, by the consideration, that every honest endeavour to relieve our afflicted fellow-creatures is entitled to a patient and candid investigation, I shall rely upon the liberality of my brethren, and no longer hesitate to explain my peculiar opinions. Though I have ventured distinctly to assert, that spinal maladies and distortions are frequently situated in the ligaments, I would not, as I have already stated, be understood to insinuate that they are invariably confined to this fabric. What I wish to maintain is, that although the disorder fixes sometimes in other tissues, its usual commencement, even in such cases, is in the vertebral ligaments; and that by bestowing greater

attention upon the natural figure of the back, we shall soon discover, that derangement in the anatomical figure of the spine prevails much more generally, and to a greater degree, than is either admitted or believed.

I have been frequently consulted after practitioners of great merit and experience had declared the spinal column to be perfect and well disposed, where the graceful hollow in the loins was wholly obliterated, or where the vertebræ, having been propelled from their positions, in various directions, appeared like a continued wreath from the neck to the loins. At other times, I have found particular vertebræ projecting outwards, inwards, or sideways, so as to discover to the finger and the eye an irregular and confused group. I have not hesitated, in these instances, to assert that the spinal chain was mechanically deranged, and have often proved the truth of my prognosis, by restoring its lost figure, and thereby obtaining a complete cure. I am far from joining the popular sentiment, and admitting, that in original conformation the spinal column assumes various shapes and external appearances. On the contrary, little or no variation prevails in this respect among newly born children. The several anatomical changes, which are impressed upon the spinal column, and lead to such distressing consequences, originate from accidental circumstances in the progress of life.

The instances are so frequent, and operate so extensively, that an elderly person with an erect gait and mien is almost a phenomenon. He more commonly displays a permanent stoop and bend in his back. In such cases, all the vertebræ, from the neck to the sacrum, are usually engaged. The trunk then assumes an unnatural, often grotesque, shape and appearance. When the prominence forms between the shoulders, or in the loins, it is often very considerable. These derangements, though generally esteemed the unavoidable consequences of advanced age, are in reality the effects of bad habits, of injuries, or of disease, acting slowly and insensibly upon the spinal column. How these several causes operate, and what tissue they invade, it will be my business to inquire. With this view, I shall next proceed to give a short account of the nature and composition of the vertebral connexions.

OF FIBROUS STRUCTURE.

An opinion seems to prevail, which it will be proper to notice in this place, — that fibrous structure, being incapable of stretching, never contributes towards the spinal gibbosities, incurvations, and other deformities which are so prevalent among delicate persons. How far this opinion rests upon a firm basis, will be more clearly understood, when we have taken a survey of the several parts which compose the vertebral joints,

and compared them with some other articulations. The fibrous structure of the vertebral joints may, for this purpose, be divided into, first, the white, and, secondly, the yellow ligaments.

1st. It has been observed by ancient and modern writers, that the humerus and maxilla inferior sometimes fall out of their sockets, through weakness of the ligaments.* I have myself witnessed a similar accident in the wrist of a young man. The fractured portions of the os femoris, when the misfortune takes place within the capsular ligament, are, it is well known, seldom reunited. The whole limb, in such cases, grows gradually shorter, by the superior part pushing upwards, and rising above the acetabulum. This alteration is necessarily attended with elongation of the capsular ligament, the tendons, and other component parts of the hip joint. Unless this change took place, it is clear that no new arrangement could be made in the situation and disposition of the thigh. As these accidents are produced by elongation of white articulating fibres, it follows that these substances will stretch, under certain favourable circumstances. The several joints mentioned have, like the spine, their capsular ligaments, their tendinous cords, and membranous expansions, by which the movable bony extremities are firmly supported and preserved in

* Celsus.

close connexion. So long as this tissue maintains its tone unimpaired, the ends of the bones remain in contact. It is only in proportion to the relaxation and stretching of this substance, that they are disjointed and severed from each other. Though none of these membranes will admit of sudden extension without being injured, they may be safely, and often are, considerably elongated by a slow and gradual progression. It is in this manner that the vertebral joints give way to the regular and imperceptible operation of constitutional causes.

2d. All yellow ligaments are elastic and extensible to a great degree, as we see in the suspensory ligaments of the heads of quadrupeds, in the substances placed between the cartilaginous rings of the trachea, in the middle coat of the arteries, and in the outer membrane of the corpora cavernosa penis. The yellow ligaments of the spine are strong, flexible, and admit of considerable motion. They, in the first instance, more than the white, suffer the vertebræ to vacillate and recede. Afterwards, both structures are brought to participate; and then the disorder advances with greater regularity and increased rapidity. All the vertebræ are articulated, and possessed of motion; but it is more limited in the dorsal than in either the cervical or lumbar vertebræ.

Besides the general elasticity above described, an

original difference is observable in the flexibility of the joints in different persons, which disposes certain individuals more than others to suffer from spinal maladies.

A different opinion is entertained by many persons in this country, which I am desirous to notice and counteract in this place, because it is erroneous in principle, and leads to mischievous results. Some can scarcely be prevailed upon to admit the articulated structure of the vertebral pillar. They say it is so firmly tied by ligamentary bands, and is moreover so well secured by the intervertebral substances, that the motion of a single bone is hardly perceptible. A highly respectable member of the profession, who is distinguished as a teacher and an author, denied positively, in my hearing, the jointed structure of the column. He said, the vertebræ are fastened together with so many strong ligatures, that each of them retains only a very slight degree of flexibility, and their movements are so unlike those of true articulations, that the two actions ought not to be confounded. This conversation took place not longer back than the year 1822, and shews how little the peculiar fabric of the spine had then been considered by the faculty at large. Since the conversation alluded to, the anatomy and diseases of this complicated organ have been more carefully examined, and much useful knowledge has been brought to light. Although

juster notions already prevail, it may not be a waste of time to state some of the reasons which led to the opinions that I have always held, and still maintain, upon this important question.

Whoever will dispassionately investigate the rotatory movements of the human spine, as well as its ordinary flexions backwards, sideways, and forwards, must, I think, perceive, that the several vertebræ* of the back and loins are endowed with no ordinary versatility. The extent of motion varies, it is true, considerably in different individuals and families. With some, the back will scarcely bend in any direction, while with others it is extremely pliable and yielding. I have seen many examples of both kinds, but I shall only detain my readers with the following.

A young lady, of twenty-five, rather plump, and above the middle stature, is well known to me, whose spinal column possesses such extraordinary flexibility, that she can at pleasure curl it to touch the back of her head with either heel. Nor is this astonishing aptitude confined to a single movement. It is equally conspicuous in every posture. In proof of her general disposition, she can bend her back in the opposite direction, and, stooping forward, seize with her lips a

* Derived from the Latin word *vertere*, to turn, because the vertebræ can rotate or turn upon each other.

piece of money deposited on the floor between her feet. Having drawn it within her mouth, she can raise herself into the erect posture, without any adventitious aid or support. We often meet with striking instances of spinal mobility in public exhibitions, some of which I have noticed;* but this is the most remarkable that I have witnessed myself in private life.

The pliancy of all this lady's joints is equally conspicuous, and a slight gaping of the bones may be distinctly felt when the joints are put into motion. I have frequently seen it displayed, by bending each of her fingers in quick succession, so as to strike their tips against the back of her hand. This she has repeated several times in my presence. A person furnished with such faculties, was, it may be imagined, strongly inclined to spinal distortion. She had at different times, according to her own account, so many indications and alarming symptoms of the complaint during early youth, that, in order to arrest their progress, she made it an invariable rule to repose several hours daily upon an inclined plane. Notwithstanding these precautions, carried on through several successive years, there is at this time an unnatural hollow in her loins, which, by compressing the crural nerves at their origin, occasions great inconvenience and weakness in the inferior limbs.

* See Med. and Phys. Journal, vol. li.

In order to produce these spinal flexions, all the vertebral joints must be endowed with unusual pliancy, or she would find it impossible to exhibit the tricks and gesticulations which she performs at pleasure, and apparently without an effort. It is quite clear, that unless the back admitted of great alterations in its external figure and appearance, these attitudes could not be produced. Accordingly, we perceive the spine on such occasions sinks inwards, making a semicircular depression whenever the foot approaches the occiput. On the other hand, when she stoops forwards, it pushes out the back into a roundish ball, or unsightly gibbosity.

I could adduce many striking instances, besides the one related, of increased susceptibility to spinal distortions in some persons over others. I shall, however, content myself with mentioning a particular family of my acquaintance. One of the daughters, aged eighteen, was lately under my treatment for lateral curvature. Two of her sisters, and a little brother, are, to my knowledge, suffering from a similar malady. Both parents lived many years in the West Indies. The mother was born and resided there till after her marriage. This lady displays extraordinary flexibility in all her joints; she wreaths and twists her back in every direction. She can likewise bend her fingers and limbs in a remarkable manner. The son, a fine boy of three years old, possesses similar

faculties. He surprised me exceedingly by bending his knee joints, at my desire, forward, backward, and sideways, to a greater extent than I had ever witnessed before. The two sisters, and my patient, are equally gifted with their brother. I am, moreover, informed, that the rest of the children, whom I do not know, have equal pliancy in their limbs. This family, including the mother, are all distorted in their figures, some more, and others less; but not one of them is wholly straight. To such a degree does this increasing complaint shew itself in some families, that it may, I think, be denominated hereditary, with as much propriety as gout, scrofula, pulmonary consumption, and the diseases which have hitherto been so distinguished. Like them, it may be prevented by timely care and judicious management. It is also speedily and effectually cured, if properly attended to in an early stage. Inveterate forms, and extreme cases, are alone of difficult removal. But this furnishes no new principle in the animal economy. Wherever disease has long taken possession of an organ, it acquires too much strength and firmness from the delay, to be eradicated without difficulty, exertion, and patience.

It is, moreover, well known, that the tendinous expansions called fasciæ, or aponeuroses, and the periosteum, will give way, and gradually enlarge, when they are pressed upon by hard bodies situated below them. Mr. Howship found the latter stretched and

lengthened, in the course of his researches into the structure of bones. Having fractured the thigh of a rabbit, and killed it at the distance of twenty-three days after the infliction, the broken bones remained disunited. "The periosteum surrounding the fracture was not lacerated, but had become very much thickened and elongated."* Other confirmations might be added, from the most respectable authorities, were they required, to shew the extensibility of all those organs; but as the foregoing proofs are sufficient to establish the principle for which I contend, I do not wish unnecessarily to multiply examples. We may therefore conclude, that the several ligaments which fasten the joints to one another, admit of being considerably stretched, and pulled, and bent, without being either torn or injured.

The foregoing observations apply directly and forcibly to explain those deviations of the spine in which the white and yellow ligaments are equally concerned. If we admit, as we must necessarily do, the elasticity of these substances, and take into account their anatomical connexion with the vertebræ, and with one another, we shall find no difficulty in understanding by what agency the vertebræ slide out of their places, and form those monstrous distortions which daily meet

* Howship on the Formation of Joints. Med. Chirurg. Trans. vol. viii.

our eyes in the public walks. They may be produced in the most healthy constitution, by adopting a leaning posture, and continuing in it day after day, for a long time together. This is exemplified in the colliers of a particular mine in Lancashire, who are, I am told, obliged, from the thinness of the stratum, to sit in a bent posture, and force their right side into the vein, while digging out the coal. In process of time, the spine is, in all of them, curved towards the right, from their continuing so many hours in a strained attitude. These labourers sleep above ground, and therefore preserve their health unimpaired, except in as far as it suffers from their mode of working among the coal. Similar gibbosities, arising from the same cause, are said to prevail among the colliers near Rotherham in Yorkshire. The intervertebral substance is in these persons squeezed together, and compressed on the left side, by the bodies of the vertebræ being pressed nearer to each other. The same vertebræ are forced asunder on the opposite side; in consequence, the ligaments are stretched and extended. When the position is frequently changed, and the incumbent weight removed, the intervertebral matter for some time recovers its former dimensions. The vertebræ no longer press unduly upon the ligaments, which contract by an inherent elasticity, and resume their former position. Repetition produces similar effects, which are also removed in the same manner. At length, some of the ligaments give way permanently,

and permit a single vertebra to jut out. A lodgement being once made, and the same causes continuing to operate, it protrudes more and more. Other vertebræ follow in succession, because the proper support being taken away, they no longer receive their accustomed protection. We may also advert, in confirmation of the preceding details, to the well-known historical fact, that the Athenian rowers were deformed in the shoulders, from their peculiar occupation on ship-board. The greater part of the Thames watermen are said to be similarly affected, and, as it should seem, from the same cause. It is likewise well known, that the bargemen in the king's ships are selected for their graceful and athletic figures. The principal business of these mariners is to convey officers from place to place, chiefly by rowing. Sailors so employed gradually lose their fine shapes, and are called, in the jocular language of their comrades, "bible backed," to mark the striking change of personal appearance, from their new service. In France, too, the aged vine-dressers, (*les vieux vigneronns*,) contract, from daily occupation, a permanent rotundity in their backs. With many it increases to a decided hump. Labourers in working among the vines are obliged to remain constantly stooping. This posture assumes at last a fixed and unalterable habit, because the spinal joints first assume a new action, and afterwards accommodate themselves to the change. It is owing to a similar disability of the ligaments,

that certain religious fanatics in the East* lose the power of moving those parts of their bodies which they had long held in a state of continual restraint. We have here an assemblage of curious facts, observed and recorded in very different situations and circumstances. Nor must it be forgotten, that these several distortions occurred chiefly in vigorous constitutions, from the employment of severe and long-continued muscular action, aided sometimes by a favourable disposition of the person.

During the labour of rowing, for example, the muscles of the arms and back powerfully withdraw the articular tissue from the upper dorsal vertebræ, while, by the position adopted, these vertebræ are as forcibly impelled in an unsupported direction. The spinal column is so firmly bound together, and its parts are so curiously interwoven, that they for a time successfully resist the most powerful efforts. Frequent repetitions oblige them at length to give way. A single bone slips a little. The phalanx, once deranged, becomes more easily broken, and ultimately suffers all the irregularities which have been represented. Playing upon the piano-forte is, for the reasons already given, a dangerous recreation, particularly with delicate females. Though the per-

* Mémoires relatifs à l'Expédition Anglaise, par M. le Comte de Noë, Pair de France, 1826.

formers neither raise their shoulders nor exert their arms, like athletic boatmen; yet, nevertheless, stooping to finger the keys, and long-continued muscular activity, dispose the back to bend outwards. This injurious consequence might, I think, be often averted, were the notes and instrument placed high enough to preserve the trunk erect during the performance. Moderate action of the arms strengthens the organs, and prevents deformity, when it is assisted by a good carriage.

It is a melancholy fact, that few ladies moving in elevated society enjoy a correct figure: nor can any real improvement be contemplated for them, so long as the pernicious customs which lead to vertebral deformity and its inseparable concomitant, sickly health, are so generally encouraged. Now that the nature and origin of spinal affections are so much better understood, we may reasonably expect, that in future, parents will be solicitous rather to bestow upon their children useful acquirements, than to exhaust their stamina with mischievous embellishments. The ardour with which the latter are prosecuted is truly surprising.

Mediocrity is no longer tolerated among the ladies in any pursuit. Nor do they rest satisfied with a single accomplishment: they try ambitiously to excel in many. In the mean time, invigorating exercises are

neglected, and the frame becomes gradually undermined by sedentary studies too long indulged. A predisposition acquired in this way facilitates the approach of spinal complaints, and enables very trifling causes to establish them permanently.

The very admission, that muscular exertions are sufficient of themselves, under any modifications, to occasion spinal distortions, encourages a belief that they cannot, when once formed, become instrumental towards their removal. These, however, are questions to engage the ingenuity and talents of the advocates and abettors of muscular action in the removal of spinal maladies. How they will be able to reconcile the preceding facts with their favourite hypothesis, is more than I am able to anticipate. I freely acknowledge, for my own part, that I do not understand by what mode of agency, the same set of muscles can be made first to introduce a complaint, and afterwards, by continuing their operations, under different management, to work the cure.

A knowledge of the injurious effects of posture upon the spines of hardy labourers, cannot be too strongly impressed upon the minds of parents and teachers. I have already adverted to the over-anxiety to educate girls in the fascinating accomplishments of music, drawing, and dancing, in the prosecution of which they are confined in hot rooms, and forced

into strained attitudes, for hours together, and to the manner in which it has led, in different ways, to the most distressing consequences. If long perseverance in any habit be sufficient to produce distortion and deformity in the spinal arrangement of adult and athletic males, it will surely be much more likely to induce them in the sickly and pampered children of the affluent. Though various causes may be assigned for the increased prevalence of these complaints in our time, I am convinced that the relaxing effects of hot rooms, and a too ardent pursuit after feminine accomplishments, are the principal ones. By admitting the elasticity of fibrous structure, and its disposition to stretch under certain favourable circumstances, we are enabled to understand many obscure actions which are going on in the animal economy, and, in particular, to fix the doctrine of spinal distortions upon a simple and stable foundation.

I now proceed to give a brief anatomical description of the spinal articulations, and various matters which compose them.

OF THE SPINE.

The vertebral pillar, spinal column, or back bone, is a long bony stalk, formed by the superposition of twenty-four bones, to which, from their ability to

turn round, the common name of vertebræ is given. It occupies the back and middle of the trunk, of which it constitutes a sort of centre. It supports the head by its upper end, the superior extremities and breast at the middle, and is in turn borne by the pelvis at the lower end. Since the vertebral column protects the higher parts of the body, and accommodates itself to their movements, it must of necessity possess a great deal of strength and flexibility. The solidity of the spine is given by the vertebræ. Its elasticity arises from the flexible cartilages placed like sections of a cylinder between each of the bones. The pillar is usually divided into three regions. The superior, or cervical, answers to the neck, and consists of seven vertebræ. The middle, or dorsal, assists in forming the thorax: it comprises twelve vertebræ. Lastly, the third or lowest, named lumbar, corresponds to the loins, and includes five vertebræ.

The vertebræ are disposed horizontally one upon the other. Their figure is symmetrical, their size very considerable in the lumbar region, diminishing with some irregularity as they rise higher in the column.

We designate the vertebræ numerically, computing them from above downwards, or more commonly by the names of the regions in which they are deposited.

The first cervical vertebra has received the name of atlas, from its supporting the head. The second is called dentata, because it possesses a round prominence, a sort of axis, or tooth-like pivot, upon which the first vertebra revolves. The vertebræ are all fashioned upon a common model; yet their general figure varies according to the divisions in which they are found.

Every vertebra consists essentially of some portion of a solid cylinder placed forwards, and of a ring furnished with several projections behind. We enumerate upon this middle line, and on each side of it: First, The body; a considerable portion of the whole is convex before, flat or concave behind, to correspond with the vertebral canal. It is connected with the rest of the vertebræ by a sort of pedicle or stalk. Secondly, The vertebral canal, situated between the body and apophyses. Thirdly, The spinous process jutting backward, leaving between it and the two next, certain spaces filled with muscles and ligaments. On each side of the vertebræ we observe: 1st. Two sloping notches, hollowed towards the pedicle, by which they are united to the bodies, and destined to form a continuous canal, with similar notches in the contiguous vertebræ. 2dly. Two oblique or articulating apophyses, one superior, the other inferior, articulated with similar apophyses in the two next vertebræ. 3dly. One transverse

process, directed outwards, as its name indicates. 4thly. A flat plate, united with that from the opposite side, to furnish the spinous process which occupies the back of the vertebræ.

OF THE VERTEBRAL ARTICULATIONS.

The vertebral column, formed of numerous bones, joined together in many parts of their surface, offers to our attention a series of very intricate, curious, and complicated articulations. Some of these are common to all; others are peculiar to certain vertebræ, and present, in consequence of the varying forms of the bones, differences very important both in the number and disposition of the ligaments which connect them. Such are the articulations of the two first vertebræ with each other, and with the occiput. We shall defer what we have to say concerning the two last articulations, and confine our observations at present to those which are common to all the bones of the vertebral pillar. In this respect, we shall find the vertebræ forming articulations: 1st, by their bodies; 2dly, by their oblique or articulating apophyses; 3dly, by their plates; 4thly, by their spinous processes. The means of union is sometimes limited to each vertebra, as in the intervertebral fibrous cartilages, the yellow ligaments, and the interspinous ligaments; or they apply to the whole

column : such are, the anterior and posterior vertebral ligaments, and also the superspinous ligament.

First, The articulation of the bodies of the vertebræ.

The anterior vertebral ligament occupies the forepart of the bodies of the vertebræ, from the second cervical to the sacrum, under the form of a flat, fibrous bandage. It has a bright, pearly appearance, and is narrow and thin in the neck. It enlarges and becomes thicker in the back and loins. In the latter region it is strengthened by the pillars of the diaphragm. Its external appearance is concealed by deep-seated organs in the neck, chest, and belly. The back side rests upon the bodies of the vertebræ and the fibro-cartilages, to which it adheres very firmly. We find at the sides, neck, and level of every joint an oblique fibrous bundle, which extends from the higher vertebræ to the next below it. The fibres of this ligament are longitudinal. They leave little vacancies for the vessels to pass through. Some are superficial and long; others deeper and shorter. This ligament holds the bodies of the vertebræ in front, and resists any extension of the column.

The posterior vertebral ligament is opposed to the former, being placed behind the bodies of the vertebræ. It begins at the second vertebra of the neck, and extends to the sacrum, where it terminates insensibly.

This ligament, resembling in shape a long fillet, is narrower in the back than either in the neck or loins; and is, moreover, drawn closer together in places, because the fibrous riband, of which it consists, contracts at the middle of every vertebra, and dilates again behind each of the cartilages. It is of close texture; the posterior is polished, shining, and aponeurotic. It is shaped to the vertebral canal and the investing membrane of the spinal marrow. The anterior surface adheres to the bodies of the vertebræ, and still more to the fibro-cartilages. This ligament is made up of longitudinal fibres,—the deep-seated are short, the superficial longer. It assists in confining the bodies of the vertebræ, and in limiting the motions of the spinal column.

The intervertebral fibrous cartilages are pieces of pliant and elastic cushions, placed between the bodies of the vertebræ, in the spaces which separate the second and third, to the junction of the last with the sacrum. Their form in every division corresponds exactly to the bodies of the vertebræ between which they are deposited. They go on increasing in size from the cervical division, in which they are very thin, to the loins, where they are thickest. In the neck and loins they are thicker forward than behind. It is reversed in the back.

They adhere very closely, by their upper and

lower sides, to the corresponding surfaces of the vertebræ. Their outer edge agrees in front with the anterior, and behind with the posterior vertebral ligament. There is at the sides a partition in the bones,—superficial depressions to receive the heads of the ribs. The intervertebral fibrous cartilages are confined on the outside by ligamentous fibres. They are very strong, having a common centre, and the fibres laid obliquely across each other.

These fibres, less in number behind than in front, leave between them spaces which increase towards the middle of every cartilage. We discover in these intervals a soft, pulpy, uniform, and glutinous substance, which is confined in them. If we cut the cartilages horizontally, and macerate in water, they imbibe some portion of the liquid, swell, and assume a conical figure. These fibro-cartilages impart to the spine its pliancy and its elasticity.

Secondly, Articulation of the oblique processes.

The surfaces of the articulating apophyses are covered with thin cartilaginous incrustations, which rest upon a small synovial bag, reflected from one projection to the other. The joints are defended on the outside by a few irregular ligamentary fibres.

Thirdly, Articulation of the vertebral plates.

The yellow ligaments fill the empty spaces lying between the vertebral plates, from the second cervical to the last lumbar. They take the figure of the spaces. Narrow and thin in the neck, they become gradually larger in descending. Each is divided into two quadrilateral portions, one extending towards the right, the other to the left. They are reunited cornerwise behind, at the middle of the commencement of the spinous process. Their superior edge is attached to the internal surface of the vertebral plate above: the inferior to the same edge of the lower plate. They appear backwards to be continuous with the interspinous ligaments. They consist of a stout, elastic, and very firm yellow tissue. These ligaments complete the vertebral canal behind. They resist too much flexion of the spine, and assist in rectifying its obliquity, by their elastic disposition.

Fourthly, Articulation of the spinous processes.

The interspinous ligaments fill up the spaces lying between the spinous processes in the back and loins. In the neck, they are furnished with muscles. The ligaments look like small membranous fibres, and assume the figure of the spaces which they occupy. They are narrow and triangular in the back; large, strong, and quadrilateral, in the loins. Their superior edge is attached to the inferior part of the spinous processes above, and the inferior border to the

upper portion of the spinous apophyses below. They are mixed backward with the superspinous ligament. They consist of irregular fibres, each running obliquely from one spinous process to another. They secure the vertebræ behind, and prevent too great flexion of the spinal column. The superspinous ligament is placed behind the tops of the spinous processes of the dorsal and lumbar vertebræ, from the seventh cervical to the middle tubercles of the posterior surface of the sacrum. It is thinner in the back than in the loins, where it is very thick. The fibres are disposed longitudinally; some being superficial and longer, others deeper seated and shorter. They correspond with the skin behind, but are before inserted into the tops of the spinous processes. In the intervals they are mixed with the interspinous ligaments. The use of this ligament is to confine the vertebræ behind, and restrain the too great flexion of the spinal pillar.

It appears from the preceding short anatomical description of the spinal column, that each vertebra is furnished with five distinct and separate articulations, independent of the jointed structure of the plates and spinous processes. An organ of such inherent complexity, and latitude of motion, is necessarily exposed to many casualties, in discharging the ordinary offices of life, under the greatest care and circumspection. But if the body be long confined, or often put into a strained attitude, the spine

will gradually acquire in the strongest constitution a fixed habit, and at length remain in it, after the posture is discontinued. In this way, the column becomes a little convex towards the right, between the shoulders, and concave towards the left *in right-handed persons*.* The deviation takes place, because, from the habitual position of the arm, the spine is forced to take that direction. *In left-handed persons*† the order is reversed, which affords a convincing proof, that the above explanation is true, and agreeable to the phenomena. This principle admits of a few exceptions, which will be pointed out in their proper places. I have already shewn, that hardy labourers suffer in the same way, and to a great degree, from continuing in forced postures during their working hours. With these well-authenticated facts before our eyes, we can no longer be at a loss to account for the lamentable distortions so generally seen in delicate females, who, in pursuing the fashionable modes of education, are condemned to remain many hours together in dangerous and unnatural attitudes. We may reasonably conclude, that if the rigid stamina of healthy peasants are obliged to submit, the pliant organs of tender girls will afford only a feeble resistance. It has already been shewn, that the human spine is endowed with extensive motion, forwards, backwards, sideways, and circularly.

* See Bichât, Cloquet, &c.

† See Becland.

In order to understand these several contortions, we must bear in mind, that each vertebra possesses five movable joints. Four of the diarthrodial character are formed by the two superior oblique processes being articulated with the two inferior of the vertebra immediately above it. The two inferior are in like manner articulated with the superior processes of the vertebra below.

This description of joints enjoys greater latitude of action than any other. Those of the vertebral apophyses are particularly free, because the bony surfaces are small, the capsular ligaments thin, and the surrounding fibres few in number. The remaining articulation has, as its name imports, the power of motion in every direction.

The fibro-cartilages, placed between the bodies of the vertebræ, are capable of great extension, and of being squeezed into a very small space, while the middle part is incompressible, or nearly so. It therefore becomes a fulcrum or pivot, on which a ball and socket may be made with such a gradual yielding of the substance of the ligament, into whatever direction our spines are turned, as saves the body from the dangerous consequences of violent shocks.

Hence it is evident, that the centre of motion is altered in different positions of the trunk. When we

bow forwards, the upper moved part bears entirely on the bodies of the vertebræ, which must be brought nearer together in the part pressed upon. If we incline back, the oblique processes sustain the whole weight. On reclining to one side, we rest upon the oblique processes of that side, and part of the bodies. When we stand erect, all the bodies and oblique processes have their share in our support. The extent of these several flexures is limited much more by the yellow and other ligaments, than by the capsular and fibrous structure immediately surrounding the joints. The former being strong, resist with great force all violent exertions. So long as they preserve their tone unimpaired, the different joints continue firm and tight. There is no vacillation, no looseness, in them. But if great efforts are made, and frequently repeated, or if the ligaments be habitually exposed to long-continued exertions, however slight, they gradually elongate, stretch, and suffer the entangled vertebræ to slip, sometimes in one direction, sometimes in another. The deviation is at first so little as to be scarcely apparent. It slowly increases, and in the course of years produces those frightful gibbosities which continually assail our eyes in this crowded capital. It follows, from the foregoing statement, that the distortion is confined to no particular direction; but the vertebræ are driven backwards, forwards, or sideways, by the varied operation of the same occasional causes. This, as it appears to me, is the true origin of all

spinal deformities, however dissimilar their external appearances, if the vertebræ be sound and healthy. When they are diseased, the complaint assumes a different character as well as aspect, and requires other modes of treatment for its removal. Though I have, as already observed, been accused of limiting the seat of this malady in every instance to the ligamentary structure, I never entertained such an unreasonable opinion, as will be apparent on an unprejudiced examination of my former statements. To them I appeal with perfect confidence for proofs of my consistency.

It follows, from the preceding observations, that the opinion which prevails generally in this country, of the spinal column being too firmly joined together to admit of the smallest separation under ordinary circumstances, rests upon an untenable foundation. Indeed, this conclusion is opposed to every day's experience of what is going forward in the animal economy. The flexibility of the spinal chain was well understood and fully admitted by the father of physic, as appears by the expressions that he employed when treating on it. The term *σάχις*, *spina dorsi*, is derived from *ῥήσσω*, *frango*, *quia spina multis vertebriis rupta*. He also denominates the spine *κλονιον*, from *κλονεω*, to shake or tremble. It is clear, from the significant words used, as well as from the tenor of his numerous writings, that Hippocrates was well acquainted with

the disposition of the spine to lose its natural arrangement.

After the foregoing remarks on the extensibility of fibrous structure, and a few preliminaries on luxations in general, I shall proceed to consider more particularly the nature and treatment of spinal complaints. Their alarming increase, their extraordinary obstinacy, and the many distressing consequences to which they lead, entitle them to the attentive consideration of all medical practitioners. These maladies are, as I have already observed, produced in various ways, and fix their seats in different tissues; but as elongation of the ligaments, with displacement or luxation of the vertebræ, is the most common cause, I propose, in the first division, to confine myself to this variety.

It is not my intention to enter into the consideration of joints, further than to explain the pathology and general treatment of vertebral dislocations.

If one of the articulating bones be either wholly separated, or only partially removed* from the other,

* “Maxilla verò et vertebræ, omnesque articuli, cum validis nervis comprehenduntur, excidunt aut vi expulsi, aut aliquo casu nervis vel ruptis, vel *infirmatis*: faciliusque in pueris et adolescentulis, quàm in robustioribus.”—*Celsus de Ossibus*.

For an instance of complete dislocation in one of the cervical vertebræ, without fracture, see the *Lancet*, for March 1827.

the disorder is called a dislocation, luxation, or disjunction. In medical writings these are words of the same import. The first derives its origin from *de loco*, out of place; the second from *luxo*, I loosen or disunite; the last from *de jugo*, out of the yoke—a phrase taken from the ancient mode of unharnessing draught oxen. The corresponding Greek terms are *εξαρθροσις*, *σπριγμα*, *διαλυσις*.

These are definite expressions, and free from all ambiguity; a proof that the medical writers of antiquity were more correct in their phraseology than the moderns. Displacement is also frequently used to mark the lower grades of dislocation, but very improperly, since we employ it to denote the changes in soft parts, as well as in joints. For example, if a portion of naked intestine pass out of the abdomen or pelvis, we call the projection a prolapse. When the integuments are carried along with the bowel, and conceal it, we denominate the tumour a hernia. For the same reason, every derangement in the articulations is called a luxation or dislocation. As these several extrusions are *real displacements*, it follows, that whenever the term is employed without a careful definition, it is more likely to mislead than to inform.

The foregoing remarks are not made to bolster up any particular doctrine, but from a desire to introduce a more correct nomenclature into this branch of the

healing art. As far as relates to my own opinions, it is really of no importance whether it be said that the vertebræ are luxated or displaced. All that I contend for, is, that the articular ligaments elongate before the vertebræ change their position.

Nor is this doctrine brought forward to serve a particular purpose on the present occasion. It is merely a repetition of the sentiments contained in the letter written to my first spinal patient, before her treatment commenced. In explaining my views, I neither mentioned luxation nor dislocation, because, in writing to a lady, I did not think it necessary to clothe my ideas in a professional garb.

It is usual to divide luxations into two stages or species. The first takes place when one of the bones is wholly removed from its fellow. The dislocation is then said to be complete, perfect, or entire. In the second, the bones still remain more or less in contact with each other. This latter example is denominated an imperfect dislocation, a subluxation, or partial disjunction. Most joints admit of both dislocations, and in every degree. Hippocrates, in his treatise *De Articulis*, observes, "We may conclude that the articulations which slip, and are disjoined, do not always fall out entirely, nor are they invariably luxated in the same manner. In some the dislocation is much more considerable than with others. When it is

extensive, the parts are replaced with greater difficulty, but unless they be restored, the bones, the flesh, and the habit of body, are all debilitated, and much injured. Should the bones slide, and be luxated in a small degree, they are more easily re-instated; but if the reduction has been neglected, or the attempt failed, the inconvenience is less than with the former. It is of great consequence in the other joints, to determine whether the dislocation be of great or little extent. With respect to the heads of the thigh bone and arm, the luxations are very similar, because both are round. The cavities which receive them are likewise round, and adapted to their figure. Hence it follows in these joints, that one half cannot be displaced. The bones, on account of their rotundity, must either fall entirely out of the socket, or return into it again. Therefore, as far as relates to the present subject, they are wholly or very little dislocated. Sometimes they are forced to a greater, and sometimes to a less distance from their natural situations. This deviation is more observed in the thigh than arm.

“Luxations in early infancy, if the removal be small, may be entirely corrected, especially in the joints of the feet.

“Most of those can be cured whose legs have been bent inwards from birth, unless where the deformity is very considerable, or affects children further

advanced in age. It is of the greatest consequence to enter upon the treatment before there be any great defect either in the bones of the feet, or in the flesh of the leg.

“These crooked legs do not afflict in one, but many ways. Generally the foot is forced inwards, because the joint is not driven entirely out of its place, but some part of it being arrested, it becomes inured to the same position. We must be careful during the cure, that the tibia in reference to the ankle be forced and driven inwards. On the other hand, the os calcis is to be thrust directly backwards, that the prominent bones may be replaced both in the middle and across the foot.”

It is clear, from these excellent remarks, that Hippocrates was well acquainted with the nature and treatment of luxations, though he has been led, in some instances, to confound them with original or connate distortions of the limbs. According to him, every articulation in the body is capable of perfect, and, excepting the hip joint, of which he speaks doubtfully, of imperfect dislocation also. With the recorded opinion of such an authority before us, it is very surprising that subluxations should have been so generally overlooked in modern times. One would rather be led to conclude, *à priori*, that members admitting of complete disruption and separation would,

in more favourable circumstances, be only partially severed and disunited. Such is really the fact, and it is, moreover, agreeable to experience, that many joints easily subluxated will scarcely allow of entire disjunction. It is of great importance to distinguish between the several sorts of deformities which afflict the human body, in order to establish a rational mode of cure for each. The limbs lose their figure from many causes. Some are primitive, and depend upon original malformation. Others are acquired in the progress of life, and proceed from hurts, mismanagement, or disease. Since my attention has been particularly occupied with the pathology and cure of personal deformities, both original and acquired, I have been pleased to find them more obedient to rule than I had anticipated. In childhood the ligaments elongate with ease, and the bones imperfectly ossified give way to slight pressure. They can be moulded and squeezed into almost any form and shape. By taking advantage of this plastic disposition, the affected members may be easily compressed, and held in the wished-for position, with ligatures and mechanical contrivances. The parts thus fixed readily adapt themselves to the change, and, after a short trial, become so entirely reconciled to the alteration, that, with little subsequent management, they will permanently retain it. One of the most common and afflicting deformities of the human frame is the club-foot, the *varus* and *valgus* of the Romans. In the first variety, the sole of the

foot is turned inwards; in the latter, it is reversed. Both deviations are productive of lameness, and make walking exercise both difficult and troublesome. Conceiving the disorder to be situated partly in the ligaments and partly in some of the tarsal bones, I begin the treatment by shaping a metallic sandal to the size of the foot, with the edges turned upwards to confine the part more firmly, and prevent its sliding about. After the foot has been placed in the sandal, it is to be secured with circular bandages, carefully applied. The foot and envelop are to be deposited in a deep leather shoe, made to receive and confine them. A thin iron plate, screwed to the bottom of the shoe, with a flat steel rod attached to it at right angles, and surrounded with soft leather, is then to be placed along the inside of the tibia, as far as the knee. A broad linen fillet of moderate tightness passed round it and the limb, from the foot to the knee, completes the mechanism and its application. When the limb has been properly secured, little irregularity is apparent. The several parts of the apparatus are to be frequently examined, and occasionally drawn firmer and closer to the leg and foot. Every thing being carefully adjusted, the foot must be permanently retained in its new situation. Though irksome at first, after a few days the bones and ligaments accommodate themselves, and the position ceases to be disagreeable. By steady perseverance the disorder will

at length be entirely subdued, and the patient rewarded with a complete cure. The same instrument, with few alterations, will be equally useful where the ankle joint presses too much either outwards or inwards.

For the bowed leg and distorted knee, the steel rod must be stretched along the leg and thigh, as far as the middle of the latter. A linen or cotton roller is then to be carried round the instrument and limb, of a suitable firmness, and sufficient length to encircle the whole deformity. The rod, well padded and stuffed, is to be furnished with joints opposite to the ankle and knee, to enable them to play freely, and conform to the varying movements of the member. When the mechanism has been judiciously executed, and is altered as the case requires, it is a gratifying sight to contemplate the pliancy of the affected part, and observe its disposition to assume a more perfect shape.

It has been repeatedly observed in the course of this work, that complete luxations are usually the consequences of external violence, while the imperfect more generally originate in constitutional causes. As the latter have been so much neglected by our best modern authors, I propose to make them the subject of a few general observations for the better elucidation of spinal complaints, and from a wish on my part to

draw the attention of my brethren particularly to them. Were these maladies incurable, according to an opinion too commonly entertained, the inquiry would be of little moment to the sufferers. But since it has been clearly shewn in the preceding pages, and more fully by the continental faculty, * that in an early stage they are speedily subdued, it will not be too much to assert, that the business of life, for which these invalids are nearly disqualified, as well as their most valuable enjoyments, will be essentially promoted by a full investigation. This undertaking will, I hope, be soon carried into effect in this country, by some medical gentleman who has leisure for the employment.

In the mean time, it is presumed that the following cases, and annexed engravings, will not be unacceptable, or deemed irrelevant. Together they exhibit a clearer view of subluxations and distortions in the inferior extremities, than could have been conveyed in the best written description, without the aid of prints.

The reader will easily perceive the distorted appearances of the lower limbs in the different engravings, and find no difficulty in tracing them to their true source.

* Boyer, Scarpa, Delpech, &c.

PLATE I.

In the first print, the right thigh is bent inwards at the knee, and is, moreover, slightly rotated. The head of the femur is consequently twisted in the cotyloid socket. The internal condyle of the femur inclines upwards, and its fellow is equally depressed. By this deflection the patella rests on the external condyle. The hollow in the outside of the knee arises partly from the intrusion of the femoral condyle and patella, but much more from the heads of the tibia and fibula being driven inwards. The enlargement of the joint on the inside is occasioned by the femur and tibia pressing unduly in that direction.

As the superior end of the fibula sinks into the hollow, the lower discovers an unusual prominence. The internal ankle is also forced outwards, by displacement of the tibia at its upper extremity.

In the left thigh and leg the deviations are less striking; but the knee presses inwards, and the internal ankle is unusually protuberant. It is also evident, from the turn of the foot, that this ankle is partially dislocated.

PLATE II.

Though the distortions are more indistinct behind, the defective arrangement is visible in both knees.

A

B

F

D

G

H

I

C

K

M

L

E

N

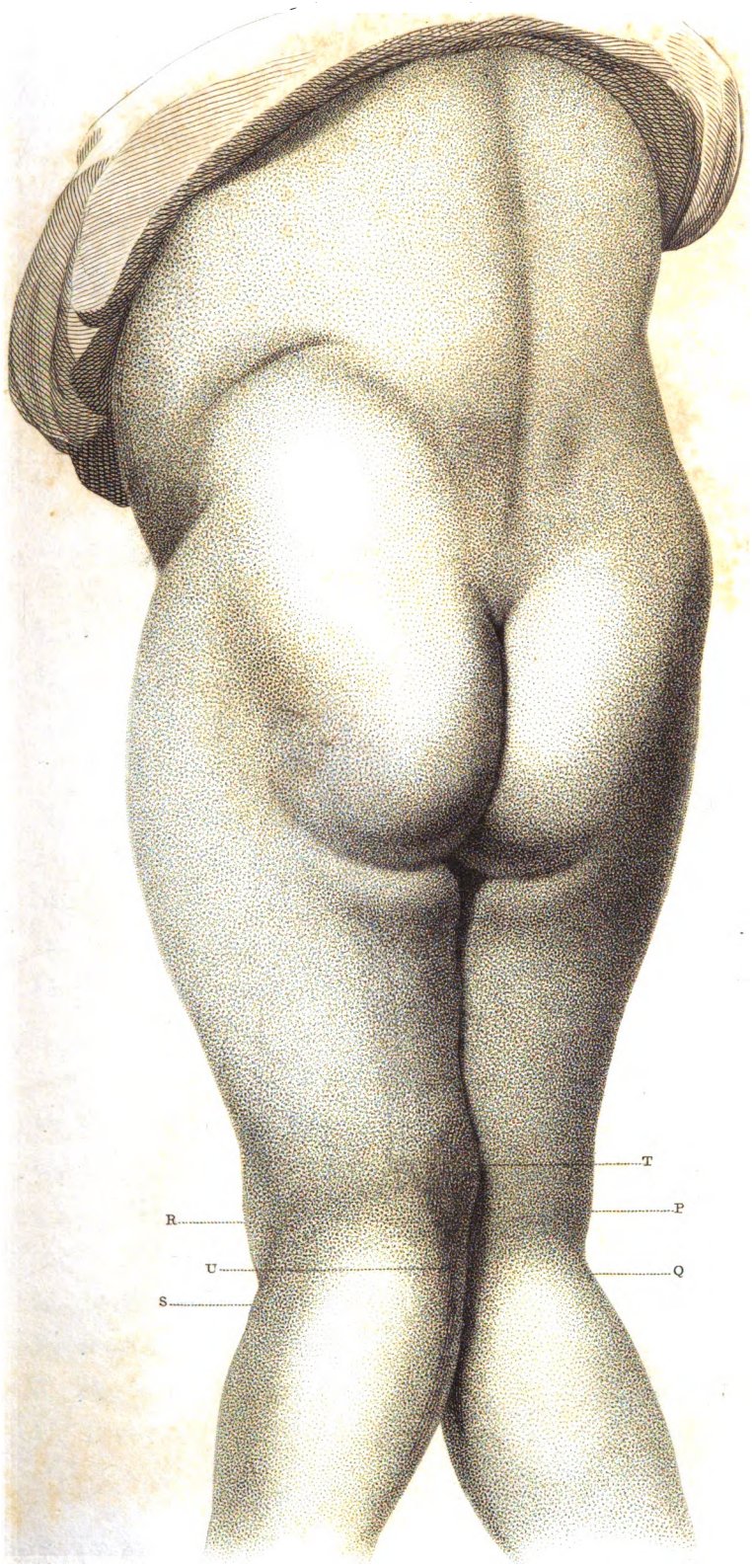
O





F. H. Green del.





R ———— T
U ———— P
S ———— Q

PLATE I.—*Front View, Right Side.*

- A. Hip joint concealed.
- B. External condyle of the femur.
- C. Internal condyle of ditto.
- D. A hollow, occasioned chiefly by the tibia sinking inwards.
- E. Inner head of the tibia prominent.
- F. The patella.
- G. Head of fibula pushing inwards.
- H. Outer ankle.
- I. Inner ankle.

PLATE I.—*Front View, Left Side.*

- K. Outer condyle of the femur.
- L. Outer head of tibia.
- M. Patella.
- N. Inner ankle.
- O. Foot inclined inwards.

PLATE II.—*Back View, Right Side.*

- P. Outer condyle of femur tending inwards.
- Q. Outer head of tibia pushing inwards.

PLATE II.—*Back View, Left Side.*

- R. Outer condyle of femur.
- S. Upper head of tibia.
- T. Inner femoral condyle.
- U. Inner head of tibia.

The irregularities discoverable in these two prints were taken from a girl of six years old. She was well shaped at birth, and continued a good figure, till she fell into weakly health about four years ago. From that time she began to falter in her gait, and to be soon tired. Her knees gradually lost their proper direction, and inclined inwards. Shortly after, her ankles became affected, and jutted out more than they had previously done. Inability to move her limbs, and deformity, have been constantly increasing since her first seizure. She walks with an infirm step, and has great difficulty in elevating her feet from the ground.

It is clear, from the appearance of both limbs, that the malady is confined to the hip joints, the knees, and ankles. These, having lost their natural disposition, are true subluxations, or imperfect dislocations.

A steel machine, constructed according to the above-described principle, and possessing joints to correspond with the several articulations, was fixed to the lower limbs. The little girl wore it for some time, and conformed strictly to the prescribed rules. During this period, the hip and ankle joints were entirely replaced. The knees also acquired a better disposition; but less attention having been subsequently bestowed upon the case, the patient's recovery has been proportionably retarded.



S. Bellin sculp.

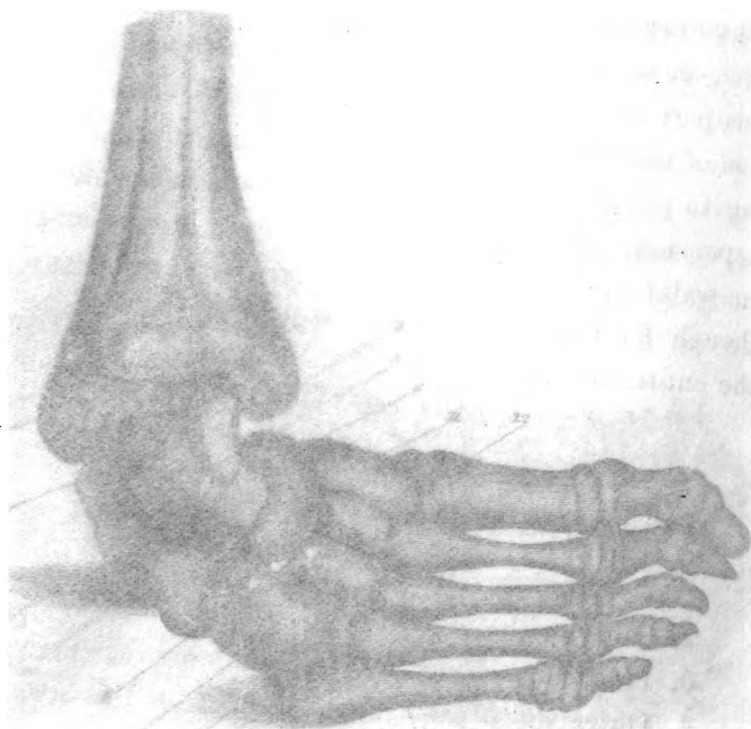
The three next engravings are intended to distinguish and explain the common variety of club-foot, the *talus* of authors. In the first, the neck of the astragalus is considerably elongated. It is, moreover, bent inwards; whereas the perfect bone is in this part nearly straight, and its direction, the position of the foot is so situated, that in order to get it up to put it down, the sole is raised, and adapted to expansion, or of being spread the upon the ground. In walking, the weight falls upon the outer edge; though for convenience and use it should rest upon the entire sole or plant.

PLATE III.

Explains the Structure of the Astragalus.

1. Inner ankle.
2. Outer ankle.
3. Inner edge of astragalus, } Showing the curved
4. Outer edge of astragalus, } direction of this bone.
5. Marks the attachment of the capsular ligament, beyond which the bone is drawn out into an oblique head. N.B. Os naviculare had never met with its articular surface here seen.
6. Os naviculare very much hollowed to adapt itself to the sharp form of the anterior head of the astragalus.
7. Body of cuboid bone, very convex.

* Dublin Hospital Reports, vol. i.



The three next engravings are intended to distinguish and explain the common variety of club feet, the *varus* of authors. In the first, the neck of the astragalus is considerably elongated. It is, moreover, bent inwards; whereas the perfect bone is in this part nearly straight. By its deviation, the position of the foot is so much changed, that on attempting to put it down, the sole is rendered incapable of expansion, or of being spread flat upon the ground. In walking, the weight falls upon the outer edge; though for convenience and use it should rest upon the entire sole or plant.

PLATE III.

*Explains the Skeleton of a Child's Club Foot.**

1. Inner ankle.
2. Outer ankle.
3. Inner edge of astragalus. } Shewing the curved
4. Outer edge of astragalus. } direction of this bone.
5. Marks the attachment of the capsular ligament, beyond which the bone is drawn out into an oblong head. N.B. Os naviculare had never moved on the articular surface here seen.
6. Os naviculare very much hollowed, to adapt itself to the sharp form of the anterior head of the astragalus.
7. Body of cuboid bone, very convex.

* Dublin Hospital Reports, vol. i.

8, 9. Shew the places where the articular capsules had been attached, and the great length of bone included within each of these sacs, all of which was covered with cartilage.

10. Outer edge of the os calcis.

11, 12, 13. The three cuneiform bones.

PLATE IV.

Was taken from a Child of Three Weeks old.

1. Inner ankle.

2. Outer ankle.

3. Internal edge of the foot turned upwards and inwards.

4. External edge of the foot turned downwards and outwards.

PLATE V.

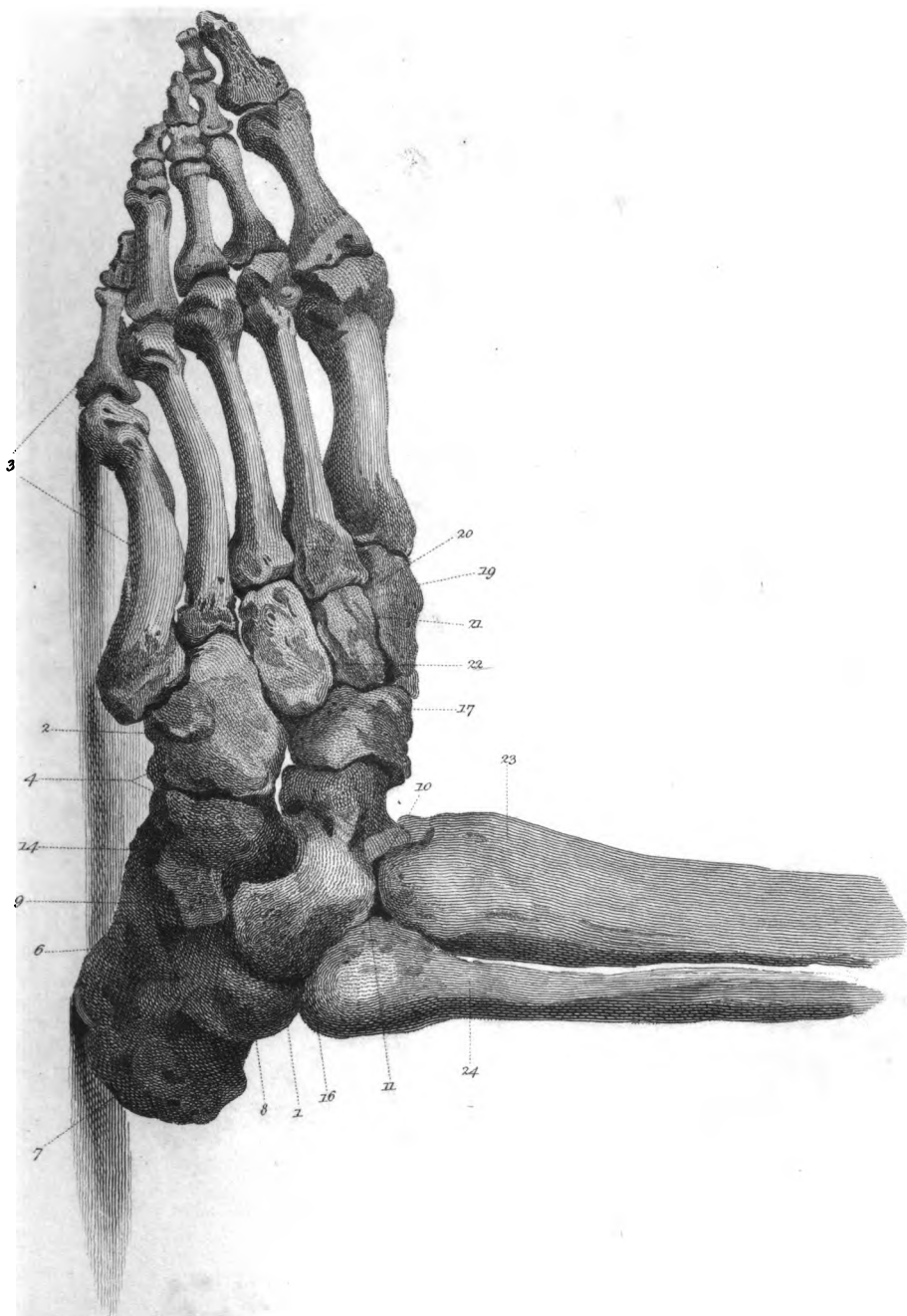
Was taken from the Left Foot of an Adult Male.

Most of the tarsal bones are sensibly misshapen. The striking irregularity of this club foot shews itself in the almost total inversion of the outer or plantal arch. The plantal, or, as it is often called, the solar arch, consists of the os calcis¹ or calcium, the cuboides,² and metacarpal³ bones of the little toe. In a well-made foot, the os calcis rises to complete one side of the arch, the cuboides and metacarpal bones forming the other.









B. P. Green del.

S. Bellin sculp.

In the deformed foot, the calcæum, instead of ascending towards the astragalus, as in the other limb, follows a more level⁴ course. The arch of the sound foot measures in height one inch and seven eighths: that of the other⁵ is rather less than an inch. The os calcis is of nearly the same length in both limbs; but the left is much thicker and rougher.⁶ Its lower part, particularly the projection of the heel,⁷ turns considerably inwards, giving occasion to a large portion of the deformity. The outside is more convex⁸ below the fibula than in the sound calcæum. By this disposition the upper part, where it joins the astragalus,⁹ presses outwards. The face¹⁰ of the astragalus, at its articulation with the leg¹¹ bones, is therefore not quite horizontal. The internal edge is a little raised,¹² and the external somewhat depressed.¹³ That portion of the os calcis which advances towards the cuboides, is also lower. The fossa,¹⁴ situated between it and the astragalus, is consequently larger than natural. The increase is owing both to the calcæum¹⁵ sinking at its fore part, and to an enlargement in the groove¹⁶ of the astragalus. The os naviculare¹⁷ is elongated, and rather broader. It has never moved. The os cuboides¹⁸ is expanded every way. The internal cuneiform¹⁹ bone is likewise particularly large. Its upper portion, instead of rising to a ridge, is flattened.²⁰ The other two^{21, 22} preserve nearly their ordinary shape. The tibia²³ and fibula²⁴ are rather longer than those of the right side, and formed an obtuse

angle at their junction with the astragalus. Little is known of the history of this case. The man was a malefactor, who expiated his crimes on the gallows. His skeleton became the property of Mr. Samuel Bucknill, a respectable medical practitioner at Rugby, in Warwickshire. This gentleman obligingly favoured me with the loan of both legs and feet, that I might have the engraving executed under my own eye.

In the first print, the club foot was occasioned principally by the bent figure of the astragalus. In this the contortion involves nearly all the tarsal bones. They have together produced a twist in the several parts of the foot, which, by elevating one of its sides, and depressing the other, gave permanency to the deformity.

Though I have given an account of the club foot in this place, it is more in deference to the authority of Hippocrates, than from a full conviction in my own mind that this disease is really a dislocation. The reader will perceive, on referring to the engravings, that the deformity proceeds more from a faulty condition of the astragalus and other tarsal bones, than from their articulating compages.

In infants, the bony fabric is imperfectly ossified, is soft, and admits of being moulded into almost any shape and form, by the constant and regular opera-

tion of the means recommended. At this early age the bones are so plastic and yielding, that with time and judicious management a great number of misshapen limbs may be cured. As the child advances in years, the bones grow firmer, more rigid, and brittle. These changes take place progressively, and increase the difficulties till they are at last insurmountable.*

Having proved the jointed construction of the spinal column and its inherent flexibility, it will not, I think, be difficult to establish the anatomical deviations, of which I am the advocate. The vertebral articulations, as already explained, accommodate themselves with ease to ordinary movements, and after they are finished return again to their former positions. These alterations are frequently repeated in the day, and no injury follows. The spinal pillar preserves its beautiful symmetry, and the accustomed operations of the system are regularly performed. In this way the child passes from youth to old age, enjoying good health, and the free use of his corporeal faculties. But when the constitution is impaired by illness, or the trunk is frequently impelled into constrained attitudes, for many

* I shall return to the subject of dislocation, in commenting upon one of the four cases which yet remain to be published, in order to complete this (the first) division of spinal complaints.

hours together, the vertebral joints gradually slide out of their proper stations, and the contour of the spine becomes subverted.

We have already shewn, that after the articulating ligaments have elongated, so as to suffer the vertebræ to recede, their devious course will be governed by accidental contingencies. The distortion may be posterior, lateral, or anterior, according to the inclination of the component vertebræ. Besides these deformities, which are the most striking, we not unfrequently find the column projecting outwards in a continued line, from the nape of the neck down to the sacrum. It then forms a sort of wreath, or chaplet, which is quite distinct from the natural disposition of these parts. Single vertebræ are also sometimes forced out of their primitive stations, in various directions. This irregularity in the vertebral chain, though scarcely apparent to the eye, is nevertheless perceptible to the touch, and often gives rise to very distressing ailments.

After this brief explanation of the several species, I shall proceed to the consideration of each in the order enumerated.

FIRST CASE.

Mrs. A. B.* aged twenty-six, of a sanguine temperament and fair complexion, complains of great and long-continued weakness and uneasiness in her back. Upon examination, I found the third, fourth, fifth, and sixth dorsal vertebræ much displaced, and projecting backwards in the form of an arch. On slightly touching the skin on the right side, near to the projection, she suffers a painful sensation, which always goes off when greater pressure is used. Upon coughing or sneezing she constantly experiences a distressing tightness across the chest. Going up and down stairs always, and walking generally, produce great difficulty in breathing. She is liable to faint from slight exertions. Occasionally some pricking and numbness are felt in the right foot for a few minutes. Little pain or tenderness is excited by pressing the spines or bodies of the vertebræ; nor does there appear to have ever been any inflammation in them. She first discovered a small projection in the back, about six years since. As it was never accompanied with pain or tenderness, she continued to disregard it, under a supposition that nothing could be done for her relief; though she knew that the enlargement kept increas-

* Vide Med. and Phys. Journal, vol. xlv. for December 1820.

ing, and that her height was visibly diminished. From this time exercise soon produced fatigue, and the trunk suffered most from it. She spent six weeks, in the spring of 1817, in a constant round of fashionable amusements; in which time the weakness of the back was so much increased, that a physician and surgeon of the greatest eminence in London were consulted. Four dorsal vertebræ were discovered to be much displaced, and the medical gentlemen said they could only be cured by anchylosis. For this purpose caustic issues were inserted, and afterwards discontinued at the patient's own desire. A recumbent posture, according to Mr. Baynton's plan, was then adopted, and the diseased arch covered with emplast. galban. comp. Tonic and aperient medicines were also directed. This latter mode of treatment, though never strictly followed, has been persevered in without any benefit for the last fourteen months.—Oct. 24, 1818.

Several weeks unavoidably interposed between my first consultation and commencement of proceedings. The plans which had been hitherto pursued having proved unavailing, I employed the interval in devising a mode of treatment upon different principles; and, in my opinion, more likely to prove useful than those to which the patient had already submitted. After much consideration and reflection, I decided upon adopting the following method, which not only succeeded com

pletely with the patient alluded to, but subsequently with many others. Having made my election, and formed a plan of proceeding, I communicated my sentiments to the lady herself in a letter, of which the following is a copy:—

DEAR MADAM,—After repeated inquiries into the commencement and progressive increase of your spinal swelling, nothing surprises me so much, as its freedom from pain, and all inflammatory accompaniments. The exemption from these symptoms through the whole course of the complaint, convinces me that it does not proceed from organic alteration in the bones or cartilages. Had either of them been affected in such a manner, the complaint would not only have been distinguished by pain and inflammation, but would, moreover, have been followed by some of their usual consequences. I have been led, by a careful consideration of different circumstances, to deviate from the common opinion, and to believe, that in your case the disorder is situated in neither of these structures. To me it appears much more probable, that the malady is *wholly confined to the connecting ligaments of the vertebræ*. These having lost their proper tone and firmness, gradually stretched, and grew longer. Owing to this infirmity, the prominent vertebræ separated, and removed further asunder. The elongation would of course lead to some changes in the arrangement of the vertebræ. Being under

less confinement, they gradually deserted their former places in the column, to enter into new ones. This alteration of situation is, I think, easily explained upon anatomical principles. None of the vertebræ are in actual contact, or touch, though they approach very nearly to one another in several places. Where-soever they approximate, something is interposed to prevent their junction and cohesion. The bodies are separated by cartilage, and their processes by a slimy bag, which keeps them apart. The ligaments constitute the chief connecting medium of the column. They are naturally firm, strong, and curiously interwoven among the vertebral prominences. So long as they preserve their *strength unimpaired, no change in position, or derangement of parts, can possibly occur.* There is no vacillation, no permanent alteration of form. The flexions and flexures are performed with ease. These motions having ceased, and the column being again at rest, the parts return to their former places. When, however, a particular attitude is frequently repeated, or long persevered in, the ligaments concerned gradually accommodate themselves to the acquired position. Should this constrained habit be much longer continued, deformity will assuredly supervene. Such is, I conceive, the origin and progress of spinal complaints, when they proceed from weakness in the ligaments. In your case the disorder seems to have commenced in them, and can, I think, be removed by restoring the extruded ver-

tebræ to their former stations. With a view to effect this desirable change, I propose to employ strong frictions to the prominent vertebræ. These to be followed by well regulated pressure, directed to the same parts.—After the process has concluded, I should confine the vertebræ with long slips of adhesive plaster, to prevent their receding. Lastly, the trunk is to be immediately replaced in the supine direction, and to be furnished with a mechanical contrivance to maintain constant pressure upon the prominent vertebræ. These are some of the means, which I venture to suggest, for the cure of your malady. As the vertebræ project almost straight backwards, I think the proposed plan is more likely to succeed, than if they had taken a lateral, or forward direction. I think it only candid in me to inform you, that after a diligent search among the medical books in my possession, I can no where discover any authority either in support of the doctrine, or the practice, that I have ventured to advocate; you must therefore receive them as the unsupported intimations of my own mind, after an attentive investigation of the accompanying symptoms, and a cautious review of my practice in similar cases, which you know to have been extensive. I can safely affirm, in pursuing the usual routine, my practice has been so unsatisfactory and inefficient, that were I to labour under a spinal disorder myself, I should be ready to submit to any plausible suggestions for its removal.

I cannot conclude without apprising you of another difficulty. An opinion prevails, I believe universally, that the materials of all joints are incapable of stretching. They are said to be unyielding and inelastic. Under certain limitations, the notion is strictly true, and confirmed by daily occurrences. Whenever violence is suddenly applied, the articular structure is much more likely to burst asunder, than give way to the impelling force. These objections and arguments bear little relation to your complaint. In it no extraordinary violence has been used, no sudden force applied to break the ligaments. They have, on the contrary, been subjected to the slow and progressive operation of constitutional causes, which, by gradually stretching and extending them, have suffered the extruded vertebræ to slide out of their natural posts. It is well known, that in this way the component bones of many joints have actually given way, and receded to a considerable distance from each other. If, then, the fibrous structure of some joints be capable of stretching and lengthening sufficiently to permit the bones to separate, why should not the corresponding materials of other joints be obedient to the same laws?

Having stated my own opinion of your case, and the probability of success by submitting to the proposed mode of cure, I leave you, without further comment, to determine for yourself upon the propriety

of adopting or declining the treatment which is now submitted to your approval.

I am, dear Madam, &c. &c.

E. HARRISON.

Nov. 21, 1818.

The patient having taken a few days for consideration, as well as in order to make the necessary preparations, submitted to the treatment this morning. The attendant, having first smeared her right hand with almond oil, began by rubbing the parts upon, and contiguous to, the projection, backwards and forwards, along both sides of the spine, for a whole hour. I limited her operations chiefly to the bodies of the elevated vertebræ, and heads of the prominent ribs. She also carried her frictions over the middle and ends of the curvature. I then endeavoured, by pressure with my thumbs, to drive the extruded vertebræ towards their natural stations in the column. In doing this, I directed my principal attention to the bodies of the vertebræ, their transverse processes, and different parts of the arch. Having finished this stage, I carried long slips of adhesive plaster across the back to keep down the raised vertebræ. The operation concluded by placing the lady's back upon a hard and flat mattress. A similar method of proceeding was daily repeated under my own eye.

My attendance upon this occasion, in the first

instance, became a matter of necessity, rather than of inclination, having been called in at the express desire of the patient's friends, almost immediately upon my arrival at a neighbouring house, to which I had been invited on a pleasurable excursion, subsequently to my having formed the determination of retiring altogether from the emoluments of my profession. Had I shewn a desire to meddle with the affairs of others, I should indeed have been deserving of blame. As the medical gentleman formerly employed, resided in London, and had been in regular correspondence more than one hundred miles distant, upwards of twelve successive months, it may naturally be supposed that some disappointment had already been felt by the lady herself, after this long trial of her patience. So far, however, was I from encroaching upon the privileges of any other, as hath been very unfairly insinuated, I was actually placed where I had no resident practitioner to oppose. The abode of the family apothecary was not less than ten miles off, and the nearest physician lived at a still greater distance; I was therefore subsequently obliged, either to take an active part myself in the treatment which I had prescribed, or the patient could have derived no benefit from my advice. In this dilemma, my resolution was promptly formed, and I have not ceased to rejoice at the determination I then made. — Nov. 26th, 1818.

The two uppermost of the affected vertebræ have

already sunk down so as to leave a great hollowness between them and the two lower ones. The distressing pain in the skin formerly mentioned is nearly gone; nor has the patient lately suffered much uneasiness of the right foot.—Dec. 5th, 1818.

The lowest vertebra in the curve recovered its natural situation six weeks since, and the other three are much fallen. The pain on the right side of the incurvation is quite gone. She no longer experiences any inconvenience from sneezing or coughing. The difficulty in breathing, and disposition to faint, have entirely left her; as well as the tightness over the chest and stomach.—March 21st, 1819.

The two upper bones of the arch have obtained their proper places, and been stationary for the last two or three weeks.—May 12th, 1819.

All the bones are restored to their natural places, leaving little prominence or other affection of the spine.—July 25th, 1819.

She has been lately permitted to rise from her mattress, and walk about the room for a quarter of an hour before and after dinner. She moves with ease, and finds no inconvenience from it. The health is extremely good.—Sept. 20th, 1819.

On returning home after an absence of four months, her friends were particularly struck with her improved appearance, and declared her to be considerably taller than at any former period. This opinion leads to a belief that the disorder began earlier than the time above stated.—Oct. 20th, 1819.

The lady continues in very good health in every respect. The spine remains quite sound and well. Walking and carriage exercise afford her great pleasure, and are pursued without fatigue. —Sept. 30th, 1820.

Mrs. A. B. continues in good health, and has for several years participated in the amusements and recreations of her age and station.—April, 1824.

Mrs. A. B. has regularly visited London every spring, and entered into its various amusements with great spirit. She remained in excellent health till last Midsummer. About that time it was her misfortune to be seized with an inflammatory complaint, which brought her life into great danger, and left her in a state of extreme debility. She was carried, on her recovery, to the sea-coast late in August, and has continued there through the winter. She only left her maritime residence this month, having recovered her former strength and rosy complexion.—June 12th, 1825.

The health of this lady is again entirely restored. She has lately participated freely in the recreations of her age and rank in life. Before dismissing the case, it is of importance to remark, that since the spinal treatment was relinquished, in May 1819, the patient has been afflicted with two very severe and tedious fits of indisposition, attended with much fever. One, as already stated, occurred in June 1824; the other in the autumn of 1825. Her constitution being extremely weakened in both attacks, convalescence was proportionally slow. It required in the former a long abode near the sea; in the latter, a regulated temperature for many successive months. During these illnesses, and perhaps even before their invasion, the ligaments, from inattention to the prescribed rules, had partially given way, and suffered some of the vertebræ slightly to protrude again.—March 22d, 1827.

Remarks.— I have reprinted this case at the head of the present collection, to mark the exact period when I first imbibed the opinions which I have ever since entertained, with respect to the nature and origin of the common form of spinal complaints.

I am the more solicitous to ascertain and fix the precise date, because this is, I believe, the earliest instance upon record of a successful attempt to remove *constitutional* deformity of the spinal column by constant recumbency, with the assistance of manual and

mechanical contrivances. It is not unknown to me, that strong efforts have been made, and curious artifices employed, to relieve these distressing complaints, where they were occasioned by hurts, blows, and falls; but never, to my knowledge, for the removal of deformities produced by constitutional causes. Hippocrates details the various methods used in his time with minuteness and perspicuity. He has been followed in the same course by the elegant Celsus, and other writers amongst the ancients. Only few of the moderns either supported the doctrines or imitated the practice of remote ages. Both have been too generally neglected, under a mistaken idea that nothing could be done to reinstate the luxated vertebræ, or mitigate the tortures inflicted upon the unhappy sufferers. I cannot join in such gloomy apprehensions, because I am convinced, from experience and careful observation, that most cases are susceptible of mitigation, and the greatest number of complete cures. It is not, however, my intention at this time to prosecute the subject further, but rather to limit my inquiries to *constitutional* distortions. In these I am happy to say, the practice has proved, in my own hands, successful, beyond my most sanguine anticipations. Neither it, nor confinement, has in a single instance, produced the slightest detriment to the patients. They have suffered no harm in any way, notwithstanding the injurious reports and numberless mistatements which have been industriously circulated, to

obstruct the career of a most useful practice. That the happiest results have proceeded from it in the present instance, I am ready to assert in terms the most unqualified. Should my statements in this or the other cases be doubted, I engage to authenticate them by an appeal to persons of the highest honour and veracity.

It appears that Mrs. A. B., previously to my being consulted, had been fourteen months under the constant direction of a physician and surgeon of the first eminence, respectability, and experience in London. During this long period she derived no sort of benefit or mitigation of her sufferings, notwithstanding the *recumbent posture, caustics, and all the various other expedients* usually adopted for the cure of spinal maladies, had been resorted to.

Disappointed altogether in her expectations, and despairing of procuring relief from a continuance of the means hitherto recommended, application was made for my assistance. After having been informed of all the particulars, I was greatly perplexed as to the course to be pursued in these discouraging circumstances; and the more so, because I had been accustomed myself, for more than thirty years, to place my whole dependance upon the same remedies in similar emergencies.

The unceasing despondency of the patient, arising from disappointed hopes, together with some private reasons of my own, led me to investigate her case with unusual solicitude. The further I searched for authorities, the greater was my embarrassment and my dissatisfaction with the accustomed modes. I was fully aware, that under my own direction they had generally failed of success, and as far as my personal inquiries extended, they had been equally inefficacious with others.

These considerations led me to the determination of investigating the symptoms with increased interest; and by way of getting every possible insight into the matter, to examine the deformity by somewhat rudely handling and squeezing it in every direction, and in all possible ways. I was surprised to find it not only quite free from pain, but also ready to recede in a certain degree upon the application of strong pressure. The moment this pressure was withdrawn, I observed that the part visibly rebounded, and resumed its former protuberance. I was forcibly struck with these appearances, as well as with the absence of all pain.

To prevent the possibility of error or misconception on my part in these investigations, I repeated the trials at several different times, using always the greatest caution in my method of proceeding. Having at

length satisfied myself that the vertebræ, and interposed cartilages, were quite sound, I began to entertain doubts of their having ever been affected. From all that I could collect, it appeared that the disorder had been first discovered by the casual inspection of a female friend, who happened to be present at the moment the lady was changing her dress. Her own maid had not ventured to mention her suspicions, although the prominence had been observed by her a long time before, being unwilling to produce uneasiness, which she thought could not be relieved. As it had never displayed any inflammatory character, and was moreover devoid of tenderness, nothing had arisen to alarm the patient, or draw her particular attention to the part, until her fears were awakened by this accidental discovery, and the conversation to which it gave rise. By following the train of reasoning which these circumstances suggested, I was insensibly led, from a consideration of the bones and cartilages, to turn my thoughts to the spinal joints. The more I reflected upon their composition and uses, the stronger was my conviction, that the seat of the malady was placed in the articulating fibrous structure. After having fully satisfied my own mind upon this point, I drew out a written statement of my opinion, in the letter inserted above, and submitted it to the patient's consideration. After reading it attentively, she entered into my views, and declared her readiness to submit to the mode of treatment recommended. Having secured

her approbation and submission to the proposed plan, I began the cure, by laying her constantly in the supine posture upon a firm mattress, and ordering the projecting vertebræ to be well rubbed every day, as long as the operation could be borne, with an emollient liniment. They were afterwards kept down with long silk strips of adhesive plaster drawn across them, and over the prominent spinous processes, to be fixed upon the skin on each side of the spine. The patient was then placed horizontally upon her back, and desired to remain constantly in that posture. After a few repetitions of the process, I had the satisfaction to perceive a sensible detumescence. By submitting to this mode of treatment for eight months, the enlargement was removed, and the spinal column restored to its natural form. During this whole period no inconvenience was felt, nor did a bad symptom or embarrassing circumstance arise, to interrupt the operations. Had the projecting vertebræ ever been carious, as the former medical gentlemen declared, or much inflamed, I do not believe that the spinal column could have been reinstated by the practice employed. So far were they from exhibiting marks of former or present disease, that all the component parts of the swelling were, when I examined it, sound, healthy, and, as far as I could judge of the vertebræ composing it, of their natural dimensions; no alteration of structure had taken place in them, otherwise some traces would have remained to indicate the mischief. The

swelling was, I am convinced, wholly occasioned by laxity and elongation of the articular compages, suffering the vertebræ to slide out of their native beds, and to form an elevated arch. But if the vertebræ can be pushed outwards by the gradual operation of constitutional causes, is it not reasonable to suppose that they may be driven back again, by the judicious application of suitable measures? Proceeding upon this idea, I advised strong friction to be applied to the tumour, and had the pleasure soon to discover its good effects. A little perseverance led to further benefit. In eight months, as formerly mentioned, the swelling was subdued, and the back restored to its original figure.

Some persons have ventured, upon hypothetical grounds, to deny the possibility of subduing any species of gibbosity. Others again assert that, when it does give way, its restoration is to be attributed to the reclining posture alone. The result of the present case is, I think, conclusive in both respects. According to the relation given, a deformity of six years standing, which had resisted the united efforts of two eminent practitioners, aided by the recumbent posture for upwards of twelve months, was removed in eight by the new treatment.

It is to be supposed, that in this long period all the remedies usually employed in similar cases had

been resorted to, and found ineffectual. In such unfavourable circumstances, I thought myself justified in venturing upon an untried course, more especially as it had received the approbation not only of my patient, but of her family likewise. I call it untried, because the treatment that occurred to me, as suitable to the occasion, had never, as far as I know, been even recommended, much less employed by any one for the same purpose. No writer or practitioner, to my knowledge, had hinted that the complaint is ever wholly fixed in the spinal ligaments, till the idea occurred to me, and I published cases in support of it. Since that time several medical men have fallen into my views, and advocated the same doctrines. Some of them have even condescended to recommend my instruments and adopt my terms, without advert- ing to the priority of my claims, or even so much as referring to my name.

This case presented the first opportunity that occurred in my practice to make trial of the new mode for the removal of a distorted back, though it was not the first time that I had declared my opinion in favour of it. More than thirty years before I tried it, I was much struck with the lamented death of Dr. Easton, of Manchester. According to newspaper intelligence, the horse on which he was riding stumbled. Although the doctor preserved his seat, and the animal re- covered its feet, he received such a jar in the struggle,

as displaced one of the lumbar vertebræ. Paraplegia immediately supervened. In this deplorable situation the doctor was suffered to remain at rest, until death released him from further misery. I observed at the time, and on several occasions afterwards, that in such an hopeless case I should have endeavoured to stretch the spine, and draw the vertebræ further from each other, in order to gain space enough to force the displaced bones back again.

About the year 1806, a similar calamity befel Mr. Shuttleworth, a respectable medical practitioner, of Market Razon, in Lincolnshire. This gentleman's horse in falling backwards was thought to squeeze the rider between itself and a gate-post. Mr. S. had no reason to think, notwithstanding the hurt in his back, that it ever came into contact with the post, or received any injury from it. He was found by my informant in this distressing predicament, soon after the accident, and replied to his anxious inquiries, "My back is broken, and the injury irremediable." The inferior extremities had already lost their feeling, and were become paraplegic. On the most careful examination, no tenderness, bruise, or discoloration, could be discovered in the part affected, or any where in the course of the spine. Hence we may conclude, in this case likewise, that the injury arose rather from the violent shock given to the spine, than from its meeting with any hurt by striking against a hard

body. Might not death, as well as paraplegia, presuming them to have been occasioned by pressure upon the cord, and stretching of the nerves, have possibly been averted by replacing the vertebræ?

A great hollowness was observable in the loins, occasioned by the second and third lumbar vertebræ having sunk considerably below their natural level. The want of action and sensibility in the lower limbs was accompanied with involuntary discharges of his fæces and urine. He remained in this deplorable condition six weeks, and died at last of mortification in the paralyzed members. I declared openly, during the continuance of his miserable existence, that his friends were culpable in not causing an effort to be made for his recovery. It was quite clear to every one, that unless the luxated vertebræ could be returned, and the spinal cord freed from injurious pressure, his restoration was hopeless.

The patient unfortunately never entertained any expectation of relief, and declined all professional interference, after the first few days; otherwise I had reason to believe that my assistance would have been requested. I anxiously waited to be consulted, and determined to treat the case as a vertebral dislocation. Had I then known, as well as I now do, how much the spinal joints are capable of enduring, and with what ease and safety they admit of elongation, I

should certainly have waved professional etiquette, and offered my services spontaneously, in the hope of rescuing a fellow creature from inevitable destruction. At that time my opinions were too crude and unsettled to permit my speaking with confidence; and therefore a feeling of delicacy towards the practitioners employed, which I now lament, restrained my inclinations, and prevented the free utterance of my wishes, while they could have been made useful to a human being in affliction.

Whether the foregoing, or any other treatment, would have been successful with the patients mentioned; it is impossible to decide. So unfavourable were the anticipations of the faculty, that nothing effectual was attempted with either to mitigate their hard lot. But in cases like these, which had always proved fatal, not only every rational scheme, but even every crude suggestion, is worthy of consideration. No situation can be imagined more distressing, no affliction more poignant, than when persons in a sound mind are abandoned to their fate, and doomed to waste months, perhaps years, in constant suffering, without even the consolation of hope to soften their calamities. If any condition of misfortune can justify the trial of doubtful expedients, it is surely in circumstances like these.

The spine is a jointed pillar capable of undergoing

considerable changes, without necessarily destroying the disposition of its parts, or extinguishing the vital principle. It appears, from the narrative, that Dr. Easton had the misfortune to dislocate one of the lumbar vertebræ. As the infliction was not produced by external violence, I cannot bring myself to believe that the luxated vertebra was either fractured or otherwise injured in its structure. All that occurred was probably confined to the partial dislocation of a single vertebra. This, by compressing the spinal cord, paralyzed the inferior extremities, and gradually led to a fatal catastrophe.

Now we know that other articulations are frequently disjoined, and their texture considerably bruised, without material detriment to the parts implicated. So far are they from sustaining structural deterioration on such occasions, that after the bones have been replaced, often with great force and difficulty, the organ soon recovers its lost tone, and performs as usual its accustomed operations.

The articulating compages seldom inflame or suppurate after the roughest treatment: but if all other articulations in the human body admit of such rude handling, may we not infer from analogy that the spinal joints will also suffer it, without any permanent bad consequences? Such were the ideas I entertained at that distant period, and subsequent

experience has led to their confirmation. It is well known that Mr. Chessher stretches the spines of his patients, and in this way draws out the column from one to three inches daily, for several successive years; but as it invariably returns at night, when the extending force is removed, to its former state, no benefit accrues from this method. It is not only painful to bear, but very distressing to the vertebral joints. Yet, notwithstanding its severity, I never heard that it has led in any instance to suppurations, or other organic mischief in the back. Impressed with these sentiments, I have ventured, in many instances, to lengthen the spine with machinery, and have, by means of it, removed the articulations to a considerable distance from each other. By this contrivance, and pressing upon the vertebræ when so separated, I have succeeded in gradually reinstating them in the column. In recent instances the distortion is frequently removed in two or three weeks. Inveterate cases require a longer period; and even where they are not susceptible of a complete cure, it is seldom that they do not admit of considerable amendment. I know of no instance where the structure suffered any detriment from this treatment; I am therefore inclined to believe that the same practice might have been adopted in these unhappy cases with the reasonable prospect of a successful issue. I am the more confident in this opinion, from the case of Colonel Sibthorpe, who suffered severely from

a hurt in his back, received by the overthrow of his carriage. The symptoms in his and the other cases bore a near resemblance to each other, and proceeded from the same cause. Though the disorder had afflicted the Colonel twelve months when he applied to me, the depressed joints were soon elevated to their proper level; and after the cure was completed, he left London in excellent health.*

Having contracted a severe cold upon the journey home, he soon felt its deleterious effects, and sank under its influence. Upon dissection, the vertebræ, the enclosed cord, and all the parts connected with his former complaint, were declared to be sound. This examination proves that displacement of the vertebral articulations does not necessarily imply organic mischief of the parts, or an hopeless state of the spinal column. If, then, we can succeed in replacing the luxated vertebræ in these distressing situations, as was done in the case of Colonel Sibthorpe, we shall have great reason to expect a favourable issue upon other occasions.

Several years before the occurrence of the last accident, on taking my evening walk, I heard a loud cry for help issuing simultaneously from many

* See London Med. and Phys. Journal.

mouths. I ran to the spot, and saw a man lying upon the ground. A horse was standing near: twenty voices anxiously vociferated, as I hurried along, that he had just fallen from the horse and broken his neck. He lay on the ground motionless, and apparently quite dead. I instinctively placed my knees against his shoulders, and grasping his chin and back of the head firmly between my hands, proceeded to stretch his neck with all my strength. The patient immediately shewed signs of returning animation, by moving his limbs, and soon afterwards raised himself from the ground.

He speedily recovered sufficiently to remount his horse and ride home, a distance of nine miles, without sustaining any particular inconvenience from the accident. It may be said, that this man was only stupified by the fall, and would have recovered of himself had he been left undisturbed. Whether the lifeless state to which this patient was apparently reduced, proceeded from vertebral subluxation, or concussion of the brain or spine, cannot be satisfactorily determined. For my own part, I then entertained the opinion which I still retain, that some of the superior cervical vertebræ, probably the first, were partially displaced, and pressed upon the spinal marrow or phrenic nerves, so as to interrupt the motion of the diaphragm, and the process of respiration. In that case, had he not been relieved from the compression

by restoring the natural arrangement of the cervical spine, death would have speedily closed the scene.

After I had finished the preceding remarks, I accidentally repeated the leading particulars one day after dinner. An ingenious guest replied, "the case you have described is familiar to me. I heard it related by a London anatomist, about ten years ago, when I was his pupil. The lecturer, he said, was decidedly of opinion that the man would have been irrevocably lost, had you not promptly interfered to save him. He added, a very few moments must have finally decided his fate. The teacher gave it as his opinion that some of the ligaments attached to the dentoid process of the second vertebra were stretched in the fall. This brought the process into immediate contact with the spinal cord, and led to the compression, which would have proved fatal had it not been speedily removed." Another guest, an intelligent country gentleman, denied the explanation given, and offered, I think, a more rational one, deduced from comparative anatomy. He observed, that in the prosecution of field sports he often caught wounded hares and rabbits alive. In order to put a speedy end to their sufferings, he made it a rule to luxate the first joint of the spine, which always proved instantly fatal. He effected the disjunction by firmly grasping the back part of the animal's neck, close to the skull, with his left hand, and fixing the other

upon its forehead. A slight degree of force is sufficient, in this situation, to drive the condyles of the occipital bone away from the first vertebra, and produce complete dislocation.

He entertained no doubt in his own mind that dislocation did take place on these occasions, because he had frequently examined the parts after death, to convince himself of the separation, and to learn the easiest way of killing his game. I was forcibly struck with the reasoning and arguments of my country friend. To me they appeared much more convincing and satisfactory, than those of the medical teacher. A careful examination of the corresponding articulation in the human body, will, I am persuaded, satisfy the anatomical reader that the spine is capable of suffering luxation in the same part, by the application of external force, under particular circumstances. Suppose a person falling from a height to pitch upon his head, with the neck inclining to his chest. The jar he would receive, aided by the weight of the body, must, I think, be sufficient in many instances, to force the spine forwards, so as to produce incomplete, if not entire dislocation of the first vertebral joint with the occiput. I am of opinion, for the reasons given, and a careful review of my patient's situation, that the asphyxia in his case was occasioned by subluxation of the first spinal joint, and happily removed by the process promptly adopted by me.

But to return to the case under consideration: Encouraged by the gratifying success I experienced with my first patient, Mrs. A. B., I pursued the same method with four others, during the course of the following summer, and became eminently serviceable to them all. In the first trial, I depended entirely upon recumbency, frictions, daily pressure, and slips of adhesive plaster; but, in addition to them, I now surrounded the body with a firm bandage, in order to produce constant pressure upon the protuberant parts. The following spring, in addition to other means, I had a stuffed wooden shield placed upon the back, and under the belt, to increase the pressure. About this time I began to operate on the projecting vertebræ with a metallic instrument, imbedded in soft leather, to prevent the skin from being bruised. Over and above these contrivances, I now employ a steel machine, constructed upon the principle of a windlass, to draw out the spinal chain, and place the vertebræ further apart from each other. Steel shields have lately superseded, in many instances, those formerly in use, because metal can be fashioned with greater exactness than wood, is firmer, and sits closer to the parts intended to be acted upon.

Explanation of Symptoms.—The symptoms under which this lady suffered, originated, I conceive, chiefly in disturbance of the nerves issuing from between the projecting vertebræ. The painful sensation occasioned

by gently touching the skin, was, I think, an affection in many respects resembling tic douloureux. We are so little acquainted with the cause of this distressing complaint, notwithstanding its frequency, and the attention given to it by eminent pathologists, that every hint calculated to elucidate its hidden nature, however crude, is entitled to consideration. I therefore venture to say, that I have long been of opinion, that the chronic form is generally induced by irritation or pressure, applied to the sides of the affected nerves, in their course from the brain or spine, and not by any injury, either at their commencement or termination. In the neuralgia facialis, the variety most carefully investigated, nothing satisfactory has hitherto been detected. The brain, and nerves at their commencement, are admitted to be quite sound, nor has any thing been discovered amiss, on examining the branches distributed upon the face. Here, unfortunately, the investigation has always stopped. Had it been carried farther, and the nerves been traced from the brain, through the bony canals, to the face, probably some rough eminences, or other irregularities, would have been detected in these unyielding tubes, sufficient to disturb the nerves, and thereby occasion their morbid sensibility.

The marked benefit produced, in this case, by replacing the prominent vertebræ, leads us to con-

clude, that the malady was, in some way or other, connected with the displaced vertebræ.

The distressing tightness of the breast, upon coughing or sneezing, arose from irritation and distraction of the nerves distributed to the muscles of the chest. They proceed from the vertebræ, and run almost transversely across the body. We can, therefore, easily understand, why the patient suffered from suddenly expanding and agitating the thorax. The heart and lungs derive their nerves immediately from the cardiac and pulmonary plexuses. These again are supplied partly by the par vagum, partly by the great sympathetic. However opinions may vary as to the origin and composition of the latter, all the cases shew that the spinal cord exerts great influence over the internal viscera, and it can only affect them, by propagating its energies through the great sympathetic. We infer from these premises, that both the syncope and dyspnœa were occasioned by some irregular action of the nervous power, either in the spinal chord or nerves, during their passages along the foramina vertebrarum.

The numbness and pricking pains occasionally felt in the right foot, arose from pressure upon the spinal chord or crural nerves. In whatever part of the theca it takes place, the lower extremities are

found to suffer. The inconveniences produced, differ exceedingly in different cases. In some, the limbs are little affected; in others, they lose, altogether, both their sensibility and motion. Whether the complaint be trifling or severe, it is to be accounted equally a species of paraplegia, and can only be cured by removing the offending cause.

Objections answered.—It remains to notice some of the principal objections which have been raised against the truth of the opinions, and efficacy of the treatment, recommended in the former part of this treatise.

1st. To those who assert, that no change can be made by any interference in the defective arrangement of the vertebral joints, the successful issue of the present case affords a satisfactory reply. This patient, as appears from the foregoing particulars, was cured of a large dorsal protuberance, by artificial means, and the process, by which it was effected, occupied only eight months.

It may be advanced in favour of the new practice, that in this first trial many things were omitted, which would have greatly facilitated the cure, and which are now always introduced in similar circumstances. Thus, although the principle remains undisturbed, and is, I believe, firmly established, the manner of carrying it into effect has in this short

time undergone many changes, and is, I am persuaded, *still capable of further improvements*. Some of these I hope to establish by my own efforts. The rest will be gradually supplied by the co-operation and industry of others; so that the practice will eventually obtain all the importance which it deserves, notwithstanding the temporary obstacles interposed to obstruct its progress.

2dly. If recumbency alone, as some persons maintain, were sufficient to restore the natural figure, by correcting the distorted spine, what prevented its being successful in the present instance, before I was consulted? The patient had remained constantly supine, upon a horizontal couch, for fourteen successive months. During this long confinement, time enough was surely allowed to accomplish the object, had it been attainable by simple recumbency.

We are warranted in asserting, from our own experience, that, in slight instances, arising at an early age, lying flat upon a firm couch is sufficient, in a certain degree, to restore the form of the back and chest. But, even then, it very seldom wholly reinstates the vertebral joints, however long and strictly the recumbency may have been observed.

3dly. Objections have been raised against the permanency of these cures, as it appears to me, upon

very insufficient grounds. The case I have described is, I believe, the oldest upon record; and since no relapse has appeared, we have every reason to believe that none will ever take place.

The subject of it conformed strictly to the usual regulations, so long as the curative process was going on. It had scarcely terminated, before she launched again into the various amusements of fashionable life. In these she has continued freely to participate ever since her recovery, and at first in direct opposition to my earnest solicitations.

Conclusions arising out of this Case.—To the timid, who fancy that lying flat will destroy the health, I recommend an attentive consideration of the foregoing statement. A lady in delicate health submits to constant dorsal recumbency twenty-four months, for the removal of a spinal complaint. Her habit of body improved under the discipline, and she subsequently experienced no inconvenience from it.

We may conclude, from the result of this case, 1st. that undeviating recumbency upon the back is rather beneficial than injurious to the human constitution; 2dly. that it seldom, if ever, wholly succeeds, without the aid of other means, in the removal of spinal deformity.

In the course of this inquiry, abundant proofs will be given of its salutary influence in protecting the frame, and even in many instances subduing its tendency towards disease. The prediction of the medical advisers of this patient was in no respect confirmed. The malady neither abated, nor did anchylosis supervene. At the termination of her course, the distortion exhibited the same appearances: no alleviation was apparent. Hence it follows, that the intention which she had in view was wholly defeated. The result of this, and many similar trials, afford a complete and convincing answer to the advocates for mere recumbency. Could it have disentangled the contorted fibres, and changed the figure of the bent spine, time enough had surely been given to effect the object. The total failure of the plan in such able hands, is a convincing proof that recumbency alone cannot remove vertebral deformity, though it may enable the parts to acquire sufficient tone to prevent further irregularity. In this view, the practice is entitled to great commendation. But I am convinced, after all unfounded prejudices shall have subsided, it will be rendered subservient to other important purposes, and be made instrumental towards the cure of various medical and surgical complaints, where rest has been found beneficial.

My own experience would fully justify the preceding conclusions, had they not been anticipated by the late Mr. Baynton. This gentleman, whose mo-

desty, acquirements, and discriminating talents, form a striking contrast to the arrogant pretensions of some late writers on the same subject, speaks in the highest terms of undeviating recumbency in the treatment of spinal complaints. According to him, it promotes health, however long continued, and is supported with cheerfulness. Extraordinary and unaccountable as this declaration may appear to the inexperienced, it is nevertheless strictly true, and can be confirmed by many of the faculty who have accompanied me to witness the methods adopted on these occasions.

I shall take occasion, in commenting upon other cases, to shew the beneficial influence of undeviating rest, not only upon spinal maladies, but in removing some distressing complaints of the limbs, chest, and nervous system.

SECOND CASE.

MR. C. D., aged twenty-four, of a delicate habit, has been a long time indisposed. He is subject to severe palpitations of the heart, from apparently slight causes, great tightness over the stomach, and want of appetite. He swallows with inconvenience, and reading aloud soon tires him. The eye-sight has gradually got worse for several years past. He used to amuse himself with gardening, but has been obliged to desist, because, on stooping, his face became uncomfortably swollen and red for a long time afterwards. He also felt a dull heavy pain in the upper and internal part of his head. He suffers great uneasiness in the right side, whenever even slight pressure is made on the edge of the ribs, or immediately below them. All the false ribs on that side are flat and protuberant; the liver has, in consequence, been forced upwards, and driven out of its proper situation. I impute the pain, fulness, and prominence, to a derangement in the functions of the liver, from its having been displaced along with the ribs. He has taken an aversion to common diet, and relishes only fat meats, butter, or food prepared with warm condiments. Left arm very weak, and often nearly insensible. The lower limbs are numb and cold; they are also subject to clammy

perspirations and convulsive twitchings. Bowels constipated; urine very turbid, of extraordinary colour, and disagreeable smell; pulse frequent; the whole of the spine lying between the shoulders is considerably arched, and rises so much above them as to be quite unsightly; the small of the back is disagreeably hollow. This prominence is occasioned by the sublaxation of three of the cervical, and five of the upper dorsal vertebræ; all of which are tender, stand irregularly, and at unequal distances from each other. He imputes his complaint to the fatigue of riding on horseback when in weak health; he fainted repeatedly from the exertion. He has consulted several of the most eminent of the faculty within the last few years: no two of them entertained the same opinion of his case; some declared him to be consumptive, and recommended a mild climate; others referred his disorder to the liver, and others to the stomach.—
March 3d, 1820.

The eight vertebræ, formerly described, have been for some time restored to their natural situations. The curve is entirely removed, and the part sunk into a groove of nearly an inch in depth below the shoulders. The hollowness in the loins is not more than natural. The spine, in consequence of these alterations, is become straight, and remarkably well shaped. The ribs on the right side have been made to resemble those on the left. The palpitations have entirely left him, and

the tightness over his stomach is removed. The weakness and numbness in his arms and legs are no longer experienced. Has not lately had spasms nor clammy sweats, and the feet are much warmer. His looks have considerably improved, and the urine is natural. He has taken an aversion to fat in every way, preferring lean meats, with a proper mixture of vegetables. The diet is natural, and appetite good.—May 5th, 1820.

He is quite well in health, and feels his back gaining strength daily. The liver having fallen into its natural situation, the tenderness formerly mentioned is nearly gone: it had constantly troubled him for the last ten years.—July 20th, 1820.

The eye-sight is entirely restored. Deglutition is easy, and reading aloud no longer fatigues him. He returned home this day in very good health and spirits.—Sept. 18th, 1820.

The tenderness over his liver, and all the other complaints, having entirely left him, he has lately ventured to take walking exercise in the open air. This recreation is performed with ease, produces no fatigue, nor is it attended with any uneasiness of the back.—Nov. 29th, 1820.

The patient continues to enjoy good health. The

tenderness over the liver, and all the other symptoms of his former indisposition, having entirely left him, he walks about daily and alone in his father's park and grounds. This recreation is performed with ease, produces no fatigue, nor is it attended with any inconvenience.—July 10th, 1821.

This gentleman went from under my care into a distant county, where he has subsequently resided. My information concerning him has neither been frequent nor circumstantial. According to the last account, he continues to look well, enjoys the exercise of walking, and occasionally performs divine service in his parish church.—Dec. 17th, 1824.

Remarks. — Several of the symptoms described above have been already explained; others will come under review in treating the subsequent cases.

It has been already recorded, that three of the lower cervical, and the five upper dorsal vertebræ, had been forced considerably outwards, forming a large backward arch in the neck, and between the shoulders. The nerves issuing from them were therefore stretched, and consequently impaired in their functions; hence the muscles subservient to deglutition, and to articulate sounds, became enfeebled in their actions. The voice preserved its usual tone and compass; but the exertion of speaking or

reading aloud soon induced fatigue, and obliged the patient to desist. It appeared to me in this, and many similar cases, that the deficiency of power was felt more in the muscles of the chest generally, than in those of the larynx in particular.

The stomach is copiously provided with nerves, from the par vagum and splanchnic branches, for the purpose of digesting its food. The latter furnish the greater proportion; and since many of them suffered in their functions from coming out of the projecting dorsal vertebræ, we are furnished with a clue to the depraved appetite and impeded digestion, under which this gentleman suffered, at the commencement of his cure. The force of this proof will be more strikingly apparent, when we take into consideration that he recovered his natural appetite and good digestion, immediately upon the vertebræ regaining their former stations in the column.

He complained at first of weakness, insensibility, and coldness in both the upper and lower extremities. We have already remarked, that in whatever portion of the dorsal column undue pressure is applied to the spinal chord, these symptoms are excited in the inferior limbs; but they are never felt in the upper ones, unless the cause be fixed, as it was in this case, high enough to disturb the brachial nerves.

THIRD CASE.

MARY ANN RAFTER, aged fifteen, the 3d January, 1820, weighs only forty-four pounds, is four feet one inch in height. She always leans towards the left side, which she supports by a strong crutch placed under the arm-pit. By the assistance of it, and a short thick stick, she contrives to remain upon her feet through the day. She met with an accident when only eight years old, by falling upon the pavement out of a window in the first floor: she was much bruised, and in consequence became seized with bad health. Three months afterwards, she was first discovered to be crooked, in the back and breast. For the removal of this deformity she became a patient in the Brunswick-street hospital, in Dublin, where she underwent the usual treatment, by issues and caustics applied to the upper part of her back, during the period of seven months. She left the hospital unrelieved, and has since that time never applied for further medical assistance. Pulse 80, small and feeble; is always costive: she sleeps well, has a good appetite, and can bear a great deal of fatigue; though her breathing is easily disturbed, and becomes very distressing on using slight exertions.

PLATES VI. AND VII.

Represent the Deformity in Front, before the Treatment began, and after it was concluded.

- A. Top of the right shoulder.
- B. Ditto of the left shoulder.
- C. Point of the sternum.
- D. Left ilium concealed.
- E. Right ilium.

PLATES VIII. AND IX.

Shew the Distortion of the Spinal Column, before and after the Treatment.

- A. B. C. as above.
- D. E. Length of the arch.
- F. Its greatest elevation.

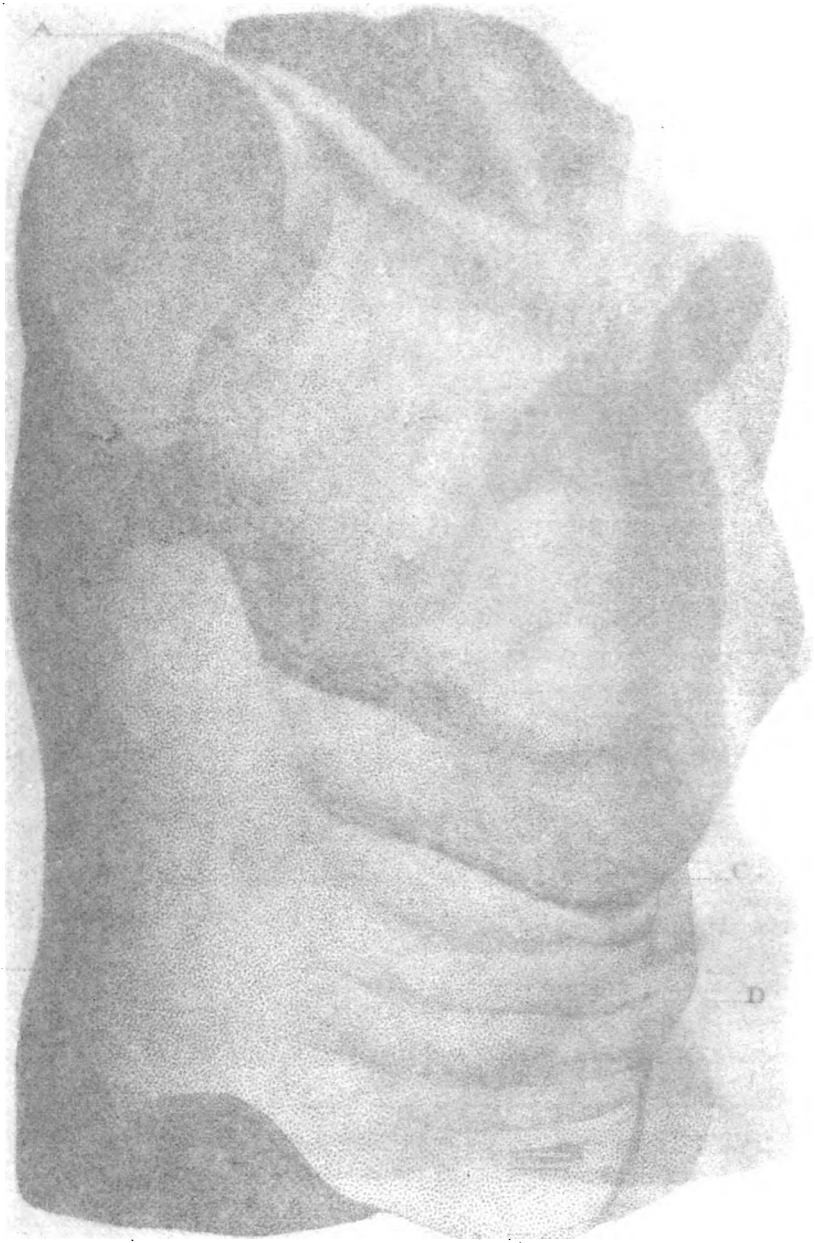
Height of her side, from the spine of the ilium to the top of the shoulder on the left side, six inches and a quarter; ditto from ditto on the right side, seven inches and a half. Distance from the umbilicus to the point of the sternum, two inches. Circumference of the body at the point of the sternum, round the most prominent vertebræ, twenty-nine inches.—
July 14th, 1820.

On examining her this forenoon, the spine was found to be straighter, sensibly elongated, and its



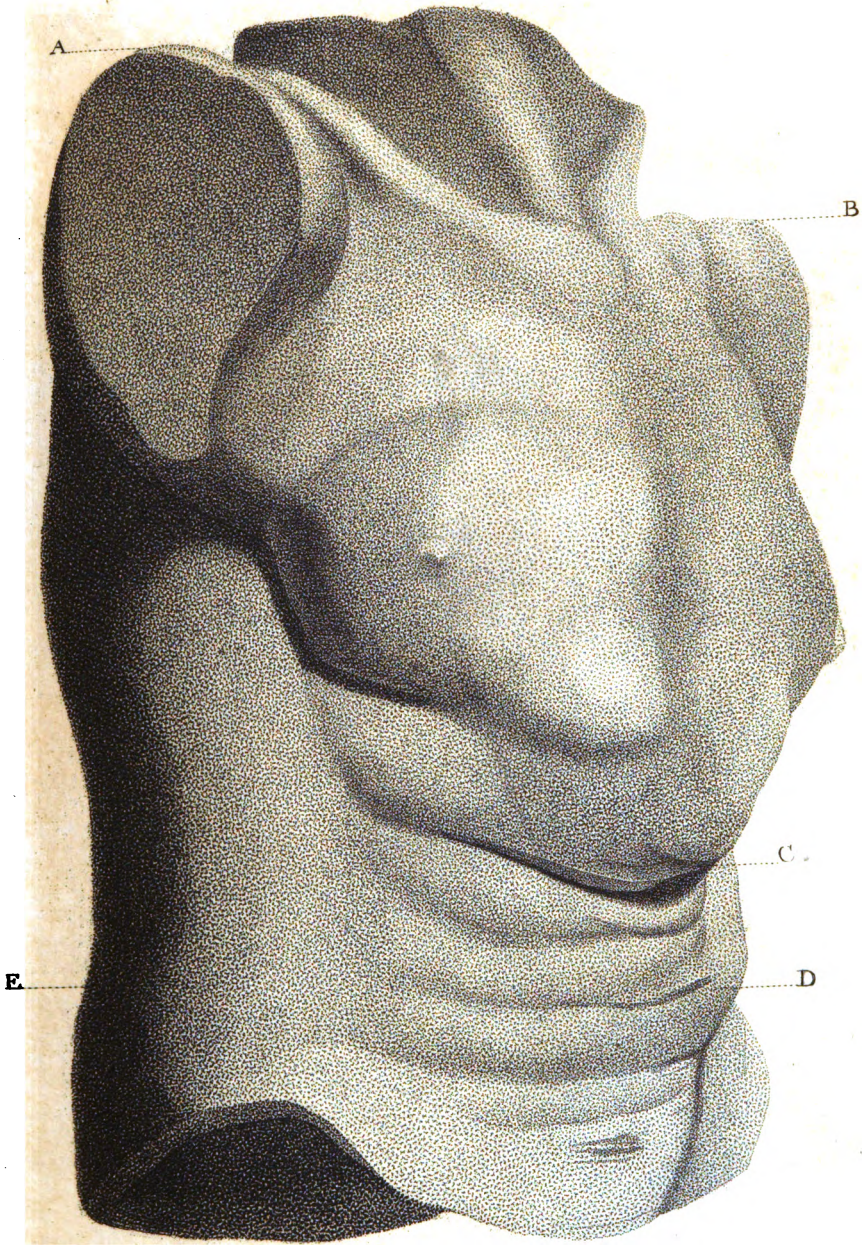
B. B. Green del.

S. Bellin sculp.



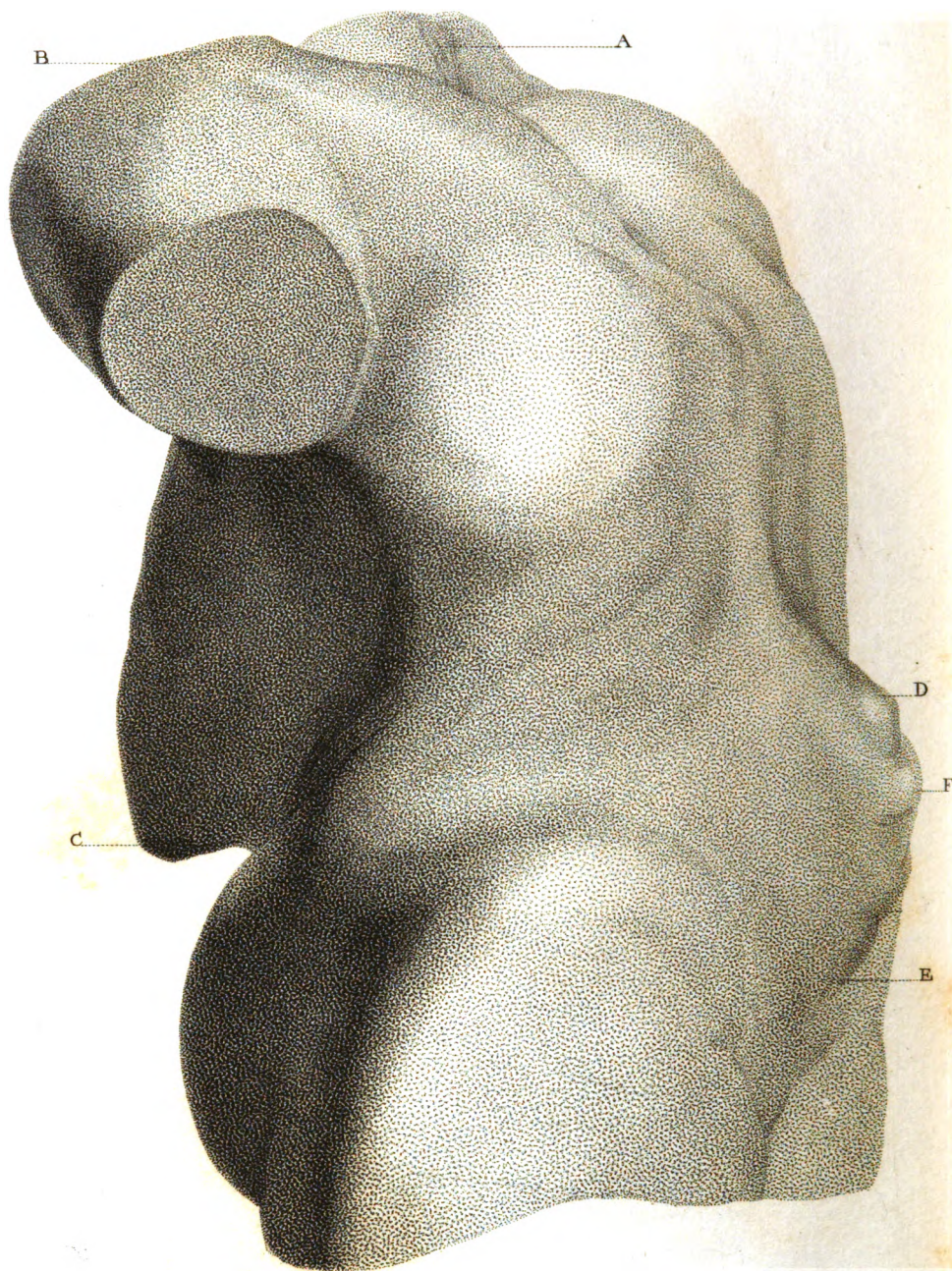
1875





B.R. Green del.

S. Bellin sculp.



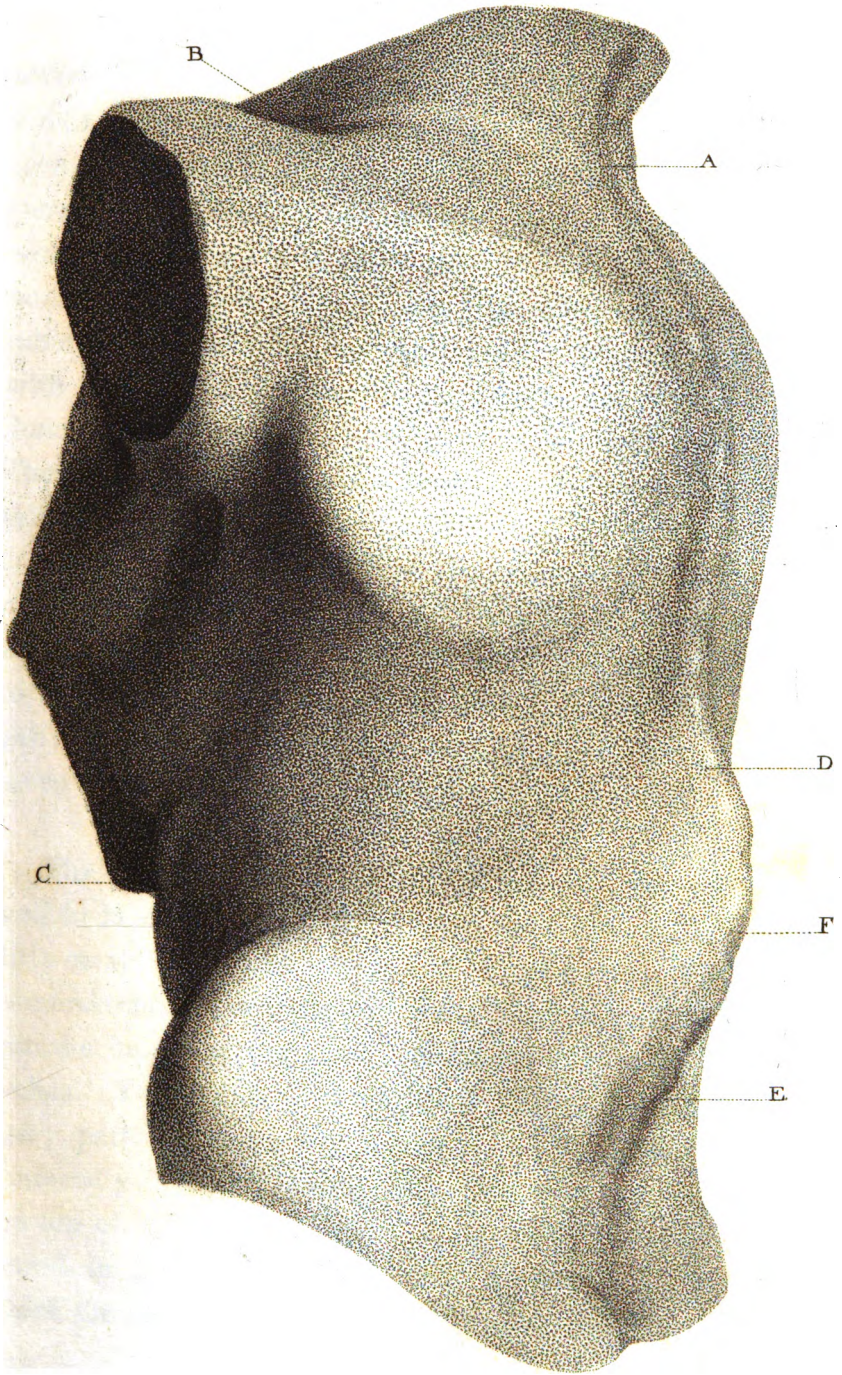
B. R. Green del.

S. Bellin sculp.



S. P. Green, 1881





B. R. Green del.

S. Bellin sculp.

several parts had become more distinct. The five lumbar vertebræ were seen raised into an elevated arch; above them the bones were depressed. The shoulders and spine lying between them were pushed outwards, making a strongly marked and misshapen hump. The lower cervical bones are irregularly protuberant: the sternum is little altered. She breathes with difficulty in the horizontal posture; and the abdominal muscles act powerfully to assist respiration. The belly is less tumid; and the spines of the ossa ilia, relieved from the load of flesh which hung over them, are clearly visible. Height on the left side as above, nine inches and a quarter; ditto on the right side, eleven and a quarter; length of spine from the nape to the cleft between the nates, fifteen inches and a half; circumference round the chest, as above, twenty-seven inches and three quarters.—July 16th, 1820.

The respiration is quite easy, and she is perfectly well in health. Height on the left side, ten inches; ditto on the right side, eleven inches and a half. The circumference from the point of the sternum now falls into the hollow of the back, and measures twenty-six inches. The improved shape of the spine is visible in every part. The cervical bones were at first thrust confusedly together, leaving very little space between the top of the chest and head. They are already restored in great measure to their natural beds, by which the neck is considerably elongated. The hump

includes two or three of the cervical, with five or six of the upper dorsal, vertebræ, and also comprehends the back parts of both scapulæ; making altogether a very unsightly protuberance. The lumbar vertebræ are all engaged in forming a considerable posterior and somewhat lateral curve, in which their transverse processes on the left side are thrust inwards. On the right they are forced obliquely outwards; at the same time that the vertebræ lean towards the top of the sacrum in such a way that the transverse processes of the two last are forced partly over the posterior spinous process of the right os ilium. It is chiefly owing to the particular shape of the arch, and its inclination to the right loin, that this side is longer than the left. The lower dorsal bones, pressed together, were at first almost concealed between the hump and the lumbar arch.—July 31st, 1820.

She is in the best possible health, and gains flesh daily. The height on the left side, as formerly noted, is eleven inches and a half; ditto on the right side, as ditto, is twelve inches and a quarter: the circumference, taken from the sternum, now surrounds the lower part of the hump, and is twenty-seven inches; distance from the umbilicus to the point of the sternum, five and a half inches.—August 25th, 1820.

She is in all respects well, and quite free from pain. She has gained a great deal of flesh and colour

since she entered upon the present treatment. The mammæ, which were flat and indistinct, have become full and prominent. The neck, at first concealed between her shoulders; is now raised above them, and is well formed. It is owing to this improved disposition in the shoulder points, that the two sides approximate nearer to each other in length. Height of left side, ten inches and three quarters; ditto of right side, eleven and a quarter inches; circumference, twenty-seven inches; distance of the umbilicus from the sternum, five inches; length of the spine, as formerly measured, sixteen inches; length of the whole person, four feet seven inches.—Oct. 31st, 1820.

Remarks.—Mary Anne Rafter has enjoyed uniform good health during the whole period of her restraint. Her face, which was at first thin, pale, and haggard, has become plump, blooming, and juvenile. She has gained a great deal of flesh. Her limbs are well formed, and the lower ones are alike in length and appearance. The left leg was at first much shorter than the right. She walks erect, and with ease, requiring no support. Her appetite is good, and her bowels have regularly performed their functions without any artificial interference. She sleeps well, and is always cheerful: breathing is easy in all positions, and the fulness of the abdomen has entirely disappeared. The lumbar vertebræ, which at first were thrust down upon the sacrum, have risen higher

in the back. The arch is much reduced, and has no longer any lateral turn. The five bones of which this arch consists, are all loose and movable. The transverse processes are nearly of the same level and depth below the skin on both sides. Her weight is increased to fifty-seven pounds.

The distortion has been gradually and regularly diminishing ever since she entered upon the present course, so as to hold out the reasonable prospect of ultimate restoration to a good figure, could she have been induced to persevere long enough in the treatment. Thinking herself well in health, and being impatient of longer confinement, she was this day (May 12th, 1821,) released from all restraint, at her own desire, and suffered to go home,—with an assurance that, unless she submitted to remain longer in the recumbent posture, for the affected parts to recover their lost tone and healthy energy, the deformity, instead of continuing stationary, would certainly go on increasing till she either sunk under its effects, or was rendered unfit for any useful employment.

It is clear, from the progressive improvement which has taken place in the disposition of Mary Ann Rafter's spine and chest, that no bony union or true anchylosis had taken place in either of them. When that connexion is once formed, the parts can never be again disunited by any known process. The distortion,

such as it is, must remain fixed and unalterable. By ankylosis, the ancients meant to express simply crookedness of a joint. This state being generally accompanied with rigidity and loss of motion, the term, by an easy extension of its signification, was made to comprehend them also.

Of late, when ankylosis has been found to prevail in a member, the loss of motion has been supposed in every instance to proceed from osseous union of the articulating bones.

We have too many proofs of the consolidation of bones in the human body to doubt its frequent occurrence. But as crookedness and rigidity frequently proceed from a morbid condition of the ligaments alone, the two states should be carefully distinguished in practice.

Such was M. A. R.'s case. The success which followed the treatment shews, that we have in this country been led to entertain a narrow and erroneous opinion of spinal distortions and curvatures, by supposing that when once established, the malady is always rendered permanent and incurable.

I omitted to mention in its proper place, that her eye-sight was very defective when she first came under my care, and had been progressively growing worse

for several years. She could not see distant objects ; her perception of near ones was dull, imperfect, and obscure. The sight is much recovered ; it has been regularly becoming clearer and brighter from the commencement of her treatment. In the last case, vision is reported to have improved, as the spinal disorder abated. I shall communicate other cases to the public in which equal or greater benefit has been derived from similar means.

The intimate connexion which has been observed to subsist between vision and spinal maladies, may, it is conceived, be satisfactorily explained on anatomical principles. The sixth pair of nerves, the pathetic, arise, it is well known, from the corpora pyramidalia, and run to the abductores oculorum. A branch from the deep-seated vidian is also expended upon the eye. Both nerves are connected with the great sympathetic by means of fibrils, which pass to them from the upper portion of the carotid ganglion. Two fibrils proceed separately from the under side of the same ganglion ; and after running a short distance, unite to form the trunk of the great sympathetic. The ganglion, therefore, lies between the nerves above mentioned and the sympathetic ; having an intermediate position, it communicates anatomically with the three. According to some pathologists, the great sympathetic derives its origin from these nerves, and especially from the sixth. According to others,

it merely ascends from the first or highest cervical ganglion to join them. It seems to be really of little moment, in a medical point of view, how the question is finally decided. The fibrils which connect the carotid with the upper cervical ganglion, are too slender and inconsiderable to convey much energy from the nerves above mentioned, through the interposed carotid ganglion to the trunk of the great sympathetic. The two portions run close to the carotid artery in the carotid canal, and pass with it out of the base of the skull and along the neck. It then traverses the thorax and abdomen to the lower part of the pelvis. In this long and extensive range it communicates with, and distributes influence to, all the viscera, and nearly to every internal part of the human frame situated below the head. It is the connecting bond of the ganglionic system, and is intimately mixed with the spinal nerves. After this short exposition, we can easily perceive a real foundation for that sympathy which is known to subsist between the eyes and several internal organs. We meet with too many examples of the appearance of symptoms remote from their source, to doubt the truth of the connexion on that ground alone. Pregnant women, it is well known, encounter the most distressing sensations in the feet, as if the skin were pricked with something sharp, or pierced by the teeth, when the uterine nerves are irritated by the weight and distension of the gravid womb. Tumours

seated within the pelvis produce great misery in the lower limbs of both sexes; and swellings of the axilla affect the fingers in like manner. A woman whose spine was very crooked, (*dont l'épine étoit très-courbée*,)* constantly suffered, after eating, a most violent pain in her left great toe, which generally went off with copious alvine discharges. Clysters increased its intensity, so long as they remained in the bowels. Many remedies were given, to no good purpose. After death, the lower false ribs on the left side were found thrust into the bottom of the belly and iliac region: by compressing the sigmoid flexure of the colon, they prevented the free passage of excrementitious matters. The lumbar congeries of nerves squeezed between the displaced bones and fæces, became disturbed in their motions. Hence arose the affection of the crural nerve, which was transmitted by the saphenal branch to the very extremity of the foot. The anatomical communication formed in the brain between the abductores oculorum, the deep-seated videan nerve, and great sympathetic, enables us to understand why pressure and wounds of this nerve, in the neck, breast, and belly, occasion convulsions in the eyes and loss of sight. We can also perceive how the irritation of intestinal worms produces contracted pupils and prominent eye-balls. But, of all proofs, the most striking and unequivocal is drawn from the well-established

* Portal, Cours d'Anatomie.

fact, that distressing pains referred to the very bottom of the foot, are often felt for a long time after the limb in which the supposed pains are imagined to exist, has actually been amputated above the knee. Here the pains, though felt as if they were in the foot, must proceed from a portion of the cut nerve, situated above the amputated stump. These occurrences lead us to deny the uniform truth of the adage,—*ubi dolor, ibi mali sedes*.

Having shewn that affections proceed from the nervous trunks to the extremities, we shall have no difficulty in maintaining that they are transmitted in a contrary direction from the minute branches, through the trunks, first to the spinal marrow, and afterwards to the brain. In this way we often become affected with lethargy, apoplexy, palsies, convulsions, epilepsy, and, according to some, with tetanus and hydrophobia.

For the same reason, the nerves of the eyes exercise great influence over the functions of the stomach. It is well known, that rapid circular movements of bodies often provoke vomiting; and that in sailing swiftly along narrow rivers, sickness is excited by keeping the eyes steadily fixed upon the receding banks. The overstraining of the eyes in reading is likewise known to induce nausea in delicate persons, and sometimes vomiting. In the former examples,

the nervous disturbance is communicated from the affected part to the eyes: in the latter the order is reversed, the malady being transmitted from the eyes to the stomach. Were more proofs wanted to establish the reciprocal connexion between the nerves which supply these organs, they may be drawn from the well-known fact, that after dividing the great sympathetic, the eye of the same side generally loses its lustre, sinks in the socket, and the pupil is dilated.

Since a distempered state of the nerves displays itself under so many forms, can we hesitate for a moment to believe that vertebral dislocations produce the internal pains and uneasiness with which they are constantly attended? In many other diseases the indications and effects are likewise discovered in apparently dissimilar and remote portions of the frame. These seemingly unconnected phenomena are held together by an impalpable principle, denominated sympathy, which regulates many of the most important operations of living animals.

In proportion as we become acquainted with this power and its regulating laws, we shall be better able to detect the early approaches of some of our most formidable distempers. Among these we must include paraplegia,—a disease which has not hitherto received its full share of professional consideration. This malady is, I believe, in every instance occasioned

by some affection of the spinal marrow, which unfits its nerves for propagating their energies with due vigour to the ramifying extremities.

Though the seat of paraplegia is fixed in the spine, yet the symptoms, as we have already observed, reveal themselves in the most distant parts of the frame. They are seemingly so unconnected with the vertebral column, that our latest and most experienced practitioners* have been deceived into an opinion that the source of this hitherto intractable complaint is to be sought for in the brain, rather than in the spine. Since I first combated this doctrine, six years ago, I have met with so many additional confirmations, that I am more and more satisfied of the stability of my position. When we contemplate the extensive range of the spinal nerves, and that irritations applied to the roots are commonly felt only at their ramifying terminations, we can at once perceive how affections of the vertebræ produce all the nervous symptoms which are associated with paraplegia.

It follows, from the foregoing observations, that we are not to conclude, as a matter of course, that the source and origin of a complaint is invariably fixed in and confined to the affected organ. One or more muscles may be subject to pains, cramps, insensibility, para-

* Dr. Baillie, Transactions of the Royal College of Physicians.

lytic relaxations, and other nervous sensations, when the cause is entirely situated in the spinal column, or other remote part. The pathological and practical inferences to which this principle leads are most important in a medical point of view. Instead of limiting our examination in obscure cases to the ailing part alone, we should not rest satisfied till we have carried it along the course of the nerves up to the spine.

We shall often be rewarded for our diligence, by discovering the offending cause in a distant place, after having sought for it in vain where the symptoms appear.

Though all our former efforts to eradicate or even to mitigate the malady had availed nothing, they will now easily effect a complete cure, when applied under different circumstances, and to the seat of the disease.

Not only do obstinate chronic pains, dispersed over the frame, originate in a distempered spine, but many nervous complaints proceed from the same source. Among these we may enumerate hysteria, a disease which is generally referred to the brain. My reason for entertaining this opinion arises partly from the case under consideration. Fits of hysteria, in their most regular form, always occurred whenever the back was strongly pressed, either between the spine and left shoulder, or on the elevated transverse processes in the right loin. Similar, and even greater pressure, applied to other portions of the spine, was

never productive of either hysteria or any nervous disturbance. These paroxysms, which I could induce at pleasure, were so frequently repeated, and with such precautions on my part, that I have no doubt they were wholly independent of the will of the patient, and occasioned in the manner described. Though the seat of hysteria is generally in the brain, it has been traced to a morbid condition of the uterine system. Without combatting admitted doctrines, we may therefore be allowed, from the present case, to infer that hysteric affections do not invariably proceed from the brain, but are sometimes carried to it, after having been excited by causes operating primarily upon the spinal cord.

Mary Anne Rafter, as I have already remarked, being tired of confinement, deserted her couch abruptly, to return to a vagrant mode of life. She had recovered sufficiently to discard her crutch and stick ; nor, to my great surprise, has she found it necessary to resume either of them, though, since the treatment was discontinued, she has till lately wandered about the country with haberdashery articles. This laborious employment exposed her to great danger of a relapse, by the fatigue she underwent, and the weight of goods she had to carry. Hitherto she has continued well, though she has sometimes walked more than thirty miles in the day.

After regaining her liberty, she entered into the matrimonial state, and last July became the mother of a fine boy. She soon overcame the effects of her confinement. The child survived his birth nearly ten weeks. He then died, more, it is believed, from want of proper nourishment, than from the invasion of any particular complaint.—Nov. 30, 1824.

THE CASE CONTINUED.

MARY ANN RAFTER became pregnant a second time, and in the early part of November, 1825, was delivered of a dead female child. The infant was born, after an easy labour, two or three weeks before the full period of uterine gestation. The mother soon recovered from the effects of her accouchement, and enjoyed good health till late in December. At that period she contracted a severe cold, and the menses suddenly stopped. She was seized immediately afterwards with daily fits of sickness and vomiting. Her strength rapidly forsook her. She had, for the last fortnight, frequent chills, succeeded by fever and great difficulty in breathing. These symptoms continued unabated to her death, which took place last Sunday morning, April 9th, 1826. On the following Thursday the body was laid open in my presence by Mr. Carpue and Mr. Greenwood, with the assistance

of three other medical gentlemen. The spinal column being removed through a longitudinal incision in the back, the vertebræ and interstitial cartilages were subjected to a severe scrutiny. They were declared to be perfect, and to manifest no traces of former disease. It is, therefore, ascertained in this case, by indisputable testimony, that the spinal pillar can be disgustingly misshapen, and curved outwards and internally, without impairing the structure of either bone or cartilage. Distortions of both descriptions are too numerous and well marked, to admit of either cavil or misrepresentation. Should the details of this important dissection be viewed with suspicion, it is happily in my power to support them with the most convincing evidence. This I shall not hesitate to produce, when properly invited to make the disclosure. In the mean time, I venture to assert, that the *post mortem* investigation of Mary Anne Rafter's spine has completely subverted the popular hypothesis of Mr. Pott, and placed the truth of my own doctrines upon an imperishable foundation.

All the medical assistance administered to this poor girl before she became my patient, was, as already observed, in a Dublin hospital. The surgeons of that institution, following the usual notion that the bones were distempered, tortured her with caustic issues for seven successive months. This cruel and

ineffectual treatment took place in the incipient stage, when the complaint could have been speedily subdued by suitable applications. No other plan was attempted by the faculty, because they thought only of caries and caustics. Since juster notions have begun to prevail, it is reasonable to expect that the old method will be speedily superseded by a practice more agreeable to pathology, and better adapted to the cure. On referring to the engravings, the reader will perceive that, in one part, the back was driven considerably inwards, and, in another, as much outwards.

The doctrine of caries having been shewn to be inconsistent with the appearances observed in this remarkable gibbosity, it can no longer be maintained as the usual cause of spinal affections.

Should the abettors of muscular action in the formation of spinal complaints, continue to maintain their opinions unchanged, it will be curious to ascertain to what single or combined muscular power they ascribe the origin of the several distortions which prevail with sound vertebræ. The relative situation of the muscles and spine will not, I think, suffer them to draw the latter either backward or inwardly. All, therefore, that the muscles can be supposed to effect on such occasions, will be confined to the lateral distortions; but as even these are commonly more pro-

tuberant than lateral, if the above explanation be true; they cannot, even in this instance, be properly referred to the actions of the muscles.

I am ready to admit, that strong and violent exertions, or what have been denominated gymnastics, have a tendency to increase the power and activity of the human frame. In this way they are often serviceable in giving a better carriage to delicate invalids; but I cannot so readily subscribe to their ability in reducing an enlarged shoulder or gibbous back. These deformities are not, I think, to be corrected through muscular agency; but those who favour this doctrine may at any time place their opinions at the bar of the public, by making casts of the projecting parts before and after the treatment. Should the swelling sensibly abate during the process, the reduction will appear in the models. These are the tests to which I have recourse, whenever my patients will submit to the measure. Many models of both descriptions are now in my possession, ready for exhibition to all who express any desire to view them. The muscular method of rectifying the spine differs in so many leading circumstances from my own, that both cannot rest upon sound pathology. Let them be fairly opposed to each other, and brought into open collision. This is what I wish to see carried into effect, that their comparative merits may be justly estimated, and the palm awarded to the deserving. Where the public

health is concerned, it becomes an imperative duty to remove uncertainties, and establish medical doctrines, as much as possible, upon authentic facts and legitimate inferences.

The skin surrounding the neck was extensively suffused with a dark-coloured, or rather livid, ecchymosis. It nowhere displayed a putrid disposition, nor was there any such appearance either in the chest, abdomen, or pelvis. The liver was turgid with dark blood, and somewhat enlarged; the stomach contained no food, and the intestines were also empty; round the pylorus, and in the large curvature, the stomach was unusually red and vascular; the lungs adhered in many points to the costal pleuræ; they were darker than natural, and had a few small tubercles dispersed through their substance. On cutting into the pericardium, six ounces of a serous fluid were collected and measured. The heart deprived of its blood was small, flaccid, and pale.

That this patient died of *hydrops pericardii*, is, I think, clearly proved by the dissection. The large accumulation of watery fluid round the heart was quite sufficient to interrupt its motions, and arrest the sanguineous circulation, so indispensable to the continuance of life. The heart and great arteries were found empty, because the constant pressure of serous liquid upon the heart impeded the entrance of blood

into its cavities. They were consequently unfurnished, and could forward little to the pulmonary, and still less to the aortal, branches. Owing to this interruption, the vital fluid stagnated in the liver and venous system: ecchymosis was produced in the neck, and turgescence in the hepatic organ. According to this explanation of symptoms, the death of Mary Ann Rafter was unconnected with her spinal complaint, except in as far as that malady tended to weaken the natural energies of her constitution, and to make it more prone to suffer by the ordinary causes of disease.—Thursday, April 13th, 1826.

FOURTH CASE.

MASTER GEORGE ANDREWS, of St. Vincent's Place, City Road, aged thirteen, of a florid countenance and fair complexion, leans towards the left at all times. The leg and thigh of that side are nearly two inches shorter than those of the other side. To obviate this defect, the shoe-sole is stuffed with leather. He is obliged, in walking, to make use of both a crutch and a stick. Eight years ago he was struck with a stone on the false ribs of the same side, at a considerable distance from the spine. He was much hurt, and being unable from anguish to raise himself in bed, the following morning a surgeon was consulted, who advised an embrocation to be applied. The pains were relieved for a few days, but soon returned with equal violence, and extended from the part affected to the bottom of the foot. They have continued to the present time, with little variation or abatement. He has lately been subject to frequent fits of numbness, which always begin in the bruised part, and proceed from it along the same side to the sole of the foot. Many different remedies and applications have been tried for their removal, but to no good purpose. About eight months after the accident, one of the lower dorsal vertebræ was discovered to project a little. The eminence was at first scarcely perceptible, but increased

gradually; and, others following, the swelling has been enlarging ever since. He has for some time been quite well in health, though soon fatigued, and easily put out of breath. The heart always palpitates violently, and the apex, having been forced out of its natural situation, beats regularly under the third rib. He sleeps well; appetite good; urine and alvine motions natural. Has a very aged appearance.

On viewing him naked, I found the heads of eight of the upper dorsal vertebræ too prominent, and gradually rising like an inclined plane towards the hump. The remainder, with the connected ribs, had formed a large elevated swelling, inclining towards the right, seven and a half inches long, six and three quarters broad, and three inches high in the part most raised. Three of the upper lumbar vertebræ assist in forming the lower part of the deformity. The ribs at their sternal attachments were very irregularly fixed, and huddled together, especially on the left side, so as to contract the chest in front, and give it a disagreeable appearance. The margin of the ribs on the same side nearly touch the pelvis. Some notion may be formed of the severity of the blow, from its having produced a depression on the part struck, which was very conspicuous in the first model, and not entirely effaced in the last. He is four feet in height, and measures twenty-eight inches round his body at the middle of the hump. His back, from the cleft between

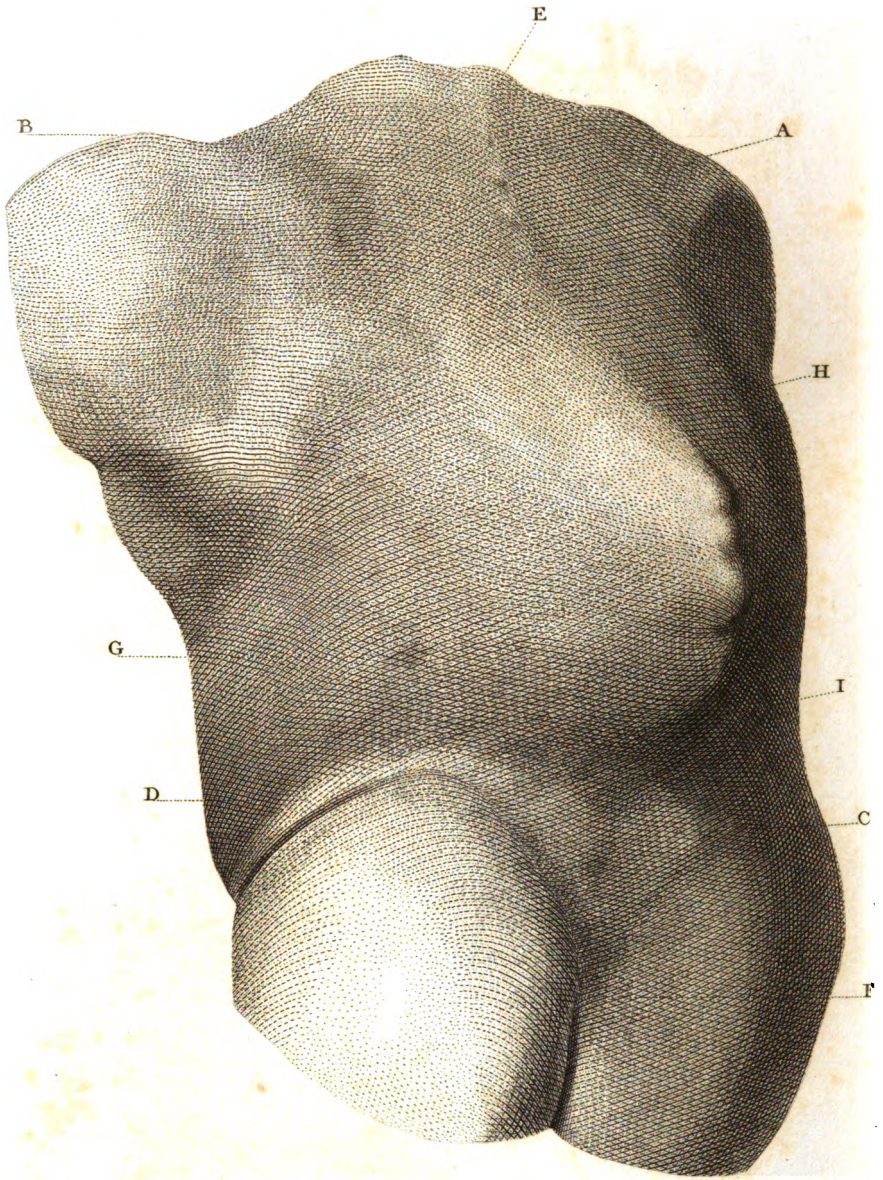
the buttocks to the nape of the neck, measures seventeen and a half inches. The affected limb, when stretched out, always becomes numb for a short time, and afterwards prickles, first in one part, and then in another.

PLATE X.

- A. Top of the right humerus.
- B. Ditto left ditto.
- C. Crista ilei.
- D. Crease in the skin.
- E. First dorsal vertebra.
- F. Division of the nates.
- G. Impression of the stone.
- H. Top of the gibbosity.
- I. Bottom of ditto.—Jan. 31, 1821.

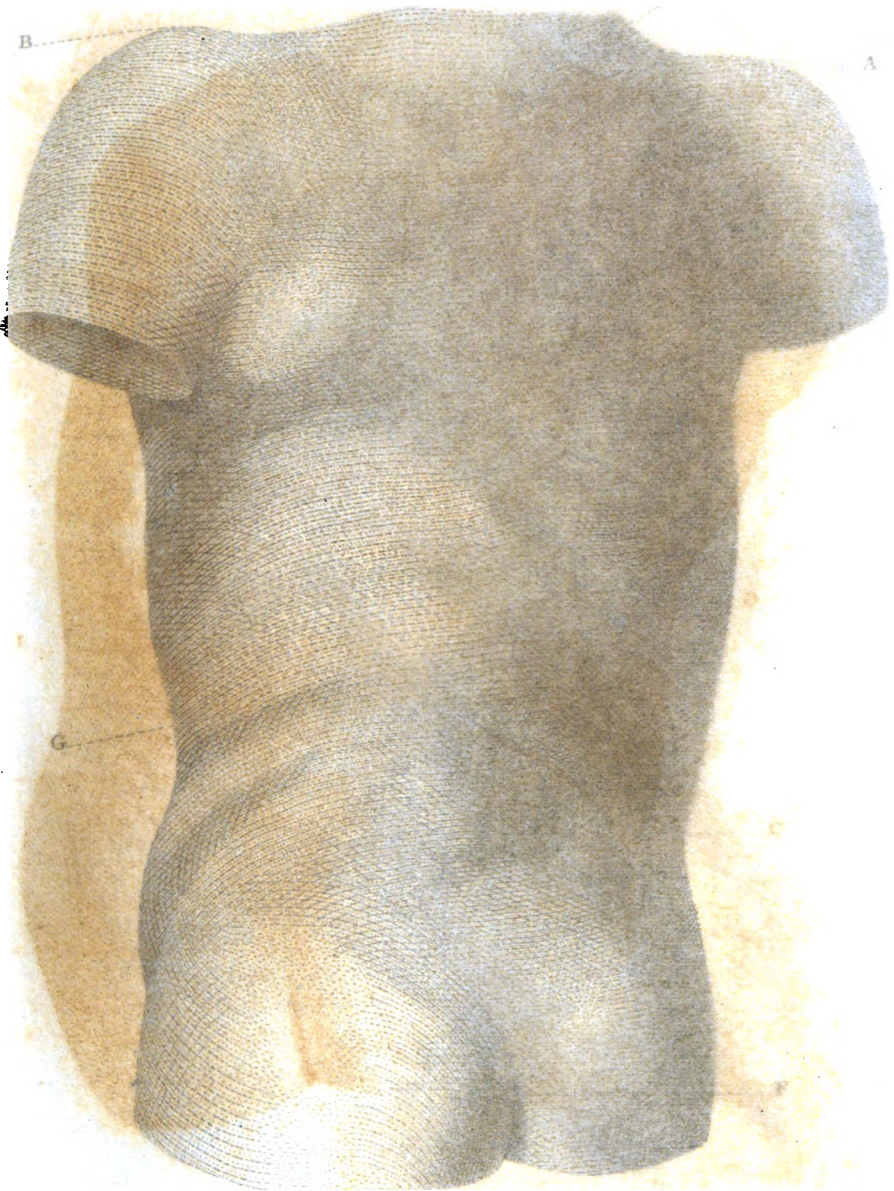
His spine is elongated more than two inches, and the height of the hump is reduced from three inches to one and a half. Both legs are become nearly equal in length, and the hollow on the left side is almost obliterated. The chest is greatly improved in its external form and appearance. His heart beats much less, and has sunk nearly into its proper place. The health is very good, and his countenance has become juvenile.

Length of the hump, at first seven inches and a

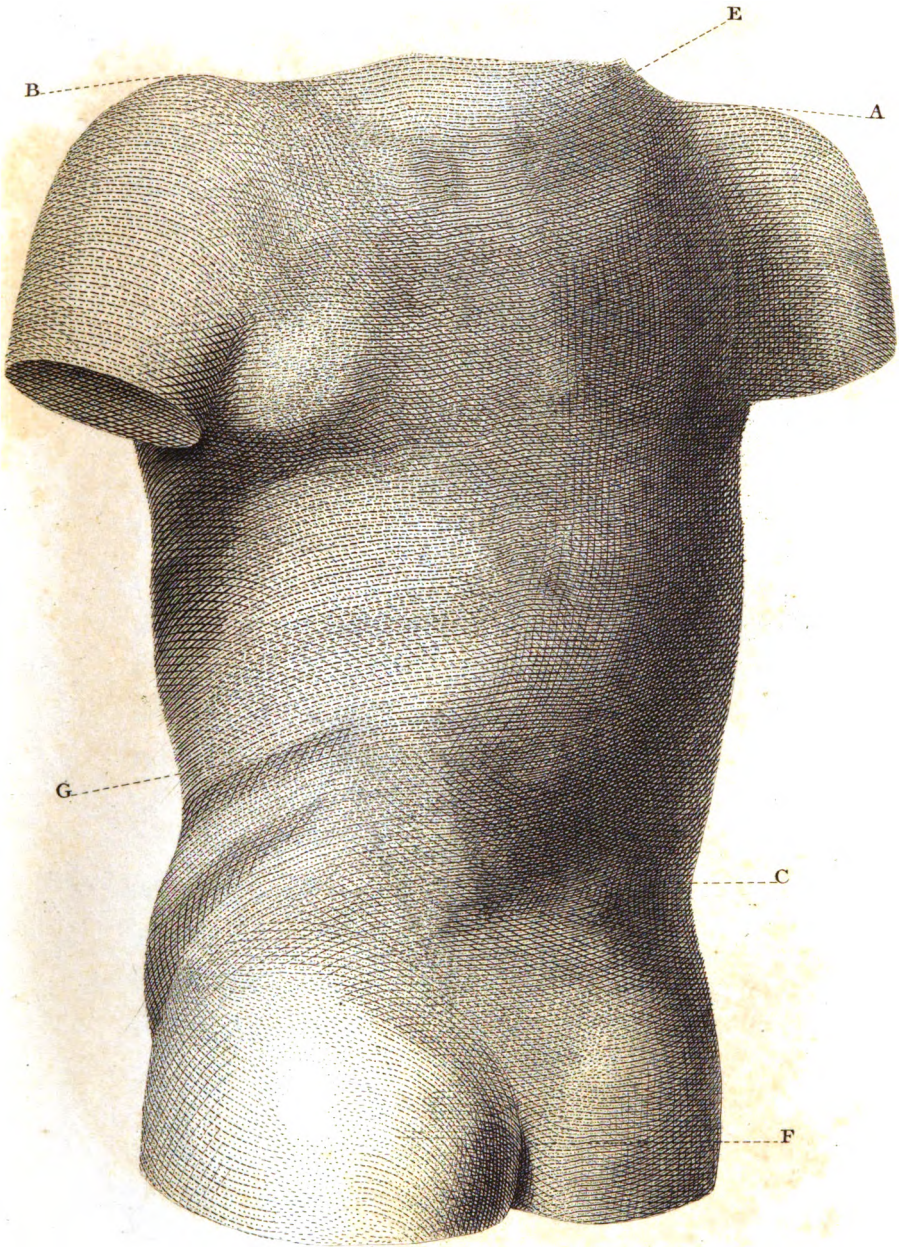


R. Green del.

S. Bellin sculp.







half, is now reduced to four and a half; breadth, at first, six inches and three quarters, is now four inches.—April 10th, 1821.

A gradual detumescence has been observable ever since the last report. What remains is only perceptible on viewing the naked back; it cannot be discovered through a tight waistcoat. The heart has entirely recovered its proper place, and his lower limbs are exactly of the same length. He has grown full ten inches since he first lay down, is much plumper, and in excellent health. The circumference of his waist is at this time only twenty inches, though it was full twenty-eight immediately before the treatment began.—August 10th, 1823.

The patient has, from an early period of the process, enjoyed uniform good health; he walks quite erect, is very grateful for the recovery of his figure, and the opportunity now afforded him of filling a useful station in society.

PLATE XI.

- A. Top of right shoulder.
- B. Ditto left ditto.
- C. Crista ilei.
- D. Site of the former crease in the skin.
- E. First dorsal vertebra.

F. Division of the nates.

G. Impression of the stone.—Nov. 29, 1823.

Remarks.—To apply the general theory to this case, we have only to remark, that Master George Andrews being severely hurt in his side by a stone, to relieve the pain, unconsciously bent towards the ailing part. Had he adopted the attitude occasionally, and only for a short time together, his back would probably have continued to maintain its erect figure, notwithstanding the injury inflicted. Unfortunately, the violence and obstinacy of his sufferings led him to lean considerably at all times. In consequence of this habit, the intervertebral, and probably the vertebral structure also, became permanently reduced on that side, and proportionally expanded on the other. The yellow ligaments, which are strong and flexible, soon accommodated themselves to the new posture. The capsular ligaments, and other articulating fibres, stretched gradually in one direction, and contracted equally in another. As soon as these several organs had suited themselves to this new attitude, the deformity began. However slight it might be in the first instance, yet, having once formed, the swelling continued to increase, till, in the space of eight years, it arrived at its present magnitude.

With my early patients, as already observed, I employed only dorsal recumbency, frictions, appro-

priate manipulations, straps of adhesive plaster and bandages, to confine the projections. Soon afterwards I began to place wooden or steel shields under the bandages, to make greater compression on particular spots. Before many months had elapsed, I endeavoured to elongate the spinal joints. In order to accomplish the object, I fixed a person at the head to keep the body steady, by grasping the patient's arms close under the axillæ. One or two assistants then pulled at the legs. It was during this operation, and while the articulations were forcibly separated and expanded, that I undertook to rectify the vertebræ, by driving them again into the column. Finding that the process was seldom well managed by muscular strength, or that it could be long enough continued to obtain all that was wanted, I substituted a steel machine, which, being attached to the bottom of the couch, acts on the principle of a ship's windlass. Having tied my patient to the upper end of his bed with arm-straps, I connected the ankles or hips to the steel machine, or elongator. By this simple contrivance, a great deal of force may be introduced, and the spinal column lengthened several inches, without raising pain, or producing uneasiness, as I know from abundant experience. This apparatus, which is more fully explained in the sixth case, was tried upon Mr. G. Andrews, and is now seldom omitted with any patient whose deformity is considerable and inveterate.

When I first began mechanically to rectify the spinal column, I always elongated from the ankles; but I now apply more frequently to the hips, because I find that the vertebral articulations are in this way both easily and powerfully drawn out. In fixing the stretching force at a distance from the luxated vertebræ, I conformed to the advice of eminent practitioners.* The power exerted was so visible and satisfactory, that for a long time I continued to employ it, after a friend of mine had made trial of the hips. Where the disorder is complicated with paraplegia, or contractions, I still give a preference to the ankles, in order to relieve the spine and limbs by a double operation. I have lately preferred the hips, on common occasions, because the former mode was suspected in a few instances, although, as I think, unjustly, to have injured the lower limbs. The true ground of this charge will appear in the following statement. One of the complainers was carried immediately from under my care, and, without any preparation, successively to Calais, to Dover, and to Ramsgate. She was then placed in a boarding-school, where, according to the report of a near relative, "she was very ill managed." This little girl became my patient in the following manner. After I had carefully examined into the circumstances of her enormous gibbosity, (of which a drawing is preserved,) I

* See Boyer's Lectures.

said, without making any promise of relief, "If you choose to place your daughter under my care, I will take the charge of her." To this proposal the mother replied, "Then God's will be done. I will leave her with you; for I have been told by a hundred medical men, that in her present state she cannot live to be a woman."

The patient certainly derived considerable advantage from the curative means employed, and it would have been permanent, had my usual directions been strictly observed. But as proceedings directly opposite to them were adopted, I ought not, in fairness, to be made accountable for the miscarriage to which they led. I can safely affirm, that of the many patients who have continued under my professional care, and submitted to my regulations during the convalescent stage, not one has suffered from the process, or failed to preserve the benefit obtained.

FIFTH CASE.

MISS SARAH SOPHIA TARRANT, of Newington Green, aged nine years, has always been very delicate. It is believed she was born under the seventh month, but was remarkable for the symmetry of her person and the beauty of her features. Her countenance is dull, sallow, and contracted; the eye is languid, and she has an antiquated look. She has a deep and most distressing cough, which returns in fits, and at short intervals. Such is its violence, that at every attack the attendants are alarmed with the apprehension of its proving fatal. The dorsal vertebræ rise gradually from the neck to the ninth inclusive. All the ribs are more or less displaced; the three inferior ones are elevated, with two of the superior lumbar vertebræ, into a large projection. Six ribs on the right, and five on the left, swell out with them to assist in making the protuberance. The chest is much contracted in front and behind.

The complaint was occasioned by falling upon the ice, in January 1820. It was first discovered on the 25th of the following month, and had only just commenced: it has been gradually increasing ever since.

In the previous autumn, she often felt pain in her back after stooping, but no distortion was perceptible till the time mentioned. She measures only three feet six inches. Her parents are of opinion that she has grown nothing for the last year and a half. Appetite is remarkable, being equal to that of two healthy adults; but her food never seems to impart any nutriment. Bowels are obstinately constipated: the motions have a strong and peculiar odour, something like the washings of a foul gun; they are generally hard, in some parts clay-coloured, and in others having the appearance of pickled walnuts. She is subject to very severe and most distressing pains in her legs and thighs, which are often cold and numb. —April 3d, 1821.

Her spirits are much more lively; she is no longer fretful, and the appearance of the countenance is greatly improved. She has gained flesh and weight since she began the treatment. Appetite is natural; her motions are good; she is no longer subject to hasty and irresistible calls to make water. The heart, which beat forcibly, and much below the natural situation, has risen to its proper place; its strokes are no longer violent or particularly strong. The cough is much relieved, both in severity and force. The protuberance is greatly reduced: nine of the eleven ribs have been nearly restored to their proper situa-

tions; two on the right side remain something displaced. She is increased in height two inches.— May 10th, 1822.

She is always cheerful, is much improved in her general appearance, and has an open countenance. The cough has entirely left her. Her chest and loins are much broader, and finely turned. Appetite is regular and good, but not extraordinary; she lives upon fresh animal food for dinner, with a suitable proportion of vegetable matter, and this diet agrees with her. The ribs on the left side have been some time replaced; the eighth and ninth on the right side are still slightly elevated. All the vertebræ, except the eleventh and twelfth dorsal and first lumbar, have been entirely replaced, and these are not more than a quarter of an inch too high.— June 25th, 1822.

The recumbent posture has been strictly observed, and her health has been uniformly good, ever since the last report. The swelling is wholly removed, except in the three vertebræ formerly mentioned, which are still slightly protuberant. The ribs have all of them been some time reinstated. She now measures in length four feet four inches.— October 10th, 1823.

Miss S. S. Tarrant gets up every day, and walks

about for some time with great ease to herself. The health, complexion, and general appearance, continue unimpaired.

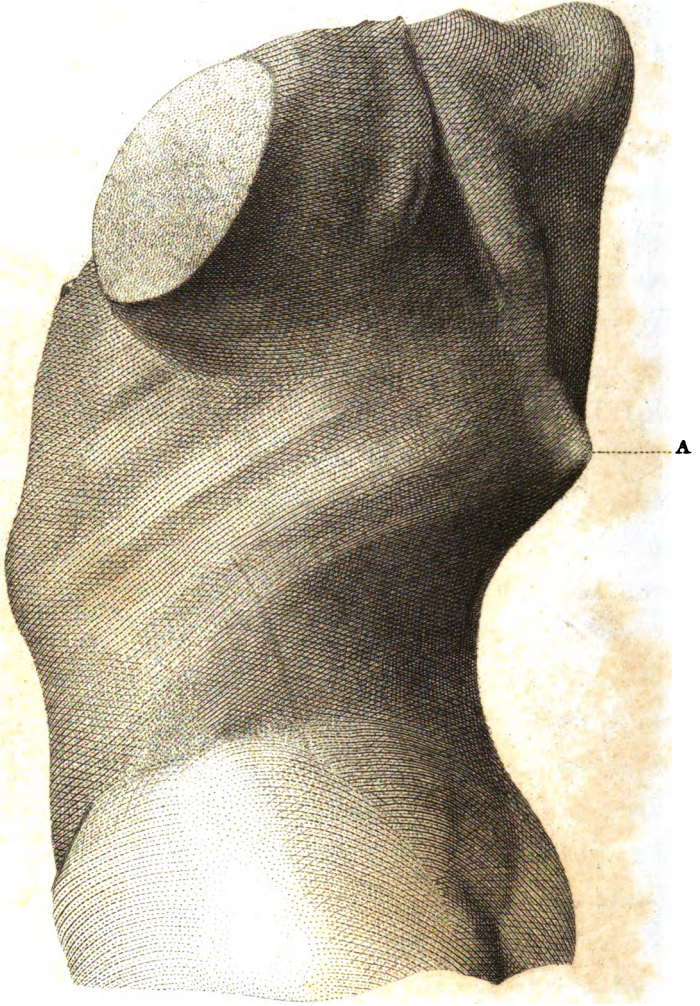
She has through the whole confinement been cheerful and happy, from a strong prepossession, that the plan she was pursuing would ultimately restore her to the full possession and enjoyment of all her faculties. I have the gratification to add, that her patience and most sanguine anticipations have been amply rewarded. — Dec. 5th, 1823.

Remarks. — The improvement in health constitutes a feature of this case, as striking and important as the recovery of figure. One of the most eminent and experienced of the metropolitan faculty had declared, only a few days before I was first consulted, that she would not survive three months. A harassing cough, a wasting hectic, and other distressing symptoms, were consuming her strength. She was in such an alarming situation at my first visit, that I submitted my opinion to the parents in a written report; the contents of which met the approbation of their medical attendant, a gentleman of great professional experience and respectability. The report was couched in the following terms.

Feb. 19th, 1821.

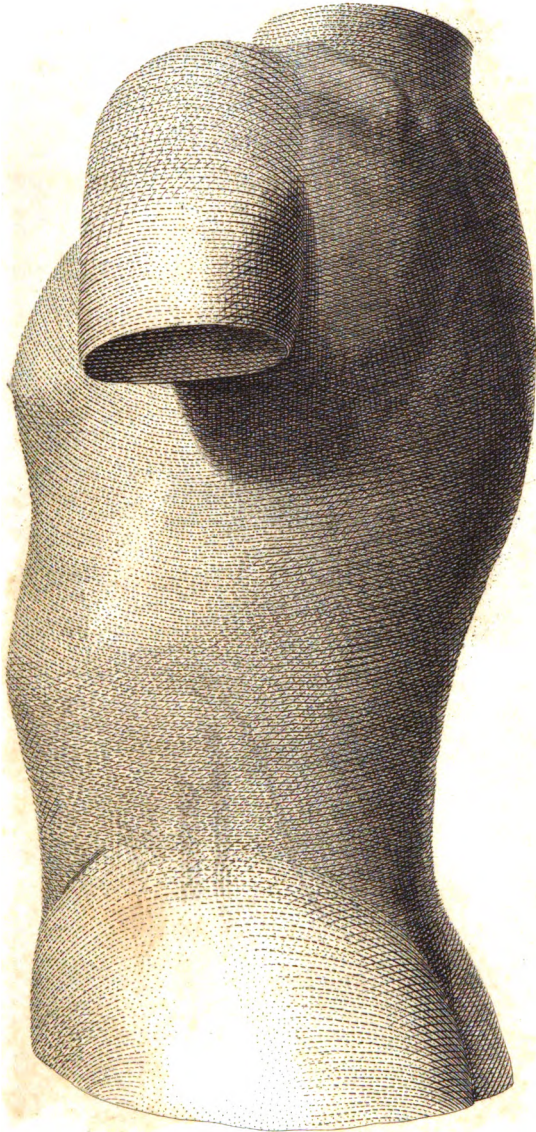
“ On examination this morning, I found three of the

lower dorsal, and two of the upper lumbar, vertebræ, partially displaced in the person of Miss S. S. Tarrant : one was considerably higher than the rest, and its spinal process stood out prominently and alone. The ribs on both sides, by their firm attachments to the vertebræ, are forced almost directly backwards, and, together with these protuberant vertebræ, constitute the large roundish swelling which is so conspicuously placed below the shoulder-blades. In front are several marked depressions, or lines, on each side, extending from the sternum to the back: they were produced by the posterior or outward spinal curve having drawn the lower ribs along with it. In consequence of these deviations, the chest is peaked and contracted. The heart beats with unusual force, to drive the blood through the displaced pulmonary vessels and aorta; a displacement which is the unavoidable consequence of their being firmly bound internally to the bent spine. From the derangement of the spine and chest, the heart, lungs, stomach, and liver, must have their important functions impeded and disturbed. The patient has from these circumstances been reduced to infirm and delicate health, and become predisposed to pulmonary consumption. This very dangerous state can only be removed by restoring the back and chest to their natural form, that the spinal nerves and internal organs may be reinstated in their natural abilities."









I had the satisfaction to observe, that, under the treatment, she advanced rapidly, and quickly succeeded to a good state of general health. Nor has it, during the whole period, suffered the slightest interruption, either from constant recumbency, or the other means employed for her cure.*

PLATE XII. *taken before, and* PLATE XIII. *after the treatment concluded.*

A. the most prominent vertebræ.

* The Casts of this and all my other patients were modelled from nature by Mr. Mazzone. That the Engravings might exhibit a faithful picture of the parts intended to be represented, the corresponding Drawings are taken in the same position of the Casts.

SIXTH CASE.

MRS. WELLS, of Hemel Hempstead, aged forty, was thrown out of an open carriage with great violence, upon her face and elbows, some time in August 1817. She was much bruised, but felt no particular inconvenience till March, 1819. During this time her shoulders were observed to grow more prominent, and to be accompanied with a marked depression in the upper and fore part of her chest. She has been a severe sufferer ever since, and has taken many medicines of different kinds, without obtaining the smallest relief. The case was for a long time supposed to be rheumatic, and treated accordingly. In the spring of 1820, she consulted a very experienced and highly respectable surgeon: he said that she was suffering under a disease of the spine, in which several of the vertebræ were decayed, and added, that nothing could be advised for her with the smallest prospect of relief. He recommended, amongst other things, the insertion of caustic issues near to the part most protuberant. His directions were neglected, owing to the despondency of her medical attendant, who substituted blisters, and never had recourse to issues or setons.

Has little use of the upper, and none of the lower, limbs: they always feel heavy, cold, and numb,

though to other persons they are sometimes cold, at other times hot. She is unable to bend her back in the smallest degree; nor can she turn herself to either side as she lies in bed. The weakness of her limbs and back came on imperceptibly, and have increased very slowly. It was more than two years after the accident occurred before she was entirely deprived of all power, in either the back or inferior extremities. Appetite has lately declined, and her liver has often been affected. The latter complaint is discovered by looking at the countenance, which is at these times dull, sallow, and of a yellowish brown. The urine is frequently turbid, with an ammoniacal smell; motions dark coloured and offensive; menses are of a brown or greenish hue, and emit a disagreeable odour; pulse weak, and of moderate frequency. All the dorsal vertebræ and ribs, by their extraordinary prominence, form an unsightly convexity or gibbous swelling. The third, fourth, fifth, and sixth, in particular, appear considerably higher than the rest, forming the arc of a small circle, and their spinous eminences bend a little towards the left. Owing to this partial turn, the transverse processes may be distinctly felt on the right side. The dorsal convexity has produced a disagreeable hollow in the small of her back, with a corresponding fulness of the abdomen. There is not, and never has been, tenderness in any part of the spine.

The patient being placed upon a couch, as usual,

had her back and chest well rubbed with an emollient liniment for more than an hour, while the spine was stretched in a machine formerly referred to. It is constructed of steel, upon the principle of the windlass of a ship, and fixed to the bottom of the crib. By means of soft leathers surrounding the arms, and connected with the top of the couch; and of other leathers, attached to the ankles, which are fixed to the machine; almost any degree of stretching may be safely resorted to, by turning the roller of the machine, provided the force be gradually increased. The prominent vertebræ and ribs were then pressed, and driven in the direction of their natural situations, with an instrument held in the right hand. It has a wooden handle, into which is fixed at right angles a brass rod, four inches in length, and of strength enough to bear any degree of force that the operator may deem it prudent to apply. To the lower end another round piece of brass metal, about two inches long, is rivetted at right angles. This, well covered with soft leather, to prevent its bruising the skin; constitutes, with the other parts, the instrument that I employ in all my manipulations. I formerly used my thumbs only for pressure; but finding the other contrivance much more powerful and easier to be borne, I have for a long time given it the preference. A firm bandage was afterwards fastened round the chest, to prevent the bones from rebounding. This bandage being adjusted, she was laid flat upon the

back, and directed to remain constantly in the same position. The patient's dress, and the divisions of the mattress, admit of all the natural offices being conveniently performed, without moving the trunk of the body.—Nov. 4th, 1823.

The arms and legs have acquired more feeling, a better colour, and their natural warmth. She can already move her arms freely, and her toes a little. The back is less arched; only two of the four irregular vertebræ appear above the rest. The means of cure above recommended have been daily repeated since last report. A steel shield was this day placed over the most prominent vertebræ, and under her bandage, to confine them, and make stronger pressure.—Nov. 16th, 1823.

The contour of the spine is entirely restored, with the exception of the fourth and fifth dorsal vertebræ, which still project a little: their transverse processes continue partially depressed, and turned towards the left side. Those of the right may be easily felt. She has recovered the faculty of moving her hips, knees, ankles, and toes, with some freedom in both limbs. The left leg has from the first been weaker, and continues more infirm than its fellow.—Nov. 28th, 1823.

Besides bending the lower extremities with greater facility, she can now draw them upwards, and push

them back with some degree of force.—Dec. 8th, 1823.

Every day since last report has been marked with increased power in the lower extremities; she moves them with great freedom and ease in every direction. The proper form of the back is entirely restored, except where the two vertebræ above mentioned have raised the skin into a small circular tumour.—Dec. 10th, 1823.

The patient continues in excellent health, has a good appetite, and sleeps well. She moves her limbs with facility in every direction. She can not only pull them up and push them down, but crosses and draws them back again, without the smallest difficulty.—Dec. 31st, 1823.

The strength and activity of the lower extremities have lately increased. She can elevate and depress her chest and belly with great ease. The projecting vertebræ are lower. Her countenance is much improved.—Jan. 28th, 1824.

The two vertebræ formerly described still remain slightly raised. In all other respects the spinal column has recovered its lost figure. The menses and urine have regained their natural properties. She is in excellent health and spirits. She was this morning

assisted from her couch, and walked about in the room for ten minutes with great ease, and strength in her lower limbs.

She was permitted to return home this day, on condition that she agreed to maintain the horizontal posture until the ligaments of the spine had entirely recovered their lost tone and vigour.—Jan. 30th, 1824.

Remarks.—Mrs. Wells had a young child in her arms at the time of her accident, and contrived to preserve it unhurt. She was too much terrified to know exactly how she fell, but thinks it was either upon her side or upon her elbows and face. She sustained so little inconvenience at the moment, that from the date of her fall till March 1819, an interval of nineteen months, she followed the laborious occupation of a baker. The neighbours remarked that she slowly lost her natural figure during this period, though they were unable to account for the change produced in her person. I am inclined to believe, that although she did not tumble upon her back, she distressed it, and strained the ligaments by her efforts to save the child and herself. Had she abstained from work only for a short period, the strained parts would probably have recovered their tone, and no disadvantage have resulted from the accident. Instead of using the necessary forbearance, she continued to employ her hands in working the dough,

and after it was baked, in tossing the loaves into a higher apartment for sale. By these daily occupations she gradually weakened the spinal ligaments between her shoulders, which had sustained a shock from her fall; and they, no longer able to confine the vertebræ, suffered them to slide outwards. The ribs followed, in consequence of their firm connexion with the spinal column. Had the vertebræ been ulcerated or injured in their structure, as had been supposed, every effort to restore the spine and ribs would have been more detrimental than beneficial. It is evident, from a careful regard to the symptoms and the successful termination of the case, that the vertebræ were displaced, but not decayed, though the latter had been asserted on very respectable authority, and by a most experienced practitioner.

The foregoing explanation derives consistency and support from the following communication, which I received from a medical friend:—

Three stout healthy sisters contracted severe spinal complaints, as it was believed, in the following manner: The mother, an athletic woman, used to amuse herself by alternately tossing them aloft, and catching them under the arms. She spent some hours daily in this diversion. The backs of her children received so many jars and twists in the prosecution of these rude sports, that the ligaments became stretched and

weakened, till they were no longer able to keep the vertebræ fixed and stationary; they accordingly gave way, and spinal distortions followed.

Before I dismiss the consideration of Mrs. Wells's case, I wish to detain the reader with a few observations concerning it, because the stability of her cure will mainly depend upon a strict compliance with the directions given. I am the more solicitous to enter upon an explanation at this time, as she has already shewn some impatience of restraint, and an inclination to neglect my admonitions. This disregard of the prescribed rules has, in too many other instances, led patients, the moment they were released from personal superintendence, to become negligent, and forfeit the advantages of my previous assistance.

Not wishing to depend upon verbal injunctions in an affair of so much importance to my patient, I, agreeably to my general custom, wrote and presented to her a letter containing directions, which she promised carefully to obey. This letter may in fact be considered as circular, with such alterations and additions as were applicable to this particular case.

“ Holles Street, Jan. 30, 1824.

“ As you are shortly to leave London, I am desirous, before your departure, to trouble you with some advice respecting the future management of

your health. I do it with the greater pleasure, because you will, I think, second my endeavours with the best intentions to fulfil them.

“ I wish to caution you, not to place in danger the permanency of your recovery by hasty and rash exertions. With proper attention and unwearied vigilance you cannot miscarry; but unless you submit to the enclosed directions, you will assuredly fail. The ligaments will slowly elongate, and you will gradually lose all the advantages of my successful exertions for your benefit.

“ I am sorry to feel it my duty to state facts, and recommend measures which will, I am afraid, be unpleasant to you. But in as much as there is no royal way to health, God having made us all equal in this respect, you only stand upon the same footing with the rest of your sex.

“ I am anxious to impress upon your mind the great necessity of continuing to maintain undeviating recumbency, till the predisposition is entirely subdued. It is impossible to determine with certainty in any person, how soon the spinal column shall have acquired strength enough, after the treatment is finished, to maintain an erect deportment, and perform the usual offices of life without danger. I am inclined, all circumstances considered, to recommend to you constant

lying for the next six months; afterwards the effects must be carefully watched, and the periods of sitting up gradually extended, as they can be safely indulged. In relaxed habits, and in all cases for a long time, after the spine has been restored, the erect must be frequently exchanged for the reclining posture, in order to relieve the back from injurious pressure, and enable the vertebral joints to freely exert their inherent elasticity. The spinal column must be frequently surveyed by some careful person, and the slightest deviation immediately corrected, otherwise it will acquire confirmation, and increase by delay: It is of importance to remark, that, along with distortion, the health always declines, and the countenance becomes aged and contracted. These and various other distressing consequences may be prevented, by submitting to some temporary sacrifices; so trifling indeed, when compared with the magnitude of the danger, that I am sure you will not hesitate to comply with whatever is required to prevent a relapse. When you are doubtful as to the effect of any act, refrain from the performance of it. You cannot suffer by over care, though you may easily err by gratifying your inclinations. The frictions and liniment cannot be too long continued.

“ So many considerations of health and of usefulness are connected with a proper disposition of the vertebral pillar, that I need not, I hope, employ more

words to impress upon your mind the great necessity of uninterrupted vigilance for the next few years."

Though I have not seen Mrs. Wells myself, since she left London, occasional reports have been sent to me. It was said, when she first arose from the crib, that she appeared more upright, and discovered a better shape than at any former period of her life. Having obtained permission to use her limbs a little, she became inattentive to the cautions I had given. She not only moved about the house for hours together, but marched into the streets, and continued so long out of doors that her friends took alarm for her health, as she was observed after a time to droop in walking, and to be soon fatigued. Nor was this all; she ceased to recline in the day, and freely assisted the servants in her laborious business. She had not indulged in these propensities many weeks, before her back was observed to have lost some portion of its acquired figure, and to have grown rounder between the shoulders. A medical gentleman of high reputation, who occasionally resides in the neighbourhood, had the kindness to admonish her upon her imprudence, and to recommend greater forbearance. I also wrote a strong remonstrance, as soon as I heard of her inconsiderate proceedings. She nevertheless persevered, and has, I am informed, already lost so much in the appearance of her figure, that, unless she can be induced to practise greater

caution in future, the paraplegia may be expected to return at no distant period. It is truly lamentable, that patients cannot be made to believe, that it is not enough to conform during the first part of the treatment. The same necessity obtains through the convalescent stage, and in some degree for a series of years. The disease in early life often arises almost entirely from constitutional delicacy. In that case, the repetition of the exciting causes, while the predisposition remains, will always lead to the same melancholy results.

In order to prevent relapses in such habits, the occasional causes must be studiously avoided, until the stamina are sufficiently developed to resist their influence. Even where the complaint is purely accidental, great care is required, as the weakened organs will for a long time give way to slight impressions.

Abundant examples of this kind may be taken from other parts of the body. Where the knee or ankle is partially dislocated, or has been severely strained, it is not enough merely to replace the joint: much more is required to establish a perfect cure. The articulation must be supported with firm bandages to prevent vacillation. After the member has been properly secured, it is to be kept quiet, and to have no weight put upon it for a long time afterwards. Where these precautions are omitted, the cure is interrupted, and

at last only imperfectly accomplished. For the same reason, the vertebral articulations must be kept at rest, and all pressure carefully removed from the spinal column. When patients have continued under my immediate management, and implicitly submitted to my directions through the convalescent stage, I can assert with truth, that I have not failed in a single instance to render permanent the benefit which they had received; but where patients have been removed from under my care at the end of the treatment, or would not comply with my regulations after it was finished, I ought not to be censured for the want of success. The blame should doubtless rest with themselves, and not with me. After all, such cases are not, strictly speaking, failures, but relapses. Similar disappointments, even in the management of trifling ailments, are so common, that with the experienced they are rather matters of course, than to create surprise.

Relapses, the natural consequences of indulgences and irregularities, will be liable to assail the convalescent, who does not restrain his pleasures and occupations within reasonable limits. Could it even be demonstrated, that the treatment had proved unsuccessful in a few instances during the first stage, it would only shew that this, like other modes of practice, is not infallible.

REPORTS CONTINUED.

Mrs. WELLS has enjoyed good health since her return home, and looks better. Her back has gained strength, and is rather flatter. She feels stronger in her limbs, but has remained constantly on her couch.—
April 17th, 1824.

In a letter received from Mrs. Wells, dated Feb. 14th, 1827, in answer to my inquiries into the present state of her health, she only complains of catarrh, and slight rheumatic pains. I therefore infer, that she has attended to my repeated admonitions, and escaped the danger of a relapse.

SEVENTH CASE.

MISS PRYER, aged twenty-eight, is unable to stand or sit erect, even for a single moment, unless she be supported. She walks with great difficulty, requiring the assistance of a stick, and the arm of a friend, in consequence of the great debility, and the little power that she can exert in moving her limbs. The whole spine is tender to the touch, and bends outwards, like a hoop, whenever the weight of the head and trunk is placed upon it, either in walking or sitting erect.

On lying down, which is her only easy position, it immediately recovers its natural figure, and she then possesses the free use of her lower extremities.

She is almost constantly tormented with aching, shooting pains in the back of her head on the left side, which leave the scalp tender to the touch. The nervous system is so delicate, that the slightest causes produce palpitations, dyspnœa, sighings, tremors of the limbs, agitations, and not unfrequently hysteria, under various forms. The countenance appears dull and sallow; her sight, after a few minutes' exercise of her eyes, becomes indistinct, and as if a dark object

were sailing before it. She has seldom any appetite, and digestion is greatly impaired. The bowels are commonly torpid, and menses return at uncertain periods.

On careful examination, I could discover no irregularity, inflammation, fulness, or other derangement of the vertebral pillar. The tenderness is apparently confined to the spinal ligaments; it is very great, and extends to every part of the column.

The complaint is of fourteen years' continuance; it followed a protracted typhus fever, which seized her at the age of fifteen, and reduced her so much, that, for upwards of three months after it left her, she had not strength enough to raise herself into the erect position. From that time to the present, she has always stooped in walking, and was soon tired.

Her health was never entirely restored. About six years after the first indisposition, she was confined to her bed more than three weeks with a bilious fever. She suffered so much from the severity of her complaint, that it was many weeks after the fever left her, before she had sufficient strength to rise alone from her chair, or move without the aid of some other person from one place to another. Her knees and legs have always been the weakest members, and still remain so.

She was well rubbed with an anodyne liniment this afternoon, for more than an hour. A broad bandage being afterwards fastened round her back, she was placed flat upon the usual couch, and desired to confine herself entirely to that position.—Aug. 16th, 1822.

The tenderness of the back is wholly removed. She now feels little inconvenience, except from dyspepsia, and pains in her head. The latter differ considerably from the former headaches. She says they are more internal, and arise, she thinks, from the freer motion of blood in the direction of her head.

A stimulant liniment, consisting of lin. sapon. comp. with tinct. lyttæ, was substituted for the former embrocation, and a wooden shield fixed under her bandage the whole length of the spinal column.—Sept. 28th, 1822.

The bowels having been carefully regulated, the headach and dyspepsia are considerably relieved. She feels her back stronger, and can bend it with great ease as she lies on the couch. Continue.—Nov. 20th, 1822.

She has remained free from pain in her back, and thinks she is strong enough to get up and walk alone. Continue.—Feb. 16th, 1823.

Her countenance is become animated and clear. She was this day indulged in walking about her room five minutes, supported between two assistants. She felt no pain in her back from the erect posture, or other inconvenience from the trial. The exercise is to be repeated every second day, gradually enlarging the periods.—April 20th, 1823.

She has lately extended her walks to a quarter of an hour, and repeated them daily. She is recommended to visit the sea coast, and pass the summer there.—May 25th, 1823.

Miss Pryer is returned home from Margate, in excellent health and spirits. She can walk a couple of miles together with ease, and alone. The digestive organs are in good condition, and all her bodily functions properly performed. Headach is gone, and she has greatly improved in her general appearance.—Nov. 10th, 1823.

Miss P. has passed a pleasant winter; she has suffered a few attacks of catarrh, otherwise her health has been uninterruptedly good. She is prudent in her employment of exercise, and still devotes three or four hours every day to the horizontal posture. She proposes to reside, during the approaching summer, near the sea, and to bathe regularly, confidently anticipating the full recovery of her health and strength.

from pursuing this plan till the ensuing autumn.—
April 22d, 1824.

She could only make it convenient to remain two months at Margate. The cold bathing was very agreeable, and did her great service. Her strength is so much restored, that she feels neither pains nor weakness in the back. Her friends agree that she carries herself more upright and erect than at any former period. The countenance is also clearer and more animated. She no longer thinks herself an invalid, though she still continues to recline several hours every day.—Dec. 5th, 1824.

Miss Pryer has for a long time been in the enjoyment of good health, and her figure preserves its fine shape. She returned for a few weeks last summer to Margate, where she regularly bathed, and sailed upon the open sea. She also took several long rides on horseback. From that period to the present time she has been in the habit of often walking for hours together, without experiencing fatigue or other inconvenience from the exercise.—March 22d, 1827.

Remarks.—In this and the preceding case, the upper part of the back was observed to manifest an extraordinary convexity, when I was first consulted. In both, the gibbosity commenced with the first, and included the last dorsal vertebra. There was, never-

theless, a great and evident difference apparent in the two cases. The rotundity with Mrs. Wells continued permanent under all circumstances: in Miss Pryer it was only distinguishable during the erect position. She was no sooner laid down upon her back, than the distortion vanished, to be again renewed whenever she arose from the couch. It is clear, from these peculiarities, that in one the organs had become rigid and unyielding, while in the other, they remained flexible and movable. Nor, in my opinion, was there less difference in the pathology than in the external appearance of the projections. Though both originated in the same structure, it was differently affected in the two cases. One, as we have already remarked, had the fibres firm and stiff; in the other they were soft and bending. Having already explained the treatment pursued with Mrs. Wells, I shall proceed to relate that which I instituted for Miss Pryer.

Under a full conviction that the seat of the disease was in the ligaments, and that they were merely relaxed, I had recourse to tonic and stimulant medicines and applications. The spinal column was rubbed with the latter every day for a whole hour. I then fixed to her back a wooden shield, well stuffed, and properly shaped to the parts. This being secured in its place with long stays, the dorsal and lumbar spine was kept firm and tight: it could not vary in the least.

As the incumbent weight was also carefully removed from the trunk, the fibres gradually recovered their lost tone. No other means were adopted through the whole cure, and by them alone she was, in eight months, sufficiently recovered to leave her couch for a few minutes at a time. The periods were cautiously extended, as they could be safely enlarged. By this simple procedure, I had the satisfaction to see my patient restored to good health, and the full activity of her limbs, after they had been impaired, and rendered almost helpless, for not less than fourteen years.

I have been accused of treating spinal disorders, however variable their external aspect and internal character, upon one definite and fixed rule. No charge more unfounded could have been adduced against me, as appears from the present case, placed under my care so long ago as the year 1822; and I confidently trust to an impartial review of my several writings for a full refutation of all the rest.

I can safely declare, that my curative indications are not limited to any particular mode. They differ so much from one another, that no two individuals are treated exactly alike.

In old and considerable gibbosities, undeviating recumbency, elongation of the spine, and suitable

pressure, are, according to my experience, indispensable to complete success.

Slight and recent distortions seldom require such powerful auxiliaries, and they are consequently omitted, because I never wish to employ stronger measures than the occasion demands.

EIGHTH CASE.

MISS E. F., of the sanguine temperament, and naturally of a good figure, complains of great pains in her loins whenever she is raised from the horizontal position. The experiment is no sooner attempted, than she is violently convulsed in her arms and legs, upwards and downwards. These agitations suffer no abatement so long as her back is elevated, in however small a degree, from the couch. Her eyes, the rest of her features, and indeed the whole countenance, are frighfully disturbed on these occasions. Not a single muscle of the body seems to be at rest, so extensive and varied is the commotion. She finds neither relief nor mitigation of her sufferings, however long the conflict is protracted. The moment it is discontinued, and her back again feels the crib, the spasms cease, and the countenance resumes its former tranquillity: she becomes composed, cheerful, and easy. The transition is so instantaneous and striking, that it appears more like magic, than the effect of any natural cause.

Appetite grèater than when in good health. Digestion is always accompanied with a redness and flushing heat in the face. Whether awake or asleep,

she feels indescribable anxiety and uncomfortableness, which are sufficiently distressing to make her at times indifferent to life. The inferior limbs are always clay cold, nearly insensible, and subject to frequent twitchings; but capable of very little voluntary motion. She is much troubled with indigestion, and with a cough, which is supposed to threaten consumption, and also with a sense of stricture over the stomach. Pulse, belly, and menses, are pretty regular.

On examination, the whole spinal column, with the exception of two vertebræ, appeared too elevated.

During the first year of recumbency, the loins (for want of support) wholly lost their natural hollowness, so as to press against the mattress in every part.

All the dorsal bones now project singly, and stand too prominent. The first lumbar had, on some former occasion, sunk down full half an inch below the level of the contiguous vertebræ, and was nearly buried under the last dorsal. The second lumbar projected considerably, and was partially driven towards the left. There was a corresponding vacancy on the right side of the spine. The next below was also rather depressed; the remainder manifested nothing extraordinary.

Miss E. F., it appears, commenced the horizontal

posture six years and a half since. For three years previously she had been in delicate health, from what was supposed to be a diseased liver, and took large doses of mercury for its cure. Walking, riding, dancing, or sitting long at table, produced great fatigue, which was always most felt in the higher part of the loins. The day after dancing, or using other strong exercise, she was always obliged to remain constantly in bed. Travelling in a carriage was productive of very great inconvenience, which did not wholly subside for several days. Besides tenderness, there was the sensation of stabbing, sometimes in one part of the spine, sometimes in another. Pains in the lower limbs were often more severe than in the spine. After continuing the horizontal posture six weeks, she found herself worse than at first. She was, nevertheless, advised to continue it for twelve months. At the end of that time she tried to get up, but found herself in a much more helpless and distressed condition than on first lying down. She could with difficulty bear to be erect even for a few minutes at a time, though supported on both sides. Her sufferings being referred to general debility and disuse of the limbs, she persisted in taking exercise, till the repetition of it became intolerable when continued only for a few seconds. After an unavailing struggle of several weeks, she returned to the horizontal situation, in which she has been obliged constantly to remain. Every effort to leave the couch invariably produced not only agita-

tion, and a most distressing contraction of countenance, but also an aggravation of her malady for many successive weeks together, with a troublesome head-ach, sometimes accompanied with nearly a temporary deprivation of her eye-sight and hearing.

The first four years she occasionally had leeches and blisters applied to the back, by the direction of her physician. Afterwards, the late Mr. Baynton advised simple recumbency, and his advice was strictly followed more than six months. At the conclusion of this treatment, the patient made another ineffectual essay to leave the crib. She then consulted a different surgeon, who subjected her to the constant torment of caustic issues, and very stimulating dressings, during the period of nearly two whole years.—June 9th, 1821.

Finding no relief from any of the modes recommended, she was at length induced to consult me. By my advice, Miss E. F. has had her spine stretched and pressed in the usual manner, every other day since the last report. She has also worn a firm belt, and for the greater part of the time, next to her back, a wooden shield, properly constructed and well stuffed. Her loins rest upon a firm pad put under the shield. All the dorsal and lumbar bones have already sunk considerably. The natural hollowness of the loins is nearly restored. The two depressed

bones have visibly risen. The intermediate one is sensibly sunk, and nearly in line with the rest of the vertebral column. The distressing uneasiness left her soon after the commencement of the new process. She is become constantly cheerful, and sleeps well. Appetite natural, and digestion no longer produces any increased heat. The limbs are warmer, more sensible, and admit of being freely moved. On the day of my first visit, which was at the end of last May, she became tremulous in every limb, and immediately afterwards violently convulsed in them, and in every feature of her countenance, on being a little elevated from her crib; so that, after enduring these painful commotions a few seconds, she was, at my desire, replaced on the couch. During my third attendance, she was more elevated than on the former occasion, and remained longer in that position without experiencing any uneasiness, except slight pain in the first lumbar vertebra. Last Sunday she was put into the sitting posture, with her legs hanging from the couch. After remaining in this situation about five minutes, without suffering the slightest pain, convulsive agitation, or inconvenience in the back, she was again laid down.—July 19th, 1821.

All the projecting vertebræ are sensibly fallen, and have apparently regained their natural situations. The first and third lumbar are visibly risen. The

spinal column has in consequence a more natural appearance, and the chest in front looks much better. She was this afternoon assisted from her couch, and permitted to walk about in the room for five minutes, a pleasure which she had not enjoyed for nearly seven years. She was replaced on the couch, without having sustained the smallest inconvenience. She then observed, that during her former unavailing efforts to continue erect, she was unable to straighten her knees, or put her feet forward.—Nov. 6th, 1821.

Though the stretching and pressure were omitted after the last report, recumbency was strictly observed until May 1822, and is still submitted to, more or less, every day. The friction has also been persisted in to the present time.

Miss E. F. did not discontinue her daily walks before the end of December, and was generally on foot several hours together, without suffering any fatigue from her exertions. After remaining some time erect, or on bending the head forward, she was always seized with violent pains, which appeared to begin in the neck and to shoot upwards to the vertex. Lying down soon removes them. Upon viewing the back again this afternoon, I found the spinal column, between the upper part of the shoulders, too much elevated, and standing considerably above the scapulæ. This defect in the vertebral arrangement was unfor-

tunately overlooked by myself and her other medical attendants, twenty-nine in number. The headaches with which she had been tormented, were by all of us imputed to other causes. No proper means were therefore employed to reinstate the vertebræ. It was owing to displacement, as I conceive, that the nerves arising out of these parts became disturbed in their passage through the foramina vertebrarum. Whenever they are interrupted in this manner, the bad consequences do not shew themselves at the spinal end, but in their ramifying terminations. Here, then, the symptoms would be displayed in the neck, at the back of the head, and the vertex, because these parts are supplied with nervous filaments from the superior end of the column. This principle, which is so conspicuous in other spinal cases, will be referred to hereafter, and receive a fuller explanation.

Miss E. F. having determined, in order to relieve herself from this distressing uneasiness, to apply the same treatment to the upper part of the back which had proved successful in restoring the lumbar vertebræ, it was accordingly this day commenced.—
Aug. 18th, 1823.

The process has been repeated every second day from the date of the last report, to the prominent vertebræ, in the way already described. The health is not at all affected by it. The spine being restored

to its natural figure, the treatment is to be discontinued from this day.—Oct. 16th, 1823.

Stimulant frictions were regularly applied to the spinal region, and undeviating recumbency carefully observed to the 1st of Feb. 1824. On this day the patient again left her crib, and began to resume her walks. At their commencement the exercise was, as formerly, limited to a few minutes daily. No headach, or other inconvenience followed, though it was gradually extended to more than half an hour at a time. She had the misfortune, towards the end of the same month, while walking alone in the room, to fall down suddenly in a fainting fit. By this accident three of the lower cervical, and as many of the upper dorsal vertebræ, were again displaced, partly outwards and partly in a lateral direction. To relieve herself from the effects of this new calamity, she resolved to adopt the course which had already succeeded so well in restoring her bodily health. The method formerly described was accordingly resumed Sept. 18th, and persevered in till Dec. 20th, 1824. At this period, all the prominent vertebræ being replaced, the treatment was discontinued. Recumbency, with stimulant frictions and mechanical pressure, were strictly observed till April, 1825.

The patient left her couch May the 16th, 1825, and walked in her room with great ease for a few

minutes. The exercise has been daily repeated, gradually enlarging the periods. She is now on foot full two hours at a time, either walking or standing. She has suffered no return of headach, nor has her countenance been at all agitated, since she discontinued the horizontal posture, in the manner described. —July 16th, 1825.

Since last report, Miss E. F. has continued her daily walks, and extended them to three or four miles in every direction. She has also been upon a pleasurable excursion into the country. Her health and appearance have greatly improved; nor does she experience any inconvenience from the erect posture, or being on foot several hours together. —March 1827.

Remarks.—Many considerations will occur to the attentive reader of the foregoing case, and encourage various reflections. 1st. It was confidently asserted that simple lying would of itself remove the disorder. The late Mr. Baynton entertained this opinion, and placed all his dependence upon it. The result, nevertheless, affords a convincing proof that mere recumbency proved inadequate to the cure.

This patient was induced to adopt it for six months, under an assurance that the malady would in that time be subdued, and her health restored. But at the end of her confinement, the complaint, instead of

being relieved, had actually increased, and to such a degree, that on rising from her couch she had the mortification to find she could no longer move her limbs freely, or sit upright. The faculty, nothing daunted, notwithstanding the total failure of their confident prediction, advised longer submission, and she patiently acquiesced in their recommendation for the period of twelve months. She then made strong efforts to leave the crib, and was obliged, after a fortnight's contention, to relinquish the object. During these severe struggles, her health and appearance underwent a striking reverse. Her friends were not insensible of, or indifferent to, her sufferings; and she is of opinion, from what she endured, that the contention of a few more days would certainly have proved fatal. She returned again, highly mortified, to her former posture. Though several successive trials were made, under the direction of different practitioners, to remove her from it, she was obliged to remain constantly flat upon the back. In this miserable predicament she had continued more than six years when I was first consulted. I found her easy and cheerful while at rest. The moment her trunk was only slightly advanced from the mattress, all was agitation and commotion. Her features became hideously distracted, and her limbs most frightfully convulsed. Such a sudden transition and distressing scene I had never before witnessed. After a hasty examination of the spinal region, she was replaced upon the

bed. To my great surprise, this was scarcely effected before she recovered her wonted composure and cheerfulness. I found the hollow of the loins entirely obliterated, and all the vertebræ uncommonly protuberant, with the exception of the first and third lumbar, which had sunk considerably below their proper level. My first care was to restore the natural depression of the loins. This I accomplished in about three visits, when she was able to be more elevated, and to remain longer than on the former occasion, without either change of countenance or agitation of the limbs. At the end of a month she was put into a sitting position, with her legs hanging down. In this situation she continued five minutes, without inconvenience, and then reclined. My next endeavour was to raise the sunken vertebræ, and place them even with the rest. Both objects having been obtained, the patient was permitted soon afterwards to leave her confinement for a few minutes daily. The periods were gradually and cautiously enlarged. She was enabled, after some time, to ascend a steep hill, and to continue her walks for an hour and a half, without stopping.

Here let us interrupt the narrative, to investigate the condition of her back when she first consented to lie down, and the changes which recumbency had produced upon it. I have already remarked, that, at my introduction, the first lumbar vertebra was depressed half an inch, and the hollowness of her loins wholly

effaced. The rest of the column was likewise unusually prominent. It does not, however, follow, that the spine had remained stationary during this long period. On the contrary, I am convinced that it underwent a remarkable deviation in her protracted recumbency, and that the increase of her bodily sufferings upon motion proceeded from this alteration alone. When she agreed to lie down, she could ride on horseback, was able to walk several miles, and to dance for hours together. But after adopting the horizontal posture only six weeks, she found herself considerably worse: and at the end of twelve months she was so far from being in a condition to resume her former amusements, that she was reduced to a much more helpless and distressing state than on her first entering upon that treatment.

In order to understand the aggravation of her sufferings, we must investigate the changes which had been unobservedly taking place in the spinal pillar. When she submitted to recumbency, two of the lumbar vertebræ had sunk down, leaving the rest in proper order. The irregularities in the theca opposite to them contracted the tube at that part, and subjected the cord with its nerves to undue pressure. To this cause I refer the pains and numbness of the lower extremities, the uneasiness on sitting erect, the fatigue after dancing, and every variety of muscular exercise. She had remained flat on her back only six weeks,

when the lumbar hollow was sensibly reduced. The nerves proceeding from thence became more stretched and irritated, in consequence of their new position. They were therefore less able to convey their peculiar influence, or to regulate the various movements of the organs on which they were distributed. Nor was this all; the range of suffering being extended from the distracted condition of the nerves, the sympathetic communications were imperfectly performed. Hence her increased sufferings on first leaving the crib, and their aggravation, when, after twelve months of quietude, she renewed her efforts with greater determination and less success. In this way her afflictions were augmented and protracted upwards of six years; nor could she anticipate relief, from longer perseverance upon the present plan. Such was the deplorable condition of this interesting patient, when I entered upon her cure. It occurred to my mind, upon a review of the case, that the primary symptoms were induced by pressure of the two sunken vertebræ upon the spinal marrow, and their increase after lying down to additional distortion in the same region.

Having taken this view of the complaint, my anxiety was to replace the lumbar vertebræ and recover their natural concavity; believing that I should then restore her to the state in which the faculty found her at their first visitation. In this I happily succeeded so well, that on the third visit the patient

bore to be partially elevated. In a month she was indulged with sitting erect for a short time.

The following November, only five months after the commencement of her treatment, she was taken from the couch, and felt no inconvenience from walking five minutes in her lodging-room, supported by two people. She was indulged with short walks every day, for several weeks. Afterwards they were removed into the open air, and the periods gradually enlarged as her strength increased.

2dly. After protracting the exercise a couple of hours at a time, or sitting upright for the same period, she was always visited with a distressing pain in the occiput. It was limited to the back of her head, and left great tenderness in the part. The same disagreeable sensations were always produced by stooping forward and bending the neck. These paroxysms became so constant and troublesome, that she was extremely anxious for relief. My attention being particularly directed to this distressing complaint, I learned that, before she first entered upon the horizontal position, she was frequently troubled with the same kind of headach. This she constantly mentioned to her earlier medical attendants; but as she had not lately felt it, she ceased to dwell upon the symptom, when called upon to enumerate her afflictions. I found the two last cervical and three upper dorsal vertebræ

jutting out of the spine, and appearing eminent and conspicuous to the sight. I therefore gave it as my opinion, that the nerves proceeding upwards from these vertebræ, were stretched and irritated in the different movements of the head. To this circumstance I did not hesitate to refer the cephalæa. The patient acquiesced, and cheerfully submitted, under my advice, to another trial of the remedy. The bones were completely reduced by the usual mode, and her compliance has been amply rewarded. She now enters freely into company, and enjoys walking and carriage exercise, without experiencing any of her former inconveniences.

3dly. The patient advanced cautiously in her prosperous career, gradually enlarging her walks, and increasing her exertions, till she had the misfortune to encounter an unexpected check. While standing near the bed one morning in her lodging-room, she suddenly sunk down upon the floor in a fainting fit. In her endeavour to avert the fall, she grasped the coverlet with her whole strength. It gave way, and came to the ground along with her.

On examining the back soon afterwards, five or six of the dorsal vertebræ, between and below the shoulders, were found considerably displaced, and twisted towards the right. Whether this fresh distortion was occasioned by the concussion, or her vigor-

ous efforts to avoid the fall, is uncertain, because she was alone, and little conscious of what happened. The noise brought immediate assistance. She had already recovered her intellectual faculties, and was trying to regain her feet. By rest and soothing medicines she was speedily relieved from the primary effects of her accident. It was, however, followed with great weakness in the back, with feebleness in the limbs, dyspepsia, and uneasiness in several of the internal organs. To free herself from these distressing symptoms, which she imputed to the recent spinal invasion, she determined to submit again to her former discipline. With this intention she returned to London, and in three months the displaced vertebræ were wholly reinstated. She continued the horizontal treatment for nearly five months, and then gradually resumed her walks in the open air. Nor did she experience any return of the former symptoms.

A brief Sketch of the principal Complaints which afflicted the Patient, and of their Connexion with Spinal Deformity.

The nosologist, in attempting a methodical arrangement of the numerous and diversified phenomena which tormented the subject of these remarks, would be induced to place them under separate heads, and to characterise them by different names. The distribution

of symptoms, considered in the order of time, and of the regions invaded, would certainly justify the conclusion.

I have in some former cases explained the dependance of morbid actions upon the spinal nerves. Not wishing to travel over the same ground, I shall content myself with referring to them as the occasions arise.

This patient was apparently affected with a great variety of distinct complaints, which it will be important to investigate, in order to detect their source and origin.

Cephalæa.—1st. It has been observed, that on bending the neck forward, or after continuing some time in the erect position, she was seized with a distressing pain in the back of her head. It always left tenderness in the scalp. This malady, which never troubled her in the horizontal posture, invariably returned, when pressure on the chord, or its nerves in the foramina vertebrarum, occasioned by continuing long in the erect position, or from motion of the neck, had reached a certain point, or continued for a certain period.

When we endeavour to investigate the varieties of **headach**, we find them so numerous and perplexing,

that it is a difficult task to arrange them in any order. It is impossible, in many instances, even to decide whether the headach be idiopathic or symptomatic. Dr. Cullen, sensible of the difficulty, was led to regard it as always symptomatic. In this he differed from his learned predecessors. Both Sauvage and Sagar gave it a place in their nosologies. Each of them enumerates six genera, under the common title of *dolores capitis, faciei, vel capillitii*. The first three are confined to the head, and are denominated *cephalalgia, cephalæa, and hemicrania*. The remaining three relate to the face only. Dr. Good places five species under the genus *cephalæa*. As the origin is so very obscure, and the distinctions equally inapparent, every hint which throws a ray of light upon either is worthy of regard. With this intention, I have endeavoured to ascertain the cause of one species, and fix it in a part, which had never been suspected. In prosecution of my design, I go on to remark, that when, as in the present case, headach proceeds from distraction of the cervical nerves, it has its origin in the state of the spine, though the symptoms are only revealed in the teguments behind the head. The disorder is productive of tenderness on pressure, and leaves a soreness in the occipital scalp, by which it may be always distinguished from such affections as are situated below the cranium. An external soreness indicates a superficial disorder. Attention to the exciting causes will in many instances point out the

seat and nature of the disease. By observing them, we shall seldom fail to establish a true diagnosis.

We formerly observed, that fatigue, or stooping forward, excited the malady, and that it disappeared again in the recumbent posture, to be called forth at any time by a repetition of the same means. The origin of the complaint will be further elicited on examining the spinal column. When the cervical, or upper dorsal vertebræ are unusually prominent, we may conclude, that the nerves issuing from them possess a morbid sensibility, more ready to be roused into action by slight causes. Since my attention was first drawn to this particular species of headach, I have met with several examples, which I could satisfactorily connect with the projecting vertebræ. Some of these I have had the good fortune to cure, by depressing the elevated bones. Others had continued so long, that I only recommended means, to retard and mitigate the accessions. A married lady, the mother of five adult sons and daughters, consulted me last May for a complication of painful sensations, under which she had laboured many years.

She complained, that the least excess in eating produced acidity and flatulence, which often terminated in vomiting and diarrhœa. She was subject to palpitations of the heart and dyspnœa from slight irregularities. Fatigue of every kind, and stooping,

produced violent and distressing pains in the back of her head, which extended to the vertex, and were followed by tenderness in the part. These symptoms commenced in early youth, and had never been eradicated, though she had consulted many eminent practitioners. On inspection, I found a large convexity of the spine, beginning with the two last cervical, and including eight of the dorsal vertebræ. I therefore gave it as my opinion, that not only the pains in the occiput, but the dyspnœa, the palpitations of the heart, and dyspepsia, were all produced by pressure upon the spinal nerves issuing out of the curvature, and distributed upon these organs. In delivering my opinion, I added, that the malady was too inveterate and firmly established for removal. All that art could do for her relief, consisted in mitigating the symptoms, by adopting a regular mode of life, and avoiding the exciting causes.

Were I to attempt a nosological definition of this species of cephalæa, it would be couched in the following terms, “diuturnus, tensivus occipitis dolor, sæpe recurrens, et capillitium occupans.”

Phthisis Pulmonalis.—2dly. So various and changeable were her afflictions, that this patient was several times declared to be labouring under a confirmed phthisis pulmonalis. We have already remarked, that the spine jutted considerably. The ribs firmly tied to

it, participated largely in this derangement. The sides of the thorax were unusually flat, and extended. The latter became peaked in front. In consequence of this irregularity in the bony case, the lungs slid with greater difficulty. They were, moreover, thrust into unfavourable situations, to correspond with the irregular figure of the chest. The pulmonary circulation was necessarily impeded: nor could the blood either enter or depart with ease from the lungs, because their vessels partook of the displacement. The air cells, unable freely to expand their cavities, were less adequate to discharge their delicate offices, and the nervous influence was imperfectly conveyed through the lungs. In consequence of these various impediments, their movements were affected by slight causes, and they became more liable to the invasion of several diseases. Of these, consumption was most dreaded. Happily it never obtained a durable settlement, though symptoms of an alarming tendency were often apparent. From the disease never taking a firm root, and having left no relics behind, we are led to believe, that, although the manifestations appeared in the lungs, the morbid lesion was confined to the spine. At other times, the event has been less favourable. I was several years since in attendance upon a young lady for a spinal complaint. At one of the visits, an elder sister consulted me. She said, that about twelve months ago, she was invited to a ball at the distance of twenty miles. After dancing all night, she re-

turned home without going to bed. From that evening she had been in delicate health, was subject to pains in her back, or sides, and was liable to catch cold from trifling inattentions. She was subject to hectic flushings, and slight febrile paroxysms. The cough, short and tickling, was hard and dry. She often felt difficulty in breathing, and on lying down.

I was informed that the symptoms had been frequently removed by low diet, by antiphlogistic medicines, and the lancet; yet they always returned.

On examination, I discovered a large convexity of the spinal column, between the shoulders, with irregularity in the height, and distances between the vertebræ. I therefore gave it as my opinion, that, from the displacement of her lungs, heart, and large blood vessels communicating with them, the pulmonary circulation was impeded. Hence the dyspnœa on slight exertions, and uneasy breathing in the recumbent posture: hence, too, her increased susceptibility to catarrh. From this view of the subject, I did not hesitate to declare it as my opinion, that, unless the viscera were restored to their natural situations, by correcting the spinal curvature, incurable phthisis would soon commence.

Owing to unexpected difficulties, the treatment was unfortunately postponed, and the family retired.

into the south of France, where, notwithstanding the amenity of the climate, and unceasing solicitude of indulgent parents, the young lady sunk under pulmonary consumption in less than twelve months.

Phthisis pulmonalis is the most distressing of our indigenous maladies, whether we contemplate the number of its victims, or the time of life when they succumb to its unsparing ravages. So prevalent is the complaint, that hardly a family escapes its devastations. It renders parents childless, separates the dearest friends, and leaves the forlorn lover to bemoan his inevitable fate. To increase his sufferings and add to their poignancy, this cruel disease generally selects the finest bloom, and the most promising abilities.

For want of data, I am unable to calculate the proportional mortality from diseased spine, or to attempt more than to enumerate it among the causes of pulmonary phthisis.

Dyspepsia.—3dly. This patient was almost constantly teased with indigestion, though she conformed steadily to a regulated diet, and the other directions of her medical advisers. As she recovered the healthy tone of her stomach along with an amended figure, we are, I think, justified in concluding, that the dyspepsia was occasioned by a defective condition of the communicating nerves. Having already discoursed of this

complaint at some length in the second and other Cases, and traced its source to the spinal column between the shoulders, I refer to them for a more minute detail of the particulars.

Convulsions.—4thly. Nervous diseases constitute a large portion of the ailments to which flesh is heir, and their pathology is involved in the greatest obscurity. It has been already said, that on my first visit, this young lady was thrown into general convulsions the instant her back left the couch. Nor was it less surprising, that they should cease at the moment of her replacement upon the mattress. The transitions were so sudden, that, being wholly unprepared for them, I became lost in amazement. At the commencement of recumbency, she was so far from being afflicted with spasms, that she could ride on horseback, could walk several miles, and dance for hours, without suffering much present inconvenience. She only conformed six weeks before her locomotive difficulties had considerably increased. After persevering a whole year, her efforts to rise were first attended with convulsions. Between this period, and my introduction, she made numerous unavailing endeavours to change her position. They always excited convulsions, and otherwise affected her to such a degree, that although naturally anxious to emerge from her helpless condition, she could never succeed.

The convulsions invariably returned, and drove her back to the couch. Thus she remained, year after year, easy while lying flat, and in constant torture whenever she ventured to rise. It struck me, that the original malady, for which she sought relief, consisted in a depression of the first and third lumbar vertebræ. It was to remove the symptoms proceeding from their displacement, that she first commenced dorsal recumbency. So far from attaining her object, she had the misfortune to alter still more the spinal arrangement. In twelve months, the lumbar hollow was completely effaced. From that time, she was unable to elevate her person at all from the couch; though, in obedience to the faculty, she made numberless abortive efforts, in the hope of overcoming her obstinate calamity. Such was the helpless state in which I found the invalid. It occurred to my mind, that if the lumbar hollow could be re-established, the spasms would cease. I succeeded so far in my plan, that, at the end of a single week, she was able to sit upright several minutes together, without exciting convulsions, or any other unpleasant sensation. By persisting in the same course for only five months, I completely attained my object, and had the pleasure to see her walk about in her room with great composure and little difficulty.

On a careful review of the case, I am of opinion

that the lumbar region was now restored to the state in which it was when she first became recumbent. This second distortion, the consequence of lying with the back unsupported, having been conquered, and the proper figure of the lumbar region recovered, the spinal cord, and its diverging nerves, were so much relieved, that the convulsions ceased, and have never returned.

Whatever difference of opinion may prevail in other respects, the symptoms must, I think, be admitted to have depended upon the state of the spinal column. This structure was doubtless the *fons et origo maiorum*, because the disorder began and terminated with the distortion.

So far we are borne out by the history of the case; and the concurrent testimony of many witnesses.

Professor Cullen makes *convulsio* a genus in the order *spasmi*, and class *neuroses*. He defines it in the following terms: "*Convulsio musculorum contractio clonica, abnormis, citra soporem.*"

According to him, it may be peculiar and primary, when it is denominated *idiopathic*, or it may concur with something else, and be confined to a part, when it is held to be *symptomatic*. If I am correct in my views, this lady's sufferings were of the latter deno-

mination, and may be distinguished from the other varieties, by calling it convulsio spinalis.

Paraplegia.—5thly. In the long catalogue of afflictions under which this patient suffered, another grievous example remains to be noticed. It has been already intimated, that at the commencement of recumbency, the lady could take a good deal of exercise, but it was followed with pain, stiffness, and inability to bend her back. These inconveniences were subdued by rest in the horizontal posture. So sensible was she of its beneficial effects, that after enduring fatigue, she voluntarily continued in bed till the uneasiness was removed. Such had been her invariable custom for several years. She was, therefore, easily persuaded to enter upon the resting plan, especially as the advice was coupled with an assurance of complete and permanent success. In this expectation she was miserably disappointed. So far from obtaining the wished-for relief, she found herself, after persevering a whole year, deprived of the action and feeling of both legs. The feet were also cold, numb, and insensible.

Paraplegic symptoms of greater or less severity have been noted in many of the former cases. They gradually abated with the spinal complaint, and disappeared along with it. Not a single failure has occurred where the treatment was steadily pursued.

These paraplegias were, in every instance, complicated with vertebral distortion; and conceiving it in all of them to depend upon compression of the cord, my curative indications were constantly directed to the spinal column. As deformity lessened, so did the paraplegia; sensibility also returned; the limbs became warmer; the muscles grew firmer and plumper; the power of motion began to shew itself at the hips, in the toes, and by a feeble movement of the feet. In this case, the patient could soon afterwards draw up the limbs a little; but was unable to push them down again. At length she could separate, and bring them together. Still they were too feeble to sustain the weight of her body. The strength continuing to increase, she could stand with support, and walk a few steps on a plain surface. At length she could conquer a small elevation. In this way, the power of feeling and activity of her limbs were observed slowly to augment, till she was able at last to use them with her former ease and ability.

Such were the progressive advances in the present case, and the patient has fully regained her sensorial and muscular powers.

In their notions of paraplegia, pathologists are divided. Some trace it to the encephalon, others to the spinal cord, while a third party fix its dominion sometimes in one region, sometimes in the other. I de-

clared more than six years since, that the seat of this formidable disorder, which cripples so many of both sexes, is invariably to be found in some portion of the vertebral pillar, though I by no means wish to maintain that it always proceeds from the same structure. Many cases have subsequently occurred, which tend strongly to confirm my former assertions. In all that I have yet seen, distortion was perceptible in the spinal chain, though, in several instances, it had been unaccountably overlooked by experienced practitioners. These erroneous deductions may rather be imputed to the prejudices of education, and the obstinacy with which we adhere to early conceptions, than to the desire of misrepresenting, or of rashly impugning, the proceedings of others. A reluctance to entertain new ideas of practice, has been remarked in all ages and nations. I am, I think, fully warranted in adhering to my former declaration, because many invalids thus circumstanced have recovered the use of their limbs under my own care, by rectifying the spine, after its arrangement had been declared correct and perfect. In some of these, the lumbar hollow was entirely obliterated. In others, it was preternaturally enlarged; while in others again, the vertebrae in the column, having lost their rectilinear form, were placed at irregular distances, and as it were in chequers.

Discolouration of Skin.—6thly. One of the usual

concomitants of this wide-spreading malady, was strikingly displayed in the patient's complexion. This kind of discoloration has hitherto received no distinct appellation, though it is of frequent occurrence in spinal distortions. The countenance is entirely changed by it: the skin becomes either pale, of a muddy green, or dark yellow; yet the white of the eyes is often nearly transparent. At other times, the skin shews, as it were, a leaden stain, and appears to be covered with dirt. This depraved condition of the humours, or bad habit of body, was formerly denominated a cachexy, or cacochymy, according to the varying fancy of the pathologists. Of late it has been referred to a torpid state or defective condition of the liver; but oftentimes the white of the eyes is unaffected. The skin, though unusually dark, is free from itching. Moreover, since the urine does not die linen immersed in it, I think the mischief is rather to be searched for in a general defect of the chylopoietic viscera, than in that of any single organ. These manifestations, and the distorted aspect of the trunk, will generally announce its presence, and enable us to separate it from all other disorders. Though it is sufficient for our purpose to maintain, that the unnatural tint always disappears with the spinal crook, it may be expected that I should endeavour to account for the phenomena, and connect them with the incurvation. Were I to hazard a conjecture on this point, I

should say, that in icterus the bile is perfectly formed in the liver, and conveyed into the circulation, staining the skin and eyes, and causing an itching sensation, and is afterwards mixed with the urine. On the other hand, I am inclined to think, that in spinal curvatures affecting the nervous communication with the liver and digestive organs, the nutritive elements are neither fully eliminated, nor properly combined. They remain in the sanguineous mass, crude, and imperfectly organised, so as to tinge the skin, and mark the complexion in the manner described.

No sooner is the nervous energy fully repaired, than the viscera resume their former tone, and produce healthy secretions. Good bile is formed, and the assimilating process completely re-established. In this way, the skin recovers its natural clearness. Medicines produce no lasting benefit, although they may occasionally alleviate urgent symptoms, or remove them for a short period. Yet so fully were the medical attendants impressed with the existence of a diseased liver in the case under consideration, that they conducted the patient through two full courses of mercury for its removal; but as she experienced no permanent relief from the treatment, its effects must have been much more injurious than beneficial to her. The improvement in the appearance of her skin kept pace

with the restoration of her spine. Her complexion has long since recovered its original brightness and transparency.

Such was the happy termination of this complicated and obstinate malady, which had baffled the skill and resisted the efforts of about thirty eminent and experienced members of the faculty. Whether the explanation I have given will be deemed satisfactory, and agreeable to the laws of the animal economy, is left to the consideration of others.

The decision, however it may be, is of little consequence, since the results have been fairly stated, and can be verified in every material circumstance by the patient and her friends.

NINTH CASE.

MISS READ, aged thirty-six, has great difficulty in walking even short distances. She often stumbles on level ground, from the weakness of her limbs. She constantly stoops, and cannot raise herself upright, or remain without assistance in the erect position. The countenance is of a dull yellow; it is contracted, careworn, and exhibits the appearance of great age. Appetite small, digestion imperfect and variable; pulse weak, urine generally turbid, and emits the ammoniacal odour; bowels constipated; the stools are dark-coloured, and impart a sulphureous smell; menses return at regular periods; they are abundant in quantity, resemble tar in appearance, and are highly offensive; she is often troubled with sharp and transient pains in her right leg.

She is uncertain as to the cause and duration of her disorder, but is of opinion, that it commenced more than twelve years since, soon after falling down stairs. Change of air to the sea side, and other places, has been tried, but affords no relief. Medicines of various kinds, and regulated diet, have been equally unavailing, though they have been persevered in during the whole period of her indisposition. On examination, I

found all the dorsal and lumbar vertebræ more or less out of their proper situations. The former are irregular in their distances from each other, and in their relative height. The two last dorsal, and all the lumbar bones, combine to form a considerable posterior and lateral curvature towards the right.—Dec. 23d, 1821.

The whole spinal column is visibly increased in length, and much improved in general appearance, from the back having in great measure recovered its natural arrangement. It is already a little grooved and depressed, where it was formerly raised into a considerable ridge. The small of the back having recovered some portion of its natural hollow, exhibits a striking contrast with its late unsightly elevation. Her countenance is become open, fresh-coloured, and juvenile; appetite and digestion much improved; her urine, fæces, and menses, are all natural and regular.—March 25th, 1822.

The vertebræ were declared at this visit to have regained their natural places, and her health is entirely restored. She is permitted to walk a short time every day, which she does with great ease, and an erect mien. She has no longer any difficulty in standing upright, and is considerably taller, as well as much improved in her personal appearance.—August 7th, 1822.

The patient has hitherto enjoyed an excellent state of health, with the exception of a few slight attacks of catarrh.—June 6th, 1823.

She has possessed uninterrupted good health ever since the last report.—February, 1827.

PLATE XIV.

Exhibits a View of the Back, before the Treatment began.

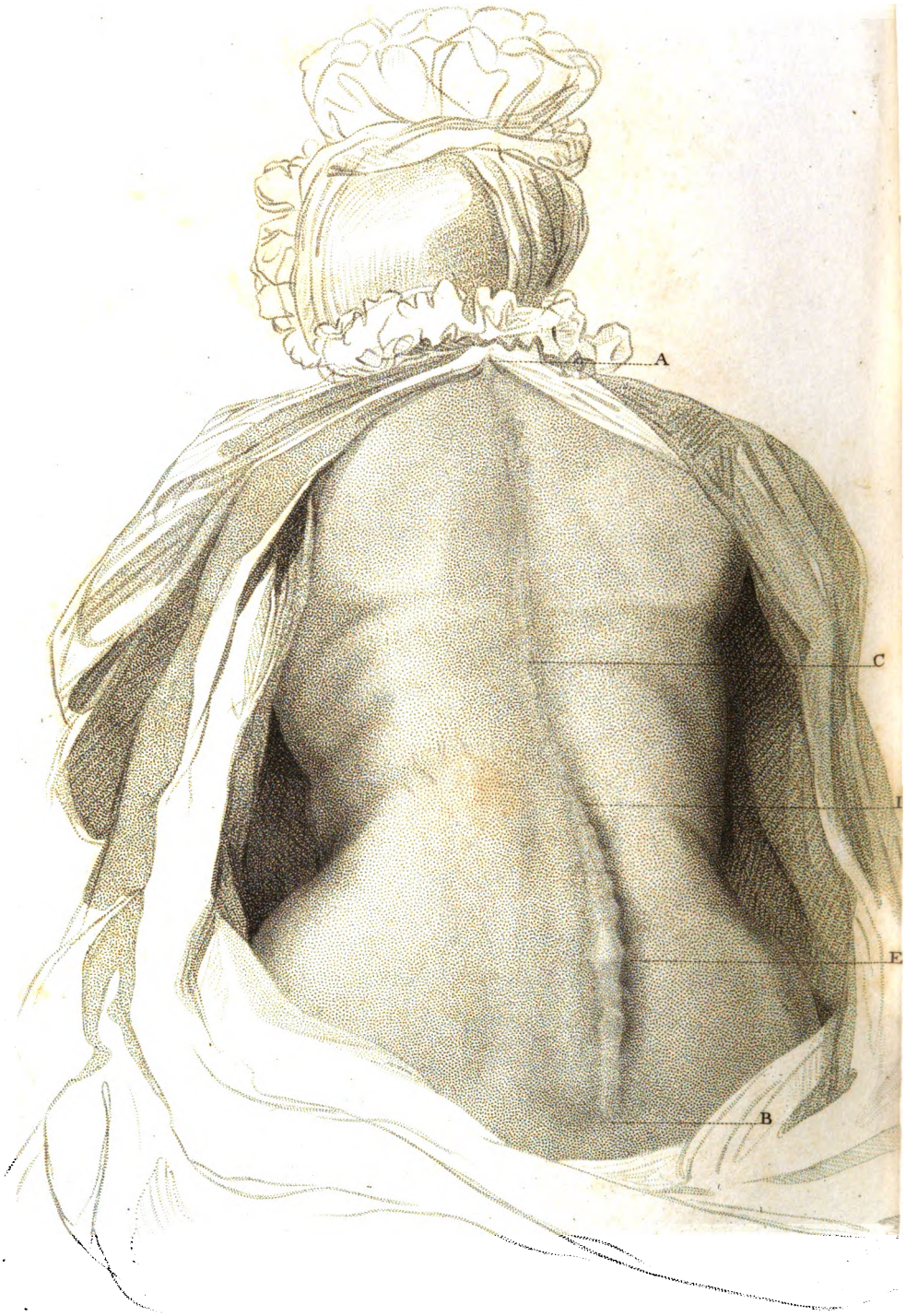
- A. B. The spinal column, with a depression between the shoulders.
- C. A curvature of the spine towards the left.
- D. B. A second curvature towards the right.
- E. The greatest bend and elevation of the arch.

PLATE XV.

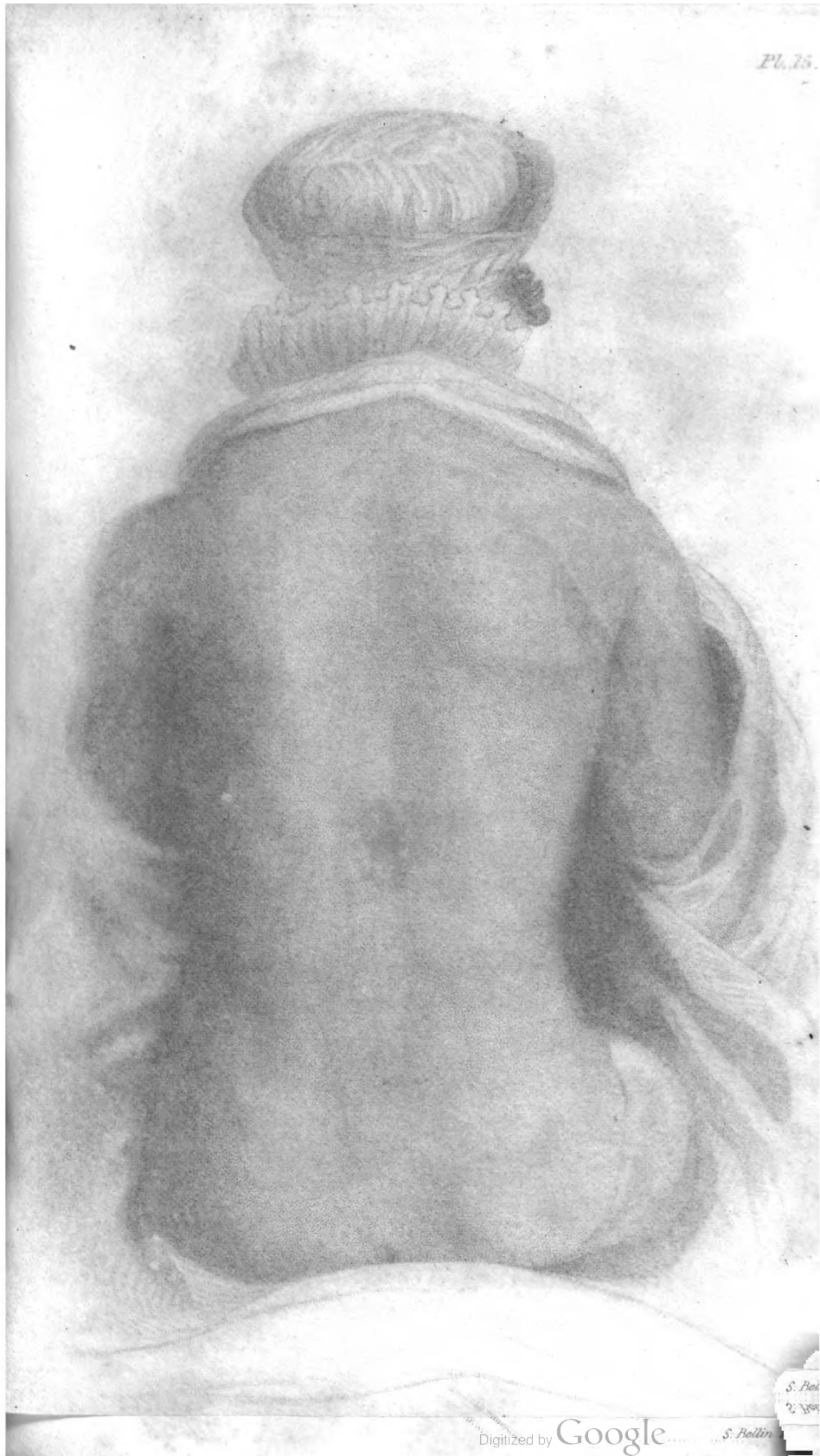
A Representation of the same Back, after the Treatment was finished.

Remarks.—I have been induced to subjoin to the present case, a few remarks upon animal secretions, in consequence of the functional irregularities so constantly observed by patients during the existence of spinal distortion, and the restoration of healthy discharges from the same organs immediately after the vertebræ are again replaced in the spinal column.

In tracing the leading symptoms of spinal com-



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plaints, we shall find that they may be chiefly referred either to inordinate action of the muscles, or disturbance in the internal viscera, and the organs of sense. All are affected, although disease prevails sometimes more in one system, sometimes in another.

1st. There is no difficulty about understanding the former. They derive all their nerves immediately from the spinal cord. Hence we can explain why the muscles are affected, when it, or the branches derived from that source, are irritated, compressed, and stretched, in the foramina vertebrarum, or in their progress to the muscles.

2dly. Though we may not be able to trace the anatomical connexion of the spine and viscera, we nevertheless do not hesitate to infer its existence from the internal commotions observable in these complaints. The relation of the parts to one another is so constant and uniform, that after hearing the details, I seldom find much difficulty in fixing upon the displaced vertebræ, even before I have made a personal examination. My deduction is founded upon an uniformity of symptoms, which appears to depend upon the connexion between certain portions of the spine and certain organs. Nor does our inability clearly to establish the intercourse, by following the nervous fibrils from one to the other, invalidate the principle.

Many things are true, which anatomy, notwithstanding its numerous improvements, has not yet been able to develop. Indeed, few of our medical facts, or pathological principles, were first observed by the anatomist; we are indebted for both to the practical physicians, who first discovered them in their professional attendance upon the sick. My detection of symptoms, and their seat in the spinal column, was first drawn from the same source. Ever since my attention was fixed upon the subject, they have been so constantly observed in practice, that I have no hesitation in pointing them out as uniform in their appearance, and produced, in some way or other, by the distorted figure of the spinal column. It has happened to me so frequently to remove internal derangements by rectifying the vertebral pillar, that when summoned to patients of this description, I do not hesitate to predict a complete cure, if the spinal distortion can be removed. Although anatomists may have hitherto failed in their efforts to prosecute nervous filaments from the spinal cord into the viscera, we must not from thence hastily conclude that the communication does not exist. We find little difficulty in following these nerves from the spinal cord into the very substance of the great sympathetic, or in pursuing other nerves issuing thence to the affected organs. In this way an intermediate connexion is found to obtain between the spinal column and internal parts, sufficient to explain the pathological

deductions which have been formed. Were the relation even less apparent, we ought not, on that account, to deny the evidence of our senses, or the dictates of experience. Hippocrates informed us, more than two thousand years ago, that parts lose their feeling, while motion remains entire; and that at other times, motion is destroyed, leaving the sensibility unimpaired. Rufus, the Ephesian, who lived about the end of the first Christian century, followed up these remarks, and endeavoured to explain them on anatomical principles. He paid great attention to the brain and nerves in his dissections of brutes. It was his opinion, that some nerves perform the office of sensation, while others are confined entirely to motion. These facts were uniformly observed and admitted, although the rationale continued unknown through so many ages. At length the mystery has been revealed by the industry of anatomists. And it may be reserved for other investigators to demonstrate the connexion of the spine and viscera, by pointing out the intermediate links.

3dly. All the organs of sense are occasionally affected in spinal diseases. Of this the reader will find convincing proofs in the different cases. Nor will he be at a loss to trace the sympathy which subsists between them from their close connexion with the great sympathetic. It follows, from the preceding statement, that inasmuch as no portion of the human

frame is destitute of spinal nerves, neither is any part of it free from their healthy and morbid influence.

On Secretion in reference to the present Case.—No process in the animal economy has more engaged the attention of chemists and physicians than the different secretions; nor is any involved in greater obscurity. We see bile, saliva, urine, semen, &c. separated from the general circulating mass by their respective glands. Though of various, and even opposite qualities, they are so carefully elaborated in their proper organs, that the conversion of one into another never takes place. The liver always generates bile, the testicle semen, and the salivary glands saliva. None of these organs were ever known to become vicarious of another. Urine has not been detected in the liver, nor bile in the ureters. Moreover, the same gland in its healthy state invariably prepares the same fluid. Under morbid vascular action, the secretion is found to vary in quantity and also in quality, from its ordinary standard. Thus while sound glands yield good products, diseased ones eliminate a vitiated compound. However familiar we may be with the substances secreted, the manner of their formation is entirely unknown. Chemists have endeavoured to elucidate the subject by analysing blood in its way to and from the glands. Hitherto no difference has been detected in its properties by the most delicate tests; so that although the constituent principles of urine, bile, &c. do cer-

tainly exist in the circulating mass, we have never been able to discover any of them ready formed in that fluid. We must, however, admit, that the elementary parts of all secretions are contained in the blood; but by what peculiar action of the vessels these ingredients are evolved and converted into bile, urine, &c. is entirely conjectural.

The operations of the nervous power upon the glands, have been variously estimated by different inquirers. It has even been asserted, that secretion will proceed independently of the nerves, because, after they have been divided, the organs to which they run are still liable to inflammation, suppuration, and the production of new flesh. These processes have been frequently observed to go on in men, when the nerves were destroyed, and more strikingly still in horses, after having undergone the operation of neurotomy. In them the hoof continues to be furnished in equal abundance, though at the time the feet are totally destitute of feeling. Physiologists, who maintain this doctrine, seem to have forgot that the blood-vessels, from which the secretions proceed, are provided with nerves from another source, and that consequently their objection does not apply in the way that was intended.

In opposition to this doctrine, it has been ascertained by experiment that digestion is very imper-

fectly performed, after dividing the branches of the par vagum, in their way to the stomach. Many other phenomena which occur in the human body, can only be explained by referring them immediately to the nervous system. To this cause must be imputed the suffusion of tears excited by grief, the flow of saliva at the sight of food, and the copious discharge of urine, under the impression of fear. But it seems to me, that the strongest proofs of nervous influence in directing the functions of living animals, are to be found in the spinal nerves. In cases of distortion, the vertebræ engaged in forming the projection are thrown out of their natural beds. The nerves proceeding from them become unduly stretched, irritated, and partially compressed. In consequence of this derangement, the organs to which they run are impaired in their functions. The fluids secreted are meagre, vapid, defective in quantity, and vitiated in their properties. Being rendered totally unfit to effect the purposes for which they were elaborated, the constitution, for want of the vivifying elements, grows languid and sickly; the faculties become torpid, and the most important organs perform their functions with diminished energy and effect.

Explanation of Symptoms.—After these few preliminary remarks upon the secerning organs, I shall proceed to examine the symptoms of this case more in detail, to shew that the spinal nerves are liable to

injury at their roots; although, as far as I know, it is a general opinion that they only suffer at their sentient extremities. It is of great importance to investigate this supposed influence of the spinal nerves upon the animal economy, and place it in the true light; because, if clearly established, it will, I think, produce a striking effect upon our physiological and practical indications. The greater part of the symptoms which afflicted this lady, proceeded directly from the pelvic viscera. These, it is well known, receive their principal nerves from the lumbar vertebræ. An irregularity in the arrangement of these vertebræ would, it is presumed, affect the nerves at their spinal ends, and disturb the secretory vessels upon which they are distributed. Accordingly, all the organs deriving their nervous supply from the lumbar spine, had their functions actually deranged while the distortion was at its height. As that diminished, the parts were gradually relieved, and at last wholly recovered their healthy powers.

The most striking symptoms in the present case were displayed in the deterioration of the urine, menses, and fœcal evacuations. These were changed and vitiated in the parts which furnish them. For the same reason, the stomach, liver, and other digestive organs ceased to assimilate the food and convert it into wholesome chyle, as appeared from the dyspepsia and colour of the skin. Hence the animal

processes were imperfectly elaborated, and the constitution exhibited many indications of premature decay. Nor could it be otherwise, so long as the chylopoietic, assimilating, and excrement agents remained disordered. We have, I think, proved, that all these organs derive a great portion of their activity from the spinal nerves. In that case we can readily suppose, that when these are diseased, the parts to which they run will suffer and prepare products of deteriorated quality. Accordingly we find, that so long as the vertebræ were out of their natural stations, the viscera connected with them did not perform their accustomed offices. But they were no sooner replaced than their former powers returned; the secreted fluid possessed its natural properties, and good health was the result.

We have, then, in the preceding case, a strong proof of the connexion between the secretory organs and spinal nerves. This patient, until her fall, enjoyed uninterrupted good health. She then became nervous, debilitated, and sickly. These symptoms were always present, and twelve years after the accident she applied for my professional assistance. I had the gratification to perceive, during my attendance, that in proportion as the displaced vertebræ inclined towards their proper stations, a corresponding improvement took place in her digestion and menstrual discharges, as well as in the complexion of

her motions and appearance of her urine; and by the time that the spinal column had recovered its correct arrangement, the original vigour of these functions was restored. It was curious and highly satisfactory to observe how closely their improvement followed the replacement of the vertebræ, affording the strongest and most convincing proof of their immediate dependence upon the state of the spinal cord.

The paramount influence of the nerves over the various operations of the animal economy is now pretty generally acknowledged. Indeed the further we proceed in this inquiry, and trace the connexion which binds the parts of living matter to each other, the clearer shall we perceive the subservience of these operations to the nervous system, and entire dependence upon it. Still it does not appear to me, that the inherent faculties of the spinal nerves, or their ability to act independantly of the brain, are either fully admitted or clearly understood by pathological writers. They have been too much accustomed, in all their speculations, to look upon the brain as the only genuine source of nervous energy, and to consider the spinal chord as a subordinate member, deriving all its abilities from this great original. According to my comprehension of the subject, such a conception of it presents a very defective and insufficient view of what really takes place in the living body. It appears to me, that the brain is the organ of the mind, and its

prolongation, under the several denominations of corpora pyramidalia, medulla oblongata, et spinalis, constitutes the organ of motion.

Though these two parts are intimately connected, and commonly unite in performing the same actions, they nevertheless sometimes exercise distinct and specific offices, and discharge them independently of each other.

The reflecting faculties, for example, are so purely mental, that we employ them in many instances without the co-operation of any thing corporeal.

The brain, we know, receives its impressions from the external senses, and makes them objects of reflection, during which operation, we have reason to believe that the organ of motion is often wholly inactive, and unaffected by what is going on. The brain and its functions are so thoroughly abstracted and independent of all other parts, that when paraplegia has taken possession of the whole trunk, the mind may remain in the enjoyment of its faculties, and exercise them, with its former brilliancy, upon the most difficult and abstruse investigations. In support of this opinion, I proceed to relate the two following cases.

“ Count de Lordat, a French officer of great merit, had the misfortune to be overturned from a pretty

high and steep bank. His head pitched against the top of the coach; *his neck was bent from left to right*; his left shoulder, arm, and especially his head, were considerably bruised. At first he felt a good deal of pain *along the left side of his neck*, but neither then, nor at any other time, had he any faintings, vomitings, or giddiness.

“ Three years and a half had elapsed since his fall, when I first saw the count. A more melancholy object I never beheld. The patient, naturally a handsome, middle-sized, sanguine man, of a cheerful disposition, and an active mind, appeared much emaciated, stooping, and dejected. He still walked alone, with a cane, from one room to another, but with great difficulty, and in a tottering manner; his left hand and arm were much reduced, and could hardly perform any motion; the right was somewhat benumbed; and the count could scarcely lift up his head; his saliva was continually trickling out of his mouth, and he had neither the power of retaining it nor of spitting it out freely. What words he still could utter were monosyllables, and these came out after much struggle, in a violent expiration, and with such a low voice and indistinct articulation, as hardly to be understood but by those who were constantly with him. He fetched his breath rather hard; his pulse was low, but neither accelerated nor intermitting. He took very little nourishment, could chew and swallow no

solids, and even found great pain in getting down liquids. Milk was almost his only food. His body was rather loose, his urine natural, his sleep good, his senses and the powers of his mind were unimpaired; he was attentive to, and sensible of, every thing which was said in conversation, and shewed himself very desirous of joining in it, but was continually checked by the impediment in his speech, and the difficulty which his hearers were put to. Happily for him, he was able to read, and as capable as ever of writing, as he shewed me, by putting into my hands an account of his present situation, drawn up by himself; and I am informed that he spent his time to the very last in writing upon some of the most abstruse subjects.

“ After death, the muscles of the tongue were found extenuated, and of a loose texture. The lingual and the brachial nerves appeared unusually compact, being nearly tendinous. The dura mater was in a sound state; but the pia mater was full of blood and lymph. On it several small hydatids, and towards the falx some marks of suppuration, were perceived. The ventricles were filled with water, and the plexus choroides was considerably enlarged, and stuffed with grumous blood. The cortical surface of the brain was much browner than usual, but neither the medullary part nor cerebellum were impaired.

“ We chiefly took notice of the medulla oblongata.

This was greatly enlarged,† surpassing the usual size by more than one third. It was likewise more compact. The membranes, which, in their continuation, enclose the spinal marrow, were so tough, that we found great difficulty in cutting through them, and we observed this to be the cause of the tendinous texture of the cervical nerves. The marrow itself had acquired such solidity as to elude the pressure of our fingers; it resisted as a callous body, and could not be bruised. This hardness was observed all along the *vertebræ* of the neck, but lessened by degrees, and was not near so considerable in the *vertebræ* of the thorax.

“From these appearances, we were at no loss to fix the cause of this gradual *palsy* in the alteration of the medulla spinalis and oblongata. I conceive that, by the accident, the head being violently bent to the right, the nervous membranes on the left were excessively stretched and irritated. That this cause extended by degrees to the spinal marrow, which being thereby compressed, brought on the *paralytic* symptoms, not only of the left arm, but at last, in some measure, also of the right.”*

In another case described by Monsieur Keratry,† the mind preserved its vigour and activity unim-

* Medical Observations, vol. iii.

† Inductions Morales et Physiologiques.

paired to the end of life, though the sufferer had the misfortune to be deprived for several years of his sight and hearing, as well as of the sensibility and use of all his limbs. "On seroit tenté de ne voir en lui, quand il parle, qu'un débris vivant de cerveau." In these deplorable examples, the brainular functions, as already observed, remained undiminished; from which we infer, that the faculties of the mind are first exercised upon the sensorium commune, and the impressions are afterwards conveyed through it to the spinal chord and muscles of voluntary motion.

I have selected and published nine cases treated according to the principles laid down. Nor shall I hesitate, on a proper application, to declare the names of the sufferers, or to mention several others who have received equal benefit. A few more similar cases, yet to be added, will conclude this the first division of my work. I shall then proceed to treat of the remaining species, in the order enumerated. Having, in a succeeding volume, finished the several species, I shall endeavour, if health be spared, to demonstrate and explain the close connexion which subsists between many nervous ailments and the spinal chord.

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