BRITISH MEDICAL JOURNAL:

BEING THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION.

EDITED BY ANDREW WYNTER, M.D.

No. CLXXXI.]

LONDON: SATURDAY, JUNE 16, 1860.

[NEW SERIES.]

A Course of Lectures ON THE NATURE AND TREATMENT OF DEFORMITIES.

DELIVERED AT THE ROYAL ORTHOPÆDIC HOSPITAL,
MAY 1860.

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LECTURE I.

GENTLEMEN,—In compliance with the rules of this Hospital, I again have the honour of appearing before you to deliver the annual course of lectures.

It is customary to commence the course with what is called an "Introductory Lecture". This is absolutely necessary at our large hospitals and medical schools, in order that the new students may have their duties laid before them at the outset, in such a manner that their attention shall be directed to those branches of their general professional education, upon which their knowledge of medicine and surgery is to be based; and also that the importance and absolute necessity of the close study and observation of disease may be fully impressed upon their minds during the short period that is to be allotted to them for the acquisition of practical information.

Many facilities are presented to the lecturer for this object, both in taking a review of the science of medicine and surgery, and in placing before the students the numerous brilliant examples of distinguished talent and well rewarded industry, which the history of the profession affords. In this particular branch of the science, however, it is not at all times necessary or useful. I have therefore determined on this occasion to place before you the nature of the cases which fall under our observation, with such general remarks as appear to me to be interesting. In the subsequent lecture, I shall take each separate deformity in its turn—the plan adopted on former occasions.

The cases, then, gentlemen, which you will find present themselves under the term "deformities", embrace every joint in the body, and include diseases of the bones, joints, and muscles, and affections of the nervous system. Thus there are contractions and diseases of the toes, feet, knees, hips, spine, the articulation of the lower jaw, the shoulder, the elbow, the wrist and fingers. The subject, therefore, embodies the whole of the voluntary muscles, as well as the articulations; and in the investigation of their causes, organic or functional disease or derangement will be found the frequent object of inquiry. Hence, although this is regarded as a branch of surgery, yet it is a branch which demands a sound knowledge of anatomy, surgery, and medicine, without which no one can safely, successfully, or conscientiously undertake the treatment, excepting only the more simple cases, such as have fallen within the capacity of the mechanist and the empiric.

Deformity, then, becomes an especial object of study in the education of those who are destined to enter the medical profession; and although comparatively few have hitherto directed particular attention to the subject, the time has arrived when it behoves every member of the profession who is desirous of keeping pace with the daily improvements in the science, and of increasing its general usefulness, to devote some time to the investigation of the subject, and to take advantage of the opportunities which now present themselves at this Hospital. One of the objects for which it was founded was, that the practice here adopted might be diffused throughout the kingdom;

and I may be permitted to say, that we, the medical officers, have reason to congratulate ourselves upon the attendance of some of the leading and most useful members of the profession—men whose lives have been devoted to one continued study of the science, and whose contributions to it must ever entitle them to the gratitude and respect of the profession at large. Noble examples are thus held up to us, especially to the junior members of the profession, to preserve our minds free from bigotry and prejudice, so that we may be enabled fairly to investigate any and every new practice which tends to the advancement of the science and the consequent relief of suffering humanity. This is one of the great objects for which we live; and therefore, by neglecting these opportunities—opportunities now within the reach of all—we commit a species of self sacrifice, proving ourselves unworthy of our calling, and act as stumbling-blocks in the way of our profession.

1. *Congenital Deformities.* The first class of deformities, to which I shall allude to-day, is the congenital. Congenital contraction or deformity of the *toes* is but seldom met with; malformations are, of course, excluded.

In the *ankle-joint*, however, we have four distinct varieties, each corresponding with some one of the motions of that articulation. 1, the inverted position, called *talipes varus*—this is the most common congenital deformity affecting the ankle; 2, the everted or *talipes valgus*; 3, the flexed, or *talipes calcaneus*; 4, the everted, combined with contraction of the *gastrocnemius*—one of the most rare of deformities.

In the *knee-joint*, I might almost venture to say, the only contraction is the flexed or semi-flexed position. I have seen but few exceptions; and in those the knees were contracted somewhat beyond the full extended position.

In the *hip*, the joint most rarely affected with congenital deformities, we find the flexed and adducted position, and congenital dislocation of one or both hips.

In the *spine*, congenital deformity in the infant is seldom seen; and when it is met with, the spine is most frequently found to be curved posteriorly. I have seen instances of lateral curvature, confined however to the middle and lower dorsal and upper lumbar vertebrae, and invariably to the left side, one preparation of which I have in my possession. I have also seen one instance in which the true rachitic condition of the spine and bones generally coexisted. In the cervical vertebrae we have *wry-neck* as a congenital deformity, and a rigid condition of one or both of the *sterno-mastoid* muscles is occasionally met with in infants.

In the *shoulder-joint*, I do not remember having seen a single case of congenital contraction.

In the *elbow*, we find contraction in the extended position, combined with contraction of the wrists in the flexed position, malformation of the elbow-joint being apparent in these cases.

In the *wrists*, there have been but few instances of contraction in the flexed position without malformation. In fact only three instances have fallen under my observation out of 18,000 cases. It is not, however, so rarely met with in combination with malformation. We have had out-patients, a few weeks old, in this condition; one having six fingers on the affected hand, without a thumb, the arm being one inch shorter than its fellow, and fixed in the straight or extended position. I have also had two cases in private, in which both arms were fixed in the same position, the wrists flexed, the knees extended; and in one of these cases both *gastrocnemii* muscles were also contracted. In this state, the patients are unable to feed themselves, or to use the hand otherwise than with the arm extended.

In the *fingers*, the only congenital deformity is the flexed or semi-flexed, and this often depends on deficiency of the skin, extending from the palm of the hand to the last phalanx. Of course, the numerous cases of malformation are excluded.

2. *Non-congenital Deformities* form a far more numerous class, as will be readily supposed, if the causes are considered.

First, the *toes* are found to be commonly contracted,—the second most frequently, the great-toe occasionally, and not unfrequently the whole, with or without contraction or deformity of the ankle-joint.

In the *ankle-joint*, we have all the deformities mentioned in the congenital classification, with the addition of one other, viz., talipes equinus, or simple elevation of the heel. This deformity is by some persons stated to be congenital, but I have never yet seen a congenital case.

In the *knee-joint*, we have the same contractions as in the congenital, viz., in the flexed and extended positions; the inward inclination, or genu valgum; outward, or genu extrorsum; and many of the contractions in the flexed position present instances of semi-rotation of the tibia upon the femur, with partial, and at times complete, dislocation backwards.

In the *hip-joint*, there is the flexed and adducted, as in the congenital, differing however most materially, inasmuch as the non-congenital is most frequently combined with dislocation of the femur on the dorsum of the ilium, as will be seen hereafter.

In the *spine*, we have three distinct varieties of non-congenital deformity, viz., lateral curvature, with more or less rotation of the vertebræ; posterior curvature; and angular curvature, with disease of the bodies of the vertebræ. In the cervical vertebræ we have wry neck, as in the congenital form, but depending on various and important causes.

The *shoulder-joint* is the subject of contraction, as is the *elbow*—commonly in the flexed position. The fore-arm is contracted in the pronated, and the *wrist* and *fingers* in the flexed, occasionally in the extended position.

Causes of Congenital Deformity. If you will direct your attention to the varieties I have pointed out, and compare the congenital with the non-congenital deformities, you will perceive that each of the former presents itself in the non-congenital form; but, as I have remarked to you, the latter are far more numerous. This, gentlemen, leads us into an inquiry as to causes, and necessarily as to the condition of the muscles, ligaments, and bones. In no case of congenital deformity without malformation have I witnessed any irregular or spasmodic action of the muscles. Cases have presented themselves in children born at seven or eight months, with spasmodic contraction of the muscles, which the parents have stated to have occurred at birth; but upon cross-questioning and making minute inquiries, it has transpired that the condition was noticed at three months old, for example, or when the child first began to walk. Out of the great mass of patients at this charity, between seventeen and eighteen thousand of which have passed directly under my own observation, many at the age of seven and fourteen days, I have not seen one infant with irregular or spasmodic action of the muscles. There are instances of cerebral irritation or disease occurring *in utero* which might unquestionably act as exciting causes and produce this condition, yet in every congenital deformity which has come under my observation the muscles have been perfectly under the control of the will, so far as the contraction would allow, even in those few cases where spina bifida has co-existed. While, therefore, I am not prepared absolutely to deny, neither can I admit this to be a congenital condition. We have had patients upwards of fifty years of age admitted into the Hospital with congenital talipes varus, in whom the adductors, which were contracted, and the abductors, which had been constantly kept upon the stretch nearly if not quite to their full extent, yet each retained their functions, and acted under the influence of the will. Muscles so circumstanced, however, of course suffer from diminished development, according to the age of the patients. This is a most important fact, both as regards our diagnosis and our prognosis.

A man, aged 25 years, some time since an in-patient, was afflicted with congenital contraction of both knees, as well as contraction of both gastrocnemii muscles. The latter, I ascertained upon inquiry, was not noticed until some few years after, and that latterly it had considerably increased. I therefore attributed the contraction of the heels to the patient's inability to place his feet flatly upon the ground when swinging himself between two crutches—his only mode of locomotion. By keeping his feet constantly extended during exercise, to enable him to touch the ground with his toes, the gastrocnemii muscles had become gradually and permanently contracted. This patient could voluntarily and with perfect regularity flex and extend his legs up to the point at which they were contracted, *i. e.*, nearly at right angles. The limbs had, by this partial extent of motion, not suffered so much from atrophy as is commonly the case. I divided the tendons of the semi-membranosus and

biceps flexor femoris of each knee; and, as soon as the full amount of extension was obtained, which occupied six weeks only, I divided the tendo Achillis in each leg. At the end of three months this man could stand, and with the aid of two sticks he could walk. Here, then, as in every instance of congenital contractions that I have yet met with, there were no functional derangement of the muscles, no displacement of the articulation, nor any obstructions in the joints; the patient was therefore perfectly cured.

The only conclusion at which I can arrive, and which is at all satisfactory to my mind is, that congenital deformities (malformation excluded) owe their origin to mechanical causes, viz., position *in utero*. If this be not so—if they arise from functional or organic disease of the brain or spinal marrow during uterine existence, how is it that we have no evidence of diseased action after birth, as we know other diseases which originate *in utero* develop themselves and exist after birth—the syphilitic as an illustration?

The question might be asked—Do we find analogous instances among the non-congenital deformities? To this I would positively answer, Yes, and in most of the non-congenital deformities. For instance, in patients who have been confined for any length of time, from fracture or other injury, the joints being kept completely at rest, contraction of the limb in the position in which it has been thus kept is commonly the result, without any irregular muscular action or interference with the efforts of the will up to the point at which the contraction has taken place,—precisely the condition met with in congenital contractions; and no evidence whatever can be discovered of muscles being in any way influenced, beyond their being contracted. The same perfect voluntary control exists, and in many instances a perfect cure can be effected in these cases.

Some years since, I was consulted by a gentleman, twenty-two years of age, who had suffered from inflammation of the knee-joint, and subsequent contraction in the flexed position. By the application of a splint, the leg had been gradually extended, and, under the advice of his medical attendant, had been kept in the straight position for two years, when he applied to me. The rectus was rigidly tense, and no perceptible motion could be discovered; but upon using great force, pain was occasioned on the anterior surface of the knee. I applied a splint with a screw attached behind, and, without operation, gradually flexed the leg to a right angle. I then directed the patient to flex and extend the limb alternately with the assistance of the instrument, and in the course of a few weeks he could voluntarily do so about halfway to a right angle. Here, therefore, was an instance, where contraction of the flexor muscles had first taken place, upon removal of which contraction of the extensors ensued. By the above treatment, the motion of the joint and voluntary power were restored, which could not have been the case had any disease of the nerves or muscles existed.

Now let us for the moment admit the supposition that congenital contraction owes its origin to some affection or temporary exciting cause in the brain or spinal marrow. Can we bring analogous cases among the non-congenital? I know of none. In the active spasmodic affections, of which we have numerous examples, the cause or effect remains, and does not yield to treatment, except in a limited degree. In cases of paralysis of one or more muscles, the paralysis, if complete, continues, and sets at defiance all our efforts, unless active treatment immediately follows the attack; so that in no way can I attribute these deformities to irregular muscular action. Of course, a difference of opinion will be and is entertained upon this, as well as upon all subjects that admit of doubt. We can only, therefore, exercise that very necessary but much neglected qualification, common sense. As it regards the condition of the muscles, I am of opinion that no structural or other change takes place any more than in non-congenital deformities, which owe their origin to position. Experience teaches us that a muscle or set of muscles may become contracted from causes hereafter to be mentioned, without any evidence or trace of a change of structure or organic alteration of the muscles themselves. I have had many opportunities of examining the muscles after death of patients whose tendons had been divided during life; and in none could I trace the slightest difference between these and the muscles which had not been contracted. I would here remark that the union of the tendons which had been divided some few months was most perfect,—a linear cicatrix being alone visible. This is most satisfactory, as serving to show that division of the tendon does not destroy its integrity, excepting during the time immediately following the operation, *provided the necessary precau-*

tions are taken, viz., keeping the parts perfectly at rest, and as far as is possible placing the divided ends of the tendon in juxtaposition. In slight cases proceeding slowly and cautiously with the after treatment, or the power of contraction, which is common to all cicatrices, from whatever cause they may originate, becomes destroyed, and a worse deformity is produced. This was the principle laid down by Delpech, the author of this operation, based as it now is upon scientific principles; and it is a principle which can in no case be departed from without incurring great risk.

Many years since, I was called in consultation upon a case which presented the appearance of talipes calcaneus. The os calcis was very nearly perpendicular; the foot flexed, everted, and contracted in that position. At that time I had not witnessed this condition but from one cause—viz., paralysis of the gastrocnemius. Upon examining this patient, I took occasion to point out to the medical gentlemen in attendance the nature of the deformity and the probable cause, directing them to examine the tendo Achillis, and satisfy themselves of the condition of the muscle, the outline of which is absent in these cases, the tendon lying loose and atrophied behind the joint. I had scarcely finished my remarks, when, to my surprise, the mother exclaimed, "Oh, sir, this has been made by a gentleman who operated upon my child two years ago." I learned that the child had suffered from slight contraction of the heel, for which the tendo Achillis had been divided, and the foot rapidly brought into the flexed position. By this proceeding, the uniting medium had been so weakened and attenuated by too rapid extension, that the power of contraction of the cicatrix, to which I have alluded, was altogether lost; and although the muscle was not paralysed, yet, from its greatly increased length, there was nothing upon which it could act before complete contraction upon itself had taken place.

The os calcis, by losing its support, was drawn down into the position mentioned by the muscles of the sole of the foot, and a deformity much worse than that for which the child was operated upon produced, with this disadvantage, that its present state cannot be remedied, beyond restoring the os calcis to the horizontal position; and, in all probability, the patient will be compelled to wear mechanical supports for life. Let this, therefore, be a caution to you; for I have since seen many similar cases.

I may here allude to some amusing experiments which have been made upon rabbits, with the view of illustrating the mode of union of tendons after operation. They require notice, from the fact that diagrams of the results have been published in the *Pathological and Medico-Chirurgical Transactions*. The rabbits, unfortunately, would not tolerate the confinement of the limb in splint and bandage after operation, but gnawed off these unwelcome appliances. Of necessity, the union was most imperfect, and no more illustrates the actual union of tendons where proper precautions are used, than the false union of bone after fracture under similar circumstances would illustrate the normal union of fractured bones.

The ligaments suffer from stretching on the convexity, and contraction on the concavity of a deformity. This also applies to those non-congenital deformities which have arisen without any affection of the joint itself. In rheumatic and some other diseases, they appear to become destroyed, and admit of dislocation taking place, as is witnessed in rheumatic disorganising of joints. They appear, however, to be merely passive agents.

The bones are not affected in their growth or development in early life, excepting the congenital rachitic condition. They become slightly altered in the articular surfaces, however, if the deformity is allowed to continue for a period of years, still retaining their natural forms. Hence, as you will more clearly perceive in the course of the lectures, the congenital deformities, contrary to what we should, *a priori*, have anticipated, are by far the most favourable for treatment, and the most satisfactory in their results.

[To be continued.]

THE HUNTER STATUE. At a last meeting of the John Hunter Statue Committee at the Royal College of Surgeons, on the 6th instant, it was decided that the execution of the marble statue should be entrusted to Mr. Henry Weekes, A.R.A.; and that when completed, it should be placed in the museum of the College. It is the intention of the Committee that Sir J. Reynolds' portrait of the great original should be followed as nearly as practicable by the sculptor.

Nettlesonian Lectures

ON

THE OPHTHALMOSCOPE AND ITS APPLICATION.

DELIVERED BEFORE THE MEDICAL SOCIETY OF LONDON.

By HAYNES WALTON, Esq., F.R.C.S., Surgeon to St. Mary's, and to the London Ophthalmic Hospitals, etc.

LECTURE I.

MR. PRESIDENT AND GENTLEMEN,—It will be doubtless satisfactory to you, and, I assure you, no less so to myself, to say why I appear in this responsible position, because I feel that the Society has a right, under ordinary circumstances, to expect from those who take the lectureship something more valuable and more acceptable than I fear I have to offer. Nor is this a mere vanity excuse, a kind of clap-trap to increase expected applause, but what I really feel.

The facts are these: most unexpectedly, and wholly without my knowledge or seeking, directly or indirectly, I was nominated to the office. My first impression was respectfully to decline, for my time is tolerably well occupied by my ordinary occupations, and I have had of late extraordinary demands on it. But recognising the duty which each individual member of a society owes to the body corporate, I resolved to contribute my quatum.

I could not readily decide on the subject that I should take; but ultimately determined to introduce the ophthalmoscope, on account of its novelty, its value, and, as I believe, the growing disposition on the part of the profession to be informed on this secret penetrating instrument. I hardly ever speak to a professional brother on an ophthalmic subject, without his asking me something about this new appliance, and requesting an opportunity to see it used.

I think that I shall best satisfy the great majority of my hearers by avoiding minute disquisition and deep detail, and rather giving a general idea of the ophthalmoscope, a sketchy outline, shewing what it is, what it can accomplish in the mystery of diagnosis, what guidance it affords for the treatment of disease, and generally introducing any practical matter with which I am acquainted.

Let me say a few words about the origin of the instrument. It seems to be generally agreed, and I believe truly, that the source of this discovery, which has revolutionised ophthalmic nosology, and rendered obsolete nearly everything that has been written or taught on the deep seated diseases of the eye, is to be traced in a communication in the twenty-ninth volume of the *Medico-Chirurgical Transactions*, by William Cumming, Esq., formerly house-surgeon to the London Hospital, "On a Luminous Appearance of the Human Eye and its Application to the Detection of Disease of the Retina and Posterior Part of the Eye."

It would appear that Mr. Cumming's attention was attracted to the subject from the description of cat's-eye amaurosis by several authors; the name being used to infer that the appearance was like the luminous glare of the eyes of some animals, by the reflection of the light from a brilliant tapetum. What was seen, they thought to be the appearance of disease; and Mr. Cumming started with his investigations under that supposition. None of the writers, he says, mention a reflection from the posterior part of the perfectly formed healthy eye of the human subject, nor had he heard of any one else who described such a condition; and he undertakes to show that the healthy human eye is equally, or nearly equally, luminous as the eye of the cat, or dog, or other animals, when observed under favourable circumstances.

It was not long before he discovered that the cat's-eye amaurosis, about which he found the statement of writers to be at variance on all points, was a matter of imagination. With our superior knowledge, we may justly infer that the mass of recorded cases of amaurosis were not diseases of the nervous apparatus of the eye.

The first case in which Mr. Cumming observed the natural brilliant reflection, he supposed to be one of cat's-eye amaurosis.