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SOME POINTS OF RECENT TREATMENT

IN THE

DEFORMITIES OF CHILDREN

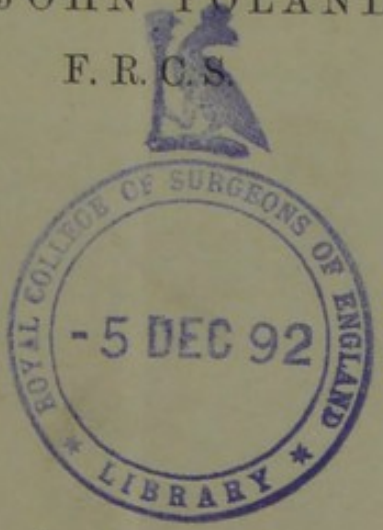
The Presidential Address

TO THE

WEST KENT MEDICO-CHIRURGICAL SOCIETY

By JOHN POLAND

F. R. C. S.



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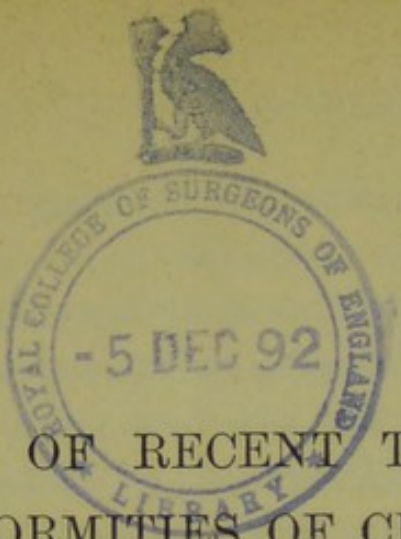

SOME POINTS OF RECENT TREATMENT IN THE DEFORMITIES OF CHILDREN.

INTRODUCTION.

GENTLEMEN,—Allow me to express the satisfaction with which I accept the honour you have conferred on me in electing me to the office of President. It is truly a pleasure as well as an honour, and I thank you most sincerely. The position is one which has been filled by many men distinguished in this neighbourhood and elsewhere; men who have grown venerable, and respected by all our members and the whole profession.

I trust that I may be able to fulfil the duties of the office as efficiently as they.

The success of our Society, however, depends not so much on the President as upon the individual efforts of the members, and I hope my year of office will be as prolific in contributions to our debates as the past and former years have been. Our debates have ever been characterised by their practical utility, and their amicable discussion; and I trust that next year my successor in office will find the Society in a condition no less flourishing than it now is.

One word as to our Library. The Council whom you have just elected will, I hope, have their attention directed to the very important question of putting our Library on a firmer basis; so as to afford means whereby the members of our Society, like other local Medical Societies presiding over

particular districts, may have a ready means of access to the current literature of the day.

Gentlemen, I have chosen for my address this evening a subject to which the greatest interest is attached, and in which surgical practice has been much simplified of late years: I mean the *Deformities of Children.* The time at my disposal is so short that it will only allow me to review *some points of recent treatment.*

LATERAL CURVATURE OF SPINE.

First, as to Lateral Curvature of the Spine. Happily lateral curvature is being recognised more and more in its earlier stages, and legion is the name of the muscular exercises and mechanical contrivances which are adopted by so many surgeons to correct the deformity, and restore the normal curve to the spine, to provide a normal muscular support, and to strengthen the muscles generally.

This tends to show that day by day less faith is being placed in spinal supports than in former years, and that treatment by exercises and gymnastics is to be advocated, in the early stages at any rate; and all heavy apparatus avoided—in fact condemned.

Appropriate gymnastics should take the first and most important place in treatment.

In infants and very young children every form of apparatus should be carefully avoided. The mother can easily be taught the simple principles of treatment, and, by her manipulations of the spine, performed several times a day, she can completely correct the slight deformity which may be present at this early period of life.

In older children the condition should certainly be diagnosed before the dressmaker finds it out. For instance, a right-sided dorsal curvature, with more or less flatness about the angle of the left scapula, and accompanying fulness on the

right side, may be detected by careful examination before any marked scapular projection ensues.

The lumbar curves are much more amenable to treatment than the dorsal or cervical, and almost always yield good results. We must not, however, forget that they may be due to differences in the length of the lower extremities, and are to be treated accordingly.

In the treatment of Scoliosis, I am of opinion that better results follow the use of gymnastics than even movable jackets.

All treatment may be summed up as follows :—

(1.) The spinal column must be made more flexible.

(2.) The muscles must be strengthened.

(3.) Faulty habits must be corrected, and the young patient made conscious of the corrected positions, so as to assist by his own efforts in maintaining them, and relieving pain.

But each case should be made a study by itself, for the treatment is sure to be unsatisfactory unless its peculiarities are carefully investigated and noted by the surgeon, and the exercises and drilling modified according to the special indications of the case.

These exercises may be carried out at home or in the special gymnasia of which there are plenty in London ; always remembering that the exercise, or whatever movement is employed, should never be carried so far as to produce fatigue ; and also that, during the usual daily period of rest in the afternoon, lying on the back is essential in all cases.

A special chair with an oblique seat, raising the sole of the boot, a well-padded mattress, Barwell's loop girth—all these are useful details.

Massage is also a useful adjunct to treatment.

An almost complete recovery may be looked for in young

subjects who have not yet attained the period of complete osseous development, complete at least so far as regards the uprightness or erect position of the body, even though bony deformity may have been present.

In the meantime the nutrition of the child must in all cases be increased, and any evidence of rickets treated by the usual remedies—Cod-liver Oil, Iron, etc.

When there is rotary lateral curvature producing extreme deformity, whether due to infantile paralysis or no, most relief is obtained by an accurately adjusted Sayre's splint, or a felt jacket moulded to all the irregularities of the body, and closely fitting in every place. This will retain the body in the improved position—especially after self-suspension—better than any other device. Such conditions are, however, as you know, quite incurable.

CARIES OF SPINE.

This brings me to the treatment of Caries of the Spine. The treatment by mechanical fixation, advanced a hundred years ago by Percival Pott, is the same as that in vogue to-day—the methods only are altered.

Sayre's method is still employed for the greater proportion of cases of Pott's disease in which this form of treatment is applicable. It fixes the spine and secures locomotion during treatment where possible, and is by far the best application, but requires patience and a complete grasp of the principles laid down by Sayre. It may be necessary to apply the bandages four or five times before a suitable jacket is attained. The jacket is usually changed once in three months.

In many cases of spinal caries in children the plaster of Paris splint may be advantageously replaced by an adaptation by Messrs. Krohne and Sesemann of the well-known Thomas' splint, with the addition of a pelvic band, a support

for the shoulders, neck, and head, and two sliding foot-pieces. By the cross-bars the child can be lifted as one stiff piece and carried about or placed in a reclining position.

Continuous extension in the horizontal position is also useful in the case of children when the application of a spinal jacket is found to be impracticable.

In applying the plaster of Paris jacket to young children for the treatment of dorsal or lumbar spinal disease, my experience is decidedly in favour of Davy's suspension and extension by the hammock. In fact, in such cases I hardly use any other. The dinner pad of Sayre's treatment is rendered unnecessary by the dinner itself, and a long thin piece of canvas-webbing is the only thing required besides the plaster of Paris and the jersey.

But caries of the spine is not to be treated by any particular method, jacket or apparatus. For instance, in disease of the cervical or high dorsal region it would be quite useless to apply a plaster jacket to the trunk. We must be perfectly familiar with all the advantages of each method, and apply each as the particular case may require.

I would only add that suspension is dangerous when the disease is acute and where there is any probability of there being great destruction of the bone and neighbouring structures.

In cervical caries most surgeons have now discarded the use of Sayre's "jury mast." The rotatory movement which its construction allows, its cumbersomeness, and its prevention of perfect rest in the horizontal position, are real disadvantages in the treatment of these cases in children.

The neck should be fixed by one or other of the *cervical collars* which have been introduced of late years.

1. An ordinary poroplastic jacket combined with an accurately-fitting collar and helmet-piece.

2. An apparatus consisting of two incomplete rings for

supporting the head, formed of one piece of steel continuous at the back, the lower shoulder ring resting on a poroplastic collar or Sayre's jacket.

3. Furneaux Jordan's very simple and efficient figure-of-eight bandage to the head, neck, and chest; the upper loop embracing the head like a fillet; the decussation being at the back of the neck over and below the seat of the disease, and the lower loop partly encircling the chest; or

4. A poroplastic felt splint (Barwell) may be moulded over the front of chest and shoulders, meeting behind on each side of spine—a part also passing up in front of throat to lie under the chin and on the rami of the jaw.

5. A moulded leather splint, consisting of a breast-plate and chin-piece combined with a dorsal-plate and head-piece.

Cases of cervical disease accompanied by paraplegia, with loss of control over bladder, have been successfully treated by means of a simple leather collar coming under the chin.

Moderate extension has been employed in certain cases of cervical disease and a plaster bandage applied; but I certainly think that this should be undertaken with the greatest caution and judgment. Any of the simple forms of apparatus I have just mentioned which secures prolonged and absolute rest, is quite sufficient.

Suspension should never be used as a remedial agent, but merely to permit of the application of a proper support to the spine. The application of any extension to an angular curvature with the object of reducing the deformity can only be followed by disastrous results, owing to the forcible separation of the destroyed vertebral bodies or discs which have fallen together in the natural process of the disease and its repair.

Infants and very young children should never be suspended; raising the child by the armpits is quite sufficient, and allows the proper application of a jacket.

As to *complications*, several operations have, during the past eighteen months, been performed for angular curvature accompanied by paraplegia. The spinous processes and laminæ have been resected with varying success, but by far the greater proportion of cases of spinal caries with paralysis tend to recover by prolonged and absolute rest in the horizontal position, so that the operation can only be necessary in extraordinary cases.

Another common complication, chronic abscess, I prefer to open by the lumbar incision, going through the quadratus lumborum muscle under strict antiseptic precautions.

To promote the osseous deposit between the spinous processes which is found in all cases of natural cure of spinal disease, a periosteo-plastic operation has been once or twice practised. It consists in dissecting up the periosteum of these processes, and suturing them together.

It is interesting to note the difference between the result of osseous inflammation of the spinous, articular, or transverse processes, and that of similar inflammation of the bodies of the vertebræ. The one tends to form comparatively healthy bone, the other to degeneration and disintegration.

This operation may, therefore, be of considerable benefit in certain cases.

One warning as to the diagnosis of spinal disease. Let us never forget the possibility of an affection of bones, ligaments, and muscles *without destructive disease*, even in younger life. As in the hip-joint, so in disease of the spine, the quack may every now and then cure conditions which have been regarded as serious disease by the legitimate practitioner.

GENU VALGUM.

Passing now to *Genu Valgum*, or Knock-Knee. In children under two years of age, where the deformity is

slight, daily attempts at correcting this by manipulation should be made, and the child kept off his legs. Like the curvature of the tibia, it will very readily yield to these simple measures, and get well in a month or two. In older children, while the bones are still soft, some form of mechanical support should be used, combined or not with tenotomy of the biceps tendon and ilio-tibial band of the fascia lata. This condition may be a result of flat-foot, so that our treatment in early cases should be directed to raising the inner side of the heel and foot; at any rate, I may say that flat-foot, in all probability, promotes the occurrence of genu valgum.

We must not forget to strengthen, by action, the muscles which, when carrying out their proper functions, prevent these deformities. Tiptoe exercises are of use in slight cases of knock-knee, as in cases of flat-foot.

It would be perfectly useless for me to enumerate the many kinds of splints which can effectively be used for straightening the lower extremities of young children in their various degrees of knock-knee or bandy-leg, or rachitic curves of the thigh or leg, or to describe the screw or other forms of clamp used for the same purpose.

Operations for the relief of genu valgum, bow-leg, and other rachitic deformities should only be undertaken after the bones have become eburnated and hard.

I believe that most cases of knock-knee are curable before fifteen years of age without any serious operation—up to twelve years of age simple cases are easily curable by pressure.

Osteotomy for the correction of deformity is practically devoid of danger; it accomplishes in a few weeks results which mechanical appliances would take years to achieve. Ogston's operation of sawing the internal condyle nearly through by means of an "Adam's" saw, and then fracturing

it so as to bring the limb at once into good position, is now discarded by most surgeons. A modification of MacEwen's operation of dividing the femur transversely above the epiphysial line from without inwards instead of from within outwards has been recommended on account of the preservation of the periosteum.

Osteoclasis, as practised by means of the osteoclast of Robin, Delore, and others, still finds some adherents in Germany and America.

BENT TIBIÆ.

As to bent tibiæ, my own opinion is—and I make it a standing rule in practice—that osteotomy should not be performed for curved legs below seven years of age, except under very exceptional circumstances. I prefer from ten years of age upwards. The plan I usually adopt in antero-posterior, or lateral bends in the bones of the legs, is to make a simple cut with a saw a good way into the bone and fracture the remaining undivided bone; the fibula is then easily fractured at the required spot. I find it quite unnecessary, except in very rare cases, to remove a wedge of bone from the convexity of the curvature, but the child must be kept off his feet for several months after the operation, otherwise the soft uniting material is sure to yield, and the deformity to be reproduced.

An alternative form of treatment of bow-legs, especially in younger years, but more dependent upon the condition and brittleness of the bones, is that of *forcible fracture*. This is accomplished by grasping the leg with the two hands close together above the ankle and below the knee, thus avoiding the epiphyses: it may even be necessary for the operator to fracture the bone across his own knee. The limb is then put up, as in all the operations just mentioned,

in proper position, and kept immovable by plaster of Paris dressings.

Electricity has been called into requisition, and in these cases the wedge of bone may be removed from a bent tibia by means of a circular saw worked by electricity, and called an electro-osteotome—the exact degree of aberration of the bone being determined by an instrument called a spenometer.

CONGENITAL EQUINO VARUS.

The treatment of club-foot should be begun within a few hours after birth. The infant's foot being exceedingly pliable, the deformity is readily corrected by Hüter's method, and a felt or light plaster of Paris splint applied, or better, a light tin splint with a flannel bandage. It should be removed daily, care being taken not to obstruct the circulation. The foot-piece of the tin splint should always be at a right angle with the leg-piece. In the intervals, manipulation and thorough stretching by the hand cannot be too frequently performed—in fact, this is the essential treatment.

Club-foot is an arrest of the fœtal unwinding of the limb, and affects all the structures of the foot, leg, knee, and even, to some extent, of the thigh. Tenotomy is rarely if ever required at this early age. Others prefer to begin treatment by plaster of Paris at six weeks of age, rectifying the deformity by considerable force, applying the bandage next the skin, and allowing it to remain on for six weeks before removal. After the varus has been corrected a tin splint may later on be applied to the back of the leg and sole of the foot to correct the "equinus" condition.

If this method is applied immediately after birth, and great care exercised in each case, I certainly think that there would never be any necessity for the severe operations which have frequently been practised at a later age, viz. syndesmotomy and tarsectomy.

Tenotomy is only required in later years when the child is able to stand or ready to walk; that is, when the limits of advantage to be gained by manipulation and mechanical apparatus have been reached. It may be then that only the tendo Achillis will require division to correct the remaining equinus position and effect a complete cure. The anterior part of the foot should now be quite straight, or even slightly abducted. A child should therefore have an almost normally-shaped foot by the time it is old enough to walk. The division of the tibial tendons is no longer considered necessary in these cases. After tenotomy the foot should be restored *immediately* or *rapidly* to its proper shape; that is to say, in the first instance a considerable space will be left between the ends of the divided tendon, and in the second a slight interval will be left between the ends of the tendon for a week, after which the plaster of Paris should be applied two or three times a week. The tendo Achillis will unite after division, even though the ends may be separated nearly two inches—a firm piece of tendon is always reproduced between the divided ends. Davies-Colley's outrigger apparatus, before or after tenotomy, is at once a simple and effectual method of everting the anterior part of the foot in these cases.

The operation by open incision on the inner side of the sole down to the bones opposite Chopart's joint finds favour in America for severe cases. It has been adopted as being an operation requiring a much shorter time for cure than any other less radical treatment. In this operation the foot is immediately restored to its natural position.

If, however, the club-foot has been neglected for years, or the deformity wholly untreated—that is, if the child has walked for a number of years upon the deformed foot—then some form of *operation* must be performed to obtain complete replacement. There still

remains a great difference of opinion as to which is the most desirable operation. The number of operations in this country, in America, and on the Continent, is so great that it is impossible for me to even mention them all—removal of a wedge from outer side of tarsus—excision of the cuboid or astragalus—linear osteotomy of the tarsus—fracture of the tarsus—removal of wedge and pegging—complete transverse division of tarsus with chain saw, etc.—osteotomy of the tibia and fibula just above the ankle, etc. etc.

I myself agree with what Dr. Sayre says, that in such cases a wedge must be removed from the outer side of the foot, thus shortening it; or else the inner side of the foot must be lengthened. Although there are usually changes in the shape of the articulating surfaces of the bones, yet the chief obstacles to replacement are the dense ligaments of the tarsus, especially the internal lateral and astragalo-scaphoid, and the various prolongations of the plantar aponeurosis. When these are freely divided, the foot, in almost all instances, returns to nearly the normal position. If a foot can be relieved of its deformity without the removal of a wedge of bone or the extirpation of a part or whole of the astragalus the patient has a much surer and more elastic support than when these bone operations are resorted to, as they almost invariably leave more or less anchylosis and diminution in the size of the foot and are not always followed by cure.

FLAT-FOOT.

It must not be forgotten that all infants on commencing to walk are normally flat-footed; but after the leg muscles have developed, when the child runs about, the normal arch begins to form. When the flat-foot persists, the treatment largely consists in restoring the plantar arch by mechanical means; in bracing up certain ligamentous

structures, especially the calcaneo-scaphoid ligaments ; and in strengthening the muscles which support this arch, especially the tibialis anticus. Gymnastic exercises, such as walking on the toes with the heel raised from the ground, etc., tend to strengthen the tibial muscles, such as the flexor longus pollicis, which have such an effect on the structure of the arch.

Others recommend that, in simple cases, the sole of the boot be perfectly flat ; or that the ordinary relative distance of the heel and toe from the ground should be interchanged ; or, what amounts to the same thing, that a well-laced boot should be worn, quite an inch thick in front fining off to a line or two at the heel. By these means the normal inclination of the os calcis will be maintained and the weight of the body properly distributed.

Prof. Humphry says that in flat-foot the muscles on the tibial and flexor aspect of the foot become relaxed and enfeebled, that they thus fail to exert a proper contractile power, and so cease to afford their proper support and to effect the normal movements of flexion and incurvation : hence the antagonistic muscles, the extensors and peronei, not being duly stretched or extended, fall into a contracted and irritable condition which in no small degree aggravates the deformity and the discomfort. The condition is further increased, and may in some cases even be excited, by the demand made on them to steady and brace the tarsus when the foot is placed on the ground and the weight of the body thrown over it. Their state is similar to that of the muscles on the outer side of the knee in cases of knock-knee, and of those occupying the concavity of the spine in cases of lateral curvature ; and is analogous to that of the flexor muscles in cases of diseases of the knee and other joints. This state is relieved by rest, especially if the rest is combined with extension by means of a well-applied splint ;

but it soon returns unless the treatment is continued for a sufficient period.

For this condition I know of no better or simpler apparatus than the "artificial muscle" introduced some years ago (1861) by Mr. Barwell. To make up for the absent or diminished force brought about by paralysis or debility of certain sets of muscles, a spring or springs of india-rubber stretched between the origin and insertion of the muscle or muscles to a degree of tension sufficient to supplement the weakened, or supply the absent power. Thus, for instance, in flat-foot the depression of the arch of the foot and the outward rotation of the foot can be remedied by applying the force imitative of the anterior tibial muscle.

Tenotomy is rarely required.

In more severe examples of rigid flat-foot, arising from neglect of simple cases, the foot, after it has been thoroughly relaxed, should be put up in a position of extreme supination and flexion, with a plaster of Paris splint. Later on a well-padded shoe should be used.

Severe operations on the foot, such as excision of the head or the whole of the astragalus, transverse division of the tarsus, astragaloid osteotomy, removal of scaphoid, or other portion of the tarsal arch, are now rarely practised even by the surgeons who introduced them. They should be entirely discarded.

As to the various PARALYTIC DISPLACEMENTS of the lower extremity, I need only remark that the orthopædic instrument-maker now supplies artificially the loss of power in a single muscle, or group of muscles, by means of india-rubber springs, or other special appliances, constructed to meet the requirement of each individual case, even the most complicated. However, in certain cases of "DANGLE-LEG," due to infantile paralysis, in which the leg has become nearly, if

not quite useless, it may be advantageous to ankylose the knee by excision, or otherwise, as the child grows older, and thereby secure a useful limb.

PARALYTIC VARUS of the foot may be rectified in much the same manner by producing ankylosis of the ankle joint. This was suggested some years ago by Von Lesser, and has been recently reintroduced.

WRY-NECK.

Most surgeons now agree that wry-neck, as soon as developed, should be immediately divided just above the clavicle, either by the subcutaneous or other method, the head placed in its normal position, and retained there for ten or fifteen days by means of plaster of Paris or other apparatus.

When due to caries of the spine the treatment should be directed to giving these parts complete rest, when the contraction of the muscle will rapidly disappear. Furneaux-Jordan's bandage alluded to above is an excellent application in this condition.

I would here mention that the localised induration of the sterno-mastoid muscle seen in infants, occasionally syphilitic, but more usually the result of injury during delivery, may develop torticollis later on. In the early stages it generally disappears if gentle friction be employed, in the course of six to eight weeks. The treatment of chronic spasmodic wry-neck is still unsatisfactory, as its causation is obscure. Division of the sterno-mastoid and excision, or stretching, of the spinal accessory nerve have been found successful in a limited number of cases.

Time will not allow me to speak of the numerous interesting DEFORMITIES of the extremities due to epiphysial fractures and separations of the long bones, and to speak

of arrest of growth with deformity, the result of similar injuries. I hope I may have the pleasure of bringing these before you on some future occasion.

I will only add, by way of conclusion, that I have refrained from describing any of the numerous and complicated machines which are devised by modern instrument-makers, and have been truly likened to instruments of the torture-chamber rather than appliances for the alleviation of suffering. All the methods I have alluded to, with, perhaps, the exception of some operative measures in extreme cases, are such as any one can carry out in the daily performance of his practice with eminently satisfactory results, provided always that a regular study be made of each individual case. The simpler the form of appliance or splint the better, simple means often producing results far more gratifying than can be obtained by elaborate apparatus.

I have to thank you for the patience with which you have listened to me ; and, in closing, I would impress upon you that the more attention we pay to young patients with deformities such as I have mentioned, the earlier they are treated, and the more systematic the examination, the greater will be our success in alleviating and, perhaps, removing conditions which would prevent such patients from leading an active and useful life.

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