tendons of the peroneus longus and brevis are divided. The fasciculi of the external lateral ligament are cut, when the foot can easily be twisted inwards, the upper articular surface of the astragalus now looking outwards. The interosseous ligaments between the astragalus and os calcis are divided with the point of the knife, and the astragalus grasped with a lion forceps. It can now be wrenched from its place, any ligamentous fibres which attach it to neighbouring bones being cut. Little hæmorrhage takes place, and the foot can now be replaced and will be found readily to assume a position at right angles to the leg, with the sole in a normal state. In this position it is secured by a suitable splint, and the wound treated antiseptically. What happens to the divided peronei I am not curious to know, as the new ankle-joint performs all its usual movements. But if anyone should be anxious to secure the union, the divided ends should be brought end to end, the two cut extremities can be tied together with catgut sutures.

VI.—MR. NOBLE SMITH, F.R.C.S.ED.,
Surgeon, All Saints Children's Hospital.

Mr. Noble Smith considered that osteotomy was rarely if ever required in children under 10 or 12 years of age. That after seeing a large number of cases operated on by osteotomy he had no reason to alter this opinion. Plaster-of-Paris was of the greatest use in the early stages, and all operative treatment should be deferred until the resistance of a structure seemed to demand it. Until the foot can be placed in a perfect position the bandage should not be left on for longer than a week or ten days, when it should be reapplied, the foot being forcibly held in as good a position as possible. Complicated apparatus are never necessary, but careful adaptation of light and simple splints is effective.

VII.—MR. H. P. SYMONDS, F.R.C.S.ED.,
Surgeon, Radcliffe Infirmary, Oxford.

Mr. Symonds said he had practised the operation of dividing the tarsus with the chain saw for four years with very satisfactory results. It was applicable to cases of varus and valgus, whether simple, or combined with talipes equinus or calcaneus; in the latter, tenotomy must be used to complete the cure. He preferred this operation to any other, such as the removal of the cuboid, head of astragalus, scaphoid, etc., for the following reasons:—1. It was more simple and more easily executed. 2. There was practically no deformity left. 3. It was almost a subcutaneous operation. The situation of the section was at the greatest convexity of the tarsus. A small incision was made on the outer border of the foot below the convexity already mentioned, a knife to which a chain-saw was attached was passed through the sole, from without inwards on the right side, keeping as near to the bones as possible, appearing on the inner side at a point exactly opposite to where it entered; the knife, followed by the saw, was withdrawn, and reinserted at the inner opening, only this time it was carried above the tarsus beneath the tendons on the dorsum of the foot, passing out at the original opening on the outer side. The knife was detached, leaving the saw encircling the tarsus at its greatest convexity. Handles were attached to the end of the chain-saw, and with a few to-and-fro movements the section was completed. The operation was done under the carbolic spray with all antiseptic precautions, great care being taken to see that the chain-saw was thoroughly clean. The foot was dressed at the end of twenty-four hours, and again at the end of a week, when it was put up in plaster-of-Paris for a month or six weeks.

REWARD FOR BRAVERY.—Dr. Thelwall, of Farndon, was presented at Chester Police Court, on Saturday last, by the Chairman of the Bench, with the Royal Humane Society's medal, for conspicuous courage in saving life. On August 28th, a man named Youde flung himself into the Dee, when it was in flood. Dr. Thelwall was passing, and at once jumped into the river, and brought the man ashore in an unconscious condition. He then set to work to restore animation, and eventually succeeded.

AMBULANCE AND THE POLICE.—The inspector, one sergeant, and six constables, stationed at Fleetwood, have been examined in ambulance work by Dr. Trimble, of Preston, and received commendation.

THE Medical Entrance Exhibitions at University College have been awarded to F. W. Wesley (£100); C. G. Spencer (£60); and B. L. Abrahams (£40).

SCOLIOSIMETRY¹; OR AN ACCURATE AND PRACTICAL METHOD OF RECORDING CASES OF LATERAL CURVATURE OF THE SPINE.

Read in the Section of Surgery, at the Annual Meeting of the British Medical Association held in Glasgow, August, 1888.

By BERNARD ROTH, F.R.C.S., London.

I HAVE read many works on lateral curvature of the spine, but I do not remember ever having finished the perusal of any author with a clear and definite idea of the cases of scoliosis described. Every surgeon who has attempted to understand the proper treatment of lateral curvature, and has lost his way in the labyrinth of innumerable methods of treatment which he has entered, will support me in the statement that up to the present time no accurate and practical method of recording these cases has been presented to the profession. Before proceeding further, let us agree on some simple method of classification of the various stages of this most terrible, in its severe forms, of all deformities which come under the care of orthopædic surgeons.

Dr. Oscar Witzel, in Gerhardt's *Handbuch der Kinderkrankheiten*, 1887, very ably shows that every pathological form that is, osseous deformity of the spinal column—is preceded by a pathological posture, in just the same way that the normal osseous form of the spine in the adult is the result of the various postures of the individual during years of growth from infancy. I agree with those who maintain that in lateral curvature of the spine osseous deformity is always preceded by so-called "postural deformity." Some surgeons, however, deny that lateral curvature exists unless associated with osseous deformity of the vertebrae, and, like Mr. W. Adams, speak of "weak spines," which "frequently pass into and become cases of confirmed lateral curvature." However, when once osseous deformity has set in, to that extent, the case is now acknowledged to be incurable by leading surgeons; cases with osseous deformity only differ from one another according to the degree of this deformation.

The best classification is, therefore, to divide all cases of lateral curvature into two large groups, quite irrespective of their causation, namely: (1) those without any osseous deformity of the ribs or vertebrae, shortly "postural stage;" and (2) those with osseous deformity, "osseous stage," which may be conveniently subdivided into (a) slight, (b) moderate, and (c) severe or extreme, according to the degree of the osseous deformity present. After this explanation, we can appreciate the confusion that reigns everywhere in the literature connected with the treatment of scoliosis. In a lecture given by Professor Lewis A. Sayre, of New York, December 24th, 1879, he mentions the case of a young lady, aged 25, with "well-marked double lateral curvature of the spine," whose treatment by plaster-of-Paris jackets was commenced on April 16th, 1879, and ended on December 3rd of the same year, when "she is perfectly cured." In the same lecture Professor Sayre declares "that many cases become perfectly cured in a year, and are not compelled to use any jacket at all afterwards." I maintain that these were cases of lateral curvature of the first or "postural" stage, without any osseous deformity, although some surgeons would deny their having been cases of lateral curvature at all.

Mr. W. Adams, in his *Lectures on Curvature of the Spine*, 2nd edition, 1882, p. 265, says, "In all the slighter cases in youth, a judicious combination of mechanical support, according to the situation, form, and severity of the curvature is the only scientific treatment to be relied upon in practice for curing such forms of curvature as are capable of being cured." Again, at page

¹ The German writers use the term "Scoliosimetry," and the first notice of my paper was given in the JOURNAL under the title of "Scoliosimetry," so I applied to my friend, Mr. John Tweedy, who is an able medical etymologist, in addition to being one of our leading ophthalmic surgeons. He wrote: "Scoliosimetry would mean the art of measuring with a curved or crooked measure, whereas I understand you mean the art of measuring the curvature. This would be 'Scoliosimetry,' from *σκολιός* and *μετρον*. In compound words derived from nouns of the third declension, the rule is to drop the final *σ* and add *ο*, as in *φασκο-λόγος*, from *φασκ* and *λόγος*—*phylology*; and so *σκολιός* would drop the final *ς* and add *ο*, making the compound word given above.

268, he says, "If these cases be submitted to treatment before any very obvious external deformity has occurred, they are generally curable within one or two years." I am sure no surgeon could tell me, after studying Mr. W. Adams's book, to which stage of lateral curvature he refers, whether with or without osseous deformity, and what he means by the word "cure" when employed by him. I could go on for hours quoting from various writers, with the same confusing and confounding results.

Several attempts have been made to record and measure accurately cases of lateral curvature. Mr. Barwell and others have recorded the number of degrees of deviation of the distorted spine from a plumb-line dropped from the seventh cervical vertebra. Others, again, have taken accurate drawings and measurements of the patient's figure, not only posteriorly, but also laterally. Dr. Mikulicz employs a special apparatus, which is attached by a pelvic band to the patient, and requires, even in the hands of the inventor, from five to ten minutes to give a record of one position. A much more complicated measuring and drawing instrument (skoliosometer. Germ.) is that of Dr. Schulthess, which consists of an iron stage on which the patient stands, and in which he is fixed; innumerable screws and rods surround him, and, according to the author, from fifteen to twenty minutes are required to obtain a record; this is given by a pointer, which is made to follow the contour of the patient's back, and to the other end of which a pencil is attached, which reproduces the contour on a sheet of drawing-paper. A third method is to place a roughened sheet of glass in front of the patient's back, and to trace his outline in the same way as is done in the toy slates intended to teach children drawing.

Unfortunately for these methods, every case of lateral curvature, with the exception of those with extreme osseous deformity, causing complete ankylosis of the vertebrae, presents at least two erect postures, one when the patient is in his habitual position, and the other when placed in the best possible position by the surgeon. Now it appears to me absurd to take careful measurements of the degree of curvature of a patient at the first examination, whilst he is in a comfortable, that is, the habitual posture; and then a few weeks or months later to take measurements again, while the patient may be in the best possible posture temporarily assumed, as appears to be done by most authors. Undoubtedly a series of instantaneous photographs, taken according to my suggestion in the habitual and then in the best possible posture, are as good a record as can be obtained for cases of scoliosis of the first class (postural or non-osseous deformity cases), and for subdivision c, or severe cases of the second class (osseous deformity cases). But for cases in subdivisions a and b of the second class, where the osseous deformity is only slight or moderate, photography is less useful, as it gives no sufficiently accurate record of the amount of this bony deformity. Besides the taking of a series of photographs entails far too much time to be frequently employed in active professional practice.

Now the method I wish to bring before you to-day is so simple, and yet so efficient, that it applies equally to all cases of scoliosis. It scarcely requires a minute to obtain a record, and can be relied upon for reference for any number of years afterwards.

A very short description of the method was given in my article, *Lateral Curvature of the Spine*, in *Heath's Dictionary of Practical Surgery*, 1886, so short, indeed, that, having been several times requested to amplify it, I decided to prepare this paper for to-day.

The patient is placed in front of the surgeon, standing without shoes, with knees extended and feet together, all clothing having been removed to well below the iliac crests, so that the gluteal cleft is just visible. We will suppose that the legs are of equal lengths, or have been made so by a block placed under the shorter limb. Here I may say that surgeons who can draw ever so little will find a rough outline sketch of the patient's back and spine, while in the habitual position, useful before proceeding further; and that the curve of the spine is more readily recognised if marked with a soft copying-ink pencil (see Figs. 1 and 4). After inspecting the patient laterally and in front, the trunk should be flexed as far as possible, the knees being kept extended, and the arms allowed to hang down loosely, so that the scapular muscles are thoroughly relaxed. Now the level of the ribs posteriorly, uncovered by the scapulae, should be carefully examined for any inequality. In the most common form of scoliosis with dorsal (upper) convexity to the right, if there be any osseous deformity present, the right ribs will be more or less unduly prominent, sometimes so slight that a good light and a well-trained *tactus*

cruditus are necessary to make out a difference on the two sides. I now take a tracing of the ribs posteriorly as follows. I feel for the lower angle of the left scapula, and, fixing one end of a pliable metal tape with my left hand at that point, I carefully mould the tape close to the ribs across the spine, to the lower angle of the right scapula, which is likewise to be carefully felt for. With the copying pencil, I mark the metal opposite the dorsal spine, and then carefully remove the tape, upper edge downwards, on to a sheet of quarto-size paper, and draw a tracing inside the tape, marking on the paper the point where the tape crossed the spine. The pencil line is afterwards inked, and the tracing cut out and folded thus down the middle (see Figs. 2 and 5), opposite the point marking the spine, and we have now an accurate record of the ribs posteriorly (see Figs. 1 and 4).

Fig. 1.—Rough sketch of back of girl, aged 16, with severe scoliosis (habitual posture).

Similarly, a record is taken of the erector spinae muscles, usually midway on each side between the last ribs and the iliac crests—that is, opposite the third lumbar vertebra, marking the tape as before where it crosses the spine. (See Figs. 3 and 6.)

Fig. 3.—Tracing of loins midway from ribs to iliac crests in flexed position of trunk in same patient as Figs. 1 and 2 (half natural size).

A little more dexterity is required if the patient is stout or the erector spinae are bulky, as, if too much pressure is employed in moulding the tape to the contour of the loins, the muscles and soft tissues will cause the tape to spring up when the pressure is removed, and this will vitiate the record. This second outline is then transferred to the paper with the tracing of the ribs posteriorly.

In cases of extreme osseous deformity I have found it advisable to take the tracing of the ribs posteriorly at a higher level—that is, from the top of the left axilla to the corresponding place on the right, including thus a portion of each scapula, the patient having the trunk thoroughly flexed as before. In this case I also mark on the metal tape where it touches the inner border of each scapula, as in this tracing of a girl aged 17 years. (See Fig. 5.)

Unless this modification is adopted—that is, taking the tracing from between the axillæ instead of from between the lower angles of the scapulæ—tracings of the ribs posteriorly in extreme cases are unsatisfactory, too little of the ribs posteriorly being given when the tracing simply extends from the lower angle of one scapula to that of the other, from more or less increased immovability and displacement of the scapula, as can be seen in Fig. 3, where very little of the right ribs posteriorly would be shown if I had stopped the tracing on reaching the right scapula.

Although this method has taken rather long to describe, it

the mammæ are undeveloped, just below or above them, marking on the tape the position of the nipples and the mid-sternum. In taking this anterior tracing the patient should be placed in the best possible position, with the thorax well thrown forwards, and he should endeavour to press against the tape whilst it is being moulded to his outline.

I have employed this method of recording cases of lateral curvature for several years past, and have found it more useful with each year's further experience of it. By its means I have been able to show gradually increasing osseous deformity in cases of

Fig. 2.—Tracing of ribs posteriorly taken from lower angle of one scapula to that of the other, in flexed position of trunk, in the same patient as Fig. 1 (half natural size).

enables a surgeon to obtain a correct and reliable record of a case of scoliosis in less than a minute after a little practice.

The metal tape I employ is made of pure tin, and is 20 inches long, five-eighths of an inch wide, and about one-twenty-fifth of an inch thick (50 centimètres long, 1.5 centimètre wide, and 1 millimètre thick), and can be obtained from Messrs. Mayer and Meltzer, of London, in a small case to go in the waistcoat pocket.

Several writers on scoliosis have employed a metal tape, but

scoliosis due to infantile paralysis of the spinal muscles, than which there are no worse cases to treat, and also in bad cases of scoliosis after empyema. I have also demonstrated further increase of the osseous deformity where my advice has not been followed, and the patient has come back to me after an interval of months or years.

I am convinced that if this method of recording cases of lateral curvature were adopted generally, it would be the death-blow of

Fig. 5.—Tracing of ribs posteriorly, taken from one axilla to the other, in flexed position of trunk, in same patient as Fig. 4 (half natural size).

their records are of but little use because the tracings were taken when the patient was erect, when the real amount of osseous deformity is more or less masked by the scapula, as far as the ribs posteriorly are concerned, and by the contraction of the loin muscles with reference to the lumbar vertebræ.

When there is osseous deformity of the ribs anteriorly, especially in cases of pigeon breast, a tracing can be easily taken from one axilla to the other, either on a level with the nipples or, where

the treatment of such cases by steel, poroplastic, and other supports, except in a few rare cases with more or less complete paralysis of the spinal muscles. These tracings enable surgeons to recognise how the osseous deformity of the ribs and vertebræ gradually progress from bad to worse in spite of the most complicated and expensive spinal supports. Faith being lost in spinal supports of all kinds, it will be found that the only rational and really successful treatment of lateral curvature, and one which is

far more rapid than any other yet offered to the profession, is that which I have the honour to advocate, that is, re-education of the muscular sense of the best possible position, and methodical

Fig. 1.—Rough sketch of back of girl aged 17 years, with extreme scoliosis (habitual posture).

Fig. 6.—Tracing of loins midway from ribs to iliac crests in flexed position of trunk, in same patient as Figs. 1 and 5 (half natural size).

exercises of the muscles to enable the patient to maintain this improved position without effort; or, to put it more shortly, "treatment by posture and exercise."

A CASE OF GASTROSTOMY, WITH EXHIBITION OF THE PATIENT ELEVEN MONTHS AFTER THE OPERATION: SUBSEQUENT HISTORY, DEATH ON 403RD DAY.

Read in the Section of Surgery at the Annual Meeting of the British Medical Association held in Glasgow, August, 1888.

By JAMES MURPHY, M.A., M.D.,

Surgeon to the Sunderland Infirmary; President of the Northumberland and Durham Medical Society.

THE patient that I have the pleasure of bringing before the Section, is a man, J. L., aged 47, on whom I performed gastrostomy on September 9th, 1887, and nothing whatever has passed through his œsophagus since three days before then, that is since September 6th, although he has gained considerably over twenty pounds in weight. His history is as follows. He is a rivetter by trade. His father died, aged 42, of some brain disease, from which he suffered for only a few days. His mother died, aged 37, of phthisis. There are 6 brothers living, and 2 sisters; one sister died, aged 25, of phthisis. The patient has always enjoyed excellent health, never had any form of venereal disease, lived a sober life, and has been nearly always in constant work, till January 1887, when he was off work for five weeks, from a blow of a hammer, that fell on his right side while at work.

In April, 1887, when in what he considered excellent health, he found one day, at dinner, that a piece of meat stopped in his œsophagus, and that he was unable to swallow it, and in a few seconds he vomited; he found that he could finish his dinner only

by chopping up his food very fine, and from this date till August, when I first saw him, his difficulty in swallowing had gradually increased, so that eventually he could only swallow liquids, and even those in very small quantities and very slowly. In August he consulted my friend Dr. Coatsworth Watson, who, recognising it as a stricture of the œsophagus, kindly sent him to the Sunderland Infirmary, under my care, with a view to having gastrostomy performed.

On admission he presented the appearance of a man in a state of great exhaustion and very much emaciated, with a well-marked malignant cachexia; he could with difficulty swallow a few drops of milk, and if he took as much as a teaspoonful at a time, he almost immediately vomited it. A full-sized bougie passed with ease as far as the lower third of the œsophagus, where its course was abruptly stopped; beyond this it was impossible to pass the smallest size. In the attempt to do so a little blood was found on the end of the tube. He has never vomited blood, nor felt any pain where the obstruction occurs, which he can point to, and on carefully listening with a stethoscope, the fluids seem to stop at the point indicated. He has a double inguinal hernia; there are no scars in his groins. From the absence of all causes which might give rise to traumatic stricture, the denial of syphilis, the history of his symptoms, and, above all, the cachectic appearance, I regarded it as a case of malignant stricture of the œsophagus, and proposed gastrostomy to him; this he refused, and left the infirmary, but returned on September 8th, not having been able to swallow a single drop since September 6th. On the next day I performed gastrostomy, adopting practically the method of Howse.

Taking as a guide the triangle of Tillaux¹—which has for sides the left costal cartilages; and the liver, and for base a line drawn transversely from the tip of the tenth rib, recognisable by the break in continuity and the fremitus that can be obtained owing to its ligamentous attachment to the ninth rib—I made a vertical incision down to the sheath of the rectus, about two inches long, having for its centre the centre of this triangle. I then incised the sheath of the rectus, and, dividing its fibres with the handle of a scalpel, opened the peritoneum, the hæmorrhage, which had been very trifling, having been arrested. On passing in two fingers, I at once seized the transverse colon, which was easily recognisable by its thin feel; this I gently pulled downwards, and, passing my fingers underneath the left lobe of the liver, swept it well over the vertebræ and readily found the stomach, which I easily brought through the wound, and passed a strong and moderately thick silk ligature for about half an inch through its serous and muscular coats, to hold it by while passing the sutures. By gently pulling the stomach as far as possible in the opposite direction to that in which I was passing a suture, I passed eight silk sutures in a circle through the serous and muscular coats of the stomach, and then through the whole thickness of the abdominal walls about an inch from the incision. The method I found most convenient for passing the sutures was using a silk suture eighteen inches long, with a rather thin, slightly curved needle about two inches long on each end. The suture was then passed through the coats of the stomach, and each needle was passed from within through the whole thickness of the abdominal wall. The sutures, on being passed, were secured with Kœberlé's forceps, and finally, when all the eight were passed, each was drawn tight and knotted, no bougie or other substance intervening. After this six others were passed, first through the coats of the stomach, and then through the peritoneum and skin, and then secured. The suture which was used to manipulate the stomach was knotted at the distance of a couple of inches and left on. The patient was supported by enemata for five days, when a narrow tenotome was passed through all the coats of the stomach, the patient not feeling the puncture, and through the small opening thus made a No. 7 gum-elastic catheter was passed, and on this the funnel of a binaural stethoscope was attached, and a couple of ounces of warm milk allowed to flow gently into the stomach, and next day all the sutures were removed, the wound having healed. He was fed in this manner with a small quantity of either milk or beef-tea every few hours, and in a few days a flexible india-rubber tube was introduced; and he wears this constantly, and changes it himself every six or seven weeks. There never was any rise of temperature; indeed, for the first few weeks he had a subnormal temperature. He soon began to

¹ *Vide Traité d'Anatomie Topographique avec Applications à la Chirurgie.* Pat. P. Tillaux. Page 719. Quatrième édition. Paris: Asselin et Houzeau. 1884.