albumen is often less than one-fifth the volume] of urine examined, and the characteristic large hyaline and granular casts may be absent for days, and even for many weeks, consecutively. Cases III and IV, before recorded, afford illustration of this statement.

The main purpose of this communication has been, not to refute the ludicrous suggestion that I had failed to recognise a class of cases which for many years past I have been diligently observing and recording, but rather to reiterate and emphasise certain facts and principles regarding the clinical history of albuminuria which even now are less generally recognised and acted upon than their great practical importance demands.

ANTERO-POSTERIOR COMPRESSION FORCEPS FOR APPLICATION AT THE BRIM OF FLAT PELVES.¹

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THESE forceps are not presented as an improvement on the classical long pelvic curved forceps. With many modifications to suit many tastes, these latter serve their purpose admirably; and, until recently, when these instruments failed in simple cases of obstruction at the brim, whether in flat or in generally contracted pelves, I believed that the only alternative to them was craniotomy; turning being reserved for special cases, the nature of which I have referred to in a paper published in the *Edinburgh Medical Journal*, for January, 1886.

I shall not here enter into the question of turning or craniotomy, as an alternative to forceps at the brim, in cases of flat pelves. This subject I have discussed pretty fully in the paper referred to; and I am justified in believing that the views I have there expressed are now generally accepted by the profession; since, in two and a half years, no attempt, so far as I know, has been made to controvert them.

What I am now submitting to your criticism is a new instrument designed to take the place of craniotomy, where the other forceps have failed, in a large number of cases of obstruction at the brim. It is known that in flat pelves the head of the child, which as a rule lies in the transverse diameter of the pelvis, or nearly so, and in an extended position, may, according to the relation of the pelvis to that individual head, pass in various ways; each having its own mechanism. These are amply detailed in textbooks, and need not detain us; I shall only add that, in my experience the same head may pass through the same brim with varying mechanism, according to the position the head is placed in, or is allowed to take naturally above the brim. The most satisfactory mechanism, and the one most favourable for the ordinary forceps, is that of simple flexion of the head in the transverse diameter of the pelvis, rotation following immediately after, as the head is then in the cavity of the pelvis.

The position of the head, which renders the ordinary forceps a peculiarly unsuitable instrument, is where it lies well above the brim, and with the anterior parietal bone overhanging the pubes. Here the well-known tendency of the ordinary forceps to cause flexion and rotation of the head comes into play too soon; that is, before the head has even become engaged in the brim. Under such circumstances the difficulty is really increased by the forceps, and the more the traction the more the difficulty. Delivery is, in these cases, utterly impossible with such instruments; and version, as I have elsewhere shown, is unsuitable. To meet these difficulties, and thus in some cases be able to avoid the horrible operation of craniotomy, in which not only is the woman exposed to increased danger, but an innocent babe is deliberately killed—this is the object of these new forceps; and, since they are never to be used until craniotomy is the only resource left, it follows

that every child born alive with these instruments is one life saved, without any increased danger to the other.

These instruments are first compressors and then tractors. Now it is obvious that theoretically an instrument which is able to compress the head in the proper direction is preferable to one which only or mainly acts by traction in the cases we are considering, for naturally the head must undergo compression; but, without compressing instruments, that must be done at the expense of the maternal soft parts.

The first difficulty, however, is how to manage this without taking up so much room in the already diminished diameter of the pelvis as will more than make up for any reduction made in the bulk of the head, and the measure in which I have succeeded in doing this must be the measure of the success of the instrument. This difficulty is so real a one, especially considering the strength of blades required, that probably it has deterred others from trying it; for any instruments apparently designed to lie in the antero-posterior diameter above the brim (like my friend, Dr. Reid's) are really meant to lie in the oblique or transverse, like the ordinary forceps. These have blades of the usual length, so as to be able to grasp the head in the occipito-malar direction; whereas antero-posterior compression forceps must have short blades so as to grasp the head vertically.

The first method which suggested itself was to make the blades very narrow, and apply them in the lateral conjugate of that side of the pelvis in which the bi-parietal diameter lay. This, however, I soon found was impracticable, as there was no room in the side of the cavity for the instrument to work. I next tried the blades so wide that the rims lay in each of the lateral conjugates. This kept the instrument in the middle of the cavity; and, by permitting the promontory to completely pass through the fenestrum of the posterior blade, removed entirely the difficulty of finding room for it. The great width of the anterior blade served to protect the bladder from pressure; but I found that fully an eighth of an inch of the anterior pole of the diminished diameter was lost by this width of blade, the head during extraction having this space between it and the pubes. By altering the transverse curve, however, of this blade, so as to make it coincide with the anterior curve of the pelvic brim, even this loss of space was rendered unnecessary; little more than the thickness of the rims requiring to come off, and this not actually in the diminished diameter. The transverse curve of the posterior blade I have made a segment of a large circle with its convexity forwards, so as to permit the head during compression to pass backwards into the space on either side of the promontory. Another difficulty which early presented itself was that the frontal portion of the head being much narrower than the bi-parietal portion, the blades must be able to lie flat over this wedge-shaped surface. This, however, was easily managed by making the lock unusually loose, permitting so much rotation of the handles on their long axes as to make the distance between the blades at the two sides differ by fully two-eighths of an inch.

Before venturing to introduce these new instruments into the pelvis of a living woman I used them and compared their action with the ordinary forceps perhaps more than a hundred times with dried pelves and foetal heads either fresh or preserved in spirits and water. When I speak of the ordinary forceps in these experiments I refer to those with which I am most familiar, and therefore have most confidence in, namely, the late Sir James Y. Simpson's. In these trials I found in some cases both instruments equally successful, whilst in some instances the Simpson's forceps had the advantage, and in some others the new instruments succeeded where the ordinary forceps failed. The result in these cases depended somewhat on how the head happened to be placed above the brim. It may be worth while detailing a few of these experiments, noting that, in many of them, these new instruments were at the time in an incomplete form, and had some disadvantages which they are now free from.

1. Placing a premature foetal head above the brim of a flat pelvis with a conjugate diameter of two inches and a half, the new forceps with moderate traction drew the head through the pelvis without any appreciable indentation of the head by the promontory. Whilst the outer edges of the anterior blade were pressing on the brim of the pelvis, the inner edges of the same blade were about an eighth of an inch from the anterior surface of the pelvis, thus preventing the head from quite reaching the pubes by about this distance.

Applying Simpson's forceps to the same head at the brim of the same pelvis, it was found that they could only lie in the trans-

¹ Read in the Section of Obstetric Medicine, at the Annual Meeting of the British Medical Association, held in Glasgow, August, 1888.

verse diameter, an attempt to force them even slightly into the left oblique diameter being prevented by the pressure of the posterior part of the left blade against the ala of the sacrum, and of the anterior edge of the right blade against the right pubic bone about an inch from the symphysis.

On grasping the head by the forceps when placed in the transverse diameter, the head was found to descend posteriorly, being deeply marked by the promontory, whilst the anterior part of the head bulged over the pelvic brim, and no amount of traction could bring it through. Any attempt to direct the head backwards into the hollow of the sacrum by the forceps was ineffectual on account of the forceps blades only rotating backwards on their tips as a centre of rotation, the blades having no grip of the head.

The new forceps had grasped the head in the most favourable position; the tip of each blade lay below each ear, the occipital rims of the blades lay over the parietal eminences, and the frontal rims lay anterior to the coronal suture; the forceps had thus complete control of the movements of the head. When Simpson's forceps were applied, the face was in the right blade, the tip of which reached beyond the chin; the left blade enclosed the occiput and its tip pressed deeply into the neck. The pendulum movement was found to be a great assistance to the passage of the head with the new forceps. Although the posterior parietal bone was flattened with the forceps, there was in no sense an indentation of that bone. After many trials, resulting in complete compression and softening, the head was found to pass more easily by pushing from above or by Simpson's forceps, when the head was placed exactly in the brim, than with the new forceps.

2. With a soft premature head placed in an extended position over the brim of a simple flat pelvis having a conjugate of two inches and a quarter, Simpson's forceps caused an increased projection of the posterior part of the anterior parietal bone over the horizontal ramus of the pubes, on account of slight rotation of the head following traction, and there was no descent of the head. The compression forceps flattened and brought the head through easily, with marked flattening of the posterior side of the head, but with no indentation of the bone.

3. Generally-contracted, artificially-flattened pelvis, with mature but compressible head, antero-posterior diameter of pelvis being three inches and one-eighth; head passed (1) with very slight hand-pressure; (2) easily with Simpson's forceps; (3) less easily with the compression forceps, the blades of which seemed to occupy too much room.

4. Simple flat pelvis, antero-posterior diameter $2\frac{1}{2}$ inches, the soft mature head lying decidedly above the brim. Simpson's forceps, when head extended, caused bulging of the anterior parietal bone over the ramus of the pubes, which bulging increased as traction was increased, and as slight rotation occurred. Not only was no attempt made by the head to enter the brim, but increased traction seemed to cause increased bulging, and no descent took place. The compression forceps, under the same conditions, at once flattened and drew down the head till the base of the skull had reached the level of the plane of the brim. No further progress was, however, made till the anterior blade had been removed, when slight traction forwards and downwards with the posterior blade completed delivery. Head reintroduced after having been thus flattened and Simpson's forceps applied, the more traction the more bulging, and no attempt at descent occurred.

Without occupying time with more details of similar trials, I may mention that, as a rule, the more the head lay above the brim, the more were the compressing instruments successful, whilst the more the head was through the brim at the beginning of the experiment, the less successful were the new instruments. Sometimes the compressing forceps would draw the head through the brim, but so completely was it then locked, that no pendulum movement was possible. If, however, the anterior blade were then withdrawn, the head could be pushed through from above with very slight pressure. In these circumstances it was usually necessary to leave the posterior blade attached, since its withdrawal was found to be impossible without endangering the soft parts over the promontory and also the ear of the child. Should such a difficulty occur in actual practice, I should first endeavour by abdominal pressure to complete delivery; failing this, an attempt might be made to pass the ordinary forceps with the handle of the impacted blade held well back against the coccyx. If delivery were still impossible, craniotomy would be required.

I have spent so long a time endeavouring to perfect the instruments before risking their application to actual cases of obstructed labour, that I have only had four opportunities of doing so. The first occurred in the hospital. It was a case of generally-contracted pelvis, the true conjugate being about 3 inches, and the head lay in the transverse diameter. Barnes's forceps were applied, but they failed to deliver. Before resorting to craniotomy I applied my own instruments. The application was easy, but not succeeding to extract with slight traction, I desisted, and craniotomy had to be performed. The child weighed $8\frac{1}{2}$ lbs. The woman ultimately made a good recovery, although there was dribbling of urine for two or three weeks after confinement.

The second case was also a hospital one. The woman had had two previous children, both delivered by myself. Her first labour was terminated by the forceps, and the child was stillborn. At the second pregnancy labour was induced about the end of the eighth month, when I delivered her of a living child by Barnes's forceps. At this second confinement it was discovered that the flattening of the pelvis was apparently increasing, the inter-crural measurement having been this time nine inches and a half instead of ten; whilst the interspinous was on each occasion ten inches. At the third labour, which was also induced, the head was found to lie in the third position, and flexed. Barnes's forceps, which ought to have delivered such a case easily if the disproportion were not too great, failed to effect delivery after fourteen minutes' traction, and, as the instruments slipped twice during this time, it was decided to try the axis-traction forceps of Professor A. R. Simpson. It was found by two of us, however, utterly impossible to introduce the upper blade, apparently on account of the strength and abrupt pelvic curve of the blade. My compression forceps were next tried. At the end of eleven minutes the head was lower, but, as it had not cleared the brim, it was decided at once to perforate. So great was the obstruction, however, that the head had to be twice perforated, and it took thirty-seven minutes to complete the extraction. The woman was dismissed well on the thirteenth day.

The third case occurred in the outdoor department of the hospital, and was under the care of Dr. John Ritchie, one of the hospital staff. The pelvis was a flat one, and the woman had had six previous confinements—four girls delivered alive by forceps, one girl stillborn without instruments, one boy delivered by craniotomy. At this, the seventh labour, Dr. Ritchie tried Simpson's forceps for one hour, and then sent for me. As the instruments had slipped under his use, and had already been tried for one hour, I did not reapply them, but at once inserted my own. In fifteen minutes the head was at the outlet, and the labour was completed by the straight forceps. The child, a boy, made only one or two efforts at respiration, though the heart beat for fifteen minutes. The head was not indented, and the woman made a good recovery.

The fourth case occurred in the practice of my neighbour, Dr. James Dunlop. This was the fifth confinement. Of the other four children, one was born dead with, and another was born dead without, instruments. At the fourth labour craniotomy was performed by myself, after repeated efforts to deliver by the forceps. On this, the fifth occasion, I found the pelvis to be a flat one, with a true conjugate of about $3\frac{1}{2}$ inches. The head lay above the brim in the first position, but extended, and with some dipping of the frontal portion. I applied Simpson's forceps, whilst Dr. Dunlop kept up firm abdominal pressure; the patient being in the dorsal position. Though the lock remained loose and the handles were kept well back, the blades repeatedly slipped, and as the head had made no advance at the end of half-an-hour, I felt it was quite useless to try them longer. As the child was still alive I introduced my compression forceps. In one minute the head passed into the pelvic cavity with a jerk. Soon it was at the vulva; when I removed the blades and pushed the head out by pressure on the distended perineum, the whole operation occupying only three minutes. The child, a large boy, cried at once vigorously: the head, which was unusually firm, had only slight surface markings, and mother and child did well.

I have had no occasion to use the instruments since, but these I now submit to you, I consider, a further improvement on those the history of which I have given you. You will observe that the instruments are simple in construction, and although strong and moderately long, their weight is only 22 ounces. Axis-traction is effected by means of a towel passed through a ring in the shank near the lock, as in the Barnes's forceps, whilst the handles are used wholly for compression and for antero-posterior

pendulum movement. Their introduction is extremely easy. The anterior blade is slipped over the occiput, and then passed along the side of the head till it lies exactly behind the pubes. The posterior blade is then introduced along the right side of the anterior one, first into the hollow of the sacrum and then upwards till the promontory is felt to lie in the fenestra.

The forceps were made by Messrs. W. B. Hilliard and Sons, Glasgow, and the dimensions of the instrument are as follows:—Total length, 15 inches; handles, $5\frac{3}{4}$ inches; fenestra, 4 inches; breadth of blade, $2\frac{1}{4}$ inches; breadth of rim, $\frac{3}{8}$ inch; thickness of rim, $\frac{1}{8}$ inch. The head curve of the blade is a segment of a circle whose diameter is 9 inches. The transverse curve of the anterior blade is a segment of a 5-inch circle, with the convexity looking forwards; that of the posterior being a segment of a 20-inch circle, with the convexity also forwards. When the handles are closed, the blades are at the widest part $1\frac{1}{2}$ inch apart; the tips being then only $\frac{1}{8}$ inch separate. The edges of the rims are well rounded; the shanks are very strong and the lock is very loose; whilst the pelvic angle measures 30 degrees.

Fig. 1 (from a photograph).

Fig. 1.—View of a mature foetal head lying above the brim of a flat pelvis, with a conjugate diameter measuring two inches and a half. The anterior parietal bone considerably overhangs the pubic bone, and the head is in its usual position under these circumstances—extended, and with its long diameter in the transverse diameter of the pelvis. The long forceps are applied in a diameter midway between the transverse and the left oblique of the pelvis, since there is no room for them in the left oblique diameter. They have, it will be seen, no control of the head, traction causing only a rotation of the head above the brim, which increases the projection of the anterior parietal bone, and the forceps finally slipping off the head in a backward direction. Craniotomy would be required in such a case, unless antero-posterior compression forceps were at hand.

Dr. J. H. AVELING thought there would be no objection to making Dr. Sloan's forceps sigmoid in form. He was the first to suggest this shape of forceps, ten years before the publication of Tarnier's instrument.—Professor STEPHENSON (Aberdeen) condemned the principle of compression aimed at by such forceps. Compression increased largely the danger to the child, and did not aid the

extractive power. It did not diminish the diameter in the narrow strait, and all these powerfully compressing forceps did was to give a very firm hold, a point to be gained by safer means. Experience taught him that many of the stillbirths with forceps were due to compression.—Dr. W. L. REID showed a pair of antero-posterior forceps which were also axis-traction ones. These had been used constantly for seven or eight years, and had given the author more satisfactory results than those obtained by the older instruments. They were applied obliquely from the antero-posterior diameter, just as the ordinary forceps were applied in the oblique from the theoretically transverse diameter. After the head had come sufficiently low down to permit of rotation, the instrument was practically a straight forceps. Dr. Reid believed that force being applied by the blades in the oblique diameter left as much room as possible for the head in the abnormally short one.—Dr. HARVEY (Calcutta) thought that there was an undue dread of the compressive power of the forceps among English obstetricians. French, German, Italian, and many American forceps had much compressive power, and the obstetricians of

Fig. 2 (from a photograph).

Fig. 2.—The same head and pelvis in the grasp of, and after slight traction by, the new instruments. The perfect control of the head by these forceps is shown, and the value of the pendulum movement with such instruments is made apparent.

these countries were not afraid of using compression. He believed that if the compression was gradual and not violent it did little harm; and even if it did, the alternative in most instances was craniotomy, and children were not saved by craniotomy; so that, if by compression we could get in some cases a diminution of one-eighth or a quarter of an inch, we should be enabled to save a certain number of children who would otherwise have to be subjected to craniotomy.—Dr. HEYWOOD SMITH, commenting on the question of compression, said that it seemed that it was merely, as far as the safety of the child was concerned, a question of compression *versus* compression, that is, Was it not better and less fatal to the child to subject it to a shorter, if severer, compression for a short time rather than, by omitting to use the forceps, to subject it to a perhaps less compression for a much

longer time with a probably fatal result?—Dr. M. CAMERON said he had in a large number of cases been called upon to assist in cases where forceps had been tried and failed, whilst in many cases great complaint was made of the forceps slipping. Invariably he found that in these cases the difficulty was due to the position of the head, namely, occipito-posterior, and, if the position of the head were corrected, delivery was easily effected.—Dr. DUKE said he quite agreed with Dr. Stephenson's remarks as to the danger of compression forceps, and sought to obtain the same result by additional traction with a well-made, firm-holding obstetric forceps; but, as he hoped to read a paper on this subject shortly, he refrained from making further remarks at present.—Dr. MORE MADDEN said the question raised by Dr. Sloan's valuable paper was one which had by no means hitherto received as much

the child. Now he explained that, when he advocated craniotomy instead of version in the interest of the mother, he had been accused of having too little regard for the child. His object now was to have a living mother *plus* a living child, and his cases showed that in no instance in which he attempted this had the mother suffered, whilst where his forceps failed the sequel showed that craniotomy alone could in these cases bring about delivery. The real question was whether we should compress in the diminished diameter or in the transverse. Professor Stephenson said we should think only of getting a good grip of the head; but where he advocated his new forceps, Dr. Sloan explained, was exactly in the cases in which no oblique or transverse forceps could by any possibility get a good hold and they must slip. The only good grip possible was by such instruments as he showed.

Fig. 3 (from a photograph).

Fig. 3.—The same as Fig. 2, but viewed from above; also made slightly larger for clearer definition. The promontory, the right edge of which is seen, is within the fenestrum of the posterior blade, whilst the bladder would be in the fenestrum of the anterior blade. The transverse curve of the latter blade will be noticed as coinciding exactly with the anterior edge of the pelvic brim, and the head is occupying the whole of the antero-posterior space at the brim. The whole head is represented as carried towards the observer's left. This is sometimes done by these forceps, but not as a rule to the extent indicated in the figure. To the left of the figure the head seems to overhang considerably the pelvic brim anteriorly; but a reference to Fig. 2 will show that this is the chin of the child, and that the brow is already engaged in the brim. The apparent overhanging anteriorly is increased in this view by the fact that the anterior portion of the head is lower than the posterior. The sagittal suture would be found in consequence nearer to the promontory than to the pubes, as often happens in flat pelvis. Therefore, whilst the anterior blade reaches nearly to the neck, the posterior blade reaches only to the left ear. An inspection of the position of the tip of the posterior blade relatively to the promontory, and of the tip of the anterior blade relatively to the position of the bladder, will show how these structures cannot be injured by contact with the instrument during extraction.

consideration as its importance demanded. The compressing powers of the forceps were not generally sufficiently appreciated. He was convinced that by the proper employment of a well-designed compressing forceps (and it practically mattered not whether the instrument used was that shown by Dr. Sloan or his own), it would be possible, in nine cases out of ten, to effect delivery of living children, and this in cases in which this would not otherwise be possible.—Dr. SLOAN expressed his regret that the question of axis-traction had been introduced, as it had nothing to do with the subject. These instruments could be made with axis-tractors, but he preferred them as they were. As to the danger of compression, he reminded the gentlemen who had objected to it that there was only one way of getting over it, and that was craniotomy. The real question was, Is this compression to be done by the forceps or by the mother? Professor Dill said that he (Dr. Sloan) ran the risk of forgetting the mother in his care for

Fig. 4.

Fig. 4.—The antero-posterior compression forceps, about one-fourth size, showing pelvic angle and short blade. The front view can be seen in Fig. 2.

He pointed out an interesting matter in the history of his cases. The first was a complete failure, and was bound to be so. The second was an improvement on this; some descent occurred. In the third the child was actually delivered, though it did not survive. In the fourth case the child actually did cry lustily, notwithstanding the doubt expressed by Dr. Cameron; and he reminded him that, though the forceps slipped in this case, it was an occipito-anterior case, as he would see from the paper. Dr. Sloan quite understood how gentlemen could not grasp the real state of the case from a rapid reading of his paper, but he trusted that when they had it before them they would carefully examine every sentence, and, if his arguments impressed them as reasonable, they would give his instruments a fair trial.

NOTE BY DR. SLOAN.—A fifth case occurred on the morning of December 15th, 1888, and, although the child was dead before these instruments were applied, the ease with which delivery was effected throws some light on the value of the new forceps, even in the interest of the mother.

Dr. Arthur Mehan asked me to see with him Mrs. A., of Partick. She had been in labour for eighteen hours, and he had given Simpson's long forceps a thorough trial of half an hour's duration, during which time, though the handles were kept well

back, they had slipped four times, the head passing backwards above the promontory during traction. This was Mrs. A.'s fourth confinement. The previous children—two girls and a boy—had been born alive, delivery in each case having been effected by the forceps. The traction had varied from twenty to thirty minutes, and the head of the third child had been considerably bruised and cut.

On examination I found the vagina filled with blood-clot, the os almost fully dilated, and the head presenting above the brim. The posterior fontanelle lay on the right side, and somewhat to the front of the middle line, the position of the anterior fontanelle being just above and posterior to the left side of the promontory. I have said the position of the anterior fontanelle, for there was really no fontanelle, the four sutures actually meeting in a point. The cranial bones were, however, freely movable at their junctions, and could evidently be made to overlap during compression of the head. The diagonal conjugate measured three inches and a half, the interspinous measurement was ten inches, whilst the distance between the iliac crests was ten inches and a quarter. This was, therefore, a case of slightly undersized as well as flat pelvis, with a true conjugate of scarcely two inches and three-quarters, the head lying extended, and with its long diameter in the left oblique diameter of the pelvis, as far as this was possible in such a pelvis. Careful and repeated examinations were made over the whole of the abdomen by Dr. Mehan and myself, but no fetal heart-sounds could be heard. Now, Simpson's forceps had been proved to be unsuitable for the case. Turning, owing to the length of the labour and the almost certain death of the child, few would have considered justifiable, whilst craniotomy was not warrantable if my antero-posterior compression forceps could deliver in a short time and with moderate traction. These instruments were therefore applied, the head having first been carefully placed with its long diameter in the transverse diameter of the pelvis. The introduction was easy, though locking was not so easy as I have always found it to be, apparently on account of some obstruction at the extremity of the anterior blade.

Traction was made by means of a towel passed through the ring and held by the left hand; the right hand, which grasped the handles, being reserved for compression and pendulum movement. After less than one minute of very moderate traction the head passed into the cavity with a thud; and in less than one minute more the head was born, perineal pressure being applied to complete its expulsion. Although some little difficulty, there was no unusual delay with the shoulders. The cord was pulseless, but as a matter of form artificial respiration was tried for a minute or two. The child was a female, mature and large. On examining the head it was found that not only was there no depression caused by the promontory, but, with the exception of some elongation of the head, there was nothing in its shape to indicate that it had been exposed to unusual pressure. There was an indentation about an inch below the occipital protuberance, right in the middle line; and an outline of the extremity of the blade of the forceps was well seen on the middle of the brow, about an inch above the root of the nose. These markings showed that Simpson's forceps had grasped the head exactly in its long diameter. There were no marks on the ears nor on the sides of the neck. The site of the anterior fontanelle was again examined, and found to be exactly as described. The following are the measurements of the head, taken immediately after birth: bi-parietal diameter, $3\frac{1}{2}$ inches; coronal, $3\frac{1}{4}$; bi-mastoid, 3; antero-posterior, $4\frac{1}{2}$. The patient made a good recovery.

PHARMACEUTICAL EXPLOSIONS.—According to the *Farmaceutitschesky Jürnal*, December 4th, 1888, p. 783, a sad accident recently occurred in the shop of a St. Petersburg chemist. A powdered mixture, consisting of an ounce of chlorate of potassium and one drachm of tannic acid, was ordered by a doctor who probably had forgotten his chemistry. The chemist, who also ought to have known better, set to work to dispense the prescription, and was punished for his ignorance by a violent explosion of the incompatible substances. His hands were severely burned, and his beard and eyebrows were singed off. He was only able to resume his occupation several weeks afterwards. A similar accident occurred about two months before at Warsaw, where a chemist tried to prepare a mixture consisting of chlorate of potassium, tannic acid, and oil of peppermint (*loc. cit.*, October 23rd, p. 688).

THE CLINICAL CHARACTERISTICS OF TUMOURS

AND

THE SHOCK CAUSED BY SURGICAL OPERATIONS.

*Being a Portion of the Presidential Address delivered at the
Annual Meeting of the Clinical Society of London on
January 25th, 1889.*

BY CHRISTOPHER HEATH, F.R.C.S.,
President of the Society.

AFTER some preliminary remarks on the past good work of the Society, and some suggestions as to its future labours, Mr. Heath proceeded thus:—

Mention of the Pathological Society (of which I suppose we are most of us members) reminds me of the saying of an old friend who visited that Society one evening after an absence of many years, and reported in these words: "I found them showing the old specimens under new names, and talking a language which I did not understand, but they were more positive about the correctness of their views than ever." Now it is this positiveness of the pathologist that I, as a clinician, venture to enter a protest against, and I think one of the most useful functions of the Clinical Society may be to check the results arrived at in this room by the members of the sister Society. Because a tumour shows microscopically an appearance which brings it into the class of sarcoma, I should be very loth to classify the case as one of "malignant" disease, without knowing fully the history of the patient both before and after the operation. Let me quote an example or two from my own practice. In 1883 I removed the upper extremity, with the scapula and part of the clavicle, from a lad, aged 16. The growth was a spindle-celled sarcoma, undergoing ossification, and upon that evidence alone, when I brought the case before the Royal Medical and Chirurgical Society, I was taken warmly to task by two ardent pathologists for expressing a hope that I had permanently relieved my patient, and was told that the disease would certainly recur and destroy him. It did recur, for seven months and a half later I removed a small nodule from the cicatrix; two years and a half after the amputation I cut a small mass out of the pectoral muscle; and again last November, more than five years after the amputation, he returned with two nodules near the cicatrix, which I removed, leaving him in apparently perfect health. In October, 1883, I removed a sarcoma from the muscles on the inner side of the thigh of a girl, aged 14. Recurrence took place, and five months and a half later I repeated the operation, but was unable to get away all the disease, and was only prevented from amputating at the hip-joint by the fact that even then some of the growth would have been left in the pelvis. Yet the patient is still alive and thriving, though there is a tumour in the thigh which shows little tendency to increase. In 1882 I removed a myxo-sarcoma of the upper jaw from a man of 53. In five months he reappeared with recurrence of the disease, which was again freely removed, a third time after another five months, and a fourth time after a like interval; so that four serious operations were performed in about twenty months, and yet he is now, nearly five years after the last operation, in perfect health and without a vestige of disease. And yet in a well-known work on *Malignant Disease* I am taken to task by name because in my book on *Diseases of the Jaws* I have separated the sarcomata other than the round-celled from the malignant tumours of the jaws, which include, of course, all varieties of carcinoma. The fact is that the class sarcomata includes growths of very varying degrees of malignancy, ranging from melanotic sarcoma at one extreme to myeloid sarcoma at the other, as, indeed, all pathologists allow; but what I maintain is that many cases of spindle-celled sarcoma are infinitely less malignant in their clinical history than the histological appearances would lead one to expect.

I venture also to enter a protest against the idea that the malignancy, or otherwise, of a tumour, so far at least as concerns the necessity for its prompt removal in any given case, can only be settled by microscopic examination. If the surgeon, with the patient before him, and with a full history of the growth of the