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PART I.
ORIGINAL COMMUNICATIONS.

ART. XII.—*Contributions to Midwifery, No. IV. Cases illustrative of the Use of the Forceps.* By THOMAS EDWARD BEATTY, M. D., Professor of Midwifery to the Royal College of Surgeons in Ireland ; Consulting Accoucheur to the City of Dublin and Victoria Lying-in Hospitals, &c. &c.

I HAVE adopted the title prefixed to this paper, because it is intended to contain a detail of some cases of difficult labour, in which the *use* of the forceps is, in my mind, clearly shown. By the term *use*, I mean its beneficial employment where great danger threatened both mother and child ; and I wish it to stand in strong contrast with *abuse*, to which this instrument, in common with every other valuable agent employed in medicine, is exposed.

In all branches of the healing art, mechanical assistance is employed only in cases where it is deemed necessary for the relief of our patient. What well educated surgeon would employ pulleys to reduce a dislocation, if he could replace the bone with his hands ? Who would pass a catheter into the bladder,

if he could as speedily and safely relieve retention of urine without it? Who would have recourse to the scalpel in strangulated hernia, if by the taxis, &c., he could rescue his patient from danger? The surgeon does not employ pulleys, catheter, and knife, because he *can* use them, but because he knows they are necessary for the well-being of the sufferer under his care. A similar rule is applicable to all instrumental interference in the practice of midwifery, it should always be the *dernier resort*. We do not employ artificial aid simply because we have an opportunity of doing so; but because the circumstances of the particular case before us demand such assistance. "A prudent use of instruments in the practice of midwifery is of great importance; but the necessity alone of freeing our patient from impending or present danger, should induce us to resort to them."* This sentence should be engraven on the mind of every practitioner; and it will appear that in the cases I am about to relate, the practice adopted was founded on similar principles.

"Impending or present danger." Two questions here present themselves: 1st. What are the dangers to be feared in difficult labours? 2nd. How do we know them to be impending or present? Upon an intimate acquaintance with the true solution of these questions, depends the difference between the well-informed, reflecting, experienced accoucheur, and the ignorant, reckless empiric. There is no term more abused than "*experience*," as it is frequently applied to medical men. It is no proof of experience that one has attended a vast number of cases of any particular disease, of fever for example; a physician may have seen many persons recover, and others die of this malady during a long practice; and yet, for want of observation and reflection, be totally devoid of experience; just as a traveller may pass from St. Petersburg to Constantinople, and, from a similar cause, be no wiser at the end of his journey. So

* Collins' Pract. Treat., p. 9.

it is in midwifery; he alone who studies the phenomena of natural labour in all its phases, and observes, compares, and treasures in his memory, the ever varying course of this natural function, under different circumstances, in different constitutions, he alone is to be considered experienced, and can judge of the symptoms indicative of danger in any given case.

In studying the phenomena of labour, there are five principal subjects for consideration: 1st. The moving power. 2nd. The body to be moved. 3rd. The channel of exit. 4th. The materials lining that channel. 5th. The constitutional temperament of the patient. It is well known that in the majority of instances, such a harmony exists between these several objects, as to secure the safe termination of the process; but any deviation from the proper proportion that 1, 2 and 3 bear to each other, is productive of either delay or difficulty in the delivery. Thus a deficiency in No. 1 (the contractile power of the uterus) may, while Nos. 2 and 3 (the foetus and pelvis) are of normal dimensions, be the sole cause of protracted labour. It is certainly erroneous, to place such a case as this under the head of difficult labours, as has been done by Denman. There is here no difficulty to be overcome, the delay arises from the want of the *vis a tergo*. Neither the patient nor her child are exposed to danger from the tediousness of the labour, and this leads to an important caution against judging of the danger of a case from the time it occupies. We should always bear in mind the difference between delay and difficulty. Delay implies deficiency in the moving power, while difficulty suggests the idea of an abnormal condition of Nos. 2 and 3, either an excess in the dimensions of the foetus, or a diminution in the capacity of the pelvis. Now, while simple delay is seldom productive of bad results, and is usually remediable by appropriate treatment; difficulty arising, as I have said, from mechanical obstruction, resisting the energetic action of the expulsive force always induces danger.

This leads us back to the first question proposed What are the dangers to be feared in difficult labours? Before this question is answered, it will be necessary to make a few observations upon the fourth and fifth subjects for consideration, viz., the materials lining the channel of exit, and the constitutional temperament of our patient.

It should be always borne in mind, that in every case of labour, there are a great number, and a great variety of important parts, intervening between the head of the child and the bony parietes of the pelvis. There is first the cervix, and os uteri, together with the vagina, which, with the mucous membrane common to all, form the innermost layer. These are parts endowed at this particular period with a high degree of organization; the blood-vessels especially being of much greater size than in the unimpregnated state. Outside this layer, there is at the upper and back part, the cul de sac of the peritoneum, dipping down between the rectum and back of the uterus and vagina. This membrane does not descend so low in the pelvis during the latter part of gestation, as it does previous to impregnation, but during labour it follows the descent of the cervix uteri, and will be found below the level of the promontory of the sacrum. That it is so is manifest in those cases where laceration takes place, as it so frequently does, at the junction of the vagina and uterus, or at the lowest part of the posterior surface of the latter organ; in all of which cases, the rupture extends into the cavity of the peritoneum. It may be a question, whether the vomiting that occurs in the advanced stage of difficult labour, and the tenderness of the abdomen that accompanies it, may not be partly produced by pressure of this fold of the serous membrane against the promontory of the sacrum, just as similar symptoms arise when it is subjected to pressure in strangulated omental hernia. The anterior surface of the vagina is in close contact with the back of the urinary bladder, and the urethra; with which parts it is intimately united. Along the sides of the vagina, and loosely connected with it by cellular

tissue, we have the funnel-shaped muscular sling, constituted of the levator ani muscles; and external to these muscles are found anteriorly the obturator internus, and posteriorly the pyriformis muscles. Along the back of the vagina runs the rectum; and in addition to these parts, there are the internal iliac arteries and veins, with their several branches, the uterine nerves; and the roots of the great sciatic nerves, with the obturator nerve before. All these, with the several fasciæ, and the cellular tissue that surrounds them, form a soft lining to the pelvis, along whose cavity the head is propelled in labour. We should never lose sight of the fact, that such a combination of living tissues is interposed between the solid unyielding walls of the pelvis and the foetus, during parturition.

The last subject for consideration, and not the least important in a practical point of view, is, the constitutional temperament of the patient. To those who are extensively occupied in the practice of midwifery it will not be necessary to insist upon the vast variety of constitutions that we encounter; nor upon the influence that this diversity exercises over the powers of endurance in different patients. But it is always necessary to impress upon the minds of students, that labour is not a process performed by inanimate machinery, but that it is a complex function discharged by living tissues, whose properties and energies are regulated by the peculiar temperament of individuals. Thus we see some patients sink under a labour, which, for severity and length of duration, is not to be compared to what others will endure with perfect safety; and hence we are led to discard time alone as a measure of danger. Some patients are prone to inflammatory action, phlegmonous, or erysipelatous, as the case may be; others are endowed with a nervous energy, originally deficient, or easily exhausted; and others again are of a sluggish habit, that pervades every organ, and require stimulants to rouse their dormant powers; while a fourth class, in whom hysteria prevails, have all their functions so modified by this protean malady, as to baffle attempts at accurate description, and

require the greatest skill for their management. These are but a few of the modifications of temperament that might be enumerated, but they are sufficient to show any reflecting mind, that we are not to expect uniformity of phenomena in labour, or similarity of effects from apparently similar causes.

We are now in a predicament to answer the question—What are the dangers to be feared in difficult labours? They are threefold: 1st. The death of the mother, or the child, or both, before delivery. 2nd. The death of the mother after delivery. 3rd. Inflammation, terminating in abscess or sloughing of the soft parts within the pelvis, and producing effects fatal to the future comfort of the patient. The life of the mother may be sacrificed from two causes before the labour is terminated; either by actual exhaustion, produced by the combination of prolonged pain and exertion; or by rupture of the uterus or vagina; in either of which cases, the fate of the child most commonly corresponds with that of the parent. And, when the mother survives delivery, it is notorious, that the pressure to which the infant has been subjected, is too frequently sufficient to destroy it before it is born. The death of the mother after delivery may follow in consequence of rupture of the uterus, or of collapse; or of the effects of inflammation excited in the soft parts lining the pelvis; and this, probably, after a dead child has been delivered. Or, if the effects of inflammation are not sufficient to destroy her life, she is exposed (having most likely given birth to a still-born infant) to the danger of sloughing of the vagina, whereby constriction or obliteration of that canal is produced, or the more lamentable consequence, sloughing of the back of the bladder, and urinary fistula; rendering her for life a loathsome victim of erroneous practice. Such are some of the dangers to which women and their offspring are exposed in difficult labour; no light risks, it will be admitted, and such as every practitioner is bound, if possible, to avert. But in order to avert, he must foresee them; he must perceive that danger is impending. This involves the second question.

How do we know danger to be impending or present? We have, in the condition of our patient, sufficient evidence of the approach or existence of all these sources of danger, except rupture of the uterus; and we should always bear in mind the possibility of the occurrence of this accident in every case of difficult labour. The term *exhaustion* explains the condition meant to be implied by it; muscular irritability and nervous energy are expended, all capacity for further exertion is at an end; the powers of life seem failing, and the mind as much depressed as the body, they would both sink together, unless relieved by artificial assistance. But before the patient has arrived at this formidable condition, into which the attendant should never allow her to fall, there is a train of symptoms exhibited in the case, sufficiently indicative of danger. These are so well and so concisely laid down by Dr. Merriman that I will take the liberty of transcribing them from his variable synopsis. "1. Severe shivering fits, unconnected with dilatation of the os uteri, or the passage of the head through the *os externum*. 2. Frequent or constant vomitings after the os uteri is largely dilated. 3. The accession of fever indicated by a quick pulse, a furred tongue, a hot dry skin, and great thirst. 4. Great restlessness or jactitation. 5. An anxious and disturbed mind. A disposition to sing in a plaintive and wailing tone of voice, has in particular been considered as a very frightful symptom. 6. The want of true uterine action, though there may be irregular and unproductive pains. When this happens after many hours of labour it is always an unfavourable symptom. 7. Great heat and soreness in the vagina and os uteri. 8. The discharges from the uterus and vagina being offensive both in colour and smell. 9. Violent and continual pain, and soreness or tenderness of the belly, increased upon pressure. 10. Low, muttering delirium. 11. A quick and weak, or low, sinking pulse. 12. Clammy sweats. In proportion to the number and severity of these symptoms will be the danger of the patient; it becomes the duty of the practitioner, therefore, to combat, by appropriate remedies, each of these symptoms as

they arise; but if several are present at once, unless artificial aid be timely afforded to deliver the patient, both mother and child will perish." The second danger mentioned above is, the death of the mother after delivery. This may happen from collapse or exhaustion, but is most frequently caused either by rupture of the uterus, or inflammation of the soft tissues, the result of the mechanical violence offered to them by the prolonged pressure of the head of the child. Some, or all of the symptoms just mentioned, will be observed in such cases during labour; and they will also be found to attend those protracted labours in which, although the life of the mother is spared, the local mischief that ensues bears ample testimony to the injury inflicted. In judging of the means best calculated to rescue two living beings from such dangers, it should be recollected, that it is the *continuance* of the pressure that does the mischief rather than its intensity. We know that the soft tissues of the body are endowed with a resiliency, a power of resistance that enables them to bear a temporary compression of great amount without injury, while inferior pressure continued for a length of time will terminate in their disorganization. The malingering soldier is well aware of this fact and acts upon it when he wishes to produce an ulcer. He straps a piece of coin or other hard substance tightly upon the part. At first no effect is produced, and if the apparatus is removed in a short time, there is no evil consequence; but if the same amount of pressure is continued for some hours, such a degree of injury is inflicted as terminates in the destruction of the part, and a sloughing ulcer is the result.

Bearing this physiological fact in mind, we should be always cautious how we permit the soft parts in the pelvis to be subjected to continued pressure, after we have evidence that there is an arrest to the progress of the head through its cavity, or that delivery by the natural efforts is either impossible, or so remote as to be improbable, while at the same time the local and constitutional symptoms already detailed give warning of

impending danger. We should be cautious, I say, on this point, with reference to the mother ; and we should never lose sight of the fact, that we have a living infant also in our charge. Its life depends upon the progress of the labour. Its head will bear a very considerable amount of compression for a short time, but there is a limit to such endurance. The exact period at which pressure becomes incompatible with foetal life, is difficult to determine in any given case ; but I think it may fairly be presumed, that the amount of pressure capable of producing dangerous symptoms in the mother, must, at the same time, operate prejudicially on the child, and if not removed will soon terminate its existence. I very much fear that this is a point too much overlooked by practitioners and writers on midwifery ; the safety of the mother is kept too exclusively in view, and the fate of the infant is too often neglected. This carelessness about the life of the child may suit the views of certain political economists, to whom the diminution of the human race may be an object greatly desired ; but the conscientious practitioner should remember that there are different modes of infringing the sixth article of the decalogue ; he should recollect that acts of omission are as criminal as acts of commission, and that allowing a fellow-creature to remain in a perilous situation until life is sacrificed, while he had the means of rescuing him from his danger, will as surely rise up in judgment against him as if by his own hand he had dealt the fatal blow.

The inference to be drawn from these observations is, that where we have evidence that the continuance of labour is attended with danger to mother or child ; or, as is most commonly the case, to both, we are bound to afford such assistance as will, without hurt to either, place both in a state of safety. But let no one pretend to judge of the necessity for artificial interference, who has not fully and carefully studied the phenomena of labour. It is from symptoms he is to draw his conclusion, and if he is not thoroughly conversant with those indicative of danger his opinion must be ill-founded, and his practice rash and em-

pirical. And here I would urge upon the attention of the reader the observations made upon this point several years ago, by my late father. "It is of importance that every man practising midwifery should avoid as much as possible the use of instruments in delivery; for it is certain that if he suffers his patience to be too readily exhausted, or yields too easily to the suggestions and alarm of the patient or her friends, he will frequently be induced to promote delivery too soon, very much to the injury of the patient, and consequently of his own character. On the other hand, he has an important duty to perform, in judging of the necessity, and the proper time for using instruments, and the kind suited to each particular case; for as much, or more mischief may be done by delaying their use when absolutely required as by having recourse to them too soon. In fact in this, as in most other situations, the man who has patience to watch, judgment to discriminate, and firmness to act, will be the best qualified to perform the duties required of him."*

In the observations that follow I wish it to be understood, that I omit the consideration of those cases in which the capacity of the pelvis is so much diminished by malformation, tumours, &c., as to render the passage of an entire child impossible; and that I will allude only to the more common cases of difficult labour, in which, after several hours of severe pain, the head has been forced to a greater or less extent into the cavity of the pelvis, and is then arrested. When matters have arrived at that state, the practitioner's mind becomes alive to the dangers that may ensue. If some favourable change does not take place, the signals of distress will soon be exhibited, but with a rapidity, varying in different cases, from diversity of temperament. The pulse will become fast, the skin hot, the belly tender, the vagina hot, and the stomach irritable. These are signs which we know indicate impending or present danger: danger to the mother and

* Dub. Med. Trans., New Series, vol. i. part i. p. 41.

danger to the child. Knowing this, is it not our duty to avert them? Who, if he could, would not with a word terminate such a labour at such a time? Who would not wish to possess the means of shortening the agony and danger of his patient and her offspring? Leave her unassisted, and what have we to expect? a protraction of suffering, an aggravation of danger to the mother, and death to the child. That we have a safe and efficient means of averting these, by the careful use of well-constructed forceps, will appear in the detail of the following cases. And here I would observe, that all the operations which it has fallen to my lot to perform with the forceps are here set forth; there are none concealed. I have not selected cases favourable to my views, and left the unfavourable ones behind in my note-book; but all are given, and all are favourable. I look upon this fact as most important, because it is likely that if the lacerations, contusions, and other evil consequences that haunt the imagination of some practitioners, were actually attendant on the operation, it is likely, I say, that I would have encountered some of them; it is not probable that such good luck would have been constant in my hands, and that all my patients would have escaped.

CASE I.—Age 36; seventh pregnancy. All her former labours had been very long and difficult, and in two of them the children had been still-born. The labour set in strongly, and the os uteri dilated slowly. It yielded after twenty-four hours had elapsed, and the head entered the brim of the pelvis. The pains continued strong during the ensuing twelve hours, and the head was slightly advanced during that time. At the end of this period, being thirty-six hours from the commencement of labour, the pulse became a little accelerated; but as there was some continuing advance of the head, the labour was allowed to proceed. In six hours thereafter the head had passed to the extent of about two-thirds through the brim of the pelvis, and appeared tightly jammed in the aperture. The patient's pulse was still faster than before, but no tenderness of the belly was complained

of. Her strength being good, and the pains regular, it was not judged necessary to interfere ; but at the end of forty-eight hours from the beginning of labour unfavourable symptoms had fully appeared. Her pulse was now 120 ; the pains had greatly diminished ; her strength was failing ; and she suffered considerable pain on pressing the abdomen. Her stomach had become irritable, and rejected her drinks. Under these circumstances the forceps were applied. It required some care and patience to get the blades of the instrument into their place ; but at last this was accomplished, and by slow degrees, and well graduated lateral motion of the instrument, the head was dislodged from its position, and brought down to press upon the perinæum. The rest of the operation was sufficiently easy. The child was extracted still-born. This woman suffered a good deal from inflammation of the vagina, which was subdued by fomentations, injections, and poultices, but no sloughing took place. She left the hospital in a fortnight quite well. I regretted at the time, and still continue to do so, that I had not performed the operation at the end of thirty-six hours, instead of waiting to forty-eight, as I have no doubt the inflammation of the vagina would have been prevented thereby, and decidedly the child would have had a much better chance of being born alive.

CASE II.—Age 28 years ; seventh pregnancy. This woman had borne six children, in the delivery of which she had always difficult labour, and the last child had been extracted by the perforator and crotchet by another practitioner. In this labour the head presented in the first position, and it was evident that the brim of the pelvis was somewhat diminished in its antero-posterior diameter. A considerable opposition to delivery, also, arose in this case from a convergence of the spinous processes of the ossa ischia, which encroached upon the cavity of the pelvis, and resisted the passage of the head. At the end of twenty-four hours, finding from these two causes the progress of delivery was impeded, the head having come down to rest upon the spinous processes below, while the remaining portion was engaged

in the brim of the pelvis ; perceiving that there was little prospect of delivery being accomplished by the natural efforts ; and having the former labours as a guide as to what was to be expected, I determined not to wait too long without attempting to rescue the infant from its perilous situation, if it were consistent with the mother's safety. Accordingly the forceps was cautiously introduced, and as cautiously used as an extractor ; and in half an hour from the commencement of the operation, I was gratified by the birth of a living boy, who with his mother continued to do well, until they left the Hospital on the tenth day.

CASE III.—Age 36 years ; ninth pregnancy. In this case the head presented in the fourth position of Naegele ; and instead of changing to the first in the course of the labour, as it usually does in this presentation, it continued to descend with the anterior fontanelle towards the pubis. At the end of twenty-four hours (labour being very severe) the head was firmly fixed in the pelvis, and in six hours more (thirty) finding that no advance had taken place, and the vagina was becoming tender to the touch, while the pulse was gradually increasing in frequency, delivery was effected by the forceps. The child was dead. This patient recovered without any unpleasant symptom.

CASE IV.—Age 30 years ; fourth pregnancy. This was a footling presentation, and the labour went on without anything remarkable, until the arms had been extracted, when great difficulty was found in the passage of the head. The labour pains continued strong, and the cord pulsated for a considerable time during the endeavours made to extricate the head. But all attempts to accomplish this in the ordinary way having been tried for nearly half an hour, and failed ; and finding the pulsation in the funis becoming weak, I determined upon using the forceps. Unfortunately some delay took place in procuring the instrument, which was fatal to the infant ; for, before its arrival, the cord had ceased to pulsate. I passed the blades along the sides of the face and head, having the body of the infant carried forward between the thighs of the mother, and with some diffi-

culty I succeeded in extracting the head. The mother did well.

All these cases occurred in women who had previously borne children; but I now come to a class of patients in which the employment of the instrument is by some deemed inadmissible and improper. I allude to women in labour of first children, and it will be seen by the sequel whether the dread of the instrument in such case is well founded or not.

CASE V.—Age 25 years; first pregnancy. The head presented in the first position, and the labour progressed steadily and slowly, so that at the end of twenty-four hours the os uteri was completely dilated, and a portion of the child's head had entered the brim of the pelvis. The pains continued severe and constant, and at the end of thirty hours the greatest portion of the bulk of the head had passed into the cavity of the pelvis, but not so low as to fill the hollow of the sacrum or make any pressure on the perinæum.

From this time there was no advance in the progress of the head, but a very large tumour formed on the scalp. In this condition the head remained for six hours, notwithstanding frequent and strong pains. The woman was now thirty-six hours in strong labour. It was plain that the natural efforts were unequal to overcome the difficulty. The pulse had risen to 110, and great restlessness had commenced. By the stethoscope the child was found to be alive; but how long it would remain so under such severe pressure was very doubtful. I therefore determined to give it a chance for life. The forceps were applied slowly and cautiously; and when introduced the blades lay one behind the pubis, the other along the sacrum. This shews the position of the head; that it had not turned from the oblique position. By grasping the handles loosely, and swaying them back and forward, two or three times during each pain, without as yet using much extracting force, I loosened the head in its position; and then gradually caused it to descend, and in twenty minutes a living boy was delivered without a single fibre of the

perinæum having been damaged ; a careful assistant having duly supported that part. The mother and child left the Hospital the same day.

CASE VI.—Age 24 years ; first pregnancy. This case was very similar to the one just described, with this difference, however, that in the present one, labour was allowed to proceed for forty-eight hours before the operation was performed, whereas the former was delivered at the end of thirty-six hours. The reason was, that urgent symptoms of danger did not manifest themselves as soon as in the former instance. The pulse kept moderate until within a few hours of the time at which she was delivered ; and the os uteri which was very slow in dilating had not permitted the head to pass through until nearly twenty-four hours had elapsed. From that time a slow advance of the head took place, but at the end of thirty-six hours not more than one-half of it had been forced through, and from that time little progress was made, notwithstanding strong and regular pains continued. Still as no unpleasant constitutional or local symptoms were present, I contented myself by watching the case. In a few hours the patient's strength began to decline, and her pulse rose to 110 ; the vagina at the same time began to lose the cool, moist feel it had hitherto preserved, and to become hot and dry. When matters had assumed this form, I felt that I was no longer justified in withholding assistance, and finding the child to be still alive, I determined on using the forceps. By steady and cautious management, I was able to apply the instrument, and I succeeded in delivering a living girl. They both left the Hospital well on the twelfth day.

CASE VII.—Age 20 ; first pregnancy. In this case the necessity for the employment of the forceps arose from the patient having been seized with convulsions in the latter end of the second stage of labour. The pains were strong and effective, the os uteri dilated in four hours, and in six hours most of the head had passed through the brim of the pelvis. At the expiration of sixteen hours the head had made no advance ; the perinæum

was very rigid, and the vagina dry. The patient being of a plethoric habit, she was bled to æxvj. with decided benefit, for soon afterwards the vagina and perinæum became cool and relaxed. At the end of twenty-four hours the head had come down to touch the perinæum, but did not as yet press upon it. In four hours more, when at each pain the head was forcibly distending the perinæum, the patient was seized with convulsions. Delivery by the forceps was instantly had recourse to; and much difficulty was experienced in the operation, owing to the restless state of the woman, and the great size of the infant's head, which was found to measure four inches between the parietal protuberances. The child, as is most usual in convulsions, was born dead. The mother recovered and left the hospital well.

The remaining cases occurred in my private practice.

CASE VIII.—Age 22 years; first pregnancy. This lady was sixteen hours in labour before I was sent for. She was attended by an intelligent midwife. I was called to her in consequence of retention of urine, none having been passed for fourteen hours. I found the head on the perinæum, which it distended at each pain; the external parts were relaxed. The pains very weak, and few in number. Pulse 75. I passed the catheter, and drew off $1\frac{1}{2}$ pint of water; gave a drachm of ergot in divided doses, and left the patient in the hands of her attendant, expecting that delivery would soon take place. I was surprised to get a message nine hours afterwards requiring my attendance again. I found her just in the same state that I had left her, with the exception of a more accelerated pulse, more exhaustion, and irritable stomach. I at once delivered her, with the forceps, of a very large still-born boy. The mother speedily recovered.

CASE IX.—Age 32; first pregnancy. Labour commenced about four o'clock in the evening, and the pains continued during the night and following day without interruption. In the course of the second night the pains became violent, and Dr.

Guinness, of Clontarf, was sent for to see her; she having been previously under the care of a midwife of much experience. He saw the patient at four o'clock, A.M. He found the os uteri not dilated, and the pains most violent and distressing. At his desire I was sent for, and saw her at half-past eleven o'clock, A.M. I found the os uteri then dilated to the size of a half-crown piece, not very thick, but exceedingly rigid. The waters had been discharged spontaneously in the course of the morning. The pains were violent and frequent; in fact, there seemed to be no intermission, and no impression seemed to be made on the os uteri. There was great irritability and impatience; flushed countenance; hot skin; pulse 80. We agreed that it would be advisable to take some blood from her arm. This was accordingly done to the extent of $\frac{3}{4}$ xvij. with decided relief. The character of the pain was immediately altered. It became more regular and natural, and there was an intermission or suspension from time to time between the pains.

An emollient enema was now administered. At one o'clock the os uteri was felt soft and yielding; the head of the child still above the brim of the pelvis. At three o'clock the os uteri was completely dilated, and about one-half of the head had passed through the brim, in the second position. The pains were violent and frequent. At four o'clock no advance of the head had taken place; but a very large tumour had formed upon it. The bones felt remarkably firm; the external parts were well relaxed; pulse 110; restlessness and impatience to a great degree, so much so that it was difficult to keep the patient in bed. The child was ascertained to be alive. Seeing that the patient was now forty-eight hours in labour, during the whole of which time it had been most violent; that there was little prospect of the labour being concluded by the natural efforts, or at most that such an event was very remote, and that from the present condition of the patient, it was probable, indeed almost certain, that most dangerous symptoms must arise before it could take place; seeing that the child was now alive, but that from the manner

in which its head was embraced by the pelvis, and the length of time that must be spent in fruitless efforts to dislodge it by the unassisted efforts of the uterus, its death before delivery was in the highest degree probable; seeing all these circumstances, I say, we agreed that an attempt should be made to deliver her by the forceps. The blades were introduced, slow, swaying traction was employed during a pain, and in ten minutes the head was so dislodged as to come down to, and press upon the perinæum. I now withdrew the instrument, and allowed the uterus to accomplish the remainder of the delivery; this was happily effected in a few minutes, and a living boy was born, without the least injury to mother or child.

I fancy there is no one will object to this case, as illustrative of the *use* of the forceps. What would any one predict of the case at four o'clock? What were the dangers? What was the result?

CASE X.—Age 34; first pregnancy. At eleven o'clock, A. M. while sitting in her drawing room, the membranes ruptured without any pain, and the waters commenced to escape. I saw her at two o'clock, P. M. No pain had then occurred. The os uteri was very high in the pelvis, and dilated just sufficiently to enable the finger to pass through, The head could be reached with difficulty, and the scalp was found wrinkled and doughy. She remained all that night, and the following day without pain, until two o'clock, P. M., when slight pains set in. These became more severe at seven o'clock in the evening, when I was sent for. I found the os uteri dilated to the size of a half-crown piece, and soft. Labour progressed naturally until ten o'clock, P. M., at which time the os was fully dilated, and the head was engaged at the brim of the pelvis, in the second position, about one-third of it having passed through. Free vomiting accompanied this stage of the labour. When matters were in this state, the pains began to diminish in strength; and although they did not entirely cease, they became weak and inefficient. Two hours passed over in this way without any ad-

vance of the head. I had satisfied myself that the pelvis was sufficiently large to allow the head to pass, and at twelve o'clock I gave her a scruple of ergot, and repeated the dose in ten minutes. This quickly restored the energy of the uterus, and the head began to move downwards, until it came to press upon the perinæum, which point it reached at two o'clock, A. M. A very large tumour was formed on the scalp, which partially protruded through the external parts at each pain; the perinæum was rigid and unyielding, and after a few efforts at expulsion, the pains again subsided and became short and feeble. From this time no advance was made. At each pain the perinæum became distended for a moment, and then the pressure subsided. The stomach again became irritable, and rejected the drinks taken by the patient. She became very restless; the pulse rose in frequency, but diminished in size and strength; the abdomen became painful, and she complained of a burning sensation within. At eight o'clock, A. M. the pains had nearly ceased; the pulse was 120, and thready; the vomiting was distressing, accompanied by hiccup; the pain in the abdomen increased, and delirium commenced. Under these circumstances I determined on delivering her by the forceps. The instrument was easily applied, and with a few efforts directed in the axis of the orifice of the vagina, the head was brought through. No uterine action was excited by the operation. The perinæum, although rather rigid, was well guarded by an intelligent nurse, and not a single fibre was lacerated. The uterus still remained inactive and I was obliged to extract the shoulders of the infant; the rest easily followed. The child was dead; the limbs were spasmodically contracted; the fingers bent; and the surface was in many places livid. The placenta was found in the vagina, from which it was easily removed. The uterus contracted well, and no hæmorrhage followed. The patient recovered well.

CASE XI.—Age 20; first pregnancy. I was called to this lady at ten o'clock, A. M., her attendant, Mr. Rumley, not being in town. I learned that she had been in strong labour for two

hours. The os uteri was found nearly dilated, and the head descending in the first position. The pains were very strong and frequent. I waited until twelve o'clock, when Mr. Rumley arrived, and I gave the patient into his charge and retired. At ten o'clock, P. M. I was sent for by Mr. Rumley, and I found the patient undelivered. I learned that the pains had continued very strong during the day, that the head had come down to a certain point in the pelvis soon after I had left, and was there arrested. On examining closely it was found that at each pain the head came down to the spinous processes of the ischia, beyond which it could not pass, owing to a convergence of these processes. Her pulse was 110, her skin very hot, and she had much thirst. After waiting an hour, and seeing that there was no advance of the head, we considered that the deformity was not sufficient to forbid a cautious trial of the forceps, and accordingly the instrument was applied, the blades lying in the oblique diameter of the pelvis, to avoid the projecting spines of the ischia. Cautious attempts at extraction were now made; by degrees the difficulty was overcome, and a living girl was delivered. The patient recovered without any unpleasant symptom.

CASE XII.—Age 37; first pregnancy. This patient was under the care of Dr. M'Cormack, who has furnished me with the following notes of her case: "Her labour pains came on at first very slightly, on Friday, April 2nd, about twelve o'clock. She was, however, able to be up and about during the day. The pains did not increase until Saturday morning, on which day I saw her. On examination I found the os uteri dilated to about the size of a shilling, the head presenting in the first position, and the pains frequent, though not severe. On Sunday when I again saw her I found the os uteri fully dilated, and retracted. The membranes had broken; the pains were very frequent and violent, but the head appeared to be making no progress. On Sunday evening the pains had almost ceased. The os externum was hot and rigid; the bowels had not been

freed. I ordered an aperient draught, and after its operation an opiate ; hoping that, after its effects, uterine action might set in. However the only effect it produced was relaxation of the os externum. On Monday morning, finding that no uterine action had recurred, I administered ergot of rye, first in half-drachm doses in infusion, repeated twice ; and later in the day by giving three doses in powder, of twenty grains each. No uterine action was produced by either dose. I then thought it advisable to send for Dr. Beatty."

I found this patient in a very exhausted state, her pulse 120 ; the belly tender to the touch ; the head fixed in the pelvis, but not touching the perinæum ; the vagina and os externum rather dry and rigid ; and altogether forming a case by no means favourable for success with the forceps. However, I determined on giving a fair trial of the instrument, and having introduced the blades I proceeded to extract, first moving the handles laterally, in order to loosen the head in its position. In about half an hour the delivery was accomplished, and, although the perinæum proved to be very unyielding, no injury of any kind was inflicted. The child was dead. The mother recovered perfectly.

CASE XIII.—Age 25 ; first pregnancy. This lady was low in stature, corpulent, and of firm, rigid fibre. She had enjoyed uninterrupted health during her pregnancy. Labour began at five o'clock, A. M. by rupture of the membranes. Pains set in about an hour afterwards, and continued regular through the day. The head presented in the fourth position ; the os uteri dilated slowly, and at seven o'clock, P. M. it had disappeared, fourteen hours having been occupied in this stage of the labour. The head descended gradually until eight o'clock, P. M., at which time the prominent point of it had reached the perinæum, but although the pains were very severe, no change in its position was effected from that time. The anterior fontanelle remained towards the right foramen ovale, and did not at any time turn towards the back of the pelvis, as it so frequently does

when it descends in the fourth position. An enema was now administered, which acted freely on the bowels, but made no impression on the situation of the head. The pains continuing violent, the pulse got fast, and soon rose to 130, the face became greatly flushed, and the skin hot. From midnight until two o'clock, A. M. this state continued, when I took blood from her arm to the amount of eighteen ounces. The blood became speedily cupped and buffed. No change was produced by the bleeding. At four o'clock, A. M. finding that no advance of the head had occurred since eight o'clock of the previous evening, notwithstanding severe labour pains, and finding the pulse had now risen to 140, with great thirst and exhaustion, I determined on delivering the patient. I obtained the assistance of Dr. Montgomery, who agreed with me that it would be dangerous to allow the patient to remain longer undelivered, and that the forceps might be employed. I accordingly introduced the instrument, and with a good deal of difficulty the position of the head was rectified, by turning the anterior fontanelle towards the hollow of the sacrum. When this was accomplished extracting force was applied, and in about half an hour from the commencement of the operation the head was brought down to distend the perinæum. Having got it so far, and finding the uterus acting vigorously, I withdrew the instrument, and the head was soon expelled. The countenance of the infant was very livid, the eyes were much suffused, and it lay as it were comatose. The umbilical cord was cut across, and allowed to bleed, and this, joined to the usual means of stimulation, soon succeeded in reviving the child; no laceration of any kind took place, although the head of the child measured $15\frac{1}{8}$ inches in circumference.

CASE XIV.—Age 30; first pregnancy. I was called to see this case by Surgeon Neville, who had the charge of the patient from the commencement of her labour, it having existed then thirty-six hours. I learned from him that the pains were at first short, but very distressing; that the membranes had ruptured

spontaneously about twenty-four hours after labour had commenced, giving exit to a very small quantity of liquor amnii, at which time the os uteri was dilated to the size of a crown piece. Shortly after this occurred, the pains became weaker, and then ceased, the patient began to complain of exhaustion, and restlessness; the pulse, which had been 86 previously, now sank to 58 in the minute, and a cold perspiration covered her surface. From this state she was roused by the administration of small doses of wine and water, and the pains returned with increased vigour. The os uteri now dilated freely, and the head passed through it about twenty-eight hours from the beginning of labour. The progress of the head continued for two hours more, at which time it almost reached the perinæum. The pains now again diminished in strength and frequency, recurring only at long intervals, and being short and ineffectual. In this condition the patient remained for four hours, at the end of which, finding that no progress was making in the advance of the head, I was sent for. I saw the patient at just thirty-six hours from the beginning of her labour. The pains had now ceased, she was tossing about in the bed, complaining of excessive weakness; the pulse was 100, and very feeble; the stomach rejected her drinks, and the discharge from the vagina was of a very foetid nature. Under these circumstances, I was of opinion that speedy delivery was called for, and having drawn off a large quantity of water from the bladder, I proceeded to the operation with the forceps. After the blades were applied, a good deal of difficulty was experienced in first dislodging the head from the position in which it was placed; but after that was accomplished, the rest of the delivery was performed with considerable ease, and a living boy was extracted. The mother recovered without a single bad symptom.

CASE XV.—Age 18; first pregnancy. This lady, of a weak, delicate constitution, came over from England for her confinement. She had suffered a good deal from headach during her pregnancy; but when I first saw her a few days before labour,

she was pale, free from pain in her head, and with a languid pulse. Labour set in at two o'clock, P. M., and continued with severity until ten o'clock, P. M., at which time the os uteri was fully dilated. The head was passed with some difficulty into the cavity of the pelvis, and the pains became most urgent and severe. The patient soon began to complain of great pain in her head, and her pulse became more frequent; and not long after she thought she saw strangers standing at her bed-side. This was quickly succeeded by loss of vision; whereupon I at once opened a vein in her arm, and abstracted eighteen ounces of blood. The operation was hardly concluded when she was seized with convulsions. This took place about midnight. The bandage was removed from the arm, and twenty ounces of blood were allowed to flow. Her hair was cut off, and cold applied to her head. I dispatched a messenger to my house for forceps, and Dr. Peebles was requested to give his assistance. The patient lay in a comatose state after the last bleeding, in which she continued until the arrival of Dr. Peebles. We agreed that delivery with the forceps should be performed, and the operation was accomplished in the usual manner. The child was dead. After the operation the patient continued in a very weak state for several hours; no convulsion recurred; and she finally recovered without any bad symptom.

In these fifteen cases, the operation was performed with complete success, as far as the mother was concerned; not a fibre of the perinæum was torn in any of them, although eleven were first deliveries. In one case only local inflammation followed the operation, and in that case (the first), I have already said that I delayed to interfere longer than I ought, and the result to the mother and child is evidence that procrastination was fatal to the latter, and caused the local, but temporary, inconvenience to the former. Of the fifteen children, seven were born alive, and eight dead; but of these, six were born under circumstances that would have caused a similar result independently of the operation. Thus, in three of the cases, VIII. X.

XII. ergot of rye had been administered some hours previous to delivery. Now, it is well known, that when a certain time elapses between the administration of this drug, and delivery, the child is most commonly still-born. It is difficult to state exactly what length of time is required to cause the death of the infant in such cases; but I have reason to believe, from some observations I have made, that in two hours after a full dose is given, the fœtal heart will cease to pulsate. In the cases above alluded to, a greater length of time than that, intervened between the taking of the medicine and the delivery of the patient. The death of these children therefore cannot be ascribed to the operation. Two cases (VII. and XV.) were attended with convulsions, an accident that notoriously destroys the life of the fœtus before birth. And the case (IV.), in which the footling presentation occurred, must also be struck off the list, inasmuch as the funis had ceased to pulsate before the operation was commenced. We thus have the cases in which it is fair to estimate the value of the operation with regard to the infant, reduced to nine. In seven of these, living children were born; and of the two that were dead, I have reason to think, that the result was owing in one of them (I.) to the delay of a few hours after urgent symptoms had become manifest.

It is not consistent with the nature of this communication to enter upon any minute description of the operation with the forceps; but I cannot conclude without making a few observations upon the form of instrument most suitable, in my mind, to those cases in which the head is arrested in the pelvis, before it has come down to touch the perinæum. In such a position, a longer instrument than that in common use will be found of great advantage; and a blade constructed as in the accompanying sketch, will be more easily introduced, and when both blades are passed along the head, the handles will be more readily locked together, than when the usual form is given to the instrument. The entire length including the handle is $12\frac{1}{4}$ inches. Of the blade to the lock, 8 inches; of the fenestrum, $5\frac{1}{4}$ inches; the greatest

breadth of blade, $1\frac{3}{8}$ inches; the widest part of the fenestrum, 1 inch. The distance between the blades when joined, 3 inches at widest part; distance between the extreme points, $1\frac{1}{8}$ inch. The sides of the blades enclosing the fenestra are nearly round, slightly flattened upon the inner and outer surfaces, but having no sharp edge, either on the outer border or the margin of the fenestra. The advantages that such an instrument possesses over others are, first, from its narrowness, the blade is more easily introduced. Secondly, when both blades are applied, the handles can be locked with greater facility, and from the length of the blades the lock will not be within the vagina. Thirdly, from the rounded form, there is no danger of hurting the mother in the introduction, or of cutting the scalp of the child's head with the inner edge of the fenestra in its extraction. This is a point upon which too much stress cannot be laid in ordering or choosing an instrument, for most of those that are found at cutlers, are finished with such sharp edges, that both mother and child are in danger of being injured by their use. With such an instrument, as I have described, and with an accurate knowledge of the anatomy of the pelvis, and of the mechanism of parturition, it will be difficult (if reasonable caution be used) to inflict any violence upon either of the objects of our care. But a clear view of the relation that the brim, cavity, and outlet of the pelvis bear to each other, and the line described by the axis of the entire cavity, must be entertained by the operator, to insure a successful termination.

The accompanying diagram should be painted on the mind's eye when this operation is undertaken. On referring to it, the parts just alluded to will be found delineated, and it will be seen that the axis of the cavity is a curved line, extending from the centre of the plane of the brim, to the centre of the plane of the outlet. Force applied for the extraction of a head must be used in the direction of the axis, at the particular part in which the head may be placed, and the direction of the force must be altered as the head descends, so as to correspond with the ever-

varying direction of the axis of the cavity. If this rule is not followed, injury and failure are very likely to occur. The position of the handles of the instrument, when it is properly applied on the head, will point out the direction in which the extracting force is to be employed. Thus, when the head is high up in the pelvis, it will be found that after the blades have been passed up, and the lock joined, the handle will be directed backwards, and will press against the fourchette. Under such circumstances, any attempt to pull in the direction of the outlet would be fruitless and mischievous ; but if we follow the natural curve of the cavity, and draw first backwards, then downwards, and lastly forwards, according as the head is moved through the cavity, we will find our efforts crowned with success ; and unless the operator is devoid of common sense and discretion, and uses brutal violence, he will scarcely do any injury to his patient. If the head is lower in the pelvis than the case we have just supposed, it will be found that the handles of the forceps will look proportionably downwards, or even forwards, as the head is placed nearer to the vulva, and this direction must be followed in beginning the operation. In this case a shorter instrument than the one described, but constructed in the same manner, will be more convenient. As I have already said, it is not my intention to give a detailed description of the operation with the forceps ; but I thought it well to offer these few remarks upon what appear to me important points connected with it. In conclusion, I would say, let no one undertake it without good instruments, good patience, and an accurate knowledge of the position of the head, and of the anatomy of the parts through which it is to pass. If he brings these to the task, he will have reason to rejoice at saving lives from imminent peril.