Obstetrics: The Science and the Art - Part III. The Therapeutics and Surgery of Midwifery; Chapter XV. Of the Forceps

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"But if all these medicines profite not, then must be used more severe and hard remedies, with instruments, as hokes, tongues, and such other thynges made for the nonce. And first, the woman muste be layde along upright, the middle part of her bodye lying hier then all the rest, companied with women assisting her about, to comfort her and to kepe her downe, that when the byrth is plucked out she rise not withall. Then let the Mydwyfey annoynyt her lefte hande with the oyle of white Lillies, or other that may make it soople and smothe, and holding out her fingers, shutting together her hand, let her put it into the Matrix to seele and perceyve after what fashion the dead byrth lyeth in the Mother's wombe, so that she may the better put in hookes and such other instruments to plucke it out withall."

"Yf it be that it lye the head forward then fasten a hooke eyther uppon one of the eyes of it," &c. &c.

The above quotation from the "Woman's Booke, or the Byrth of Mankynde," may serve to show the Student what notions of Midwifery were entertained in the glorious age of Queen Elizabeth. Thomas Rainald, the author of this quaint old English, is the earliest English author on Midwifery. The volume from which I have made the extract was "imprinted London 1565," 4to. It consists chiefly of a translation from Rhodion. Let the Student be thankful that, in the age in which he lives, he is not foreordained to the use of hooks and other such instruments in difficult cases, for, in modern times, the resources of the obstetric art have been signally augmented by the discovery, and by the great perfection attained in constructing and using instruments for the forced delivery of the parturient woman. The ancients were not wanting in numerous inventions for expediting the birth of children, but, unhappily, all their instruments were constructed with the sole view and intention of being useful to the mother, and had no applicability to the child, except to extract it after depriving it of existence, or even to draw it forth from the womb still palpitating with life,
and presenting the most shocking spectacle of mutilation and distress. The *Uncus*, or Crotch, described by Celsus, continued, indeed, to be the model of obstetric instruments down to the close of the seventeenth century, when a happy thought resulted in the construction of an apparatus most perfectly adapted for the security both of mother and child, and which, at the present day, and in the hands of skilful and well-instructed persons, may be considered one of the greatest triumphs of art in behalf of suffering humanity.

Perhaps one of the ideas that would most readily and spontaneously present itself, in a case of difficult labor with a head presentation, would be to take hold of the head and draw it forth; and I believe that most of the good women who so assiduously exhort us to help our patients, actually do believe that we can take hold of the child's head with our fingers, and draw it into the world as readily as we can draw a dollar out of a purse, or take an apple from a basket. But we cannot take hold of the head and pull it down, simply because we cannot grasp an infant's head in the hand: we can apply the fingers to one side, and a thumb to the other side, and press it between them; but when we attempt to pull the head down, we find that the fingers and thumb are not long enough to admit of our grasping it; and we withdraw the hand, leaving the head just where it was before we made the foolish attempt, and the woman so much the worse for the additional irritation.

This attempt during the lapse of centuries, must have been made many thousands of times, and always with the same result; and the idea of extracting it with a pincers or forceps, sufficiently large to grasp the head, must also have presented itself for ages; but how to apply the forceps? A straight forceps could not grasp the head, for it would slip off, as if wedge-shaped; while to make the forceps curved, so as to grasp the head, would render it impossible to introduce it, since the forceps must first enter closed into the genital fissure, and then expand considerably to pass over the parietal protuberances so as to grasp the head when carried upwards far enough. It could not expand sufficiently to go over a head large enough to occupy with its own bulk the entire capacity of the excavation. Such, in fact, was the forceps of Palfyn, and such must have been the instrument spoken of by some of the Arabians. No forceps that could be got on to the undelivered head had been discovered; and in all cases, where the child could not be pushed back and turned, or where the head became permanently arrested, the medical people were obliged either to let the mother and her offspring perish together, or they unscrupulously sacrificed the child, to insure the escape of its parent. Our ancestors consoled themselves with a quotation from Tertullian to the following
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effect: "Atquin et in ipso adhuc utero, infans trucidatur necessariâ crudelitate, quum in exitu obliquatus, denegat partum, matricidus qui moriturus."

Barely to look over some of the plates representing the obstetric instruments employed previously to the discovery of the modern obstetric forceps, is sufficient to produce a shudder in any one familiar with the difficulties met with in parturition; and the griffin's claws, sharp crotchets, and tire-têtes, which were the boast of their inventors in a barbarous age, serve but to set forth more signally, by comparison, the eminent usefulness of the modern instrument to which we are indebted for our own escape from the necessity of employing such means as were familiar and commonplace with our predecessors.

The great desideratum in Midwifery was a forceps that might seize the head and extract it without inflicting a wound; and we are indebted for it to a Doctor Paul Chamberlen, who practised Midwifery in England towards the close of the sixteenth century. He constructed, probably with his own hands, two curved pieces of iron, which, being introduced separately, were applied one to the left and then one to the right side of the head, and united by a pivot-joint, by means of which the two separate pieces were converted into a pincers, or forceps, the handles of which crossed at the pivot or joint, and thus made the blades become capable of grasping and firmly holding the egg-shaped head of the child, while still contained in the vagina. As the handles crossed each other, and were secured by the pivot, which passed through a drilled or mortised hole in the joint, it followed that when the outer extremities or the handles were pressed towards each other, the head was firmly grasped betwixt the blades or clamps. The compressing or holding force being duly applied, a sufficient degree of extracting power enabled the Surgeon to draw the head forth from the passages, and the child was born without experiencing the smallest injury. In inventing this instrument, Chamberlen happily combined the ideas of a cochlea or blade, a junctura or lock, and a manubrium or handle; and it is surprising, seeing how simple, how manageable and how powerful is the apparatus, how beneficent and desirable, that so many centuries were allowed to pass over the records of medicine before the discovery of this method of conducting difficult labors with safety to the child. For centuries, the perforator and crotchets were the mother's instrument. The child's instrument, or forceps, was reserved to honor the seventeenth century by its invention.

This great discovery, the value of which is known only to medical men, would have entitled its author to the everlasting gratitude of his fellow-creatures, had he not tarnished his fame by shamefully making a secret of what ought to have been instantly promulgated for the
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general use of all who should stand in need of its merciful interven-
tion. But the spirit of the age, or perhaps his own venal spirit in-
duced him to confine the secret to his own breast, to be communicated,
at length to his sons, who were instructed in the mode of its use, and
are supposed to have drawn large profits from the necessities of the
unfortunate women who, knowing their superior skill, were compelled
to seek for safety at their hands only.

Little is now known of these persons except their names; and they
have deservedly sunk into the comparative oblivion that ought to
overtake all those who, having by accident or by genius, come into
the enjoyment of facilities that ought to be the common property of
humanity, instead of divulging them, and spreading their use and
employment as far as the want of them extends, are induced by a
sordid thirst for gold to retain them within their own hands, and
sometimes inhumanly permit the secret to perish, rather than give it
all the publicity and currency its importance entitles it to. Such is
the spirit of quackery or empiricism under whatever guise or in what-
ever art; and the fate of the Chamberlens, whose history is almost for-
gotten already, is but a just retribution for their base reservation of
so valuable a secret.

There is a curious and interesting case related by Mauriceau, in
which he informs us that Hugh Chamberlen, one of the sons of the
inventor, went to Paris in 1670, with a view to sell his secret to govern-
ment, and while there, boasted in the most confident manner of his
ability to deliver any woman, in any labor, no matter how difficult, in
half-a-quarter of an hour. It happened, at the time, that a woman
with a deformed pelvis fell in labor, who, after vain attempts to deliver
her, was put in Chamberlen's hands. He undertook the management
of the case with the utmost boldness, but, after a cruel perseverance
of three hours, was compelled through sheer fatigue and exhaustion,
to give it over, and confess his inability to effect the delivery. The
poor woman perished shortly after his retreat, and the body being ex-
amined, it was found that he had lacerated the womb and vagina in
various places with the points of the forceps. Mauriceau was so dis-
gusted with the issue of the affair, that he afterwards inveterately
opposed the use of such instruments; while Chamberlen immediately
returned to England, where he drew very large receipts from the prac-
tice of Midwifery in London.

As Chamberlen's preface to Mauriceau's work on the diseases of
women with child and in childbed is exceedingly rare, and particularly
so in the United States; and notwithstanding my detestation of his
wicked conduct in concealing his invention, I deem it proper to repub-
lish in this work his address to the readers of his translation of Mauriceau. It is but a proper contribution to the literary history of Midwifery, which I am sure my readers will not be sorry to possess. The following are his words:

"Having long observed the great want of necessary directions how to govern women with child, and in childbed, and also how new-born babes should be well ordered, I designed a small manual to that purpose; but meeting, some time after in France, with this treatise of Mauriceau (which, in my opinion, far exceeds all former authors, especially Culpeper, Sharp, Speculum Matricis, Sermon, &c., being less erroneous, and enriched with divers new observations), I changed my resolution into that of translating him; whom I need not much commend, because he is fortified with the approbation of the wardens of the Chirurgeons' Company of Paris.

"His anatomy was in the first edition omitted, but is in this; which, with the book, I have carefully rendered into English, for the benefit of our midwives; of whom many may yet very well admit of an additional knowledge. The principal thing worthy their observation in this book is, accurately to discover what is properly their work, and when it is necessary to send for advice and assistance, that so, many women and children may be preserved that now perish for want of seasonable help. My author makes out the breaking of the right waters, for the proper season of a natural delivery, and whenever a child is not born then, or soon after, nature is so much short of performing her office. This is certainly a great truth; and all wrong births should never be longer delayed: and for the most part floodings and convulsions not so long, lest the woman lose her life before ever the water breaks; but if no dangerous accident intervene, in a right labor, one may lengthen out their expectation to twelve hours after; and though some may have been happily delivered twenty-four hours, or two days after, yet I should not advise any to run that hazard, provided they can have an expert artist to deliver them, without destroying the child; because many have perished in that case; and it is not prudent to venture, where but one of many escapes. For the longer the labor continues after the breaking of the waters, the weaker both woman and child grow, and the drier her body, which renders the birth more difficult; and 'tis ever good taking time by the foretop.

"And that midwife's skill is certainly the greatest, and she deserves most commendation, who can soonest discover the success of the labor, and accordingly either wait with patience, or timely send for advice and help. Nor can it be so great a discredit to a midwife (let some of
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them imagine what they please) to have a woman or child saved by a man's assistance, as to suffer either to die under her own hand although delivered. For, that midwife mistakes her office that thinks she hath performed it, by only laying the woman; because her principal duty is to take care that she and her child be well, with safety and convenient speed, parted; and if this be impossible for her and feasible by another, it will justify her better to waive her imaginary reputation, and to send for help to save the woman and child, than to let any perish, when possible to be prevented; as in the case of my author's sister, and in the twentieth chapter of the first book. Yet, in countries and places where help and good advice is not seasonably to be had, midwives are compelled to do their best, as God shall enable them; which dangerous and uncertain trials it doth not become them to put in practice upon women, where no timely assistance need be wanting. Most wrong births, with or without pain; all floodings with clods, though little or no pain, whether at full time or not; all convulsions and many first labors; and some others, though the child be right, if little or no pain, after the breaking of the waters, and the child's not following them in some six or ten hours after, require the good advice of, and, peradventure, speedy delivery by expert physicians in this practice; for though a few may escape in these cases, yet the far greater number perish, if not aided by them. Let me therefore advise the good women, not so readily to blame those midwives who are not backward, in dangerous cases, to desire advice, lest it cost them dear, by discouraging, and forcing them to presume beyond their knowledge or strength, especially when too many are over-confident.

"Those few things wherein I dissent from my author, if of dangerous consequence, are noted in the margin; if not, are left to the discretion of the reader.

"I confess he is often too prolix; a fault which the French much affect; however, I chose rather to translate him according to his own style, than contract him; and also to leave unaltered some things not very well expressed, being of small moment. I find also he distinguishes not between the words plaister and ointment, but uses them promiscuously one for the other.

"In the seventeenth chapter of the second book, my author justifies the fastening hooks in the head of a child that comes right and yet because of some difficulty or disproportion cannot pass; which I confess has been, and is yet the practice of the most expert artists in midwifery, not only in England, but throughout Europe, and has much caused the report, that where a man comes, one or both must neces-
sarily die; and is the reason of forbearing to send, till the child is dead, or the mother dying. But I can neither approve of that practice nor those delays; because my father, brothers, and myself [though none else in Europe as I know] have, by God’s blessing, and our industry, attained to and long practiced a way to deliver women in this case, without any prejudice to them or their infants; though all others (being obliged, for want of such an expedient, to use the common way) do, and must endanger, if not destroy one or both with hooks. By this manual operation, a labor may be dispatched (on the least difficulty), with fewer pains, and sooner, to the great advantage, and without danger, both of women and child. If therefore the use of hooks by physicians and chirurgeons be condemned (without thereto necessitated through some monstrous birth), we can much less approve of a midwife’s using them, as some here in England boast they do; which rash presumption, in France, would call them in question for their lives.

“In the fifteenth chapter of this book, my author proposes the conveying sharp instruments into the womb, to extract a head, which is a dangerous operation, and may be much better done by our fore-mentioned art, as also the inconvenience and hazard of a child dying thereby prevented, which he supposes in the twenty-seventh chapter of this second book.

“I will now take leave to offer an apology for not publishing the secret I mention we have to extract children without hooks, where other artists use them, viz., there being my father and two brothers living, that practice this art, I cannot esteem it my own to dispose of, nor publish it without injury to them: and think I have not been unserviceable to my own country, although I do but inform them that the fore-mentioned three persons of our family, and myself, can serve them in these extremities, with greater safety than others.

“I design not this work to encourage any to practice by it, who were not bred up to it; for it will hardly make a midwife, though it may easily mend a bad one. Notwithstanding I recommend it to the perusal of all such women as are careful of their own and their friends’ safeties, there being many things in it worth their noting: and designing it chiefly for the female sex, I have not troubled myself to oppose or comment upon any physical or philosophical position my author proposes. I hope no good midwives will blame me or my author for reprehending the faults of bad ones, who are only aimed at, and admonished in this work; and I am confident none but the guilty will be concerned, and take it to themselves, which I desire they may, and amend. Farewell.

“HUGH CHAMBERLEN.”
I wish here to remark that, while the forceps consists of the cochlea, the junctura, and the manubrium, the instrument is essentially the cochlea or clamp, and that all inventors, and other persons who may project something better than any of the obstetric forceps now known to the profession, ought to bend the whole force of their art or genius to the improvement of the cochlea; since the junctura and the manubrium are matters of minor importance. To see the ridiculous attempts at improvement displayed in Mulder's work, and by every accoucheur who has just begun to get a small practice, is to convince one that most of the projectors regard the handle or else the joint as the thing, and wholly overlook the cochlea, which, after all, is what we want, and which, being of a good form and fabric, makes it indifferent how the lock and handle are arranged.

The father of the above-mentioned Hugh, Dr. Paul Chamberlen, had also for his son Dr. Peter Chamberlen, the one of whom Hugh speaks in the preface to his translation of Mauriceau. There must have been another son, since Hugh speaks of his father, his brothers, and himself. The name of one of the brothers appears, therefore, to be lost.

There are now in England specimens of the Chamberlen forceps, which were recently discovered in an old box, concealed beneath the floor of a country house formerly owned by the Chamberlens, at Woodham Mortimer Hall, in Essex. They have been described by Mr. Causardine, in Med.-Chir. Trans., ix. 183, into whose possession they came, and who had the good sense to present them to the Museum of the Royal College of Surgeons, London. There is the greatest reason to suppose that these specimens are instruments really made by the Chamberlens themselves, and that the collection shows their progress in invention, improving the apparatus at each successive attempt, until in one of the instruments they have succeeded in obtaining a really valuable form.

Being in London, in May 1845, I was greatly obliged by the kind assistance of Prof. Ed. W. Murphy, of University College, who not only procured permission, but engaged Mr. Coxeter, the cutler, to make fac-similes of the Chamberlen instruments for me, of which I here present faithful drawings. These drawings are five in number.

Fig. 118 is an extremely well-formed vectis, with a blunt crotch at

Fig. 118.
the end of the handle; the opening or fenestra is well represented in the drawing, which is from my camera lucida. The figure cannot represent the head-curve of this vectis, which is somewhat faulty in consequence of the slightness of that curve: still, it is an instrument of which one might make a fortunate use in a case of labor requiring nothing more than the vectis. The form of the hook at the other end of the handle, and the sharpness of its point, though they may perhaps entitle it to the character of the blunt-hook, might leave one, upon a narrower examination, under the impression that the Chamberlens must have employed it rather as a sharp crotchet than as a proper blunt-hook.

Fig. 119 represents, probably, the second attempt of the inventor to carry out his happy idea of the obstetric forceps; it consists of two separate pieces, with both the handles terminated by blunt-hooks; both possessing the old curve, and capable, therefore, of grasping the head when once applied to it while lying within the genital passages. I say separate pieces, since the two pieces may be taken apart by unscrewing the pivot, which in the figure is seen passing through the lock. The right hand branch was forged out of one piece of iron, like the vectis at Fig. 118; but the left hand branch was a piece of thick iron wire carried out to the extremity of the clamp, and then returned towards the lock, where its end, being flattened, forms a square head for the reception of the screw-pivot.

If this instrument, as I suppose, does really represent Chamberlen's second attempt at invention, it must be regarded as a remarkably successful effort; for, setting aside some imperfection in the amount of the old-curve or head-curve, it presents us with an apparatus, a true obstetrical forceps, of which the counterparts, being separately introduced and then locked by screwing on the pivot, might be so perfectly adjusted on a foetal cranium as to give the operator complete
power over it. The fenestra is very good: the curves, however, are extremely faulty. Not so with the forceps, Fig. 120, which is in all respects an admirable instrument as to the head-curve, as may be seen by inspecting it in the drawing. The iron of which it was forged is, it is true, rather clumsy, rough and heavy, but scarcely more to be condemned, on that account, than the heavy Berlin forceps of Professor Siebold. It had no pivot-joint, but the two compartments were fastened together by a strong flat braid, like that represented in the figure, which, being passed through holes drilled in the lock of the instrument and afterwards wrapped round the handles, would serve, after the adjustment of the blades on the head, to hold it quite securely and prevent even as much rocking motion as attends the use of the common English joint.

Fig. 121 shows the last and most perfect form of the obstetric forceps of the Chamberlens. It has what is now called the German lock; for the left-hand blade, or male blade, or lower blade, for these are synonymous terms, is provided with a fixed pivot, to receive upon it the female or upper blade, as may be seen at Fig. 122, in which the
pivot is represented, the handle being terminated by the bending outwards of the iron.

I have never delivered a woman with one of these old Chamberlen instruments, and while I should much prefer a forceps made by a modern artist to either of these early specimens of the invention, I would not hesitate in any case, where the vertex was at the pubal arch, to employ either Fig. 120 or 122, if my Davis's forceps was not at hand. The instrument is scarcely inferior to the Haighton forceps, in use in England at the present day.

In 1733, Dr. Samuel Chapman published a “Treatise on the Art of Midwifery,” &c., in which the forceps of the Chamberlens was given to the world; and from that time to the present day, it has undergone many modifications of form and size, and mode of coaptation: almost every distinguished practitioner or writer selecting some particular fashion as most in accordance with his especial views.

The instrument first employed had only one curve, that which applied itself to the head of the child in order to grasp it—and this is called the old-curve; it ought to be called the head-curve—so that a front view of it represents it as a straight instrument. An implement so fashioned could be easily applied to the head whenever it has descended quite into the excavation, or whenever the ear could be touched by the point of a finger introduced into the vagina. But in all cases of the head arrested in the superior strait, a forceps possessing only the old or head curve could not well be employed in its extraction, because the pelvis is itself curved, and hence when the points of the instrument should have mounted up sufficiently far to be on a level with or above the plane of the superior strait, the handles would necessarily press the edge of the perineum too far back towards the point of the coccyx. This pressure is both hazardous and painful, and endangers a painful contusion of the perineum, or even its laceration. To effect such an adaptation would always be difficult, and, in cases of rigid perineum, quite impossible.

From the period of the publication of this invention by Dr. Samuel Chapman, up to the middle of the eighteenth century, several new forms, deserving perhaps to be called improvements, were offered to the profession. For a history of these various modifications, which it is not necessary for me to present in this work, I refer the Student to Dr. Mülder's *Historia Literaria et Critica Forcipum et Vectium Obstetriciorum*, in which he will find accurate drawings of a great variety of forms and dimensions of obstetrical instruments, down to a late period in the history of that apparatus. To look at Mülder's account is enough to excite a smile in the reader at the ambition which
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proposes to build up a solid reputation rather by spoiling than by improving an implement already perhaps perfect.

Professor Asdrubali, in his *Trattato Generale di Obstetricia Teoretica e Practica*, vol. iii. p. 180, refers to Professor Manni's examination of the history and properties of the obstetric forceps, and he says: "Dopo questa correzione portata nel forcipe degli Ostetrici di Londra e di Parigi circa la metà del passato secolo, parea questo strumento giunto alla sua perfezione, ma lo spirito umano, sempre irrequieto più per l'ambizione di distinguersi, che per giovare ai suoi simili, ne mise fuori una serie numerosa dei già riprovati, e talvolta più meschini di quelli." And he names the forceps of Loder, Galletti, Santarelli, Steidele, Johnson, Orms, Denman, Smith, Lowther, Osiander, Eckard, Stark, Bush, Siebold, Thenance, Du Bois, Mursinna, and Brunninghausen; and concludes that all these modifications do not exhibit any real improvement of the forceps of Smellie and Levret.

Dr. Smellie, of London, and Dr. Levret, of Paris, both conceived at about the same period, that is about the year 1745, the idea of giving to the blades a new curve on the edges, so as to adapt them to the axis of the superior as well as to that of the inferior strait; and accordingly they produced the long forceps with New Curves, which are almost universally in use at the present day. Smellie, for common purposes, used his short strait forceps, fearing that too general and indiscriminate an employment of the long curved one might prove mischievous; while Levret recommended his long and powerful instrument as being equally adapted to all cases proper for forceps-operations. Smellie's instrument was united by the reciprocal notch, called the English joint or English lock, and Levret's was joined by a pivot and mortise, with a sliding plate to secure it when united. Both instruments were provided with fenesters, but of a size insufficient to do much more than render them lighter.

The French forceps, somewhat modified by Pean, has great vogue in this country at the present time, under the denomination of the Baudelocque forceps, which is two inches longer than Levret's, and is constructed without the bead or raised line that runs around the inner or foetal face of the clamps, and which, besides being useless, was found inconveniently to contuse or cut the scalp.

An obstetric forceps consists of two pieces or branches; a right-hand and a left-hand one, intended to be introduced separately between the sides of the head and the parts in which it is contained; but always so adjusted as to let the concave edge of the new curve look towards the front of the pelvis, to suit the curvature of which it was originally contrived or invented. The part that is called the
blade or clamp, the **cochlea**, ought to be applied on the side of the head, and not on the crown or occiput, and the extremity of the clamp should reach up at least as far as the chin. Hence, in constructing a forceps, it should be always considered necessary to make the clamp or blade part, sufficiently long to reach at least from the child's vertex to its chin; a distance of about five inches in the uncompressed state of the head, but which is much increased where the head is subjected to severe long-continued compression in the passages. But while the head itself requires the clamps of the instrument to be five inches long, the different positions or situations in which it is found at the time the forceps becomes necessary, demand that there should be given to the instrument length enough to embrace the head, whether it be high or low in the pelvis; and that, in introducing them, the lock or joint, the **junctura**, should not be carried within the orifice of the vagina.

There must also be a handle,—**manubrium**,—of sufficient length and strength to admit of its being used with facility. The forceps, therefore, is divided into the cochlea or blade, the junctura or lock, and the manubrium or handle. The proportion of these several parts may be adjusted in various ways, according to the taste or judgment of the several makers of them. Dr. Smellie, who generally employed his short straight forceps, constructed them of the length of eleven inches, while to his long-curved forceps he gave a length of twelve and a half inches.

The French or Baudelocque forceps, is a powerful instrument: the specimen before me, and which is made by Messrs. Rorer, is exactly eighteen inches in length, the pivot or joint being very nearly midway between the end of the clamps and the end of the handle. The ends of the clamps approach within three-quarters of an inch when the handles are close pressed together, while the greatest distance between the clamps is not quite two inches and a half. The blade or clamp has an open fenester which is not quite an inch wide at the widest part, but is six inches long, growing narrower as it approaches the lock, where it is not three-tenths of an inch in width. The lock or joint consists of a pivot in one branch, and a notch in the other. The pivot is fixed into its own blade by a screw, the top of which is a thumb-piece, by means of which it may be screwed into or withdrawn from its place. The notch in the other blade is adjusted so as to receive the pivot into the left or outer side of the instrument, and the top of the notch being countersunk, receives a conical shoulder at the bottom of the thumb-piece of the screw, by which means it is made perfectly secure against any motion except that of opening and
shutting the instrument. The end of each of the handles is curved outwards, to make a good blunt-hook; that upon occasion, may serve all the purposes for which the blunt-hook is used in Midwifery. The weight of the specimen is two pounds and seven-eighths of an ounce.

This powerful instrument, in skilful hands, may be made use of to overcome great obstacles; but, in careless or unskilful application, may be the cause of great mischief. It has been objected to by many prudent persons on account of the weight of metal, and the severe pressure of the child's head that may, almost unconsciously by the operator, be made with it. The late Dr. James very rarely used any other than a short-handled straight pair, called Haighton's forceps; yet I have had occasion to witness the application, by him, of a pair modelled upon the plan of the Baudelocque forceps. It cannot be doubted that all the benefits of the small forceps may be obtained in the use of the large one; and those who cannot conveniently command a variety of instruments would do well to familiarize themselves with that which I have above described. It has been well remarked by Baudelouque, that it is not so much the instrument that is to be looked to, as the hand that uses it.

The most convenient forceps that I have ever employed, and that which I commonly make use of, is the instrument recommended by the late Professor Davis, of the London University College.

The specimen now before me is the one described in Davis's Operative Midwifery, and was made under his direction for me by the late Mr. Botschan, of London. It weighs ten ounces and three-quarters, and is twelve inches in length: its lock is the English lock, composed of a notch in the upper surface of the left and in the lower surface of the right-hand branch. When the handles are closed, the ends of the clamps are seven-tenths of an inch apart, while the fenesters, at their widest part, are two and three-quarter inches asunder. The broadest part of the fenester is equal to two inches, while its whole length is five inches. From the extremities of the handles to the lock or point where the branches cross, is four and a quarter inches. After the branches are crossed, they do not divaricate, but proceed in parallel lines one inch and a quarter; hence, if a foetal head be ever so considerably elongated by the pressure of the parts, the clamps are sufficiently capacious to contain it, being seven inches long. In this instrument, such are the width and length of the fenestrae, that a large part of the parietal protuberances jut out through or beyond them when they are fixed on the head. Indeed, the foetal head, when held within its grasp, if it be properly adjusted, can hardly sustain any
injury from it, so admirably is it modelled on the convexities of the cranium.

I have several times delivered from the superior strait with Davis's forceps, an operation for which it is peculiarly well adapted by the boldness of the new-curve, particularly upon its convex or inferior edge. There is no forceps extant of which the new-curve so nearly coincides with an arc of Prof. Carus's circle. I am free to confess my preference for this over all other instruments for the safe delivery of the child, because I think it almost out of the bounds of possibility to injure the fetus with it, provided it be perfectly well adjusted, and used with common discretion. I have not myself employed the German forceps of Siebold, because I consider that the handles are very clumsy, and so widely separated, when the instrument is adjusted on the head, as to expose us to the hazard of compressing the cranium too violently. I have also thought the handles too much curved. But the author of the instrument is justly celebrated for his skill; and I am also aware that this is the instrument preferred and often used in our city by Dr. R. M. Huston, whose judgment and skill demand my highest respect. This gentleman, who is frequently called upon for consultation, has informed me that his success with Siebold's forceps, modified by himself, causes him to esteem it above all others. It ought to be observed that Dr. Huston's forceps, although modelled upon that of Prof. Siebold, is very different from it in regard to its lightness and manuability, in consequence of the great length of the lever. This is, perhaps, a fault, if it be true, as I believe it to be, that the obstetric forceps is not a compressor, but only a tractor and double lever. Shorter handles, which lessen the power of the lever, diminish the hazards to which the child is exposed from the compressive action of the instrument, which in most cases is, perhaps, too great. Short handles do not prevent us from holding the child securely: with short handles it is possible to make traction to an extent that is dangerous. My specimen of Siebold's forceps, manufactured at Berlin, weighs twenty-seven ounces and a half, while the instrument of Dr. Huston is but twenty-one ounces in weight.

Fig. 123 is a representation of this forceps modified from Siebold's, which I have taken from Huston's edition of Churchill's Midwifery. Upon looking along the convex edge of the new curve of Huston's forceps, it will be seen that the line is almost straight from a point a little beyond the posterior terminus of the fenestral opening, to the handle, so that the instrument is more seemingly than really curved— for the instrument, strictly speaking, is the clamp. The clamps are not very much bent, especially the concave edge of the new curve.
I subjoin here a drawing, Fig. 124, taken in the camera lucida, of my Davis's forceps made by Botshan, applied to the head of a child. It will be seen by inspection of the concave edge of the new curve, that that edge is not very much bent, while the convex edge of the curve represents almost the quadrant of a circle; and as the convex edge turns upwards to join the handle, which springs mainly from the concave edge, and is continuous therewith, it follows that, when the instrument is introduced into the cavity of the pelvis, it rests easily therein, because it does not strain back the anterior edge of the perineum towards the anus, or, what would be worse, even near to the point of the coccyx, as must happen when
the head is seized high up in the pelvis with any other instrument. The edge of the perineum, in using this instrument, comes forward almost as far as the line which is continuous with the concave edge of the curve. The great advantage attending the use of Davis's forceps, weighing ten ounces and three-quarters, is found in its lightness, and in the shortness of its handles, which, while they afford all the requisite purchase for making powerful and dangerous traction, yet from the shortness of the lever, serve to guard the child against the mischiefs of excessive compression; and I am convinced that the obstetric forceps was never designed to act as a compressor, but only as a tractor and double lever. Dr. Davis's implement is forged in such fashion that its interior face is perfectly adapted to the convexity of those parts of the head which it touches; while the fenestrae permit considerable portions of the parietal protuberances to project as segments of curves outside and beyond the fenestral openings. It would be true to say that the instrument, when accurately adjusted upon the sides of the cranium, scarcely presses the maternal tissues within the pelvis, for the exterior curves are formed so accurately that the tissues of the mother can never touch the edges of them; so that they cannot be cut by them, the surfaces of contact being everywhere broad and gently rounded. The admirable form of the old-curve or head-curve enables the instrument to touch large portions of the cranial surfaces, pressing them equably, not unequally: so that, indeed, when the instrument is accurately applied, it would be a difficult matter to do with it the least injury to the foetus, since it can scarcely slide. I prefer it for ordinary cases to all the other instruments that I have seen or heard of.

Each blade of this forceps is provided with a supplementary counterpart much narrower than the principal blades, which may be usefully resorted to in cases where, after easily adjusting the first blade, the apposition of the second blade is found to be difficult, dangerous, or impossible, in consequence of that portion of the head which the blade ought to cover, being jammed with violence against the bony wall of the pelvis. Under such circumstances, a narrow blade might admit of adjustment, whereas a broad one could by no means be safely applied.

I fervently desire the Student to have a proper idea of the meaning and intention of the accoucheur in using the obstetric forceps, for his course as a practitioner will depend much on the impressions he receives concerning the nature and design of the instrument. If I were possessed of such place and reputation in the world as might give to my opinion any semblance of authority, I do not know in what man-
ner I could exercise such authority more favorably to the interests of humanity, in this particular, than by establishing the doctrine that the obstetric forceps is the child's instrument; that the perforator, the crotchet, and the embryotomy forceps, are instruments for the mother; and that the Cesarean operation is an operation to be performed solely for the benefit of the parturient woman.

If a woman in labor is in a situation demanding immediate delivery by instrumental means without any reference to the interests of the child, it is clear that, to lessen the volume of the cranium by perforation and extract it with the crotchet or with my embryotomy forceps, is the safest as well as the swiftest method that can be employed; and every accoucheur should prefer this method in a case exhibiting undeniable proofs of the death of the foetus. Hence I repeat that the obstetric forceps is designed to save the child, and that the relief which it gives to the mother is but an appurtenant to it.

It is true that, in the conduct of a labor, the accoucheur shall often come to the conclusion to deliver with the forceps on account of some excessive pain, inability, or danger to which the woman is exposed; and this in cases where he would not adopt the resolution from views relative to the safety of the child alone.

In this sense, then, the Student might reply that the forceps is the mother's instrument; to which I answer, nay, but it is the child’s instrument; and I select it for my operation only because it makes the child safe, which could not be were I to use the mother's instruments—to wit, the perforator and the embryotomy forceps. I dare not to use the mother's instruments in contravention of the rights of the child, but I may with the child's instrument relieve the mother, and save her, while I do it no injury.

If the Student should take his impressions of this duty from studying the English books of midwifery, he will go into the world believing that the obstetric forceps is the mother's instrument, and he will use it for her, and for her alone; whereas, should he adopt the views above set forth, and which I deem to be perfectly sound and practical, he will enter upon his career feeling and knowing that he possesses an apparatus with which to rescue the child when in danger; and he will employ the instrument as often from indications relative solely to the child, as from indications relative solely to the mother; and he would, ceteris paribus, become a better accoucheur than the European Student, who, it seems to me, does not know more clearly than Chamberlen himself did, that the forceps is really designed for the rescue of the child. He will save more lives; for he will rescue many an
infant that but for such intervention would be stillborn; and he will save many a mother, who in Europe is allowed to test the spontaneous power up to a point at which embryotomy becomes indispensable to save the mother, a point at which she too often begins irrecoverably to sink.

The obstetric forceps is designed to be applied only to the cranium; it should never be applied to the pelvic extremity of the child.

The blades are to be applied to the sides of the head, the extremities of them passing up nearly as far as the chin. (See again Fig. 124.) They may be applied to the head in occipito-anterior and in occipito-posterior positions of it, and also in the transverse positions which it sometimes assumes. They may also be applied to the head in face presentations, whether the chin be to the pubis or to the sacrum; and their consummated conservatism must be frequently appealed to, for the succor of the child, in pelvic presentations in which the head cannot be extricated by the hand alone.

When properly adjusted in a suitable case, they give to the surgeon complete control over the progress of the labor.

I have said that the forceps is not a compressor, but merely a tractor; I might have said that, while it is a tractor, it is also a double lever.

In order to get a good idea of the lever-like action of the forceps, let the Student endeavor to deliver the foetus on the machine; and, for this purpose, let him employ a Baudelocque or French forceps. Having grasped the head, let him take hold of the blunt-hook of the left hand branch, and pull by that alone; and, as he pulls, very gently move the hook towards the left side, and having carried it far enough over in that direction, let him take hold of the blunt-hook of the right-hand branch, and pulling gently, or even merely holding on enough to keep the clamp of that branch from sinking into the pelvis, if he carries the handle over to the right side, he will find what is meant by, and what is the great and efficacious power of the lever-like operation of the forceps when drawn from handle to handle; for, as he carries the hook to the right, the blade of the other half of the forceps will be seen to emerge a little from the pelvis; and so, by alternating the lever-like motions, he will at last find that the forceps is withdrawn wholly from the pelvis, bringing away in its clamp the head of the young child unhurt by compression.

One of the most dangerous errors relative to the forceps that a Student could take up, would be the opinion that the forceps is, in its very design, a compressive instrument. It is not so; the forceps is not a pincers, it is an extractor—it is a real tire-tête; and I think it
ought to be established as a principle in obstetrics, that, where there
is not space enough for the descent of the head without the forceps
there cannot be produced a due proportion by merely squeezing the
head down to the required dimensions by such an instrument. If,
however the Student will hold such a disproportioned head firmly
with the cochlea, and draw it downwards, the pelvis and the tissues
may wire-draw it so as to enable it to pass the too narrow apertures
or canal. An ounce of gold may, by a certain force, be drawn through
the hole in a wire plate; while the force, a million times multiplied,
could by no means drive it through from the opposite side of the same
wire-plate. Lest, however, I might by the above give a wrong impres-
sion of my views, it is needful that I should state, that a head, by long
pressure of the pains, may sometimes be so moulded and reduced in
diameter as to pass through a pelvis smaller than the head was at the
commencement of the travail; whenever, therefore, the pains cease,
or are insufficient to reduce it, the forceps, used as an extractor, may
assist to that end by wire-drawing it; they should never squeeze it
merely to compress and diminish its dimensions; they should always
embrace it firmly enough to hold on and draw it down, so that the
passages may mould it as it descends.

The celebrated Baudelocque, in order to learn, by inspection, the
effects of direct pressure by the forceps, procured nine stillborn chil-
dren, and, by moulding their heads in the hand, restored them to the
natural shape. He also procured three forceps of the very best quality,
and as nearly alike as possible; he then applied the instruments over
the parietal protuberances and squeezed the heads until the handles
were brought into contact and tied firmly with a string, so that each
head might be accurately measured while under the compression and
then compared with its dimensions before the instruments were applied.
Such was the force employed in bringing the handles into contact, that
the instruments, though very choice ones, were all spoiled by the ex-
periment. These excellent experiments, for the particulars of which
I refer the Student to L'Art des Accouchemens, Part IV., chap. i., are
commented on by Baudelocque as follows:—

"It may be concluded from these experiments: 1st, that the reduc-
tion in size of the foetal head included in the clamp of the forceps,
differs according to the different degrees of firmness of the cranium at
birth, and the more or less complete closure of the sutures and fon-
tanels. 2d, that this reduction cannot in any case be so considerable
as has by accoucheurs been supposed, and can with difficulty, and
very rarely, exceed four or five lines, the instrument acting upon the
sides of the head. 3d, that the degree of reduction should never be
estimated from the distance remaining between the ends of the handles when they are pressed together in the act of delivering the head nor from the amount of force employed to bring them towards each other. 4th, and lastly, that the diameters which cross the compressed one, far from increasing in proportion to the diminution of the compressed one, do not in general augment to the extent of a quarter of a line, and in fact are sometimes even lessened."

The above-mentioned results, procured by so distinguished a writer as Baudelocque, ought to suffice for removing any disposition to regard the forceps as a compressing instrument, and so put us on our guard against the propensity to use it for such an object; but let it be considered that the head does not fill up the pelvis as a nail fills up the hole into which it is driven, but it is always caught and arrested by two or perhaps four points on which it is impelled, and we shall see that if we do use it to squeeze and reduce the size of the head, we shall only reduce those diameters that are already small enough, and augment those that are already too large; for it cannot be adjusted on points that are in such close contact as to constitute a real arrest. The proper view to take of the instrument is, that it is a substitute for labor pain, supplying the want of expulsive force when wholly absent, or aiding it when insufficient to effect the delivery. Impossibilities are not to be expected from it; yet in all cases where it is inapplicable, we are privileged to resort to other far less pleasant means.

It is common to apply the forceps to the head, only, after it has got fairly into the excavation, and the nearer the head is to the external organs, the more easily may the instrument be adjusted. Hence, in the management of a labor, though we may perceive the signs that indicate the use of instruments, we feel at liberty to wait until the presenting part can take an advantageous position, preferring to lose a little time, for the sake of greater facility and assurance of safety. Whenever the head has sunk so low as to get the vertex just under or behind the sub-pubal ligament, we experience little difficulty in placing the branches, successively introduced, in their proper positions, because the rotation being completed, the bi-parietal diameter does not occupy the entire transverse dimension of the pelvis; but when we have to apply it before rotation has taken place, there is great difficulty in getting either the first or the second branch directly over the side of the head; and when we fail to adjust the branches accurately in opposition, we either cannot make them lock, or we lock them in such a way that one edge of the instrument contuses or cuts the part of the scalp or cheek on which it rests, leaving a scar, or actually
THE FORCEPS.

breaking the tender bones of the cranium, while the other edge cuts
the womb or vagina by its free and projecting curve—in fact, the
forceps is designed for the sides of the head; and if, under the stress
of circumstances, we are compelled to fix them in any other position,
we always feel reluctant to do so, and look with painful anxiety to
the birth, to learn whether we have done the mischief we feared, but
which we could not avoid.

I ought to mention, that cases occur in which the forceps seems to
be clearly indicated, but in which, on trial, we cannot apply them; the
size and position of the head being such that we cannot by force or
dexterity get the blade of the instrument betwixt it and the bony
wall; in such a case skill and judgment ought to be employed, and,
when we cannot succeed, we must be content to know that we cannot,
and that no one else can. Further, we can sometimes adjust the
forceps perfectly, but cannot effect the delivery, because the parts are
too small. Here, also, we ought to suffer no feeling of mortification
to vex us for want of success; we should feel assured that we have
exerted a sufficient degree of strength and dexterity; and being satis-
fied that our duty has been in so far done, we lay aside the forceps to
resort to ulterior measures.

The forceps cannot be applied unless the parts are favorably dis-
posed; for instance, the os uteri must be dilated and gone up over the
head. The vagina and perineum also must be in such a condition
that we need have no fear of lacerating any of those parts; else, the
operation is contraindicated. A man shall hardly be justified
who inserts his forceps within the os uteri. He must
wait until the circle has risen above the parietal pro-
tuberance and can no more be felt.

Either the pains must have been proved insufficient for their office,
or else the exigent demand for delivery, arising from hemorrhage,
convulsion, or other states, must establish the indication. We should
be inexusable, if we should use them where the pains are still of vast
force, and fail of success on account of a preternatural resistance. If
we judge that the power of the pains is already as great as the patient
ought to bear, we ought not to apply the forceps, in order to add to
forces which are already of a dangerous degree of intensity.

The motive for the use of the operation should be clearly under-
stood as referable either to the mother and child; to the mother alone;
or to the child alone. The consent of responsible and interested
persons should be obtained; the motives for the operation should, if
possible, be clearly explained to the woman herself, and truthful, yet
reasonable promises should be made to provide for her safety and
comfort, both of which requiring that it be done. If time permits, some professional friend should be invited to witness and sanction the operation.

The position of the presentation should be well known; and, if needful, should be verified by the introduction of half the hand or the whole hand into the passage. The bladder and rectum should be evacuated, the latter by an enema, and the former by the catheter; the last precaution ought never to be neglected.

The bed should be prepared by bringing the end or side of it quite to the end or side of the bedstead, and then covering it with blankets and sheets of sufficient thickness to prevent the bed from being soiled. Part of a sheet should reach down to the floor, on which some cloths ought to be placed, to receive the fluids that commonly escape during the process of delivery.

The patient should be brought to the side or end of the bed, as the case may be, lying on her back, with the end of the sacrum resting near enough to the edge to admit of the most unrestrained access to the parts by the hand and the forceps. The feet should rest on two chairs or on the laps of her assistants, sitting with their backs turned to the patient, and far enough from each other to allow the operator to stand or sit between them; the patient always being covered with a light sheet or blanket, according to the temperature of the apartment.

The instruments, at all seasons of the year, should be placed before using them in a bowl of tepid water; and, when warmed, they should be anointed with sweet oil, which adheres to them better than lard.

Lastly, the parts should be freely anointed with lard.

The forceps are differently applied, according as the head is differently placed.

If the vertex present, and rotation have taken place so as to bring the point of the head just below or behind the sub-pubal ligament, the left-hand blade is to be taken in the left hand, and the fore and middle finger of the right hand should be passed upwards as far as conveniently can be done, betwixt the left ischium and the child's head, somewhat towards the posterior part of the pelvis or the left sacro-iliac junction. The branch should be held across the right groin, in a direction from above, downwards and inwards, so as to let the point of the blade be near the vulva, in which it is next gently and slowly introduced, allowing the concavity of the old-curve to be in contact with the convexity of the head. In proportion as it advances, the point is directed upwards towards the plane of the superior strait, the handle coming downwards as the introduction proceeds, care being taken to direct the point by the two fingers which guide it
as far as they reach. If any obstruction or difficulty is met with, let it be overcome by gentleness and dexterity, and not by force. For example, if the point comes in contact with an ear, that organ might be lacerated by any rude force, and a great deal of caution ought to be observed in order to protect the child from such a maiming, and the medical attendant from such a disgrace. At length the blade is introduced sufficiently far to show that the point is nearly even with the chin, and the old-curve in proper contact with the side of the cranium and face, and that it covers the ear.

The end of the handle should now be depressed, so as to force the edge of the perineum a little backwards, and then given in charge to one of the assistants, while the right-hand branch is taken in the right hand, and the fore and middle fingers of the left hand are introduced into the vagina, on the other side, as in the case just described. The branch is laid across the left groin, looking from above downwards and inwards, and the point of the blade is passed into the vagina above the first branch. This one should also be at first directed towards the sacro-iliac junction of the right side, and elevated as it proceeds so as to be brought at last into exact opposition to the left-hand branch. If any difficulty occurs in bringing it forwards enough, the two left-hand fingers that are guiding it will serve to slide it edgewise into the proper position. The branches are now to be joined at the lock; and the union of the branches is very easily effected if the opposition of the two counterparts is accurate. If the opposition be inaccurate, the locking is impossible, and ought not to be effected by force. When locked, let the handles be brought near enough together to make sure that the head is firmly grasped, and then the instrument is to be withdrawn a little, in order to effect its complete adaptation to the convex surface of the cranium, which it grasps in its jaws.

If the handles come not near enough into contact, that circumstance proves that the head is not properly seized; and nothing further should be done until the error is corrected. If they gape more than an inch and a half at the ends, they are not adjusted upon the parietal bones; but are obliquely set on the frontal and occipital regions. They ought to be a little more than an inch apart at the ends.

Whenever, during the process of introduction, a pain comes on, all action ought to be suspended until the pain has ceased. If this precaution be not observed, there is danger of contusion, or laceration by the blades of the instrument.

It frequently happens that the first or left-hand blade passes readily up to its proper position, and takes its place on the side of the head and face, without causing the least disagreeable sensation or the smallest
embarrassment to the accoucheur; but, when he attempts to put the other blade into position, he either fails to insert it as deep as the first one, or, having done so, finds himself baffled in every effort to lock the joint.

The first blade has perhaps taken up so much space as to have thrust the head strongly over against the right side of the pelvis; leaving no passage betwixt it and the cranium along which to make the second blade glide.

Upon the failure, after fair trial, both of the counterparts should be withdrawn. Perhaps a new pain may now succeed in forcing the presenting part a little onwards; or, perhaps, after wholly withdrawing the right-hand branch, the surgeon may succeed in using the left blade as a vectis to bring the head into a better attitude; so that, when the attempt to adjust the clamps is renewed, no difficulty is found to remain. He shall often succeed in adjusting the right-hand blade as a vectis, when he shall have withdrawn the left-hand blade.

When the two parts of the instrument are introduced far enough, they may have been so imperfectly adjusted that the concave edges of the new curve may be almost in contact, while the convex edges divaricate very much, the ends of the handles having their flat surfaces obliquely placed, as in Figure 125. Let the Student carefully examine this figure, and learn from it how to comprehend the meaning of this obliquity of the manubria which is difficult to understand without such explanation. It is not necessary for me here to make another figure, to show that, if the obliquity of the flat-faces of the manubria should be the reverse of what is here seen, it would be because the convex edges of the new-curves are too near, and the concave edges too far from each other. The instrument could not hold in such a position but would slip off behind, or in front, and destroy the vagina. This could not happen except where the accoucheur has placed the instrument too near or too far from the coronal surface of the head. An inexperienced person is very apt in this case to suppose the very reverse, or that he has placed the concave edge of the new-curve too far from the pubis and too near the sacrum; whereas,
it is really too near the pubal and too far from the sacral region of the excavation.

If he makes this mistake, which he will be apt to make, he would do well to remove the blade entirely, and give himself time to reflect anew upon the position of the child's head, and the relation of its right and left ears to the pelvic walls. In this way, having mastered the topography of the case, he will be likely to succeed upon renewing his attempt. It would be far wiser and far more charitable to do so than to make a barbarous and most unjustifiable endeavor to extract with forceps oblique and not in apposition, which they never can be when not opposite to each other.

Should he now succeed in making the adjustment, the handles will point parallel to the left abducted thigh in vertex labor in the first position, the head incompletely rotated; or, vice versa, to the right thigh; but, when rotation is complete and extension begun, they will coincide with the mesial line of the trunk. In proportion as the extension of the head makes greater progress, the handles rise upwards towards the woman's belly, for the head, bringing the forceps along with it in its descent, must pass out in coincidence with Carus's curve. The end of the handles in rising describes that same curve with a greater radius.

The instrument being now adjusted over the sides of the child's head, as in Fig. 124, let care be taken, before proceeding, that no external part be caught or pinched by the lock or joint. This is ascertained by passing the fingers round and within the orifice of the vulva. In general, no attempt to extract should be made until pain or tenesmus comes on. When the woman is ready, let the handles be held in the left hand, the middle finger of the left hand being placed in front of the joint or crossings, to assist in the extraction, while the index finger is pressed against the child's head, and always retained in contact therewith, during the extractive effort. The finger ought always, in this state, to touch the head; but if it leaves it, it is only because the blades are slipping off, in which case traction should cease until they are adjusted again. While the finger remains in contact with the head, there is no slipping of the instrument. It is shameful to let the forceps slip off the head and fly from the vulva with a suddenness sufficient to lacerate the parts. An operator ought to be turned out of doors, as soon as he allows so scandalous a misdemeanor to occur from carelessness or ignorance.

The most successful mode of using the instrument at first is to employ it as a lever, by moving it from handle to handle, exerting at the same time enough extractive force to prevent the opposite blade
from plunging deeper into the parts, while we move the handles to the right, or the left.

In exhibiting to my Class a demonstration of the lever-like action of the forceps, after having adjusted the instruments on the head, in the phantome, I take hold of the blunt-hook of the left-hand branch, and, leaving the other untouched, carry it (the left-hand handle) over towards the left thigh; in this action, the blade of the right-hand branch is found to be withdrawn considerably, bringing the head along with it, while the blade of the left-hand branch does not emerge at all. I next take hold of the blunt-hook of the right branch, and, drawing a little downwards, I carry it over towards the right thigh of the phantome, by which the blade of the left branch is withdrawn in like degree, bringing the head, which it grasps, along with it; so that, by several successive movements of the sort, the head is soon found to emerge completely from the vagina. It should be observed that, while I carry the left-hand branch to the left side, I do not allow the right-hand cochlea to sink deeper into the vagina, but keep what I have got with it, and then draw out an eighth or a fourth of an inch of its fellow, and *vice versā*. It is clear that if I successively get out an eighth of an inch of the right-hand, and then an eighth of an inch of the left-hand branch, keeping all I gain, I must in the end have drawn out the whole of the clamps, in which will be found the head. The problem is to adjust the forceps on the child's head, and then extract the forceps containing that head. Hence, get out one-eighth of an inch of each blade in succession by using its fellow as a lever and tractor. One trial of this method on the phantome will show the Student how powerful is the action of the forceps used in this way, for as one blade emerges, the other does not re-enter the passage.

In practice, all attempts at extraction ought to be made in conformity with the natural processes and dispositions or tendencies of the healthiest labor: there ought to be no hurry, no impatience, no temper exhibited by the operator.

In natural labor, there are intervals of rest; in artificial labor, there ought also to be good intervals of rest; which are required both for the physical relief and the moral relief of the patient. Her mind is strained up to the highest tension, by the mere thought that she is under the operation, and the tissues against which we are dragging the child yield better for a minute or two of rest, repeated from time to time, as the case admits or demands: nature gives pauses, so should the surgeon.

It should not be forgotten that the forceps embraces the head in a direction from the vertex to the chin; nor that, when the head is
evolved under the stress of the instrument, it ought to undergo the same mutations as it would if expelled by the natural pains. Hence, as the vertex emerges, and rises towards the front of the pubis, the ends of the handles must be permitted to rise along with it. They must never be prevented from taking the direction which the extension of the head, directed by the resisting perineum, naturally tends to give to them. In the last moments of the delivery of the head, during its extension, the inferior part of the occipital bone rests in contact with the mons veneris. If the forceps is still upon the head, in this situation, its handles will almost touch the abdomen of the mother.

A goodly proportion of the examples of forceps operations met with here, are, as I think, rendered necessary by rigidity of the soft parts, to overcome which, the expulsive faculties have been exhausted by vain efforts. Let it be borne in mind that, though the expulsive powers of the womb are enormously great, they sometimes fail of success because the vagina is not dilatable, or the perineum will not yield, or the labia will not suffer elongation; or all these obstacles may be in combined opposition to the delivery: remembering these things, we should not impatiently urge nature beyond her powers, lest we do injury where we are most solicitously endeavoring to do good. By rude and untempering exercise of strength, we incur great hazard of rupturing these organs, and of maiming the patient most injuriously, while we bring our art into disgrace. It is very true that the forceps acts as a dilator by separating the sides of the vagina and vulva before the advancing head; but, on this very account, and because it is so powerful a dilator, we are bound to exercise the greatest prudence in the use of it. I have, in many instances, refrained from the use of the forceps, where they were, on other grounds, strongly indicated, because I could appreciate the unreasonableness of any attempt suddenly to dilate the external organs, which I perceived to be far more frangible than dilatable.

It happens that, where the head has suffered a long arrest, and the natural powers have proved incompetent to its advancement, the application of the forceps, and moderate tractions with the instrument, will put it in rapid motion, so as to leave no doubt of its speedy expulsion under the natural powers. In such cases I have been accustomed to remove the forceps, and allow the child to be born by the spontaneous exertions of the womb. I do this with the view of sparing pain to the mother, and because the organs are less likely to suffer contusion or laceration without, than with, the instrument. But this ought not to be done except under full conviction that the expulsive...
powers, thus set in renewed activity, will be successful, since it is very mortifying to withdraw them prematurely, and be obliged to re-apply them.

Inasmuch as we cannot exert any very considerable tractile force, without compressing the head with a severity proportioned to it, we should occasionally relax our hold on the handles, in order to let the blades cease from pressing the cranium. The effects of the pressure are rendered less dangerous for the child, by being occasionally intermitted. The same reasons are conclusive against the practice used by some persons, of tying the handles with a fillet, which makes it impossible to relax the grasp of the clamps, without the trouble of untying the fillet every time such relaxation happens to be thought of.

Extreme caution is required for conducting the last stages of the operation with safety. The perineum should be well supported with a napkin held by the operator or his assistant; and the delivery of the head should be deliberate and slow, and the patient exhorted to lie as still as possible. In delivering a lady rather advanced in life of her first child, I was using a moderately strong traction while the head was passing out. On a sudden she threw up the pelvis, which changed the line of movement of the head. It was moving along Carus's curve, and as I had the handles of the forceps pretty firmly grasped during the muscular efforts I was making, I could not let go soon enough to prevent the head from lacerating the perineum very severely, by departing and moving off in a tangent of the curve. I felt then, and still do feel confident, that the perineum would not have been torn but for the unexpected and violent movement of her pelvis. She recovered from the effects of the laceration in about three weeks.

As soon as the head is delivered, the forceps should be removed and handed to an assistant, while we take care to attend to the delivery of the shoulders, and finally receive the child, which is to be done as in the most natural labor.

To apply the Forceps before the Rotation is completed.—A more difficult operation than that just described is the application of the forceps where rotation of the head has not taken place.

The first, and one of the most important steps here, is to ascertain accurately—I say with absolute accuracy—the situation of the foetal head. If the finger can reach the posterior fontanel, we ought to be able to appreciate, from that point, the relative situation of all the other parts of the cranium. If any doubt, however, remains after an attempt to discover the truth by the employment of the finger alone, the whole or one-half of the hand should be introduced into the
vagina, so that, by grasping the cranium with several fingers, we may become positively sure that our diagnosis of the position is correct. We will suppose the examination to have resulted in ascertaining that the vertex is in the first position, i.e. directed to the left and front wall of the pelvis.

The patient is to be placed upon the back, as in the other case; and the point of the left-hand branch of the forceps, guided by two fingers of the right hand in the left posterior part of the vagina, is to be passed upwards in front of the left sacro-iliac symphysis. The end of the blade being conducted up to the child's chin, it will be found that the pivot of the blade will look upwards and to the left, and the handle will be inclined towards the left thigh. The blade being properly adjusted, an assistant should be put in charge of the instrument while the right-hand branch, guided by two fingers of the left hand, is next to be introduced into the right and lower part of the vagina, and gradually swept forwards along the side of the head to the right side of the chin, so as to cover the ear; the notch being just opposite to the pivot. If the blades should not be found opposite to each other, they will not lock; they must be placed in opposition by bringing one of them more to the front, or by pushing the other more towards a lower part of the sacrum; and, when they come to press upon the opposite sides of the head, there is no difficulty in uniting them. When the branches are locked, they incline towards the left thigh of the mother, the pivot still looking upwards and to the left, and the handles having an appearance of awkwardness in this situation, which, to a tyro, communicates a feeling of doubt as to their being well placed. They look as if they were crooked, but this very awkwardness is the best evidence of their being situated right.

When ready to proceed with the extraction, advantage should be taken of the first pain, not to rotate the head by twisting the vertex to the right, but by moving the instrument from handle to handle, using at the same time a proper degree of traction. The rotation takes place as the head advances, and the vertex soon comes under the pubic arch, without any particular effort being made to rotate it. As soon as the vertex reaches the pubis, the peculiarities of this application of the forceps cease, and the remaining steps proceed as in the first-described case.

The vertex may present in the second position, in which case the posterior fontanel is towards the right and front of the pelvis. Let the woman be placed as before: after introducing two fingers of the right hand into the left side of the vagina, the left-hand branch of the forceps is to be conducted into it towards the fourchette, the point of the
blade sweeping upwards towards the child's chin, covering part of the ear, and coming off at the vertex. The handle will look towards the right thigh, and the pivot will point upward towards the right. The handle of the forceps should be very much depressed in this case, because, as the lock portion of the branch is inclined towards the right, it leaves scarcely space for the introduction of the female counterpart, to be introduced on that side; but a considerable depression of the handle affords more space for the purpose. The branch being correctly placed, is put in charge of an assistant, while the right-hand blade, being guarded by the introduction of two fingers, is passed into the vulva at its lower or back part, and its point turned upwards towards the left, as the handle sweeps downwards towards the right. The joint is brought into apposition and locked.

As soon as a pain comes on, traction, combined with the lever-like action, must be instituted, and as the head descends, the mechanism of the pelvis compels the vertex to rotate towards the pubis, under the arch of which it soon begins to jut. This being effected the peculiarities of the operation are removed, and its remaining conduct is to be fulfilled as before.

**Forceps in Occipito-Posterior Positions.**—In those cases where the vertex, instead of coming to the arch, rotates backwards and falls into the hollow of the sacrum, the forceps will be more likely to be required, because the difficulties of expulsion are greatly enhanced by the position. In this, just as in all the occipito-anterior positions, the vertex must escape first, notwithstanding it is directed backwards towards the sacrum; but, in order to do so, it must glide down the sacrum and coccyx, and along the perineum, after having distended it enormously, until the fourchette slides backwards and upwards behind the occipital bone of the infant. In order to effect this, the occipito-mental diameter of the foetus must become parallel with the axis of the inferior strait, or at least it must become nearly so. Such, however, is the violence of the flexion required for that purpose, that much time is lost before it can be obtained, and in many of the instances the woman is exhausted, and the pains gone, before it can be accomplished.

The position is ascertained by feeling the large fontanel behind the pubis, or just within the arch, while the sagittal suture runs backward towards the sacrum.

When it is found that the forceps will be required to extract the head, let the male branch, held in the left hand, be introduced into the back and lateral part of the vagina, and conducted towards the chin as far as possible, carrying the instrument up near the left sacro-iliae
junction at first, and gradually bringing it forwards so as to apply it accurately to the side of the head. The oblique diameter of the head dips so much towards the sacrum, that it is impossible to embrace the head properly without depressing the handle very much, and thrusting the edge of the perineum very far back, which, though a little painful, cannot be avoided; otherwise, the head will be grasped coincidently with its perpendicular and not its oblique diameter. The instrument being held in this way by an assistant, leaves a sufficient space on the right side of the vagina for the introduction of the female branch, which, being adjusted and locked with the male branch, leaves the handles very much depressed.

Having ascertained that none of the external parts are pinched at the lock, and that the head is surely grasped, the first movement in extraction should be to raise the handles up a little, with a view to compel the chin to approach still nearer the breast, and make the vertex to glide down the sacrum and coccyx, assisting its descent by means of the lateral or lever action of the forceps: the intention of the operator should be to draw the vertex off the sacrum, off the perineum, off the fourchette, and then let the head extend backwards on the outside.

As the perineum in this labor must be enormously distended, it behoves that great care and patience should be exercised, lest it might give way. It should be well supported, and, as soon as the vertex clears its edge, the handles ought no more to be raised, but on the contrary, depressed, to let the vertex go backwards—a movement exactly the reverse of what takes place in the occipito-anterior position. The head being delivered, the shoulders rotate in the excavation, and the right or the left one comes to the pubic arch, so that the rest of the process is concluded as in a first or second position, except that the front parts of the child, instead of the back parts of it, come out towards the front of the pelvis, which makes no difference of any import.

The application of the forceps for the occipito-posterior position, say the fourth or fifth, where rotation has not taken place, is more difficult than the one just above treated of. The blades are with much less facility applied, and, indeed, cannot take hold along the oblique diameter so completely as is to be desired; they rather seize the head along its vertical diameter at first, and are gradually brought into parallelism with the oblique one, as extraction proceeds. Reflection upon this circumstance is very needful at the time of the operation, lest the infant's head should be contused and ground, and even cut by the blades.
The introduction takes place as in a first or second position, the fourth corresponding to the first, and the fifth to the second. The handles must be well depressed in this case, and it will be allowable to make prudent efforts to rotate the vertex into the hollow of the sacrum—it being always understood that all hope of bringing it to the pubis has, after experiment, failed.

**Forceps in Transverse Positions.**—The head is sometimes situated transversely, the vertex resting against one, and the forehead against the other ischium. Let us suppose the vertex at the right ischium, and that it is intended to apply the male blade to the left side of the head, with a concave edge of the new-curve looking towards the occiput.

Therefore, let the left-hand branch be introduced into the left posterior part of the vagina, and, as the point enters more and more, the handle should be depressed, until the curve applies itself on the left side of the head in a direction from the vertex to the chin, or as nearly so as may be practicable. It should be understood, however, that the blade will scarcely apply itself in that direction, because the chin is not so near to the breast as it ought to be. When the blade is adjusted, its pivot looks to the right, and lies in a horizontal position, while the handle juts out obliquely towards the right thigh, which is much abducted.

As the left-hand branch projects towards the right, there will be some difficulty in finding room for the introduction of the right-hand branch; yet the first one can be temporarily pushed out of the way, so as to let the point enter at the inferior right side of the orifice of the vagina. When the curve is applied to the convexity of the cranium, it must be pushed upwards, backwards, and towards the left, so that its point may approach the chin, and the notch be brought in apposition with the pivot, and so locked. The head, being firmly held, may be moved in a direction from handle to handle, and moderately rotated, so as to dislodge it; and the tractions being commenced, it is found to descend, the forceps rotating along with it, until the pivot becomes vertical, and the fontanel appears at the arch.

In all the operations I have described, the male or inferior blade is to be first introduced, otherwise the female or upper blade cannot be introduced without getting it below the inferior blade. There is one position of the head, however, in which it is proper to introduce the female blade first—and there is but one—which I shall proceed to treat of: it is that in which the vertex touches the left ischium, and the forehead the right ischium.
It is clear that, when the instrument has grasped the head in this position, the handles will project very much towards the left thigh in strong abduction; but if we introduce the male blade first, inasmuch as its handle will project towards the left thigh, it will occupy all the space on that side, and prevent the insertion of the second branch, for there will be left no place for the handle to be depressed in. To avoid this difficulty, therefore, take the female or upper blade in the right hand, and introduce it into the posterior and right side of the vagina, conducting its point as near as may be to the chin, and over the face to the right side of the head behind the pubis, leaving the handle to project towards the left thigh. Next, take the male blade into the right hand, and, turning the concave edge of the new-curve downwards, insert the point into the right side of the vagina, below the female branch. Let the foetal face of the clamp apply itself to the convexity of the head, and slide it onwards, and, in proportion as it enters, make it sweep round the crown of the head towards the back of the pelvis. In effecting this, the handle comes gradually down as the clamp gets on the left side of the cranium, and at last the lock is found to be where it ought to be, namely, under the upper or female blade, with which it is then to be locked.

When we have ascertained that the head is properly held, or grasped, we may proceed, as before, to move and to attempt to rotate it, and then deliver when the vertex emerges from beneath the symphysis pubis.

The Forceps in Face Presentations.—Among the sixteen thousand four hundred and fourteen women delivered at the Dublin Hospital, under charge of Dr. Collins, thirty-three had face presentations, and four of these had stillborn children, which is a little less than twelve per cent. of mortality in this labor. I have said enough in my observations on Face Presentations, at page 377, et seq., to make it unnecessary for me to repeat anything here in relation to the difficulties of that sort of birth. It is merely necessary to remark that the forceps, when their use is indicated in this labor, must be applied to the sides of the head by carrying the points of the blades nearly up to the vertex. In those examples in which the chin comes to the pubis, the handles need not be very much depressed; but in those in which the top of the forehead is at the pubis, the handles must at first be very strongly depressed, and, as the case proceeds, they must be strongly elevated, so as to get the chin down to the fourchette, over which it must slip, and then begin at once to approach the breast again, in the act of flexion. As soon as the chin is free, we allow the
handles to descend again, while we continue the traction until the head is completely emerged. I shall take this opportunity to state, that I conceive it impossible to have a better instrument for this particular labor than Davis's forceps, as made by Botschan, 35 Worship Street, London. It holds the head as in a basket, and is far less likely than any other with which I am acquainted, to bruise or in any way injure the child. Figures 80 and 83 show the difference between a face case, in which the chin comes to the pubis, and one in which the forehead is there, and also the manner in which the head is to be taken hold of by the forceps.

The Forceps in Locked Head.—The head is said to be locked, whenever two opposite sides of it are caught by two opposite sides of the pelvic wall and held so firmly that it can descend no lower, and either cannot, or cannot without great difficulty be pushed upwards again into a freer larger space. In general, when the head is thus locked, it is in its transverse or bi-parietal diameter, one parietal protuberance being held at the pubis, and the other at the projection of the sacrum. Supposing the pelvis to be only three and a half inches in its antero-posterior diameter, and the head to be three and three-quarters in its smallest diameter, then it might happen, as it does in fact happen, that the cone of the head should be driven, by the force of the long continued pains, into the narrow pass, the delicate bones of the head giving way, and becoming indented under the pressure of the promontory of the sacrum, and moving downwards until it becomes immovably fixed by the opposing points of the pubis and sacrum. This state would constitute what is called a locked head. Many evils result from this locking of the head. For example, the woman, after vain efforts and great sufferings, becomes feverish, and loses her pains altogether; or a state of constitutional irritation comes on, marked by a frequent, small pulse, coolness of the extremities, sunken cadaverous appearance of the face, delirium, jactitation, and vomiting, which, if not soon relieved, are followed by death, hastening with rapid strides to end the strife. The pressure destroys the child; or it produces gangrene of the parts of the mother that are compressed, or causes inflammation to take place, succeeded by sloughing and its consequences. Or, the urethra, being effectually compressed betwixt the cranium of the fetus and the symphysis pubis, a total suppression of urine takes place, followed by its very serious consequences; or, lastly, the soft parts, perhaps the vagina, or possibly the womb, from being pinched as above stated, may give way during a
pain, and the laceration, once begun, may extend so as to allow the child to escape into the peritoneal sac.

Whenever, then, the head is found to be so situated that it will neither advance nor retreat, it may be said to be locked, and the case ought to command the greatest care from the medical attendant.

It is manifest that, if the arresting points of the pelvis touch the head at its parietal protuberances, no possibility exists of applying the forceps in that direction; there is not space enough to admit of the blades, and if they are to be applied to the head, it can only be on those parts that are free from great pressure, as the forehead on one side, and the occiput on the other; and this must be done notwithstanding any fear of contusing the face, of which there is some risk, but which very risk becomes less the more it is borne in mind.

When the attempt to deliver is about to be begun, the forceps should be well pressed together, so that, when the lever-like movement takes place, their blades may not be allowed to slip or slide on the forehead, which would thereby be liable to excoriation, or even to be deeply cut by their edges, formed, as is well known, for application to a convexity different from that of the face. The motion from handle to handle, assisted by a sufficiently powerful traction, will, ordinarily, succeed in disengaging the head, and getting it down into the excavation; upon which the blades ought to be removed, and, if the pains prove strong enough, they need not to be reapplied; but, in the lack of a proper force, they should be adjusted anew, and on the sides of the head, for which their curves were fashioned, and to which only they are really adapted.

In making compression, let it be carefully remembered that the compression is not designed to diminish the diameters, but only to hold the object more securely or steadily: any amount of compressive action beyond this indispensable one is mischievous, as tending to augment the difficulty by forcing the parietal protuberances more decidedly against the arresting points. I succeeded by this means in drawing a head through a pelvis so faulty in its antero-posterior diameter, that I could readily touch the sacrum, by introducing only the forefinger into the vagina. The patient was a very small woman of color, to whom I was called in consultation by a young medical friend; the child was dead, but not injured by the instrument. So great was the difficulty, that I at one period entertained very seriously the idea of performing the embryulcia. If I had known the child to be dead, I should have greatly preferred to do so.

In these cases, the operator, who alone can estimate the degree of force he employs, is the sole judge as to whether that force is too great
to be compatible with the safety of the woman: should he, upon a
due consideration of it, deem it wholly unsafe to proceed, or imprac-
ticable to succeed by any legitimate exertion of his strength, there re-
 mains the resource, sad as it is, of the perforator. Now that we have
the advantage of the stethoscope, we can with great certainty, deter-
mine the question of the life or death of the foetus in utero: and
where we find, upon auscultation, that its life is extinct, we need have
but little hesitation in applying the perforator, in order to reduce the
size of the skull by extracting its contents. In doing this, however
unpleasant the operation, we remove much of the danger arising from
a further continuance of the pressure on the soft parts of the mother.
In case the stethoscope reveals the fact that the foetus is still living, we
should feel constrained to wait so long as to overstep, perhaps, the
boundaries of prudence.

But it does not always happen that the head is locked in the direc-
tion and situation above pointed out. The vertex may be jammed
down behind the pubis, and the forehead in front of the promontory.
Here the forceps can be legitimately adjusted; and they admit of the
application of a greater force, and it will be probably found less diffi-
cult to unlock and rotate the head, in consequence of the greater con-
vexity of the points of arrest. Some degree of rotation ought to be
given to the head by means of the forceps until they succeed in get-
ing it down into the excavation, whereupon the vertex may be rotat-
ed back again to the arch of the pubis, and so withdrawn.

Impaction of the head cannot take place at the superior strait; the
form of that opening is such that its heart-shaped circumference cannot
be filled by the head of a child; there would always be found a part of
it in which not only the blade of a forceps, but a couple of fingers,
would find passage; but after the head has sunk below the strait, the
conical figure of the excavation perhaps admits of its whole circum-
fERENCE being occupied by the head, which fills it up completely, and
so completely that the forceps can find no space in which to pass.
Let the attempt, however, be made, and in every unavoidable case,
where it fails of success, the head can be opened, and the skull made
to collapse.

The Forceps in Pelvic Presentations.—It only remains for me
to relate the manner of applying the forceps in breech or footling
cases, wherein the head refuses to come away after the shoulders are
delivered. I have already said, that it is my invariable rule to have
the forceps in readiness, in every instance in which I discover that the
head is to be the part last born.
When the instrument is wanted for such a use, it is wanted sud-
denly—immediately; and the medical attendant fails in his duty, who
finds himself in want of forceps for this purpose, and is obliged to
send for them; for a child perishes while a messenger is going a
hundred yards, or putting on his boots.

There is no need of my going again at length over the causes that
render the forceps necessary on these occasions. It is enough to know
that the expulsive powers are wanting, either from disproportion, from
cessation of efforts both voluntary and involuntary, or from mal-posi-
tion, and that if the head continues undelivered but a few minutes,
the child is lost.

Supposing that the shoulders are delivered, and the face in the
hollow of the sacrum; let a napkin be wrapped round the body of the
child, including the arms, which should be placed against its sides, so
as to keep them out of the way. Then, giving the body to an assist-
ant, let it be held by the thighs or hips, in a position nearly perpen-
dicular, so as to press the nucha against the arch of the pubis; or its
back may be carried over nearly into contact with the mother's abdo-
men, to get it out of the way. The left-hand blade, guided by two
fingers of the right hand, is then to be passed in at the left side of the
vagina and applied to the head, covering it in the direction from chin
to vertex. The right-hand branch is next introduced, with similar
precaution, into the inferior and right side of the vagina, and so con-
ducted on to the head as to embrace it from chin to vertex. As soon
as the instrument locks, the tractions are to be commenced, and there
will be, in general, little delay in the extraction, if the handles be
raised as the head emerges; they requiring to be elevated, just as is
needful in the delivery of occipito-anterior positions. If an accoucheur
should attempt to perform this operation for a patient in any other
than the dorsal decubitus, he would find himself greatly embarrassed.

But, if the child be unfortunately born with the toes towards the
pubis, and rotation in the subsequent stages cannot be effected, so that
the face remains uppermost; if, in this case, vain attempts to deliver
by the hand have been tried; then, let the woman lie on her left side,
with the thighs strongly flexed; let the child be turned back as far as it
can be done with safety to its neck, so as to bend the neck very much
backwards. By giving to it this position, the forceps can be intro-
duced in front of the child, the left-hand branch being first passed up
on the left side of the chin and carried as far as the vertex; while the
female branch is introduced upon the opposite side so far as to allow
of its being locked with the pivot. As soon as the head is properly
seized, let it be drawn downwards in such a direction as to cause the
chin to emerge under the arch; to which end, let the handles be at first somewhat lowered.

Where, however, it can be effected with proper celerity, it is better, for this application of the forceps, to bring the woman to the edge of the bed, and, allowing the perineum to project beyond it, cause her feet to be supported in the usual manner. The child, wrapped in a napkin, can well be intrusted to a kneeling assistant, as it is held nearly in a vertical or standing position. In this way the branches of the instrument have free access to the left and right sides of the vagina, and lock with the greatest ease in front of the throat. Except in such a position of the woman, I cannot conceive how it would be practicable to use the long forceps; but Haighton's or Davis's forceps could be applied while on the side, though not so easily as on the back.

Section of the Pubis.—I have little to say here in regard to the operation of Symphyseotomy, commonly called the Sigaultian section—an operation which was proposed and performed by M. Sigault, in the year 1777.

The proposition to increase the dimensions of the planes of the pelvis, by cutting asunder the symphysis pubis, excited, soon after the promulgation of it, a great sensation throughout Europe, and many operations were soon afterwards performed with various success. It is probable, however, that the increase of amplitude of the planes of the pelvis is not so considerable as the friends of the section at first hoped for, and the dangerous traction of the tissues behind the separated pubes, and the gaping of the sacro-iliac junctions, one or both, were causes of ill success that have allowed it at last to fall into complete desuetude. So far as I know, the operation has never been done in this country. I feel not the least inclination to recommend the performance of it, and I refer the reader, who may feel interested in inquiring into the method, to M. Baudelocque's work on midwifery, and to the curious Essais Historiques Littéraires et Critiques sur l'Art des Accouchemens, par M. Sue, le jeune, Paris, 1779, 2 vols. 8vo. Dr. Churchill, in his System of Midwifery, p. 376, gives the statistics of the operation, as it has hitherto been done, and, in the most emphatic manner, discourages and condemns it.

Before I close this chapter, I must reiterate the expression of an opinion which I have already uttered at page 546—it is, that the obstetric forceps is the child's instrument; that the perforator, the crotchet, and the embryotomy forceps are instruments for the mother; and that the Caesarean operation, in its spirit and intention, should be
devoted absolutely to the conservation of the mother alone: in saying so, I am not insensible of the great satisfaction enjoyed by the surgeon who, under the distressing duress which should alone compel him to subject a living woman to the Caesarean section, is rewarded with the happiness of rescuing both the child and its parent from the jaws of an otherwise inevitable grave. I hold that no man has a right to subject a living, breathing human creature to so great a hazard as that attending the Cesarean section, from views relating to any other interests than those of the patient alone.

I believe that the Cesarean operation ought never to be performed in any case, whether the child be living or dead, in which, under a ripe and sound judgment and perfect knowledge of Midwifery, a decision may be obtained, that delivery *per vias naturales* is less dangerous to the woman than one by vivisection.

Now, as to a question concerning the smallest pelvis through which it is possible to deliver, I think it impossible to fix a minimum aperture through which a woman may be safely delivered. Elizabeth Sherwood was delivered having a pelvis of one inch and three-quarters, and I twice delivered Mrs. R. with one under two inches; but to say that a pelvis two inches and three quarters is the lowest through which a woman can expel a child, is to speak contrary to the record. Indeed, the dimensions that render a Cesarean section indispensable, are variable dimensions; they never can be fixed and prescribed by precept or law, for one woman may have strength and courage and endurance to enable her to bear delivery in a pelvis of one inch and three-quarters, as in Elizabeth Sherwood's case, whereas, in another woman the lapses of her strength may be so rapid, and the exigencies of her condition so urgent, that, if she be not promptly relieved she will inevitably be lost. Hence, my assertion is correct, that the dimensions demanding the Cesarean operation are variable. If we go down to diameters of one inch and a half, or to diameters of one inch, then the question of delivery *per vias naturales* is set aside. But we may find a case in which a woman, having a pelvis of two inches and a half, ought to be delivered by the section, because, we conclude she cannot live long enough to escape by the slow process of a crotchet operation. I should not hesitate, therefore, to recommend the Cesarean operation in a pelvis between two and two and a half inches in one case, nor would I hesitate in another case to prefer an embryotomy operation in a pelvis somewhat below two inches in its diameter.

I have been present in consultation where urgent demands and pressing arguments were in vain proffered to induce me to consent to
a Caesarean operation; those arguments were based chiefly upon the
claims, or superior rights, of the child. In that case, as in all others,
I was actuated in my opposition to the operation by the firm opinion
that the child has no positive claims whatever, if they conflict at all
with the rights of its more important parent; and I regard myself as
not guilty of inhumanity in indulging or in expressing this sentiment
—and I repeat a sentiment expressed upon page 531, in the quotation
from Tertullian: "Atquin et in ipso adhuc utero, infans trucidatur neces-
sarid crudelitate, quum in exitu obliquatus, denegat partum, matricidus
qui moriturus."

It appears to me an important matter that the medical profession
should have just views as to the indications for these grave and dire-
ful operations. As I have great reason to think that many gentle-
men, my brethren, have not given themselves time to reflect upon all
the points of the indications, I am the more desirous to have an
opportunity to state my own convictions in the matter, and I should
be glad in the most emphatic manner to enter my protest upon the
records of Obstetrics, against the Caesarean operation being performed
with any other views than those relative to the conservation of the
mother, with the salvo always, that to save the child is a great
additional good fortune. I believe that he who performs the Caesarean
section upon views relative chiefly to the conservation of the foetus
flies in the face of the soundest doctrine; and I cannot understand
how the conscience of such an operator should ever be appeased
under the pungent reflections that must follow a fatal operation not
rendered inevitable by the exigencies of his patient.

The number of cases of deformed pelvis met with in the United
States, appears to be far less considerable than those met with in
England or in the Continent of Europe.