Decapitation
and
Decapitating Instruments

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In the year 1852 there occurred 617,902 cases of child-bearing in England and Wales. The proportion of cases in which Embyotomy is resorted to for the delivery of the mother in this country has been computed as 1 in every 291 labours, which is equivalent to saying that this operation was practiced in upwards of 2100 of the above mentioned cases. Adding a proportionate number for Scotland, it would be a very moderate computation to state the number of instances in which Embyotomy is performed in Great Britain alone as 2400 annually. From this simple statement it will appear that the operation...
Operation, though comparatively a rare one, occurring but seldom in the practice of any individual accoucheur, is not of sufficient frequency to demand the attention of every obstetric practitioner.

The operation is fatal to the mother in one out of every 5 or 5½ cases. In other words 400 mothers or more perish annually in this island after submitting to the operation, or on an average one at least every day of the year.

This fact gives importance to the subject and makes it of consequence to enquire whether this mortality is unavoidable, whether any modification of the operation would conduce to its diminution, whether the instruments as present in use are the best that can be contrived for the purpose, and if not, of what improvements they are susceptible, or whether more suitable instruments might be substituted in their place.

There is one complication which sometimes occurs, namely where from the position of the fetus, it is necessary not only to open and evacuate one or more of the great cavities, but also
also to separate the head from the body in order to effect its extraction. The frequency of this complication has not been able to be ascertained, but it is obvious that when it does occur, it must be of the utmost importance that the separation should be speedily effected and as far as possible without injury to the structures of the mother. It is to the consideration of this complication, and the means of meeting it, that I propose to devote this paper. Perhaps the best way of introducing the remarks which are to follow will be by the relation of an actual case.

Catherine Casey, aged 35, a native of Ireland, now residing on Bell's Close, Cowgate, Edinburgh, is a tall woman, rather masculine in her features as well as in the general conformation of her body. She is also of a decidedly straitlaced habit, exhibiting many of the peculiarities of persons of that. Catherine had been the mother of six children, the first three of whom—girls—were all born naturally and are still alive. She founds, a male child.
A male child, was, after a long and severe labour, extracted with the Forceps, and only lived a few days. The fifth was a premature birth, the labour which was of short duration, having come on very unexpectedly and without any assigned reason. This fetus when born was very small and feeble. Some unfortunately were small to get the correct duration of this pregnancy.

This woman's sixth confinement, and the one which has made her case one of peculiar interest to us, took place on the 9th of November last. Through the kindness of the Resident Surgeon of the Maternity Hospital, I had an opportunity of seeing this patient early on the morning of her confinement.

On questioning her as to the duration of her labour, she informed us that the pain commenced in the afternoon of the 7th, that they increased in severity until the evening of the 8th, when the membranes ruptured, and the liquid amniue was evacuated; the pain still increased in severity, recurring at shorter intervals like early on the morning of the 9th, when they suddenly ceased. The patient becoming alarmed.
alarmed at this unusual occurrence then
for the first time sent for medical aid.
On reaching the patient's dwelling, we
found her rather weak; her pulse, though
weak was not unusually rapid. Making
a vaginal examination, we found the genital-
Canal soft and easily dilatable; its tempe-
rature was also considerably above the normal
standard, and its walls were lubricated by
a copious supply of Mucus. On passing
the finger a little higher up the vagina, it
came in contact with the left shoulder of
the Fetus, which was pushed so far down
in the pelvis that the examining finger
easily reached the bend of the left elbow,
which confirmed our previous diagnosis
as to the part that was presenting. The umbi-
lical cord was also prolapsed passing
down a little below the axilla between the
left arm and thoracic wall where it had
been subjected to considerable compression
from the firm wedging of the presenting
part at the rim of the pelvis.
After a careful examination, entertaining no hope of a favourable result ending if the case were left to nature, also from the pale and gradually diminishing pulsations of the cord, combined with the inflected condition of the patient, we concluded that the case, to afford a chance of safety to both mother and child, should be terminated artificially and without delay. Dr. Wood was consequently sent for and arrived about 8 o'clock in the morning.

A stethoscopic examination was now had recourse to but could have given no positive evidence of the fixation of the fetus, and could only have given a very unfavourable indication as to its condition in utero, as the pulsations of its heart were already very feeble if not entirely extinct.

After ascertaining the exact state of matters by a vaginal examination, Dr. Wood made several attempts to turn the fetus. This however could not be effected in consequence of the firm wedging of the presenting part in the brim of the pelvis, and of the firm contraction of the uterus round the body of the child.
This means having failed it now became evident that some more formidable measure would have to be resorted to for the safe delivery of this patient. It was therefore with her consent agreed that she should be removed to the Maternity Hospital, where she was at 12.30 P.M. seen and examined by Professor Simpson, and several other eminent medical gentlemen, who concluded, from the deformity of the pelvis, the impracticability of turning, and the weakened condition of the patient, that the child should be removed by Cesarean section.

Shortly after 1 P.M., the woman having been put under the influence of chloroform, Professor Simpson commenced the operation by passing a blunt hook round the neck of the child for the purpose of dragging it down into the pelvis so as to bring it into a more favourable position for the application of the decapitating instruments. This having been done, Simpson tried to apply Ramsbothams decapitator over the child's neck for the purpose of decapitating it, but for reasons which I shall endeavour to explain
explain at a subsequent part of this paper, this instrument could not be applied, and after several attempts was discarded altogether.

Professor Simpson then thought the Ceraceur might be used advantageously for decapitating the fetus, but in consequence of the impossibility of conducting its chain round the neck, which was tried to be effected with an elastic catheter, this means had also to be abandoned.

The operator was therefore driven to the only alternative of dividing the neck with Dr. Davies' midwifery scissors. With this means after a long and tedious process decapitation was ultimately effected. The left arm of the fetus, which had come down during a previous part of the operation, was now laid hold of for extracting the child. The resistance from the contraction of the pelvis however was so great that it was torn off along with the scapula and a portion of the Clavicle without effecting the object in view.

The vertebral column, low down in the cervical region where the neck was divided, was now laid hold of with a Cranietomy forceps.
Forces, by means of which, after some considerable force had been used, the body of the fetus was drawn through the maternal pelvis. The head being still in the uterus was laid hold of and removed with the cephalostat, which effected its compression so completely that it passed through the contracted pelvis without any difficulty.

The extent of the pelvis deformity was now correctly ascertained, and was found to be caused by the unusual projection of the promontory of the sacrum into the pelvic cavity, diminishing its conjugate diameter to 3½ inches.

The placenta soon came away, and the patient was left in quietness about 3:30 P.M. In the evening she got a full dose of Laudanum, which gave her a comparatively good night's rest. Her convalescence was rapidly established. She left the Hospital within the usual period, and when I saw her a few days ago, she was still in the enjoyment of very good health.
The foregoing case presents many points of interest; as for instance:

- The deformity of the pelvis, its cause, and the inconveniences to which it gave rise.
- Decapitation - causes of difficulty, and suggestions for obviating them.
- The Cephalotribe - indications for its proper use.

The course proper to be adopted for the future should this patient again become pregnant.

Some of these points must be passed over in silence, and in accordance with the introductory observations, I shall confine my remarks to the following particulars:

I. A consideration of the obstetrical instruments now in use for decapitation.

II. Objections to which they are liable.

III. Proposal of new instruments to which these objections do not apply.

IV. Additional uses to which these new instruments may be put.
The instruments hitherto used for decapitation are 1. Dr. Ramsbotham's decapitator. 2. The guarded enteryotomy knife, or Dr. Daini's decapitator. and 3. The midwifery or cranietomy scissors.

1st. Description of Dr. Ramsbotham's decapitator: This instrument, of a steel rod fitted into a wooden handle at one end, and having the opposite end curved or hooked. It closely resembles in shape the ordinary blunt hook, differing from it, however, in being wider in the curve; the concavity of which is reduced to a cutting edge. The invention of this instrument, or of one closely resembling it, is dated as far back as the time of Hippocrates. Celsus in his writings gives us positive evidence of such an instrument having been in use in his time. It is however to Dr. Ramsbotham that we are more immediately indebted for reversing and adding this instrument to the modern obstetric armamentarium; hence also the reason for its being known as Ramsbotham's decapitator.
2. Dr. Davis's decapitator, also known as the  
second embroyotomy knife, is a more recent  
invention. It consists of two parts, separable  
from each other at a common joint, of pre-  
cisely the same construction as that of the  
English obstetric forceps. The more efficient  
knife is armed with a knife diagonally  
attached to its handle, which is to be passed  
up into the pelvis properly directed and  
guarded by the operator's left hand,  
and carried over the child's neck as as  
to obtain a firm purchase of it. The other  
part is simply a guard to the knife and  
is to be applied on the opposite side of the  
child's neck, and with its counterpart to be  
properly adjusted at the neck. The instrument  
thus applied, by means of its handles enables  
the operator, by firm traction in the direction of the  
axis of the pelvis, and adding to this a slight sawing  
movement, to divide the neck of the child.  

3. The Midwife's or Cranio-otomy Scissor,  
though originally devised for opening and  
emptying the larger cavities of the uterus, have  
also been resorted to for dividing its neck.
in cases where either from inapplicability or inefficacy of the above named instruments this could not be otherwise effected. This instrument consists merely of a strong pair of scissors, the blades of which are furnished with shoulders or stops, placed about 1 or 1\(\frac{1}{2}\) inches from their points. These stops are for limiting the action of the instrument when used as a perforator. The blades are also sharpened internally throughout their whole length, and externally from the points to the shoulders. They are worked by the handles which are of unusual length, so as to give an increased lever power to the instrument.

Having thus briefly described the instruments generally used for decapitating the feline, I shall next proceed to discuss the advantage, disadvantage, or absolute objections to each of them in the order in which they have been described.

First with regard to P.Ramathaisi's instrument. Actual instances. There no doubt could be cited to prove its utility,
in a certain class of cases. Where the double neck of the child presents and is pressed down into the pelvis, or where from large size of the pelvis the fetal neck by the aid of the blunt hook can be brought down into the pelvis. — Dr. Hamebotham's decapitator will be found serviceable. The majority of cases, however, in which decapitation becomes necessary, present a very different state of matters, rendering the application of this decapitator not only difficult but even impossible, while in the more simple cases its application is attended, if not with difficulty, at least with considerable danger to the mother.

Numerous objections I think can be brought against the use of this instrument. I will now as briefly as possible refer to some of the principal of these objections. This instrument by itself is a comparatively useless one, requiring in most cases for its guidance and proper application the previous application of the blunt hook. Now this is an objection to it in
More ways ways than one; 1° It adds to the expense of instruments, by necessitating in addition to the purchase of the decapitator also that of its auxiliary the blunt hook.

2° It occasions an inconvenience in carriage, which is a decided consideration especially to country practitioners, who have frequently to travel long distances before reaching their patients. These are however trivial objections and if they were all might be easily overlooked. The 3° and most serious objection to the multiplication of instruments in one operation is the risk to which the maternal structures are exposed by the repeated introduction of instruments, each of which requires as a guard and guide in its application the introduction of the hand into the vagina, which, it must be remembered, is in most cases in which decapitation is resorted to, in the most unfavourable condition for resisting the effects of the concussion inflicted on it by these manoeuvres.
II Difficulty in applying this decapitator.
In most cases in which decapitation is resorted to, the neck is not the presenting part, but is comparatively out of reach of this instrument. In consequence of the firm impaction of one or other shoulder or arm, the part which in these cases most frequently presents. Now in proportion to the distance of the neck from the pelvic cavity, the amount of impaction of the presenting part in the brim of the pelvis, and the extent of congestion and tumefaction of the vaginal walls, will be the difficulty of applying this instrument, & also the danger to the mother from injury to her structures, or the endeavours to overcome these difficulties.

III Danger to the Mother from injuries likely to be caused to her genital canal by the mode in which this instrument is worked after having been applied. In the majority of cases in which decapitation is resorted to, from the impaction of the presenting part in the brim of the pelvis, and the long continuation of the labour, the circulation on the pelvis...
pelvis becomes partially obstructed, giving rise to congestion and tumefaction of all the soft textures contained in it. Now the 1st objection to the use of this instrument under these circumstances is that from the firm traction necessary to be used with it for dividing the neck, the already dangerous congestion of the maternal structures is enormously increased, thus not only increasing the obstacle to the passage of the body and head of the fetus after division of the neck has been effected, but also increasing the liability to ulceration and sloughing of these congested parts, and 2dly. In addition to this source of danger, from the caressing motion necessary to be used with this instrument, also from the necessity of having the hand in the vagina as a guard to its point, the hand moving as to correspond with the motions of the instrument, the vagina I think is exposed to great risk of being lacerated, or at least of being so continued as to give rise to ulceration or of its walls which may at the very least end
and in the establishment of fictitious communications between it and the neigh-
bouring mamma.

IV I think it will be evident from what has already been said, that in consequence of the difficulties to be overcome and the necessity of aiding the application of this decapitator by the previous application of a tumbler, also from the time necessary for the division of the meat, that considerable delay is caused. Now on labours requiring decapitation, should any complication (as for instance haemorrhage) supervene, the delay caused by the application and working of this instrument becomes of the utmost moment, for on the time spent with these manoeuvres may depend the fate of the patient.

V A very serious objection to this instrument is that it sometimes cannot be applied at all, and that in those very cases in which we would look to it for assistance. The case of Catherine Casey reported at the beginning of this paper affords decisive proof on this point. In this case the vacuum, from its unnatural
projection into the pelvic cavity, presented an obstacle to the application of the decapitator, though the blunt hook was frequently applied and without any difficulty. The facility of applying the blunt hook, while it was impossible to apply the decapitator, can only be explained by the latter being necessarily much wider on the curve, being also furnished with a cutting edge. The same liberties could not be taken with the structures of the mother in endeavoring to apply it as was done with the blunt hook.

VI. Another very grave objection to this instrument is that, even after it has been applied, it may fail to effect the division of the neck. Dr. Ramsbotham, in speaking of this instrument, says that in two cases he failed to effect the division of the neck and it was then necessary to complete the process with Smellie's scissors.

Having now given as I think all the reasonable objections to Dr. Ramsbotham's decapitator, I have next to point out some objections to Dr. Davis's instrument (the guarded puerperal instrument) which I think shall be able to do very briefly. This instrument,
Being merely a modification of Dr. Ramstott's
decapitator is liable to all the objections
that have been brought against that instrument,
(which therefore need not be repeated) and with
only this advantage over it, the portion of the
instrument which contains the cutting apparatus,
being guarded by a metallic blade, does not
require the hand to be kept in the vagina
while division of the neck is being effected
with it, which to a slight extent removes the
liability of contusion and laceration of the
Maternal structures.

We have lastly to consider the objections
to the Cranstonory scissors as a decapitator.
This instrument can be used in decapitation
in two ways, either by boring a hole with its
closed points into the part of the neck most
easily reached, and cutting from the hole
thus made outwards by opening the blade
until the neck is completely divided; or by
Cutting from without inwards using them
as an ordinary pair of scissors.

The scissors, though the most certain
means the Accoucheur has for dividing
the fatal neck in cases where decapitation becomes necessary, is also liable to several very serious objections.

I. It also requires that the neck should be dragged down into the pelvis by the previous application and use of a blunt hook, so as to facilitate its use, and in this way exposes the maternal structures to the same risks of being injured as what we can in dissecting the objections to the use of the two previous instruments.

II. The danger of this instrument, clipping, the difficulty of guarding its points properly and the necessity of having the hand in the vagina during the whole time that the instrument is in use, all add to the danger of the operation, the risk of injury to the maternal structures being very much increased.

III. The present is also liable to the objections raised against the previous instruments from the delay of the operation, decapitation with it being a slow and tedious process as it had an opportunity opening in the case of Mr. Casey, cases are also recorded where several hours were occupied
in dividing the neck with the scissors.

IV. After the neck is partially divided considerate confusion may arise from the difficulty of distinguishing between the divided tissues of the neck and the maternal structures which may be included between the blades of the scissors and accidentally wounded by them.

If the foregoing objections are well founded it must be apparent that the means which the obstetrician has at command for decapitation are far from perfect. Of the instruments that have been considered there is no single one which can be trusted to in every case. In many instances a combination of instruments must be resorted to. Even in the simpler cases with the instruments now in use the time consumed in the operation is considerably, and there is risk of contusion and laceration of important structures, while in more complicated cases the risks are very much increased.
A good decapitator must therefore be still considered as a desideratum, an instrument which would admit of the operation being certainly, speedily, and effectively performed in every case in which it was called for. How far these conditions are fulfilled by the instruments proposed in the following section I must leave others to judge. Meanwhile I proceed with their description, and a statement of the advantages by which I believe them to be characterised.

The first instrument I shall describe is for dividing the fatal nerve and consists of three separate portions.

1. A hooked or directing portion.
2. A cutting or decapitating portion.
3. A propelling portion.

To facilitate the description of this instrument, I have made a sketch of it (Plate 1) which will be placed at the end of the paper, and to which I shall have frequently to refer.
The first portion of this instrument consists of a hollow steel rod (Fig. 1 A) curved at its free extremity (B) and having a tapering wooden handle (C) attached to the other. The hollow rod traverses the centre of the handle throughout its whole length as seen in Fig. 5 which is an end view of the handle. This rod is open on the side to which the hook is directed (Fig. 1 A) this opening is for the reception and guidance of the cutting portion of the instrument. In the curved portion of the rod this opening is reduced to a narrow slit (E) which when the instrument is closed receives the cutting edge (F) of the second or decapitating portion. In that portion of the rod contained in the handle the opening is much wider than at any other part (Fig 3 A) so as to admit of the easy introduction of the cutting blade, also to admit of the proximal end of the rod of the decapitator being made of sufficient strength to receive the force applied
to it by the propelling portion without bending or breaking. Of the handle two hollow steel processes or rings (Fig 3 B) are attached on which the third or propelling portion (Fig 1 B) is made to work freely. This portion of the instrument closely resembles the form and dimensions of the ordinary blunt point.

The second or cutting portion consists of a long solid steel rod (Fig 2 A A) its rounded portion (B) fits into and slides along the tunnel of the guide, while the portion (C) occupies the opening in the shaft of the guide and acting as a buttress prevents the rod and its cutting portion being deflected to either one or other side. The free extremity of the rod is provided with a blade (D), the cutting edge or convexity of which fits into the slit in the concavity of the guide. The proximal end of the rod is twirled or caged on its inner side (E) in order that it may be worked by the corresponding teeth or cogs of the propelling portion.
The third or propelling portion (Fig. 4) consists of a thin steel rod (c) fitted into a checked wooden handle (b), the free end of which passes through a hole in the rod. The end (c) passes through and moves easily in the two rings placed one on each side of the groove in the handle of the guide. The end of the rod is converted into a toothed wheel, the teeth of which fitting into the interstices between the cogs of the second or decapitating portion which is propelled either forwards or backwards, according to the direction of the force applied to the handle (b).

Mode of applying this instrument.

Having concluded that decapitation is absolutely necessary, having also made sure of the position of the fetal neck which is to be divided, the first portion of the instrument is introduced into the vagina guarded by the hand of the operator, and applied round the neck of the child. in the same way as the blunt hook is generally applied. This portion of the instrument having been...
been properly applied may more if necessary be used as an ordinary blunt hook for drawing the child’s neck down onto the maternal pelvis so as to bring it into a favourable position for the operation. This dragging on the presenting part is not however absolutely necessary and should if possible be avoided in every case.

The directing portion of the instrument having been thus applied should be kept firmly in contact with the child’s neck while the decapitating portion is introduced and pushed up along the hollow in its shaft. The free margin of the cutting blade should be guarded in its passage up the vagina by the fingers of the left hand of the operator until it is firmly pressed against the child’s neck. There being now no further danger of injuring the maternal structures the third or propelling portion is applied and turned either by the operator himself or by an assistant in such a manner as to bring the two opposing portions of
the instrument into close opposition, dividing the structures contained between them. Almost cases I think the neck will be divided as once: if however, only a portion of the neck be thus cut through, all that is still necessary is to open the blades of the instrument without removing it from the wound and apply it to the divided portion of the neck cutting it through by working the instrument in the way already described. The neck having been completely divided, the instrument can be withdrawn without any difficulty.

From several experiments tried with the Litholite from which I have borrowed considerably in planning this instrument, I am convinced that it will be amply sufficient for dividing the neck of a child.

The principal of these experiments was performed by placing a piece of deal 2 inches square between the blades of the instrument. the blade of a strong knife.
Knife being interposed between the wood and the movable portion of the instrument, the edge of the knife being directed towards the wood. Then by firmly turning the handle, the edge of the knife and the opposing blade of the lithotrite becoming gradually approximated, the piece of wood was divided with almost a clean cut. Now as I do not know of any structure in the fetal economy that would require for its division a force equal to that required to that required for dividing a piece of deal ganined paper. I think I can justly infer that the instrument than proposed (which it must also be remembered can be made very much stronger than a lithotrite) will be amply sufficient for the purpose for which it has been suggested.

This instrument I think will be free from most of the objections to which the older decapitators are liable.

But to specify more particularly,
I notice among its recommendations—

I. The simplicity of its construction and its independence of other instruments. While consisting of three parts, it is one instrument, easily portable, complete in itself, not requiring any additional apparatus to assist its application.

II. The facility of its application. In this particular, it resembles the thumb hook, to the ease and safety of the application of which we have already referred.

III. The facility with which the instrument may be worked. In this respect, it has a manifest advantage over some instruments, the power being exerted outside of the pelvis and vagina, the hand of the operator being thus free from constraint. It can apply and regulate the force required for dividing the neck. The kind of power employed (the hand, rack, and pinion) is also one of the most easily worked and effective of the mechanical powers.

IV. The rapidity with which the operation may be completed by means of this instrument. This follows as a consequence from the last two,
for the facility with which the instrument may be applied and worked enables the operation to be completed in a much shorter time than where such facilities do not exist. This circumstance will give it an advantage over the older instruments should any complication arise necessitating the speedy delivery of a patient.

V. The safety to the maternal structures with which it may be used. The first part of the instrument having no cutting edge, can be as fearlessly applied as the thumb hook itself, while the second or cutting portion in its passage up the vagina being guarded by the shaft of the guide on one side and by the fingers of the operator on the other cannot possibly do any injury to the mother. The manner also in which the instrument works, the curve of the hook becoming a fixed point against which the blade cuts, the dangers incident to traction and the forcing motion which we saw formed so serious an objection to the use of the old decapitators, are entirely avoided. And further than being no necessity for the
hand being kept in the vagina during the looking of the instrument another source of danger is removed.

VI. The fact that this instrument may be applied in cases where others as Dr. Ramanathan's could not be applied — it would perhaps be assuming too much to assert that an instrument which has never been tried, and whose advantages therefore are only prospective will certainly be applicable in every case which may present itself. In the meantime it may be enough to remind the reader that there are some cases to which Dr. Ramanathan's decapitator is not applicable, as for instance that of Catherine Casey, but where the blunt hook can be used. From the form of the instrument now proposed resembling so closely that of the blunt hook, it is believed that where there is room for the introduction of the hook there is also room for the introduction and application of this decapitator.

VII. When applied it seems all but certain that the instrument would effect division of the child's neck. This of course cannot be
matter of absolute proof, but from the experiments with the lithistride one of which I
shall refer to at Page 28. I am quite con-
vinced on this point.

As the second instrument I have to
describe is merely an auxiliary to the
Crasem, I shall in the first place give a
brief description of that instrument pointing
out the probable advantages to be gained by
its use as a decapitator.

Description of the Crasem.

This instrument since its invention by
Mr. Chasseignac has undergone various
improvements, the consideration of which
would take up more room than I can afford
in this paper. I shall therefore confine myself
to a description of the instrument as it is
now made and sold in this Country.
To facilitate its description the Ecarteau may be viewed as consisting of three parts.

1. The barrel or sheath which is made of metal is of a square shape, and varies in length according to the size and strength of the instrument. This barrel passes through a checked wooden handle, 2½ inches in length, which is fixed to it at about 2 inches from its proximal end. Immediately anterior or posterior to the handle and fixed to the sheath are two springs the checks of which passing through two apertures in the sides of the barrel are for the purpose of preventing the recoil of the 2nd portion of the instrument, which consists of two flattened steel rods notched on their outer sides for the reception of the checks placed on the barrel of the instrument. These notches resemble the teeth of a saw, each notch having two sides the one nearest the free end of the instrument is at right-angles to the rods the other gradually in- 
clines until it reaches the base of the metal immediately before it. These rods
are attached at one end to a straight bar or handle in such a manner as to admit of a lateral lever motion, each rod and its check acting as a fulcrum to the handle in raising the opposite rod. The other end of these rods, which are slightly longer than the barrel on which they move, are furnished with a couple of pegs and a check for the attachment of the 3rd portion of the instrument, which consists of a flattened chain made after the model of the chain saw. This chain is the part which lites or cuts through the tissues upon which it is applied.

The barrel and rods of this instrument, though originally straight, have of late been variously curved for obstetric purposes. The instrument with the curve corresponding to the curve in the axis of the pelvis will be found most useful.

The Corneur has been used very extensively on the continent for surgical purposes in consequence of the bloodless character of the operations performed with it
for the same reason it has also of late come into use in obstetric surgery and is admirably adapted for removing polypi, polyipoa tumours of the uterus, also for amputating the cervix uteri when the case of malignant degeneration from the frequent occurrence of these and other diseased conditions in which this instrument has proved so serviceable. I think it is likely to become a part of the regular obstetric armamentarium and should therefore be made as widely useful as possible.

To its already numerous uses Professor Simpson as far as I am aware was the first to add another in proposing it as a decapitator. Not possessing an ear of means of experimenting with it I am unable to state positively that it will be able to effect the division of a child's neck, having however on one occasion seen Professor Simpson in demonstrating its use and mode of action to his class, cut through the forearm of a mature feline, dividing with it not only
the soft textures, but also the Radius and Ulna in a part where their ossification had been completed. I think I may safely conclude that it will be able to divide the neck of a fetus in which it must be remembered the ossous structures at birth are very rudimentary the verte-
bra consisting mainly of Cartilage the
true primary center of ossification having
not yet united.

The great obstacle however to the use
of the Scarsen as a decapitator, is the
difficulty (or rather the impossibility) of
conducting its chain round the child's
neck. As far as I am aware no satisfactory
means has yet been devised for overcoming
this difficulty. the flexible catheter being that
generally resorted to. the inefficacy of
which as a guide to the chain of the
Scarsen was clearly proved in the
case of Catherine Casey. It is therefore
with the view of supplying a more
efficient means that I have planned the
instrument I am now to describe.
The auxiliary to the Scraeuse consists of a hollow guide (Plate II Fig 1 A) exactly like the fixed or directing portion of the instrument described at page 24, also of a solid rod (Fig 2 B) similar to the second portion of the same instrument differing from it however in wanting the cutting blade at its distal extremity and having attached to it instead a round chain (Fig 2 C) which admits of flexion only in one direction. This chain differs from the chain of the Scraeuse in having its links checked on their outer side so that the whole chain when in the tunnel of the guide can only when propelled from behind pass forward with an inclination towards the shank of the guide as seen in Fig 16. The links of this chain should be of the same length and breadth as those of the Scraeuse differing from them however in being round instead of flat the female links having also a strip of metal on their outer side (Fig 3 which is a view of the section of the female link shows this Chark A).
which prevents the male links from flexing in that direction, the male and female links pressing on each other in the same way that the blade of a clasp knife works on its handle.

If such an arrangement were to extend throughout the whole length of the chain though it would not interfere with its application it would render the withdrawal of the guide both difficult and dangerous. This arrangement is therefore restricted to the links of the chain for about three or four inches from its free extremity; the remainder of the chain like that of the tesseract admitting of flexion in both directions; the last link of the chain is furnished with apparatus for connecting the chain of the tesseract to it.

Mode of conducting the chain of the tesseract round the neck with this instrument: First apply the guide or directing portion over the facial neck just as an ordinary blunt hook, then.
if not already done, introduce the chain of this instrument into the tunnel of the guide, taking care to have the checked side of the chain towards the outer side of the guide. Then drawing firmly on the guide so as to apply its hooked portion closely to the neck extrude the chain by pushing up the rod attached to it.

The chain in passing out at the tip of the guide being prevented from doubling up by the checks on its outer and by the fatal neck on its inner side, will as it is forced onwards from behind, pass down into the vagina, where it can be laid hold of and its further passage facilitated. The end of this chain being fast out of the vagina, the chain of the escueur is attached to it in the same way that it is attached to the rod of the escueur. The guide chain and all are now withdrawn (as represented in Fig. 4) drawing the chain of the escueur after them. This chain being fairly applied over the neck is now detached.
from the chain of the guide and its two ends are attached to the rods of the Seerum in the usual manner. The sheath of the Seerum being now pushed up over the ends of the rods and the portion of the chain in the vagina prevents their injuring the mother, and at the same time tightening the chain brings it into a more favourable condition for being acted on by the handle which with each alternate ascent and descent tightening the chain causes it to divide more and more of the neck until decapitation is completed when the instrument can be removed without any difficulty or danger and the labour completed by bringing down first the body and then the head of the child.

Thus aided the Seerum will quickly become one of the purest, safest, and most efficient means the Accouchew could resort to for decapitating the Fetus.
With either the Eraseur thus aided
or with the other instruments proposed
in this paper, I think the hitherto
fearful and uncertain operation of decapitating
the fetus may be undertaken with
certainty; and executed with less fatigue
to the operator; and I hope with a greater
chance of safety to poor women who
may unfortunately have to submit to it
than what we saw resulted from the
use of the older decapitators.

Besides these uses, these instruments
will be found useful under other cir-
cumstances. -- The first instrument
proposed and of which Plate I is a representa-
tion, I think be well suited for dismembering
the fetus when as the result of monstrosity,
locked limbs, or any other cause, such a
course of procedure should be deemed
necessary. I think it may also be used
for removing large soft and fibrous
tumours of the uterus, in this respect however I
think it will be superseded by the Eraseur.
Lastly. The second instrument proposed and of which Plate II is a representation will I think be found very useful in cases where the breech presents and when from inertia of the uterus, or from some slight resistance on the part of the maternal structure, the labour is prolonged so as to threaten either the life of the mother or child, and where it could be speedily and safely terminated, if the accoucheur could by any means consistent with the safety of the child aid the uterine efforts, by applying slight traction to the presenting part. It has long been attempted for this purpose to pass the lacquer through the head of the child; this mode of procedure however in consequence of the difficulty of using it has never been successful. This difficulty I think can be easily overcome by using the instrument already referred to in the following manner. Having ascertained the exact position of the breech apply the hooked portion of this instrument round one or other groin of the child in the same manner that the blunt hook is sometimes applied to this
part. This having been done draw slightly on the handle at the same time passing a finger up between the thighs of the child for the point of the instrument if this can be reached by pushing up the rod to which the chain is attached. The latter will easily pass down into the vagina, the lacque or a common handkerchief is then fastened to the end of the chain which is now withdrawn. The whole instrument being then removed draw the handkerchief or lacque round the thigh to which the shoot had been applied. If it be necessary that the lacque should pass round both limbs, the instrument must again be applied but round the opposite groin. The chain being extended as before is attached to that end of the lacque which passes down between the limbs of the child. This having been done the instrument is again removed now carrying the lacque across the entire breach in the space between the doubled-up limbs and the pelvis.
By means of the snaque or handkerchief thus applied the desired traction can be used without any fear of injuring the child as has been done in applying this traction with the blunt hook.

In planning these instruments I have made the guides of both exactly the same so that both the rod with its cutting blade and the chain can be made to work in the same guide thus connecting the two instruments into one which could of course could be made much cheaper and more portable than two separate instruments. By having them thus united the attendant can also if he has an erasure choose of the two modes of decapitating the fates the one he thinks best.

In showing the plans of these instruments to two of the principal cutlers in Edinburgh Sirs assured that they could be easily made however thought it
more prudent before ordering them to hear the opinions of gentlemen more experienced than myself with whom leave the further consideration of this subject.