

Memoir on the cutting gorget of Hawkins : (containing an account of an improvement on that instrument, and remarks on the lateral operation for the stone) / by Antonio Scarpa ; translated from the Italian, by James Briggs.

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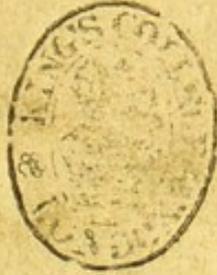
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On the Cutting Gorget
of Hawkhead—
transl. from Italian,



M E M O I R, &c.

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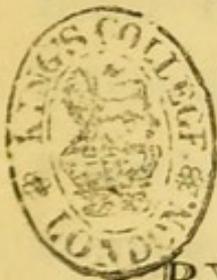
KING'S COLLEGE LONDON

MEMOIR
ON THE
CUTTING GORGET
OF
HAWKINS,

*(Containing an Account of an Improvement on
that Instrument, and Remarks on the
Lateral Operation for the Stone.)*

BY ANTONIO SCARPA,

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OF ANATOMY AND CLINICAL SURGERY IN THE
UNIVERSITY OF PAVIA, &c. &c.



Translated from the Italian,

BY JAMES BRIGGS,

SURGEON TO THE PUBLIC DISPENSARY.

KING'S COLLEGE HOSPITAL
MEDICAL SCHOOL.
LONDON:

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1816.

ADVERTISEMENT.

FOR the original of the following Memoir, inserted in the "Transactions of the National Institute of Italy,"* the Editor is indebted to Professor SCARPA, through whose kindness it has been sent to him, and at whose request the translation of the paper has been made for the perusal of a few individuals, whose opportunities might enable them to put to the test the instrument, and method of operating described in it.

* Atti dell' Inst. Naz. tom. 2.

With this view, but more particularly influenced by an opinion of its general utility, the Translator has been induced to lay it before the Public, presuming that, upon a subject on which the opinions of surgeons are still much divided, both with regard to the mode of operating, and the principles on which the operation should be conducted, the English reader will peruse with interest the views of a writer, not less distinguished for his profound anatomical knowledge, than for the various talent and indefatigable zeal with which he has laboured to promote the advancement of this branch of the healing art.

In repeating the operation according to the method here described, the Author, in his remarks on the paper, wishes "that the rules laid down by him, with respect to

the position of the instruments, should be carefully observed, particularly with regard to the staff, which should be held perpendicularly, and in the line of the suture of the perinæum, in order that it may form an exact angle with the blade of the gorget, which angle is calculated for its making with accuracy the lateral division of the prostate gland without injuring the rectum or internal pudic artery." He adds, that, "by this method, he extracts with ease calculi of very large size."

The Engraving has been made from the instrument itself, which accompanied the Memoir, the original plate being somewhat imperfect.

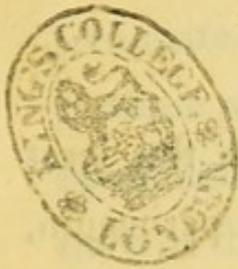
Sept. 21, Edgware Road.

the position of the instrument, should be carefully observed, particularly with regard to the staff, which should be held perpendicularly, and in the line of the axis of the perineum, in order that it may form an exact angle with the blade of the gouge, which angle is calculated for its making with accuracy, the lateral division of the prostate gland without injuring the urethra or internal pudic artery. The edge, that by this method, is extracted with ease and with little pain.

The engraving has been made from the instrument itself, which accompanied the Memoir, the original plate being somewhat imperfect.

Edinburgh, 1789.

MEMOIR, &c.



If, in the extraction of a large stone from the urinary bladder of a man, through the perinæum, the length and depth of the incision made in the prostate gland and bladder could be proportioned, at the will of the operator, to the bulk of the stone, a passage might be made sufficiently large, in every case, for the prompt and easy removal of it, without bruising or lacerating the parts through which it must pass. But, unfortunately, in the case of very large calculi, this is impracticable in the perinæum, not only on account of the triangular space between the arch of the pubis,

the ramus of the ischium, and the neck of the bladder, being limited; but also because the incision made in the base of the prostate gland and orifice of the bladder, cannot be prolonged beyond certain bounds, without occasioning effusion of urine, suppuration, and sloughing of the cellular membrane connecting the rectum and bladder.

That Rau, in order to extract, with the least difficulty, large calculi through the perinæum, should have cut, with success, the body of the bladder so high up, as to leave untouched the orifice of that viscus, was a conjecture of Albinus, unsupported by any certain and demonstrative proof. And all those who are acquainted with the history of surgery, know how very soon the modes of operating, proposed by MM. Foubert and Thomas, who had the same object in view, fell into discredit; and are not less aware of the serious evils which generally attend the method of Celsus, whenever the stone is of such a size as not to enter and distend the orifice of the bladder and the neck of the

urethra,* so that, in order to extract it, the incision must fall upon the left side of the fundus of the bladder above the prostate gland. The best means which anatomy has hitherto suggested to the surgeon in the extraction of large calculi from the bladder, by the perinæum, is the lateral incision of the prostate gland, within certain determinate limits of length and depth, and the prudent resolution of committing the rest of the operation to a gentle and gradual dilatation of the neck of the urethra, and orifice of the bladder. And, indeed, since the operation of lithotomy in the perinæum has received this perfection, and surgeons have commenced the practice, not merely of making a slight incision in the apex of the prostate gland, but of laying it completely open, and dividing the base of it to a certain extent, together with a small

* The term *cervix*, or neck of the bladder, has been inaccurately applied by surgeons, and not by the best anatomical writers, to what is properly the *neck* or *commencement of the urethra*, which extends from the orifice of the bladder, through the prostate gland, to the commencement of the membranous part of the urethra, and which in no respect belongs to the bladder. This inaccuracy frequently gives rise to much obscurity in descriptions of the operation of lithotomy.

portion of the orifice of the bladder, the violent distension which was formerly practised, during the employment of the *great apparatus*, to enable the operator to remove the stone, has been no longer necessary; and a moderate dilatation of those parts is now sufficient for the extraction of calculi of considerable size, those, for instance, of three and a half ounces in weight, and measuring sixteen lines in the small diameter; hence the *great lateral method* is, with much reason, regarded at present as the highest degree of perfection to which the operation of lithotomy in the perinæum can be carried.

The lateral operation, though executed with the greatest precision, does not exempt the surgeon from dilating, to a certain degree, the orifice of the bladder and cervix of the urethra; the dilatation of those parts, however moderate, being always necessary, even where the calculus is of middling size. The orifice of the bladder in the adult dilates almost spontaneously to the diameter of five lines, as may be found by introducing the point of the finger into the cavity of

the bladder, through the neck of the urethra. The lateral incision, within proper limits, divides the body and base of the prostate gland to the depth of four, or at most, five lines, forming with the five, to which, as it has been stated, the orifice of the bladder naturally yields, an aperture of ten lines; but in an adult, a stone of ordinary size and oval figure is sixteen lines in the small diameter, to which must be added the thickness of the blades of the forceps, consequently, even after the incision has been made with the most scrupulous exactness, the stone, though of moderate size, cannot pass out of the bladder unless the dilatation of the base of the gland and orifice of the bladder be carried to the extent of nearly eight lines beyond the size of the aperture made by the knife. But if, in order to avoid distending the parts to the extent of eight lines, the base of the prostate gland, together with the orifice of the bladder, and a part of its fundus, be divided to a depth equivalent to it, the event must necessarily be an effusion of urine into the cellular membrane between the rectum and bladder, and

consequently suppuration, gangrene, fistulæ, and other serious evils.

We know indeed from Sharp,* that Cheselden, in his first attempts, divided a part of the body of this viscus, but that he was obliged to abandon that mode of operating in consequence of the injury which arose from the insinuation of urine between the rectum and bladder.† The same thing has also been adverted to by Bromfield;‡

* Critical Inquiry, chap. v.

† Cheseldenus, ut omnia tentaret, vesicam aqua hordei implebat, quantum ægri ferre poterant; dein vesicam incidebat, sed infausto successu, propter urinam inter vesicam et partes vicinas remorantem, unde gangræna qua *ex decem, octo moriebantur*.—Camper Demonstrat. Anat. lib. ii. pag. 14.

‡ Chirurg. Obs. Licet plerique chirurgi, quod sciam, glandulam prostatam per totam suam crassitiam dividere optent, ego tamen nollem factum. Dodrantem, aut paulo minus proxime ad partem urethræ membranosa satius et utilius, quam per totam sui crassitudinem dividi pro certo habeo. Nam primo nullibi alias præterquam in ea parte calculo obsistitur, et vesicæ cervix citra omnem lacerationem sufficienter dilatatur. Deinde partibus citius sanandi facultatem hoc fortasse dabit, sphinctere revalescente, quam si perpetuo per eas transiret urina: licetque mihi, si foret opus, liquido jurare, nunquam post ullam mearum operationum fistulam remansisse,

and since, by several other eminent practical surgeons.* Franco, † the most celebrated lithotomist of his time, was, undoubtedly, convinced, by long experience, of the danger attending a too extensive and deep incision in the base of the prostate gland and orifice of the bladder; for, he says, with reference to this, “*bref, il est, requis de tenir mediocrité.*” As the apex of the prostate gland forms the greatest resistance to the introduction of the forceps and the extraction of the stone, this part of it ought, in every operation of lithotomy in the perinæum, to be completely divided. But with respect to the body and base of the gland, an incision, extending to

quod sæpe usu evenit illis qui glandulam usque ad membranousam vesicæ partem persecuerunt. Nam, tametsi aliter visum sit multis scriptoribus, fateor tamen, me non posse non putare valde perniciosum esse partem membranousam vesicæ sauciari, et si nihil aliud affert mali, fistulas exinde orituras maxime est verosimile.

* The 17th aphorism of Hippocrates, sec. vi. on the fatality of wounds of the bladder, is true, in point of fact, with regard to those which do not leave a free outlet to the urine, and occasion effusion into the cavity of the peritoneum, or cellular membrane between the rectum, and injured bladder.

† *Traité de la Taille*, chap. xxxii.

the depth of five lines, through its whole length, and consequently including a small portion of the orifice of the bladder, is, with the aid of a moderate and gradually increased dilatation, sufficient for the extraction of a stone of more than ordinary size, without the parts through which it passes being greatly contused or lacerated. In children, where the orifice of the bladder, and base of the prostate gland are easily distended, and in aged persons, in whom the orifice of the bladder and neck of the urethra are generally much larger than in adults, an incision in the base of the gland less than five lines in depth, and in children, of two only, is sufficient for the extraction of a stone of ordinary size, by means of a moderate dilatation of those parts. The large size of the stone, indeed, for instance, of one exceeding twenty lines in its small diameter, is no sufficient ground for dividing the substance of the gland to such an extent as to penetrate into the cellular membrane beyond it, and fundus of the bladder; for, as an incision of such depth is constantly followed by the infiltration of urine, gangrenous abscesses, and fistulæ, between the bladder and

rectum, it is obvious that calculi of such size ought never to be extracted by the perinæum.

The lateral operation has therefore limits beyond which it is impossible to pass, without exposing the patient to more serious evils than those which could arise from the presence of the stone in the bladder. This fact, together with its consequence, or the absolute necessity of being obliged to employ, in every case of lithotomy in the perinæum, a greater or less degree of dilatation of the orifice of the bladder and base of the prostate gland, in order to supply the deficiency in the length and depth of the incision made in these parts, however well executed, constitutes, in my opinion, the fundamental principle of lithotomy by the *lateral* method, and furnishes an exact rule by which a proper estimate may be formed of the numerous instruments which have been proposed for the prompt and safe execution of this operation. And I cannot silently pass over the error into which the student has been led, by all those who have departed from the doc-

trine of Le Cat,* and who, greatly exaggerating the advantages of the lateral operation over the great apparatus, and more especially the utility of the instruments proposed by them for executing it, have spoken of it in a manner as if, after the incision had been made, the stone were to drop spontaneously from the bladder, without making any mention whatever of the necessity of dilatation.

Cheselden, to whom alone belongs the merit of having enriched surgery with the important invention of the great lateral apparatus, in performing this operation, made use of a knife with a convex cutting edge, four lines broad, fixed upon a long handle. With this very simple instrument, he divided the prostate gland laterally through its whole length, to the depth of four or five lines; after which, by means of a slow and gradually increased dilatation of the neck of the urethra and orifice of the bladder, he extracted large calculi without any ill consequences

* Pièces concernant l'Opération de la Taille, pag. 60, 100.

ensuing to his patient. It is not however so easy a matter as an inexperienced operator might perhaps imagine, to pass a knife, within the neck of the urethra, beyond the orifice of the bladder, so that in its course it may not deviate, sometimes considerably, from its lateral direction, and not divide the prostate gland to a proper depth, especially at the base, which surrounds the orifice of the bladder; for the point of the knife is easily stopped in the groove of the staff, and either from the strong resistance which the firm substance of the prostate gland generally opposes to the gorget, so as to press it on the opposite side, or from the gland receding from the instrument, the surgeon is led to suppose that he has laid this glandular body open to a sufficient depth; when in reality he has only divided the apex, and a very small part of the base of it.

To render the execution of the lateral operation easier to surgeons of less experience than Cheselden, was the laudable motive which induced Hawkins to propose his gorget. He thought that two great advantages would be gained by

the use of this instrument ; one, for instance, of executing invariably the lateral incision of Cheselden, the other, of constantly guarding the patient through the whole course of the operation from injury of the rectum and of the *arteria pudica profunda*. Its utility as to the latter of these objects cannot be disputed, as it is evident that the convexity of the director of the instrument defends the rectum from injury, and that its cutting edge not being inclined horizontally towards the tuberosity and ramus of the ischium, but turned upwards in the direction of the longitudinal axis of the neck of the urethra, cannot wound the pudic artery. But with respect to the first advantage, or that of executing precisely the lateral incision of Cheselden, it must be admitted, that it does not completely fulfil the intention which he proposed, not only on account of the cutting edge of his instrument not being sufficiently raised above the level of the staff, to penetrate sufficiently the substance of the prostate gland, and consequently divide it to a proper depth, but because being too much turned upwards, at that part of it which is to lay open the base of the gland, it

does not divide it laterally, but rather at its upper part, towards the summit of the ramus of the ischium and the arch of the pubis; an opening, of all others, in the perinæum, the most confined, and presenting the greatest impediment to the passage of the stone from the bladder. The breadth of the point of the director is, besides, so disproportionate to the diameter of the membranous part of the urethra, that from the great resistance with which it meets, the instrument may easily slip from the groove of the staff, and pass between the bladder and rectum, a serious accident which has very often happened even in the hands of experienced surgeons.

Several surgeons of eminence have, of late years, undertaken to modify the gorget of Hawkins, but their attempts have not been successful, in consequence, I believe, of their having neglected to determine the exact relation between the parts divided in the operation of Cheselden, and the elevation and inclination given to the cutting edge of the instrument which they have attempted to

improve. Bell* has diminished the breadth of the director, but has given the cutting edge an horizontal direction. Dessault†, Kline, (Cline) Cruikshanks, preserving the horizontal direction of the cutting edge, have again enlarged the director, and have flattened the part which was before concave‡: in other words, they have only converted the gorget of Hawkins into an instrument of all others the least adapted to the performance of the lateral operation, and certainly in no respect safer or more commodious than that which Cheselden employed. These surgeons, aware of the inevitable

* System of Surgery, vol. 2, plate 13.

† Œuvres Chirurg. tom ii.

‡ Richerand, *Mem. de la Soc. d'Emulat.* tom. iv. Le procédé d'Hawkins est celui avec lequel on évite plus sûrement l'hémorragie, pourvu toute fois que l'on se serve du gorgéret de l'inventeur; le tranchant de l'instrument tourné en haut ne peut intéresser les vaisseaux du périnée. On pourroit les ouvrir si l'on fesoit usage du gorgéret corrigé par Dessault, ou par Cline. Les changemens que ces chirurgiens ont fait subir à l'instrument d'Hawkins, bien loin d'avoir ajouté à sa perfection, l'ont au contraire privé de tous ses avantages. Deschamps, *Journ. de Med.* tom. xx. Nous avons vû le gorgéret d'Hawkins, que l'anglomanie voulait à force préconiser, subir tant et tant de corrections, que d'un gorgéret on en a fait une lame plate et tranchante, d'où on ne se sert plus.

danger of wounding the pudic artery by the horizontal direction of the gorget, direct that the handle of the staff should be inclined towards the patient's right groin, and that the gorget should be run along it, inclined in such a manner that its obtuse edge may be directed towards the rectum, and its cutting edge placed at a sufficient distance from the tuberosity and ramus of the ischium, to avoid wounding the artery. In using the instrument of Cheselden also it is necessary to give the same inclination of the staff towards the patient's right groin, in order that the incision may fall on the lateral part of the prostate gland, and not injure the rectum or pudic artery; but whoever has had experience in matters of this sort, must know how difficult it is to give a proper degree of obliquity to the staff, and how inconvenient, arbitrary, and unstable this inclination of the instrument is to the operator, in comparison with that in which the handle of the staff is held in a line perpendicular to the body of the patient, and its concavity placed against the arch of the pubis; on which stability of the instrument, the safety and precision of the lateral operation depend.

On comparing carefully the instrument of Hawkins, as it was originally constructed, with the parts to be divided, as well as with the direction, extent, and depth of the incision required in the great lateral operation, I have found that the defects of this instrument arose from the excessive breadth of the director,* particularly at the point; from a want of sufficient elevation in the cutting edge above the level of the groove of the staff; and from the uncertain inclination of the edge to the axis of the neck of the urethra and prostate gland. The cervix of the urethra, in a man between 30 and 40 years of age, is only three lines in diameter at the apex of the prostate gland, four lines in its centre, and five near the orifice of the bladder. The apex of the prostate gland is rather more than two lines in thickness, the body or centre four, and the base six and sometimes eight, which surrounds the orifice of the bladder. In an adult of middle stature from eighteen to twenty years of age, the thickness of the base of the prostate gland is about two lines less, compared with that of a man of forty,

* The grooved or concave part of the gorget. Ed.

and of a large size. The precise line in which the lateral incision of the prostate gland should be made in an adult, is found to be inclined to the longitudinal axis of the cervix of the urethra and of the gland itself, at an angle of 69° . Now, from these data, drawn from the structure of the parts, the director of the gorget of Hawkins, with the alterations which I have made in it,* is only four lines broad, and two deep, the breadth decreasing at the beak.† The cutting edge of the instrument is straight near its point, but gradually rises, and becomes convex above the level of the staff, so that its greatest convexity ‡ is seven lines broad. Lastly, the inclination of the cutting edge to the longitudinal axis of the director, is exactly at an angle of 69° ; that is to say, the same as the left side of the prostate gland to the longitudinal axis of the neck of the urethra.

The method of operating with this instrument is as follows: having introduced the staff into the bladder, the curvature of which corresponds exactly to that of the axis of the neck of the

* Fig. 1, a a.

† Fig. 1, c.

‡ Fig. 1, de-

urethra and prostate gland, and the extremity of which is rather longer than that of the ordinary staff, so as to penetrate the bladder to the extent of an inch and a half, and the external incision, and opening into the membranous part of the urethra, being made in the usual manner, avoiding the bulb, the surgeon with his left hand should hold the staff firmly against the arch of the pubis, in a line perpendicular to the body of the patient; then taking hold of the gorget with his right hand, and inserting the beak in the groove of the staff, so that the convexity of the director may be directly placed over the rectum, should run the gorget on, in a line as nearly parallel as possible to the horizontal extremity of the staff situate in the bladder, not stopping until he feel that the beak of the instrument has reached the closed extremity of the groove of the staff. After having removed the staff from the bladder and urethra, and introduced the forceps upon the groove of the gorget, the latter is to be gently withdrawn upon them, in the direction in which it had been introduced. Lastly, the position of the stone being discovered, by means of the forceps, the blades are to be gently opened, and

the neck of the urethra and orifice of the bladder, so far gradually dilated by them, that the operator may be able to take hold of it easily, and extract it, without bruising or lacerating the parts through which it is to pass.

It is a certain fact, which I have ascertained by repeated observations and measurements, taken from the dead subject in the adult, that a line inclined to the axis of the neck of the urethra and prostate gland, at an angle of 69° , passes laterally through the base of the gland, at the part most convenient of all others for the extraction of the stone in the perinæum, this being neither too near the arch of the pubis, nor the inferior and posterior surface of the gland.* And as the cutting

* The prostate gland is shorter on its anterior than posterior surface; and the cervix of the urethra does not pass precisely through the centre of it, but through that portion of it which is nearest the arch of the pubis. On account of the greater shortness, therefore, of the cervix of the urethra, and smaller bulk of the gland, the nearest way from the membranous part of the urethra to the cavity of the bladder, would be through the anterior part of it; but as the incision made in the smaller portion of it would fall immediately under the arch of the

edge of the gorget is inclined to the longitudinal axis of the director, precisely at the same angle, when the instrument is held in the direction of the natural axis of the neck of the urethra and prostate gland, it follows, from mechanical necessity, that in pressing it into the bladder in a line as nearly parallel as possible to the horizontal groove of the staff, the whole of the gland, with the orifice of the bladder, must be cut through at this precise point.*

The staff being held firmly against the arch of the pubis, in a line perpendicular to the body of the patient, so that the convex part of the director may be placed towards the rectum, and take the exact course of the axis of the neck of the urethra and prostate gland, is an invariable guide by which the cutting edge at this determined angle must

pubis, which would present a great obstacle to the passage of the stone, the lateral incision, though carried through the longest and thickest part of it, must always be preferable to a division of it anteriorly.

* In the construction of the instrument, therefore, great skill and accuracy are requisite on the part of the artist.

of necessity divide the gland laterally at the part most advantageous for the removal of the calculus. This rule is the more easily to be determined, and more securely observed, as the staff lodges itself, as it were, under the arch of the pubis; and as this, of all the positions which can be given to it, is the firmest and the most commodious to the surgeon, during the operation.

With regard to the depth of the incision, it must be observed, that the director of the instrument is four lines broad and two deep, and that its cutting edge, for a man of full stature, between 30 and 40, is seven lines in breadth at the most convex part. At the time when the gorget is situate in the membranous part of the urethra and apex of the prostate gland, which canal is three lines in diameter, the apex of the gland being little more than two lines in thickness, is completely divided by it. The instrument running in succession through the axis of the neck of the urethra, to which the body and base of the prostate gland laterally correspond, the former being four lines in thickness, the latter six and sometimes eight, the director enters a

canal of four lines in diameter; that is to say, of the thickness of that part of the instrument itself. Here the gorget being forced by the firm texture of the gland against the opposite side of the canal, which is susceptible of a certain degree of distension, the whole breadth of the blade is not engaged in the division of the body of the gland, but probably about a line less. It completely divides it, however. The instrument having, lastly, reached the closed extremity of the groove of the staff, that is, having penetrated the bladder to an inch and a half beyond its orifice, as the latter yields almost spontaneously to the diameter of five lines, while the director of the instrument is only four, and the gorget is pressed aside by the hardness of the prostate gland to the extent of about a line, it follows that the base of the gland is only divided to the depth of about five lines, though the cutting edge of the gorget is seven in breadth. There are therefore always two and sometimes three lines, of the substance of the base of the gland, according to the difference of the subject, remaining undivided, which, as I have already stated, is of great consequence to the success of the operation, because the portion

around the orifice of the bladder which is untouched, prevents the insinuation of urine, and the formation of gangrene or fistulæ between that part and the rectum, and offers but a slight resistance to the dilatation, which in every case must necessarily be made, in order to effect the extraction of the stone. The same proportion holds in cutting a young man of middle stature, of from 18 to 25 years of age, with a gorget, the edge of which is only five lines broad, as that represented in the plate.

In the lateral operation with the knife of Cheselden, carefully executed, by a skilful hand, upon a man 45 years of age, and of full stature, the apex of the prostate gland is found to be completely divided, and an incision made in the base of it, to the depth of only four, or at most five lines; a result precisely the same as that which is obtained in performing the operation with the improved instrument of Hawkins, the cutting edge of which is seven lines in breadth at its most convex part. It agrees also, in this respect, when compared with the lithotome caché of Frère Côme; for

on using the latter instrument, opened at No. 12 or 13, upon the dead subject in an adult, the apex of the prostate gland is found to be completely divided, and the base of it which surrounds the orifice of the bladder, laid open only to the depth of four or five lines; which precisely coincides with the results of the numerous experiments made by me on the dead subject with the new gorget.

It is proper to remark, however, that, to obtain these results, in using the knife of Cheselden, the edge of which is only four lines broad, it is necessary to press the instrument sufficiently within the bladder, and to observe, in retracting it, to press on the back of it, and raise the handle, in order that it may penetrate sufficiently the substance of the prostate gland, from the firmness of which it is easily pressed on the opposite side, making only a slight division of those parts. In using the lithotome of Frère Côme, it is also requisite, in the act of drawing out the instrument, after it has been opened in the bladder, to raise the hand, in order that it may divide the base of the gland and orifice of the bladder to a pro-

per depth, and then to depress the hand again for the purpose of completely dividing the apex. In making these movements of elevation and depression, it is obvious that an operator, without sufficient experience, may easily deviate from the proper limits, and either not divide the base of the prostate gland to a sufficient depth, or carry the incision beyond it; not taking into account, that, having no certain rule to guide him in the inclination given to the cutting edge, before he withdraws it from the bladder, he may easily deviate from the exact direction of the wound, and consequently either injure the *arteria pudica profunda* or the rectum.* On the other hand, in using the gorget, with the alterations proposed, according

* Deschamps, *Traité historique et dogmatique de la Taille*, tom. iii. sect. 95. "Il est peut-être de tous les instruments celui qui conviendra le moins aux jeunes praticiens."—And at sect. 916, "Je dirai plus; de tous les instruments connus pour pratiquer l'incision au col de la vessie, celui du Frère Côme sera, peut-être, le plus dangereux, quand il ne sera pas conduit avec prudence, parce qu'il peut, s'il est plongé trop avant dans la vessie, intéresser la partie postérieure de ce viscère; il peut aussi manquer l'incision projetée, s'il n'est pas poussé assez avant dans cet organe. La manière de le placer en le retirant, influe encore sur la régularité de l'incision."

to a certain and invariable rule determined by the perpendicular position of the staff to the patient's body, and the inclination of the cutting edge to the axis of the neck of the urethra, the direction and depth of the incision will be always exact and within certain limits, nor can there be any apprehension of the instrument extending beyond the substance of the base of the prostate gland so as to injure the pudic artery, much less of its slipping downwards upon the rectum.

The *profunda* branch of the pudic artery,* being detached from the common trunk of the pudica, close to the tuberosity of the ischium, runs from this point to distribute the greater number of its branches to the bulb of the urethra, and is liable to be wounded even in the act of opening the membranous part of the urethra, if the point of the knife be not carried beyond and beneath the bulb. It is also liable to be divided in withdrawing the knife of Cheselden, or the bistouri c  ch  , if the edge of either instrument be too

* Scarpa sull' Aneurisma, Tab. IV. 7.

much inclined towards the ramus or tuberosity of the ischium; but nothing of this sort can ever happen in using the new gorget, as its edge, directed obliquely upwards, never extends beyond the base of the gland so as to injure this artery.

The advocates for the bistouri caché of Frère Côme, among the advantages enumerated in its favour, lay great stress on the facility and security with which the wound in the neck of the urethra may be enlarged by means of this instrument, opened at No. 5, whenever the first incision has not been found large enough for the extraction of the stone. Although I am of opinion that this can never be necessary in using the gorget now recommended, the blade of which is proportioned to the size of the prostate gland in the adult; and also, that it is a very difficult matter, either with the lithotome caché, or with any other instrument, after it has been withdrawn from the wound, to make the second incision precisely at the bottom of the first; yet, if this is to be regarded as an advantage in the bistouri caché, it is equally so in the instrument here proposed. For if, after

the internal incision has been made, and the forefinger of the left hand introduced into the bladder, along the blade of the instrument, the operator find it necessary to enlarge the wound further in the base of the gland, he has only to apply the fore finger upon the obtuse edge of the director, while, with his right hand, he moves the gorget backwards and forwards, in the manner of a saw, by which he may extend the incision in the neck of the urethra and prostate gland at pleasure, and certainly with less danger of making a fresh wound than in using the knife of Cheselden, or the instrument of Frère Côme, after it has been withdrawn from the bladder.

With regard to surgical instruments generally, and particularly those which have been proposed for performing the lateral operation, Deschamps thinks that the instruments, which are really perfect and useful, are those in which no alteration has been attempted. However true this opinion may be, in general, it does not exactly apply to the gorget of Hawkins, the alterations made in this instrument by Bell, Dessault, Cline, and Cruik-

shanks, being rather so many deviations from the principles upon which the instrument was originally constructed, than improvements in it. The form which I have given to it, is rather a modification than an alteration of its primitive shape, that it may fulfil more exactly than before the intention of dividing the prostate gland laterally, and to a proper depth, as Cheselden did, without running the hazard of wounding the pudic artery or rectum. From the repeated experiments on the dead subject, and operations which I have performed with it successfully on the living, before numerous students in this University, I am authorized in declaring it to merit a distinguished place as an instrument of surgery, and consequently in recommending the use of it more particularly to young surgeons.



EXPLANATION OF THE PLATE,

FIG. 1.

The Gorget, viewed on the back part,

a a The Director.

b The Handle.

c The Beak.

d e The Cutting Edge.



FIG. 2.

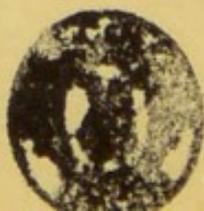
The Instrument, seen on the fore part.

FIG. 3.

The Instrument, viewed sideways.

FIG. 4.

Vertical section of the Instrument, and inclination of the Cutting Edge to the longitudinal axis of the Director.



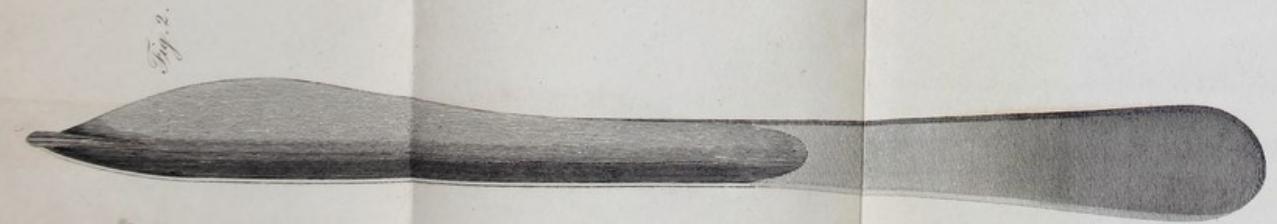


Fig. 2.

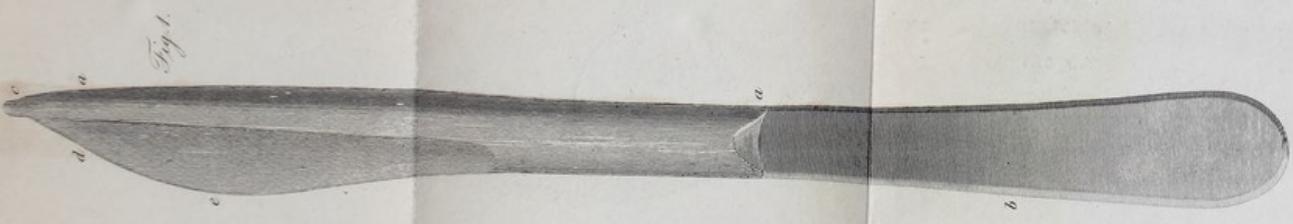


Fig. 1.

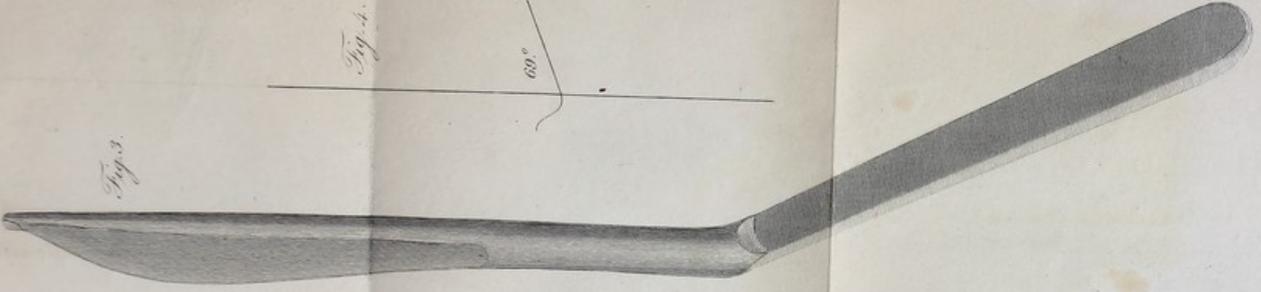


Fig. 3.

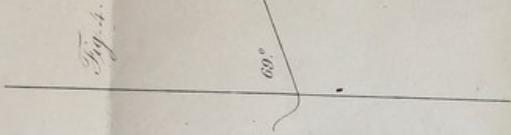


Fig. 4.



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