ARTICLE III.—Contributions to the Pathology and Treatment of Diseases of the Uterus. By James Y. Simpson, M.D., Professor of Midwifery in the University of Edinburgh, &c.

(Continued from Vol. III., (1843) p. 1027.)

PART IV.—ON THE MEASUREMENT OF THE CAVITY OF THE UTERUS AS A MEANS OF DIAGNOSIS IN SOME OF THE MORBID STATES OF THAT ORGAN.

In our last communication, we described a number of morbid conditions of the uterus in which the cavity of that organ is more or less elongated. We showed that the diagnosis of these affections could be greatly advanced by ascertaining, through the use of the Uterine Bougie, the exact extent and degree of the existing elongation. It was at the same time remarked, that in some pathological states of the uterus its cavity is shortened and diminished in depth. On the present occasion, we purpose to describe briefly this latter set of cases, and will point out in what respects their discrimination during life may be promoted by the employment of the Uterine Sound.

INSTANCES OF DIMINISHED LENGTH OF THE UTERINE CAVITY.

The Cavity of the Uterus, when shorter than natural, may have its depth diminished as the result of malformation, of disease, or of displacement.

1. Preternatural shortness of the Uterus from original malformation of the organ.—Few of the malformations of the uterus, with the exception of the duplicity and absolute deficiency of the organ, have as yet attracted much attention. It would, however, be easy, we believe, to bring together, by a little patient research, a considerable series of cases in which the organ was found less than its normal length by an inch or an inch and a half. In some instances, in fact, the cervix of the uterus is alone present, and the body and fundus of the organ are imperfectly or totally undeveloped. In more strict terms, the lower extremities of the Fallopian tubes, instead of coalescing and becoming evolved into the body and fundus of the uterus, remain separate, retain their tubal character, and open into the superior part of the single cavity of the cervix. Such appears to us to be the explanation of the case, for example, described by Lauth, in which the cervix of the uterus is alone present, and the body and fundus of the organ are imperfectly or totally undeveloped. In Andral’s Anatomie Pathologique, tom. i. p. 677.) Morgagni speaks of a uterus in which the distance from the os to the fundus was not so much as the breadth of the thumb. The genital organs were in other respects malformed.—(Epist. xlvi. 20, Alex-
ander's Translation, vol. ii. p. 661.) Dr Dewees mentions an instance of amenorrhea in which the uterus was of "a size not exceeding the thumb of a man."—(System of Midwifery, p. 69, ed. of 1837).

In that particular variety of malformation which various pathologists have described under the name of "oblique uterus," and where the organ originally lies with its fundus directed to one side of the pelvis, and has one set of its lateral ligaments shorter than another, the organ is sometimes, though not always, shorter than natural. Tiedeman describes an oblique uterus two inches and a line in length, and in which the cavity would measure considerably under two inches, (Von den Cowperschen Drusen des Weibs, &c. p. 26).

In all cases in which the uterus is malformed and shortened in the modes we have alluded to, the Uterine Sound will probably afford us important diagnostic information, by enabling us to measure the exact degree of diminution in the length of the cavity of the organ. To make the information more certain and precise, it will be necessary at the same time to ascertain, by a hypogastric or rectal examination, that the apex of the instrument has really reached the superior end of the uterine body, and hence, that it is not arrested in its progress by any structure in the cavity, or by any flexion in the walls of the viscus, such as we shall afterwards fully describe.

2. Uterine canal shortened from stricture or partial obliteration.—

"A stricture," says Dr Baillie, "is sometimes formed within the cavity of the uterus, so that its cavity at one part is obliterated entirely. This, (he adds) I believe almost always to take place at one part, namely, where the cavity of the fundus uteri terminates, and that of the cervix begins, for in this place the cavity of the uterus is narrowest. As the sides of the cavity round this place lie very near each other, and form naturally a small aperture; it is probable that some slight inflammation may unite the parts together, and shut up the aperture; or the parts may gradually approach each other without this cause, as in the stricture of the urethra."—Morbid Anatomy, edit. of 1812, p. 379).

The morbid state which Dr Baillie has so accurately described in the above quotation, as the result of his observations upon the dead body, could only be detected upon the living subject, by examination with a Uterine Probe or Bougie. Nor would the diagnosis be difficult, for at the same time that it was found that the Bougie was completely arrested in its progress upwards, at the distance of an inch, or an inch and a half from the os tinee, it might be ascertained by a hypogastric examination, that it was still far from having reached the fundus uteri.

Since the time that Dr Baillie wrote, Professor Mayer of Bonn has shown that in old persons, the os internum or cervico-uterine orifice is so often obliterated, that it may be almost looked upon as a normal condition, connected with the general atrophy of the viscus that takes place in very advanced life.—(Beschreibung einer Gra-
viditas Interstitialis Uteri, p. 14). In one or two aged patients I have found it impossible, during life to pass the smallest probe through the os internum, probably owing to the contraction in question. The cases I allude to were those of females, who in earlier life, had produced children, and where there was therefore no original stricture or malformation.

Stricture of the os internum is, like diminution in the size of the os tinea, not unfrequent in females affected with dysmenorrhœa, and who, though married, have never had children. In several cases I have met with difficulty and obstruction in passing through the opening between the cavities of the neck and body of the uterus, a sound or probe that had already passed easily and freely through the os tinea. I have at present under my care a case of this kind in which there is a most remarkable degree of antroversion of the whole uterus. Jahn, in his Essay on the Oblique Uterus, mentions an instance of that malconformation where, after death, the os internum was found so narrow that a fine probe could not be passed through it, (ut subtilissimo stilo transitum denegaret); and yet the os tinea was well formed, (De Situ Uteri Obliquo in Schlegel's Sylloge Operum Obstetr., tom. i. p. 268). In Ruysch's Catalogue a uterus is mentioned, with the os internum so small as not even to admit the head of a small needle, (ne caput quidem aciculae minoris admittere posset). Thesaurus Anatomicus, vi. No. 85.

Occasionally the whole cavity of the body of the uterus is obliterated, from the os internum to the fundus, and yet the cavity of the cervix continues patent. Cruveilhier speaks of having seen a case of this kind, "in which there was no trace of a cavity in the body of the organ, although the cavity of the neck remained," (Descriptive Anatomy, vol. i. p. 621, of Dr Madden's translation). An example of the same kind has been represented by Madame Boivin in the plates attached to her treatise on diseases of the uterus, (see plate xiii. fig. 3.)

The cavity of the uterus is, in some rare cases, partially obliterated, in consequence, as has been already stated, of the development of fibrous tumours in the walls of the organ. Under such circumstances, the obliteration is the result of inflammatory adhesions, formed between those portions of the opposed surfaces of the lining membrane of the uterus, that happened to be maintained in a state of close and morbid apposition, by the presence and pressure of the neighbouring tumours. The adhesive inflammation thus excited occasionally extends to some distance from its original seat. In all cases, however, the cavity of the cervix seems to escape, and the portion of the cavity of the body that is placed above the stricture frequently becomes distended and enlarged, from the accumulation of morbid mucous secretions within it. Cruveilhier has described a very illustrative case of this kind, in his Anatomie Pathologique, livrais. xiv. A preparation was presented to the Anatomical Society of Paris, as a morbid ovary. In exter-
nal appearance, it had much more resemblance to an ovarian than an uterine disease. On more minute examination and dissection, however, it was found to consist of an agglomerated mass of fibrous and fibro-calcareous tumours, the whole forming a shapeless body, with an irregular, tuberculated surface. The tumours varied in size, from a pea to a large compound one weighing by itself about 1 ½ pounds. On cutting into the midst of the mass, a cavity was found, filled with reddish serum, which it was easy to see was the cavity of the body of the uterus. This cavity was a shut sac, there being no opening from it. Inferiorly, its communication with the cervix uteri was entirely obliterated. When examined as to its vaginal relations, the uterus, (or uterine canal) seemed to terminate at an inch above the os tincæ. A blunt stilet, (adds Cruveilhier) passed in all directions, could not discover above this point any opening into the uterine cavity above. If the same means had been employed, as a matter of diagnosis during life, the same result would have been obtained as in the post-mortem examination, and that result would have afforded pretty conclusive evidence that the disease was not ovarian, because the uterus does not seem to be liable to become occluded in the course of its cavity, in connection with ovarian growths; and besides, the use of the Bougie would have shown the uterus imbedded in the tumour, and probably the partial canal of the cervix running in such a direction in relation to the tumour as to add further testimony to its non-ovarian character.

3. Diminished depth and effacing of the Uterine Cavity in Inversion of the Uterus.—We believe that the diminution in depth, and, in extreme cases, the total obliteration which the canal of the uterus undergoes in inversion of the organ, will generally give us the power of distinguishing this morbid state from all others to which it is symptomatically allied; and more especially from those forms of polypus that occasionally so strictly resemble it, and with which it has been frequently and sometimes fatally confounded.

When inversion of the uterus occurs immediately after delivery, it can, in general, be easily distinguished from a polypus that has passed through the os uteri after the expulsion of the child, or placenta, or both, because, omitting other considerations, though in each we may find in the vulva or vagina, (if we are led to make an examination by the severity of the symptoms,) a large fleshy tumour, yet this tumour, in the case of polypus, can be proved not to be the displaced uterus, as the fundus uteri can still be felt above the pubis, whilst the reverse is true of inversion. If any doubt remained in consequence of difficulties in the way of the hypogastric examination, or otherwise,¹ a Bougie cautiously passed by the stalk of the vaginal

¹ For cases of polypus of the vagina after delivery mistaken for inversion, see Ramsbotham's Practical Observations, vol. ii. p. 473, and Gooch's Account of Diseases of Women, p. 282; and for cases of inversion under the same circumstances, mistaken for polypus, see Gazette Médicale for 1832, p. 422.
tumour, would, if it were a polypus, prove at once the uterine cavity to extend upwards to the length of six or seven inches, and if desired, would enable us further to feel more distinctly through the hypogastrium, the fundus uteri still remaining in situ. If the tumour were the inverted fundus of the uterus, the cavity of the organ would, on the contrary, be found shortened to an inch or two on all sides, and it would be found difficult, or impossible to bring, as usual, any part fully within the reach of an abdominal examination. In those rare instances in which the inversion was complete, the orifice and cavity of the uterus would be found entirely effaced.

The difficulty, however, of distinguishing between polypus and inversio uteri is greatly increased when the diagnosis is attempted after the puerperal uterus has diminished to its normal volume, or when the patient applies for advice at a distance from the period of confinement, and the inversion is only partial. Under such circumstances it has repeatedly happened that a polypus has been mistaken for an inverted uterus,1 or the still more dangerous error committed of considering an inverted uterus to be a polypus, and treating it accordingly.2 Such errors involve not only the comfort, but the life of the patient.

It is true that a diagnosis can generally be established with considerable certainty between polypus of the uterus and partial chronic inversion of the organ, by attending, amongst other points, particularly to the two circumstances, that however similar in other respects, the tumour formed by inversion is, 1st, in its history, traceable to having appeared immediately after delivery; and, 2d, in its character, it differs from polypus in being sensitive to a greater or less degree to the touch, while the polypus is not so. We must, however, at the same time, hold in view that some fibrous polypi, when they carry down before them and are covered with a layer of true uterine tissue, or when temporarily inflamed, are found to be sensitive,3 and that the inverted uterus becomes almost insensible when long ex-

1 See cases in Annsiaux Clinique Chirurgicale, p. 207; Acta Havniensia (1818) tom. v. p. 51.
2 On cases of inverted uteri mistaken for polypi, see Morgagni de Sedibus, &c., epist. xlv., No. 4, Palletas' Exercitationes Pathologicae p. 17, 18. Gooch in his Diseases of Women, (1831) p. 263, gives an instance where Dr Hunter applied, by mistake, a ligature to an inverted uterus. A preparation illustrative of this error was in the museum of the late Dr Hamilton; the patient, as in Dr Hunter's case, having died with the uterus partially cut through with the ligature. Occasionally the uterus has been included without fatal effects; see numerous quotations in Dr Burns' Principles of Midwifery, (1837) p. 128.
3 "It is said that an inverted uterus is sensible to the touch, while polypi, on the contrary, are void of feeling. This can never be an accurate mode of forming a diagnosis, as we can only judge of the sensibility of the tumour by the expressions of the patient, which are regulated more by disposition than by the extent of her sufferings. I lately attended a lady with uterine polypus, and had I judged solely by the complaints of my patient, I should have pronounced the polypus to have been more sensible than an inverted uterus usually is."—Dr Chas. Johnstone in Dublin Med. Reports, vol. iii. p. 468.

"We shall always find it difficult to distinguish between the sensibility of the tumour
posed; and again the fact, that the tumour first appeared immediately after delivery, is not itself conclusive, because in some cases of inversion the accident has not caused such severe symptoms as to be recognised at that moment, and again, the first time a polypus passes from the uterus to the vagina is occasionally immediately after labour. In their physical character, the two diseases often very nearly resemble one another. "When the uterus," says Dr Gooch, "is only partially inverted, that is, when its fundus only is drawn down through its orifice into the vagina, and the patient has survived for many months, the tumour feels exactly like a polypus of the fundus. In the smoothness of its surface, the roundness of its body, the narrowness of its neck, and its being encircled by the orifice of the uterus, it sometimes exactly resembles polypus of the fundus." P. 255.

To show still more strongly the difficulties which occasionally intervene in the distinction between chronic inversion of the uterus and polypus, I will adduce the testimony of one or two writers, whose authorities on this point are such as to command all confidence.

Mr Newnham, in his learned Essay on Inversion of the Uterus, after having brought together the opinions of many authors—ancient and modern—British and foreign—upon this question in diagnosis, adds, "on reviewing the foregoing testimony we shall be induced to conclude that it is always difficult and sometimes impossible, with our present knowledge, to distinguish partial and chronic inversion of the uterus from polypus." Essay on the Symptoms, &c. of Inversio Uteri. London, 1818, p. 82.

In his elaborate work on Operative Midwifery, Professor Kilian offers a nearly similar observation,—"An inverted uterus may so de-

and sensation occurring in neighbouring viscera, which are irritated by the process of examination; while, too, it must be remembered, that the sensibility of the inverted uterus is greatly diminished in its chronic stage, and that the sensibility of polypus may be increased by the presence of inflammatory action.—Newnham on Inversio Uteri, p. 83.

"It is said that the polypus is usually indolent, and that the fundus of the uterus has an exquisite sensibility, but very often one meets with painful polypi; and it must be so, since they are very often covered with the tissue of the uterus. Their lower part may be insensible, because this envelope is too thin, or it may be perforated. On the other hand it is certain that the sensibility of the inverted uterus gets duller after a time."—Lisfranc Clinique de la Pitié, tom. vii., p. 133.

"In time, the surface of an inverted uterus becomes less sensible to external impressions."—Jourdan, Dict: des Sciences Médicales, tom. 23, p. 288.

"Dr Montgomery has in his museum a preparation of inverted uterus which had during life been quite insensible to the application of the needle."—Dr Burns’ Midwifery, p. 561.

"The nature and even the facts of the accident have often not been discovered till after the lapse of many days, weeks, or months subsequently; and in a smaller number of cases not till after the death of the subject."—Davis’ Obstetric Medicine, p. 1088.

Two cases of this nature are given by Levret in his paper on uterine polypi, in the Mémoires de l’Académie Royale de Chirurgie, tom. iii., pp. 543, 545.—See also Gardien’s Traité des Accouchemens, tom. iii., p. 316; Delpech’s Precis des Maladies Chirurgicales, tom. ii., p. 586; three cases in the Journal Hebdomadaire de Médecine, No. 44; Ramsbotham’s Observations, vol. ii., p. 473. I have seen one come down after a premature labour.
œitfully (tauschend) resemble a polypus that the diagnosis is scarcely possible.” - B. ii. p. 280.

In a clinical lecture on inversion of the uterus, Velpeau, in alluding to the diagnosis of that disease from polypus in some very difficult instances adds, “there are cases in which doubt is the only rational opinion.” (le doute est la seule opinion rationelle.) Clinique Chirurgicale, Paris 1841. Tom. ii. p. 425.

“When (observes Lisfranc, Clinique, vol. iii. p. 135,) the polypus or inversion has only partially opened the os uteri, we are assured that the diagnosis is impossible—authors do not even consider the case.” “From the facts we have adduced,” he adds (p. 136,) one may easily conceive the immense difficulties met with in cases of this nature; thus under a great number of circumstances, the most distinguished practitioners have believed that they had tied polyipi, when they had included the organ of generation itself in the ligature; and in other cases they have supposed they had removed the uterus either wholly or in part, when they had only relieved their patients of polyposous tumours.”

In order to resolve the difficult problem in uterine diagnosis to which these remarks refer, Malgaigne some time ago proposed a means which is thus described; (Lisfranc, Clinique de la Pitié, tom. iii. p. 137,) “a curved catheter is introduced into the bladder, it is then carried backwards and its concavity directed downwards so as to bring the point of the instrument into the bottom of the uterine sac: the index finger is then introduced into the vagina, where the point of the catheter is as easily felt as it is in the hypogastrum in ordinary catheterism. Thus the diagnosis is established, “but there are circumstances” continues Lisfranc, “in which the catheter, in consequence of the adhesion of the organs, cannot penetrate into the sac of the inverted uterus; then it might be erroneously believed that we had to do with a polypus.” Setting this last objection aside, we doubt entirely the applicability of such a means of diagnosis in this case as that proposed by Malgaigne. The urethra of the female is placed in such a direction in relation to the other pelvic contents, that if the stem of an ordinary male catheter be held in it, the apex of the instrument, when turned backwards, will look posteriorly to the hollow of the sacrum, and cannot without lacerating the urethral connections, be made to return downwards towards the vagina. To enable it to do so, the instrument would require to be curved at an acute angle, and not at an obtuse,—and if of the former shape it could not be made to pass into the bladder, and even if passed could not probably be used with safety. We make these remarks after having tried repeatedly the experiment upon the dead subject.

A more safe and easy means of distinguishing a polypus from a partially inverted uterus, will be found in the measurement of the uterine cavity, by the introduction of the Sound. In some doubtful instances its aid will afford us a certain mode of complet-
ing the diagnosis in this, a class of uterine cases, in which, above all others, the prognosis and treatment are almost entirely dependent upon the accuracy of our diagnosis.

To avail ourselves of the information afforded by the measurement of the Bougie, it is to be held in view that in polypus the depth of the uterine cavity is not necessarily diminished, but sometimes the reverse, while in inversion it is always diminished to a great and notable degree.

In four cases of polypi, of considerable size, projecting through the os uteri, and which I have had occasion to remove, within the last few months,—the Bougie in all, when passed by the side of their pedicles into the interior of the uterus, showed its cavity to be of the natural depth. In some preparations I have seen the cavity elongated, in consequence probably of its distension by the polypus, previous to the protrusion of the latter. On the other hand, in partial chronic inversion of the uterus, with the fundus uteri passed downwards and projecting through the os, the uterine cavity must be necessarily diminished on all sides in depth, by this doubling up of the organ; and further, this diminution of its depth must be proportionate in its degree to the degree of the inversion, so that ultimately, if the inversion becomes, as sometimes happens, complete, the cavity will, of course, be entirely obliterated. In a common case of such partial inversion and protrusion of the fundus as is liable to be confounded with a polypus projecting through the os, the depth of the interior cavity would be found diminished, at least by more than a half, or might measure on all sides about an inch or less in depth, instead of the usual length of two and a half inches.1 In making this measurement with the Bougie, it will always be requisite to ascertain accurately that the depth of the uterus is lessened in the same way at every point around the stem of the tumour, otherwise we might mistake a polypus, which by adhering to one side of the cavity, diminishes by the presence of its pedicle, the depth of that one side merely, for an inversion of the uterus which diminishes the depth of the cavity equally on all sides. It is for this reason that we believe the employment of the finger alone, to ascertain this shortening of the uterine cavity, as recommended by Boyer, (Maladies Chirurgicales, tom. x. p. 583) and Dupuytren, (Leçons Orales, tom. iii. p. 553) is quite insufficient. In most cases it is too large a body to be passed without force and pain, if at all, into the contracted cervical cul-de-sac,—and even if passed to its full depth, it could never leave us perfectly sure that there was not a narrow communication at some point with the uterine cavity beyond.

1 In a case in which the inverted uterus was tied in the Lyons Hospital, under the idea that it was a polypus, the patient died on the fifth day. On the post-mortem examination, the vagina and uterus were of the natural size; and the uterine cavity was on all sides reduced to seven or eight lines in depth, (dans tous les points de son etendue sept ou huit lignes de profondeur). Petit, in whose practice the case occurred, relates that four "Maitres de l'Art," after a careful tactile examination, all pronounced the
As a general rule then, it will, we believe, be found that, in cases of tumours projecting through the os uteri, and when the other symptoms leave any doubt as to whether the tumour be a true polypus or merely the fundus of the organ chronically inverted, the employment of the Uterine Bougie will enable us to decide the diagnosis, and hence also, in a great measure, the prognosis and treatment, by the positive or negative information which it affords with regard to the shortening or non-shortening of the uterine cavity. For,—

1. If the Bougie passes into the uterine cavity to its usual depth, of two inches and a half or more, the disease is not inversion of the fundus,—a fact, the certainty of which may, while the Bougie is still in utero, be farther corroborated, by the fundus in situ being actually felt through the hypogastric walls whilst it is pushed forward on the apex of the instrument, or through the rectum, whilst by the same means it is retroflected in the mode already described upon the front wall of the bowel. In this case the tumour is one which is in general safely and easily removable. But,—

2. If the uterine Bougie cannot pass at any point around the stem of the tumour to a greater extent than about one inch, the uterine cavity may be considered as shortened by inversion, and the protruding mass cannot be interfered with without imminent danger to the patient. When in any case this last point is positively ascertained, another consideration may arise.—Is the general shortening of the uterine canal the result of simple inversion of the uterus, or of inversion complicated with, and produced by the attachment of a polypus to the interior of the fundus uteri? The decision of this point may be of the first importance, both as regards the propriety and the safety of any further interference. If the disease be simple inversion, no operation would be attempted, unless under the call of very anxious and urgent reasons. If the inversion be the result of the weight and dragging of a polypus, then by removing the latter, the uterus may itself become replaced, and the patient be restored to the enjoyment of perfect health. In making this additional diagnosis between simple and complicated inversion, the anterior history of the patient, and the characters of the tumour, may be sufficient to guide us, but both again may be liable, in particular instances, to lead us into error. The length of the whole interior of the uterus, as made up by the double measurement, first of the depth of the cul-de-sac of the cervix, and secondly, of the inverted portion from the roof of this cul-de-sac to the apex of the inverted tumour, may afford us more positive information. When added together, the two measurements will, in a case of simple inversio uteri, not exceed much, if at all, the normal length of the cavity of the organ;—in a case of inversion complicated with polypus, they will exceed this standard in a ratio proportioned to the size of the polypus and the probable elongation of the uterine tissues which it has produced.

inverted uterus in this instance to be a polypus. Recueil des Actes de la Société de Santé de Lyon, (1798) p. 103.
"The only danger," says Dr Gooch, "attendant on the operation on polypus is, that the ligature may include a portion of the uterus." (p. 264). This danger, which has led to a fatal result in many master hands,1 will be easily avoided, by the previous use of the Bougie in the way we have suggested, so as to ascertain the presence or absence of any co-existent degree of inversion. If the polypus be found complicated with inversion, but yet has a sufficiently marked narrower part or pedicle connecting it with the fundus uteri, its removal in the usual way, by the ligature or knife, may be safely accomplished, if great caution be employed. If the polypus, however, adheres by a broad base, and is decidedly fibrous or cartilaginous in its structure, the case would probably form an appropriate one for the operation that has been had recourse to in several instances of late for the removal of fibrous tumours in the wall of the uterus,—namely, dividing by a longitudinal or crucial incision, the thin layer of uterine tissue, covering the projecting part of the tumour, and afterwards enucleating the mass of which it consists. In this way the source of danger pointed out in the quotation from Dr Gooch would be so far avoided.

In the preceding observations I have not adverted to the distinction between complete chronic inversion of the uterus, where the cavity is entirely effaced, and polypus of the neck or lips of the uterus. I have reserved this particular and sometimes puzzling case for consideration under another head.

1 See, for example, a case of Dr Denman's in his *Introduction to Midwifery*, p. 106, (Ed. of 1816). *Herbiniaux, Traité sur divers accouchmens, &c.* tom. ii. p. 35, and obs. xvii. &c.