

## CHAPTER IV.

## THE INSTRUMENTS SERVING FOR DIAGNOSIS AND TREATMENT.

HAVING taken a cursory survey of the principal symptoms, chiefly subjective, attending ovarian, uterine, and vaginal disease, the methods of investigation by which we bring out the objective signs and seek to establish a full diagnosis might now be described. But as the means to be employed in this investigation involve the use of instruments, I have thought this would be the most convenient place to introduce a description of the instruments employed and the mode of using them. Having become acquainted with our tools, and knowing what they can do, we shall then be in a better position to proceed to diagnostic analysis.

## THE GYNÆCOLOGIST'S ARMAMENTARIUM.

It will serve the purpose of order and conciseness if we gather into one view the chief instruments and materials employed in the diagnosis and treatment of the diseases of women. Independently of reasons of economy and method for collecting all these things into one compact portable case, stands the great practical fact that, when about to investigate a case of presumed ovarian, uterine, or vaginal disease, we cannot tell what instruments we may want to carry out the indications in diagnosis and treatment which may present themselves. For example, all local examination necessarily begins with the digital touch. This may be sufficient, but often it gives information which is imperfect, and which requires to be followed out by the speculum or sound; and when we have got the full diagnostic knowledge which finger, speculum, and sound can give, it frequently happens that we are immediately in a position to apply an appropriate remedy. Thus diagnosis is made the true handmaid of treatment. The patient is often spared the double distress of two separate examinations. It is in this quality that lies the highest recommendation of the diagnostic instruments we employ; it is this quality which invests them with a practical superiority over most of the instruments employed in the investigation of diseases of other parts of the body. The stethoscope, for example, an instrument invaluable, but not absolutely indispensable, for diagnosis, and thus helping to form a scheme of treatment, is of no use in carrying out the treatment. Like the sphygmograph or the thermometer, it is purely an instrument of observation.

It would appear to be a natural classification of our appliances to divide them into diagnostic and therapeutical. Rigorous adherence to this is defeated by the double quality which some of the instruments possess. But still this division is rational and convenient.

It is not, perhaps, superfluous to preface the enumeration and description of instruments by recalling attention to the hand and eye of the

physician. The eye, of course, is simply an instrument of observation; its application is often only possible when aided by other instruments, as for instance, the speculum; and in a great many cases it is not wanted either for diagnosis or treatment. But the hand is pre-eminently the obstetric instrument; it possesses a wide diagnostic and therapeutical range of usefulness; it is not only in itself competent to the detection of many morbid conditions, and to the treatment of some, but it is also an indispensable element in the use of other instruments.

The *Diagnostic Instruments* are:—

- The speculum.
- The endoscope.
- The speculum-forceps.
- The uterine sound.
- A flexible whalebone sound.
- The sponge or laminaria-tent.
- Dieulafoy's aspirator with special trocars.
- A bit of wax-candle, or small reflecting candle-lamp for speculum examinations and operations in dark weather or unfavorable positions of the patient.

The *Therapeutical Instruments* are:—

- The uterine sound.
- The catheter.
- The speculum-forceps.
- Simpson's metrotome-knife.
- The metrotome-scissors.
- Sims's single tenaculum-hook to hold the vaginal-portion.
- A wire écraseur.
- The intra-uterine solid caustic-carrier.
- “ “ fluid and ointment-carrier.
- The tube for carrying sticks of sulphate of zinc, or other substances, into the uterus.
- Barnes's laminaria-tent carrier.
- A scarificator.
- An intra-uterine injecting apparatus.
- A probang mounted with sponge.
- A syringe for washing out the vagina or uterus.
- A subcutaneous injecting syringe, to which may be adapted a long hollow needle to draw off fluid from a tumor for microscopical and chemical analysis.
- An aspirator-apparatus with special long needles for penetrating tumors by rectum or vagina. To explore and tap retro-uterine tumors, I have designed a very efficient trocar consisting of a tube twelve inches long, carrying a fine blade which serves both to puncture, and if needs be to extend the opening; the knife withdrawn a coil-drainage tube can then be carried through the tube into the cyst.

The most useful *Materia Medica* are :—

- Perchloride of iron (solid).
- Chloroform or ether.
- Chromic acid, in crystals.
- Richardson's styptic colloid.
- Bromine of caustic power.
- Carbolic acid.
- Nitric acid is often wanted, but it cannot be carried or packed with other things, unless in hermetically sealed tubes.
- Tincture of iodine.
- Acetic acid, concentrated.
- Nitrate of silver.
- Sticks of potassa cum culce.
- Sticks of sulphate of zinc.
- Iodide of mercury ointment.
- Medicinal pessaries: 1. Perchloride of iron pessaries.
- 2. Belladonna.
- 3. Morphia.
- 4. Gallic acid.
- 5. Iodide of lead.

The following articles should also be at hand :—

- Cotton-wool, plain and prepared with styptics and disinfectants.
- String, silk, lint.
- Needles, half-curved, carrying silver wire.
- Forceps for holding needles.
- A small collection of pessaries. (The most useful are three sizes of Hodge's lever-pessaries.)
- Thomas's or Galabin's pessaries for anteversion.
- One or two of the author's intra-uterine galvanic pessaries.
- A vulcanite intra-uterine pessary.
- A Sims's or Barnes's vaginal rest.
- A Gariel's or other air pessary.

The pessaries will be described in a succeeding chapter.

The stethoscope and thermometer are, of course, the constant companions of every medical practitioner.

In addition to the knives, scissors, forceps, etc., required for special operations, it will be useful to possess a galvano-cautery, and a Paquelin's thermo-cautery. The galvano-cautery, of which the most convenient form is Mathieu's of Paris, is cumbersome, and troublesome to work; but it does what Paquelin's ingenious instrument will not do, and therefore cannot be dispensed with.

*Instruments for use by patients :—*

- Higginson's vaginal syringe.
- Barnes's speculum for self-application of vaginal pessaries, and wool carrying solutions of lead, bromine, etc.

The special requirements of particular cases, or the views of the practitioner, will suggest further or different things to make up the equipment.

My object is to enumerate those which are the most generally useful. A selection of the above, especially including the diagnostic instruments, should be kept in a suitable hand-bag or case.

Some of the articles require a more particular description. To take first the *speculum*. Specula may be classed under three heads according to their mode of action :—

1. *Tubular*, which act by distending the vagina longitudinally, thus lengthening the vagina and pushing the uterus away before it.
2. *Valvular*, which distend the fundus of the vagina, thus widening and shortening the vagina, and bringing the uterus lower and nearer to the vulva.
3. The single *duck-bill*, which acts by retracting the perineum and posterior wall of the vagina.

In private practice, the most generally useful speculum is that known as *Fergusson's* glass tubular instrument, silvered and coated with vulcanite (Fig. 39). The light this gives is superior to that which any other form of speculum can give; and this is an advantage of primary importance, for we cannot always in the houses of patients command a good, direct horizontal light. Two sizes should be kept; one of comparatively large size for women who have had children, and one of small calibre for others. Both should be six or seven inches long, otherwise the vagina may not be distended enough to bring the os uteri into view.

The tubular speculum has the disadvantage that, when introduced its full length, it possesses no power of increasing the distension of the fundus of the vagina, so as to bring out the vaginal-portion from behind overlapping folds of a lax vagina; therefore, unless an instrument of adequate size be used, it may fail to exhibit the os uteri.

A serious objection to Fergusson's speculum is its liability to break. All its advantages are secured, without this drawback, in an instrument of the same shape made of metal plated with nickel.

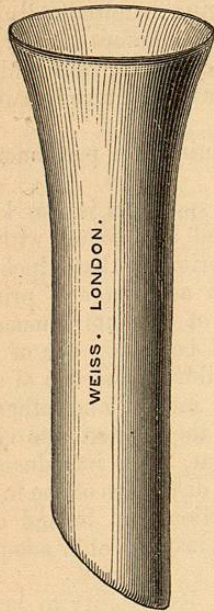
Plain glass specula are, however, useful; and if made of "*verre trempé*" would resist ordinary risk of breakage. They possess the advantage of being cleanly beyond suspicion. The German "*milch-glass speculum*" has equivalent merits.

Good valvular specula overcome the difficulty inherent to the tubular. Being introduced their full length in a closed state, the blades can be opened at their extreme points so as to stretch out the folds at the roof of the vagina, and thus bring the os uteri well into the field, without increasing the distension at the vulva. As the uterine ends of the blades expand, it is not only more easy to bring the vaginal portion into the field, but by continuing the expansion, the roof of the vagina is put on the stretch, and thus pulls open the os uteri, exposing often a considerable part of the cavity of the cervix, and thereby much facilitating the direct application of remedies.

For many years I used a modification of Henry Bennett's bivalve speculum. It is an excellent instrument, but I have been led to prefer for general use *Cusco's* speculum (Fig. 40). The wooden plug, an objectionable complication of most other bivalves, is got rid of. The blades are wide and nearly flat, so that, when brought together, they touch along the whole extent of their margins, and represent a wedge with

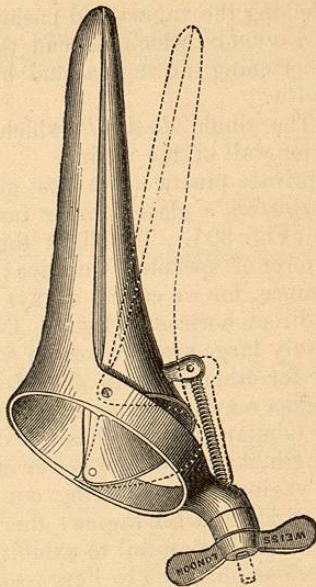
smooth edges. This makes the plug superfluous. It is not, however, quite so easy to introduce; some care is requisite to keep off the rather narrow edge from the os pubis. When introduced, the screw at the handle expands the blades at the uterine end, and distends the vaginal

FIG. 39.



Fergusson's Speculum. (Half natural size.)

FIG. 40.



Cusco's Speculum. (Half size.)

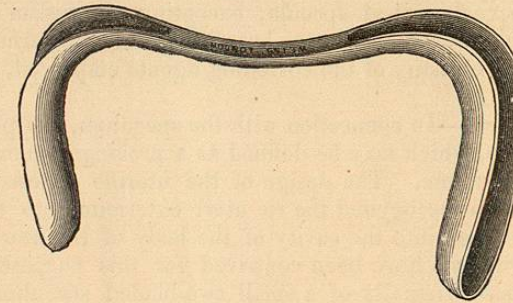
roof in a very efficient manner. This instrument is in many cases self-retaining. It is virtually a double duck-bill speculum. I have found it useful to increase by an inch or more the part in which the screw is worked at the handle. This takes the hand clear of the range of vision, and the screw from entangling the pubic hair.

*Marion Sims's Single Duck-bill or Spoon Speculum* (Fig. 41).—This is a most serviceable instrument. It is almost indispensable in the performance of protracted operations, such as the closure of vaginal fistulæ. It is not, however, so convenient for ordinary practice. In many cases an additional instrument to serve as a retractor to hold back the anterior vaginal wall is required; and this makes an assistant necessary. It is, moreover, only available in the semi-prone position, or in the lithotomy position, neither of which is it always easy to obtain in private practice. It is convenient to have it made the two blades united by a screw, so that the blade serving as a handle may be made to turn either way.

*The Author's Bivalve Speculum. "Crescent Speculum."*—There is no speculum with which I am acquainted so useful for facilitating operations upon the vaginal-portion as the modification of Neugebauer's, which I have designed (Fig. 42). In many cases this instrument is sufficiently

self-retaining to afford the manipulator the opportunity of applying remedies to, or even of performing operations upon, the cervix uteri without assistance. It gives freer space for operative manipulation than any other speculum. It brings the os uteri so near that it is commonly easy to reach it by finger.

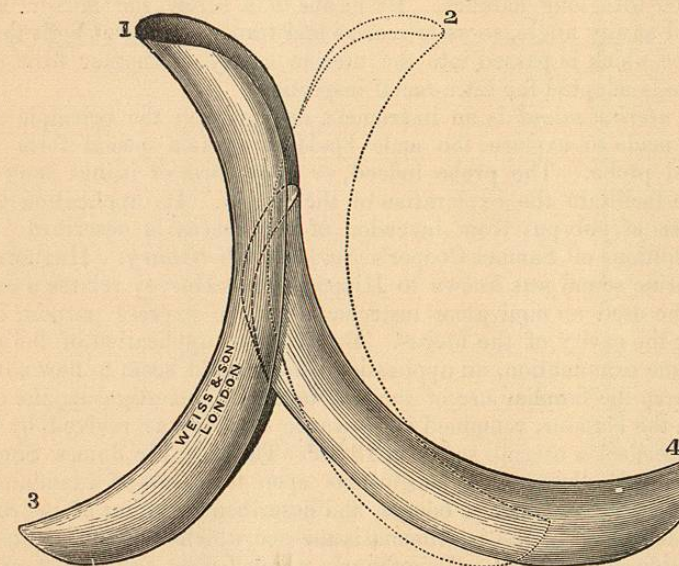
FIG. 41.



Sims's Speculum.

The tubular and valvular specula afford a perfect inspection of the whole tract of the vagina and vulva. The time for making this inspec-

FIG. 42.



Barnes's Speculum (R. B.). (Half size.)

tion is during the withdrawal of the instrument. As this is slowly done, the vaginal walls close in upon the retreating speculum, and come successively within its field. Except in very extreme cases of relaxation,

the contractility and resilience of the vagina are powerful enough to aid in expelling the speculum.

*Weiss's Self-retaining Duck-bill Speculum.*—This instrument is the adaptation of an apparatus for fixing a duck-bill or Sims's spoon-blade in the vagina, so as to dispense with the use of hands to hold it *in situ*. In this way many operations may be conveniently carried out without assistants. I have used it, and find that it answers its purpose.

All the above-described specula, excepting Fergusson's, should be plated with nickel. This gives a beautifully smooth surface, which resists the action of many of the corroding agents employed, and is easily kept bright.

*The Endoscope.*—In connection with the speculum, it is proper to refer to the endoscope, which may be defined as a prolongation or extension of the ordinary speculum. The design of the uterine endoscope is to enable the surgeon to see beyond the os uteri externum into the cavity of the cervix, and even into the cavity of the body of the uterus. Several ingenious instruments have been contrived for this purpose. One, that of Jobert, consists virtually of a small two-bladed speculum, capable of being introduced closed into the cervix uteri. The two blades being mounted on a long stem, are, after introduction, made to diverge by working a screw in the handle. It resembles in principle and action Weiss's urethra-dilator. Another contrivance that may be mentioned is that of Tyler Smith.<sup>1</sup> This instrument is applied through a modified Cusco's speculum. It consists of a mirror and a cylindrical tube, both provided with long handles. By means of a screw, the mirror can be inclined at any angle, so as to receive and transmit a ray of light through the tube which is passed into the uterine cavity. Another form of endoscope is adapted for intra-rectal inspection.

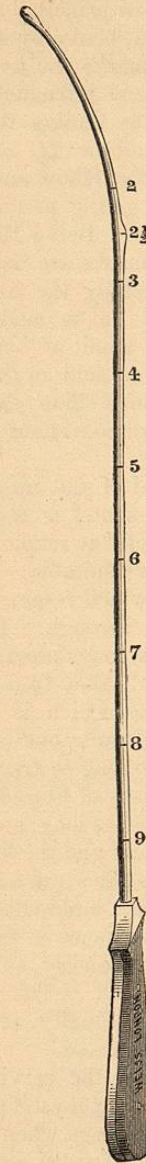
The *uterine sound* is an instrument designed on the principle of the sound made to explore the male bladder. It is a special form of the surgical probe. The probe indeed, or some form of it, has long been used to facilitate the exploration of the uterus. Its application to the diagnosis of polypus from inversion of the uterus is described in the early editions of Samuel Cooper's *Surgical Dictionary*. Huguier says the uterine sound was known to Hippocrates. Harvey relates a case in which he used an equivalent instrument for the express purpose of exploring the cavity of the uterus. But still the application of the sound to uterine examination, an application which would seem to flow so naturally from the familiar use of the instrument in investigating the condition of the bladder, remained in abeyance until it was revived by Lair, who described a uterine sound in 1828.<sup>2</sup> The late Sir James Simpson, in 1843, made known his conclusions upon the mode of examining by help of a uterine sound or bougie, and described the form of instrument he recommended. His instrument is the one which I have selected for illustration in this work. It is the one which I most frequently employ. It is provided, like the common male sound, with a flat handle to facilitate manipulation, and terminates at its other extremity in a rounded

<sup>1</sup> Obstetrical Society's Catalogue of Instruments, 1867.

<sup>2</sup> Nouvelle Méthode de Traitement des Ulcères de l'Utérus. Paris, 1828.

knob or bulb, which enables it to ride more easily over the rugæ of the cervical canal, and lessens the risk of injuring the uterus. The stem tapers gradually from the handle to the knob, the thickest part being

FIG. 43.



Simpson's Uterine Sound. (Half size.)

FIG. 44.



Barnes's Whalebone Sound. (One-third size.)

equal in calibre to a No. 8 catheter, the portion near the knob being equal to a No. 3 catheter. The exploring half of the sound should be made

of silver only moderately alloyed with copper, so as to permit of its being readily bent by the fingers. Some are made with virgin silver. This is too flexible, as it is apt to bend during use, especially in cases of flexion of the uterus. The stem is about ten inches long, and is graduated so as to indicate the depth to which it may penetrate. The graduation is marked in the figure. (Fig. 43.) There is one principal mark which is the most essential as a standard of comparison, made by an elbow or projection, just  $2\frac{1}{2}$  inches from the knob. This marks the normal length of the uterine cavity. When the sound has been introduced as far as this, resistance is commonly felt, and we know, by feeling the elbow on a level with the os externum uteri, that the knob is  $2\frac{1}{2}$  inches in the uterus. It is useful to have a mark between the elbow and the knob half an inch above the elbow. This is useful in giving precise measurement when the knob will not go the full distance. Below the knob the stem is graduated by inches. These secondary marks are best made by slight notches. There are different ways of making the index-marks; but as Simpson rightly insists, the marks should be so made as to be readily felt by the finger in the vagina, so as to admit of being read off when the instrument is withdrawn. The sound, as sold in the shops, is almost always bent at an obtuse angle at the  $2\frac{1}{2}$ -inch elbow, the two parts above and below being quite straight. It is more convenient in practice to give a slight curve to the part above the elbow.

There are cases, notably those where the canal of the uterus is much deviated by tumors, where the use of the rigid sound is objectionable. In cases of this nature it is occasionally more useful to employ a flexible bougie or sound. An ordinary male bougie is very suitable. Dr. Henry Bennet commonly uses bougies of soft material, which retain the impression of any constriction they may have passed through. Dr. Thomas uses<sup>1</sup> a hard rubber sound, about twelve inches long, provided with a knob at the end similar to the figure (Fig. 44), taken from the instrument which I use. This is made of whalebone, which is sufficiently flexible and durable, and is not likely, as the vulcanite one is, to break. My instrument is fifteen inches long, not at all too long to track the elongation of the uterine cavity produced by some cases of fibroid tumor.

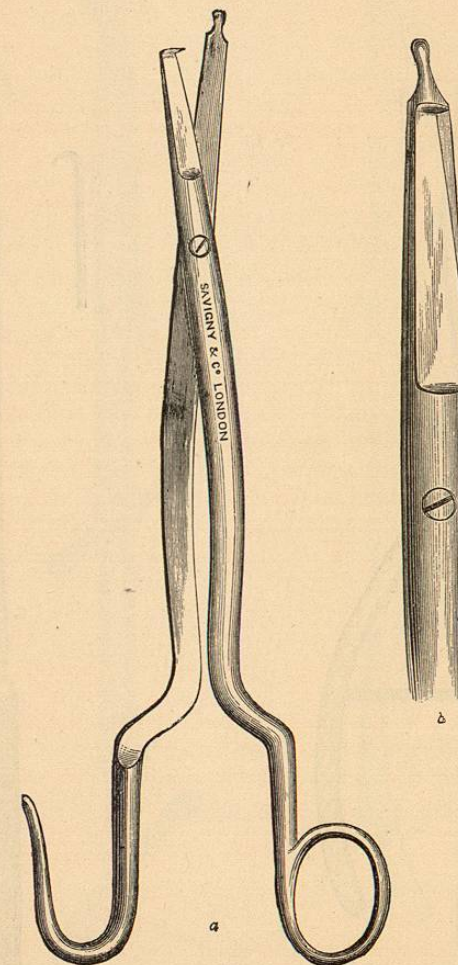
The *speculum forceps* should be about twelve inches long, and *straight*. It is sometimes made with an angle between the joint and the finger-holes, under the mistaken idea that when straight the handles and hand occlude the field of the speculum, and interfere with accurate manipulation. This objection is not real. There is a practical inconvenience in the handling of a bent forceps. It will not, for example, rotate handily, so as to wipe off adhering secretion, as the straight forceps will. The instrument should be toothed at the ends, and grooved longitudinally, so as to hold a rounded stick of nitrate of silver, or potassa cum calce.

*Metrotomes*.—The instruments I employ to incise the cervix uteri are Simpson's metrotome, and either a scissors designed by myself or Küchenmeister's. The reasons for this preference will be given when discussing the operation. Simpson's metrotome is really a *bistouri caché*, with a long handle. When closed the blade and its guard or sheath form a rod

<sup>1</sup> Diseases of Women. Philadelphia, 1872.

about the size of a sound, which is easily passed into the cervix uteri. When there, by depressing the handle to an extent determined by a regulating screw, the blade is made to start from its guard, and cuts its way out. The guard is sometimes made double, so that the blade sinks back between the two parts. This is inconvenient. When the blade, after having cut, is allowed to fall back into its guard, the point is apt to pinch a bit of tissue in the guard, and the withdrawal of the instrument is thus made awkward. A single guard answers quite as well, and is free from this little difficulty (see Fig. 46).

FIG. 45.



Küchenmeister's Metrotome-scissors.  
a. Half size. b. Full size.

*Küchenmeister's Metrotome Scissors*.—Ordinary scissors are not well adapted to make an incision clear through a rounded wedge-shaped body,