Gynæcology for nurses and gynæcological nursing ... / by Comyns Berkeley.

GYNÆCOLOGY FOR NURSES AND GYNÆCOLOGICAL NURSING

COMYNS BERKELEY, M.D.

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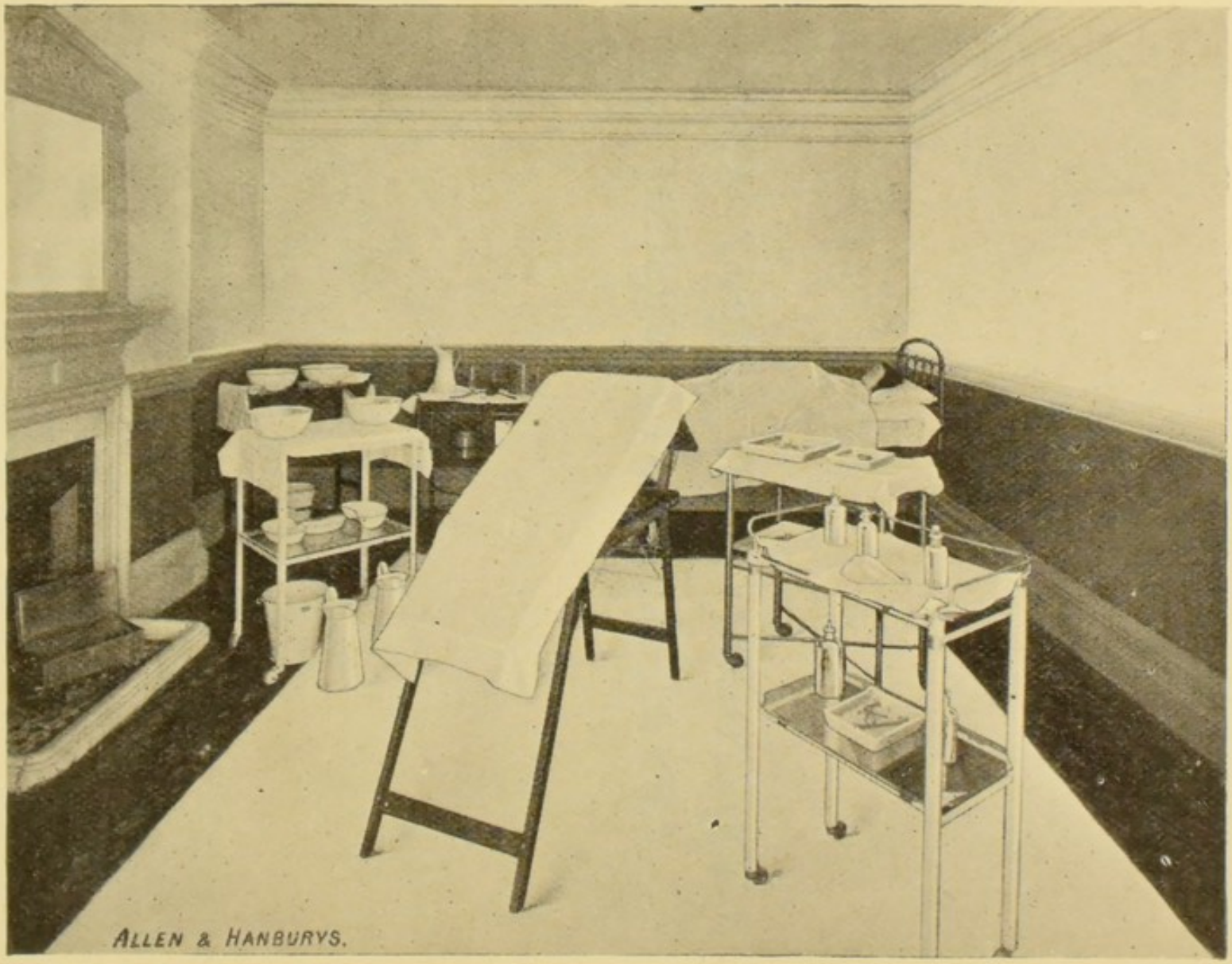

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GYNÆCOLOGY FOR NURSES

AND

GYNÆCOLOGICAL NURSING

BY

COMYNS BERKELEY

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SENIOR OBSTETRIC SURGEON, CITY OF LONDON LYING-IN HOSPITAL
SURGEON TO IN-PATIENTS, CHELSEA HOSPITAL FOR WOMEN
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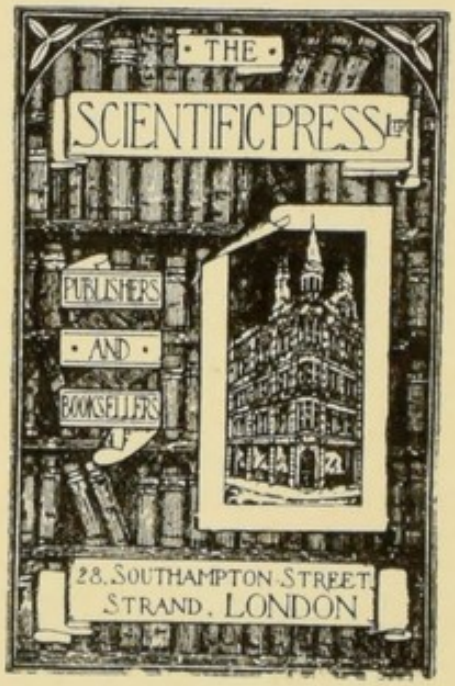

PREFACE TO SECOND EDITION.

THE favourable reception accorded this work has justified its publication. In the second edition which is now called for, I have endeavoured to incorporate the various suggestions that have been offered and to take advantage of the criticism that has been passed on it by those who kindly reviewed the book. The illustrations, which are increased in number, have been specially drawn for this edition.

I am greatly indebted to Miss Lloyd-Still, the Lady Superintendent of the Middlesex Hospital, for much valuable help, and for her conception of the *properly trained nurse*, and to Messrs. Allen and Hanbury for supplying me with the illustrations of the instruments.

C. B.

Wimpole Street, W.,
Nov., 1912.

PREFACE TO FIRST EDITION.

THE following pages contain the substance of the lectures it has been my privilege to deliver to the senior nurses of the Middlesex Hospital and the Chelsea Hospital for Women during the past twelve years. In these lectures I have endeavoured to set forth the principal facts concerned with the more common diseases peculiar to women and the chief points to be observed in gynæcological nursing, a knowledge of which is so essential to any properly trained nurse.

The subjects chosen have not been in any way exhaustively dealt with, but I think their discussion must have served a useful purpose, since this small volume is published at the request of many nurses who have attended the course of lectures it embodies.

C. B.

Wimpole Street, W.,
1910.

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GYNÆCOLOGY FOR NURSES AND GYNÆCOLOGICAL NURSING.

PART I.

GYNÆCOLOGY.

CHAPTER I.

ANATOMY OF THE FEMALE GENITAL AND URINARY ORGANS.

The genital organs of a female may be divided into external and internal.

External Genital Organs.

The following structures compose the external organs of generation which are together spoken of as the vulva.

Mons Veneris.—The mons veneris is a pad of fat in front of the symphysis pubis, and is after puberty covered with hair. It forms the anterior border of the vulva.

Labia Majora.—The labia majora, or greater lips, are composed of skin, fat, unstriped muscle, blood-vessels and connective tissue. They form the lateral boundaries of the vulva. Their inner surface is smooth, and after puberty their outer surface is covered with hair. The labia majora are continuous in front with the mons veneris and behind with the perineum, and are connected

at their posterior extremities by a fold of skin known as the fourchette and which itself forms the posterior border of the vulva. On each side, situated in the posterior part of the labia majora, is a small gland called after the anatomist, Bartholin. The glands secrete a clear fluid which escapes by a small duct through an orifice just outside the hymen. These glands sometimes become inflamed or cystic.

Labia Minora or Nymphyæ.—The labia minora, or lesser lips, are seen to be situated between the upper portions of the labia majora when these structures are separated. They vary in size in different women, and if larger than normal they can be seen projecting between the labia majora. The posterior extremities of the labia minora gradually blend with the inner surfaces of the labia majora at their lower third. In front each lip divides into two folds, which, uniting with those of the opposite side, surround the clitoris. The nymphæ are hairless.

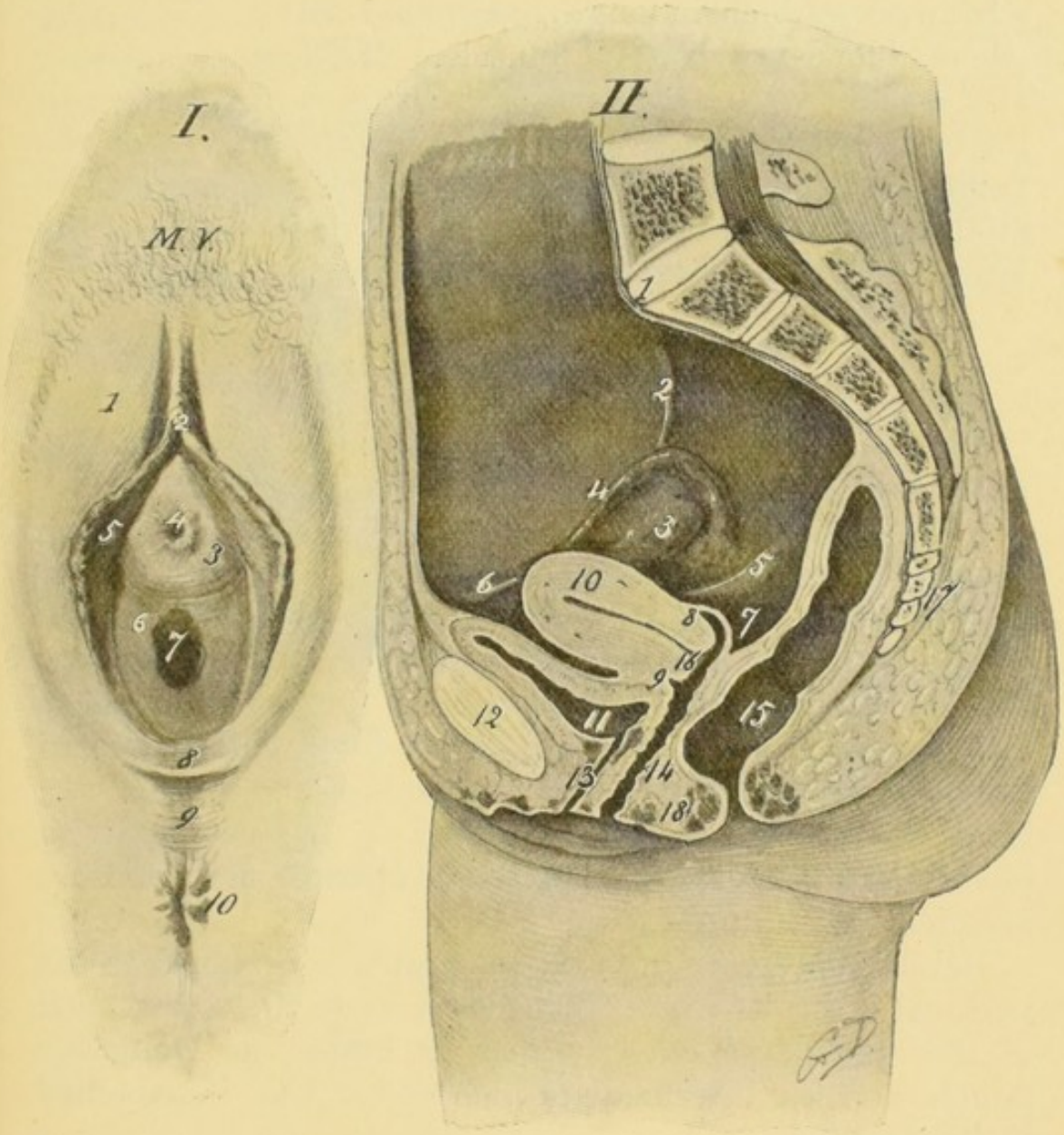
Clitoris.—The clitoris is an erectile and very sensitive structure situated at the apex of the vestibule and surrounded by the folds of the labia minora. Care should be taken, when passing a catheter, to avoid touching this body.

Vestibule.—The vestibule is a smooth triangular surface situated at the anterior part of the vulva. Its apex is formed by the clitoris, its sides by the labia minora, and its base by the hymen. Just above the centre of the base can be seen the urethral orifice. The nurse should always remember, before passing a catheter, to swab the vestibule with some antiseptic solution.

Hymen.—The hymen can be seen on separating the labia as a thin septum of mucous membrane perforated in its centre, and forms the boundary between the external and internal genital organs.

As a result of childbirth, the hymen is split up into small portions called carunculæ myrtiformes.

Perineum.—The perineum is a triangular body, some-



I.

M.V. Mons veneris.
1. Labia majora.
2. Clitoris.
3. Vestibule.
4. Urethral orifice.
5. Labia minora.
6. Hymen.
7. Vaginal orifice.
8. Fourchette.
9. Perineum.
10. Anus.

II.

1. Promontory of the sacrum.
2. Ovarico-pelvic ligament.
3. Ovary.
4. Fallopian tube.
5. Utero-sacral ligament.
6. Round ligament.
7. Pouch of Douglas.
8. Posterior lip of cervix.
9. Anterior lip of cervix.
10. Body of the uterus.
11. Bladder.
12. Symphysis pubis.
13. Urethra.
14. Vagina.
15. Rectum.
16. Perineum.

what over an inch in length, composed of skin, connective tissue, blood-vessels, and muscle. Its apex is situated at the point where the rectum and vagina first meet, and its base is the skin situated between the orifices of the vagina and anus. The lower inch of the vagina is closely attached to the anterior surface of the perineum, and the lower inch of the rectum to its posterior surface.

Internal Genital Organs.

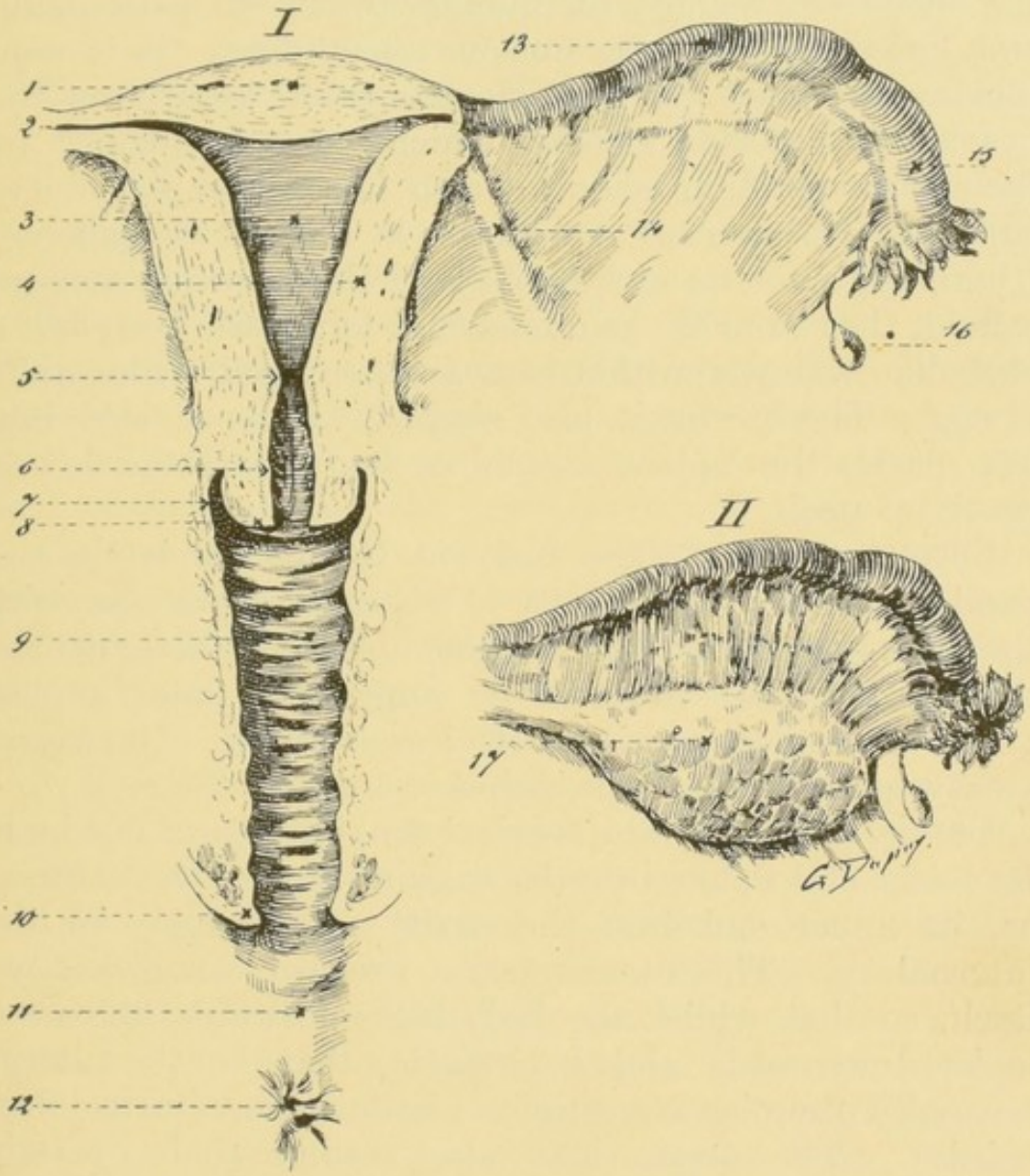
The internal genital organs comprise the following structures :—

Vagina.—The vagina is a muscular tube, lined with mucous membrane and plentifully supplied with blood-vessels and nerves. Its posterior wall measures three and a half inches, its anterior one inch less. Its relations to the structures in its neighbourhood are very important from a nursing point of view. At its lower end is situated the hymen, at its upper end the neck of the uterus. In front the urethra is closely united to the vagina at its lower part, and the base of the bladder is more loosely attached to its upper part.

Behind the lower inch of the vagina is attached to the perineal body, its upper inch lies next to the lowest part of the peritoneal cavity which is known as Douglas's pouch, and the intermediate inch and a half is attached to the rectum.

It has already been mentioned that the upper inch of the posterior of the vaginal wall is in relation with the peritoneal cavity, and it is convenient to note here that the lower part of the rectum, two and a half inches from the anus, also has a similar relation. It is most important for nurses to remember this fact, because there is a danger that an enema tube may by gross carelessness be forced from one or other of these canals into the peritoneal cavity, resulting in the patient's death. This accident has happened more than once.

Uterus.—The uterus is a muscular tube covered on



I.

1. Fundus.
2. Uterine orifice of Fallopian tube.
3. Cavity of the uterus.
4. Uterine wall.
5. Internal os.
6. Cervical canal.
7. Lateral fornix.
8. External os.
9. Vagina.
10. Vulva.
11. Perineum.
12. Anus.
13. Fallopian tube.
14. Round ligament.
15. Fimbriated end of Fallopian tube.
16. Hydatid of Morgagni.

II.

17. Ovary.

the outside by a shiny membrane known as peritoneum and lined internally by mucous membrane. It is supplied with blood by four large vessels known as the ovarian and uterine arteries, which are accompanied by their corresponding veins; it also has a complex nerve supply. The mucous membrane is termed the endometrium, and consists mostly of gland tissue which secretes a fluid, that from the endometrium lining the body being clear like water, and that from the neck glairy like white of egg. The uterus is pear-shaped, and is divided into two parts, the upper, corpus or body, and the lower, cervix or neck.

Corpus (Body).—The body of the uterus is the expanded portion. Its cavity is triangular in shape with the base uppermost, and has opening into it three canals, the two Fallopian tubes at its upper and outer angles, and the cervical canal at its lower angle. Its cavity measures one and a half inches in length.

Cervix (Neck).—The cervical canal measures one inch. Its lower end opens into the vagina through the external os, its upper end into the cavity of the body by the internal os. The uterus leans forward somewhat on itself, so that whilst the body looks forwards, the neck looks downwards and backwards, that is, the uterus normally occupies a position of anteversion (turned forwards). The uterus may also assume under certain abnormal circumstances other positions, such as those of anteflexion (bent forwards), retroversion (turned backwards), retroflexion (bent backwards), or prolapse (descent), and one or more of these may be combined.

The uterus is kept in its normal position by certain ligaments, the pelvic floor, and the intra-abdominal pressure.

Ligaments.—There are four sets of ligaments. Two in front known as the utero-vesical and round ligaments which pass between the uterus and bladder, and the uterus and abdominal wall respectively, one at each side, the broad ligaments between the uterus and the side

walls of the pelvis, and one at the back between the uterus and sacrum, the utero-sacral ligaments.

These ligaments consist of folds of peritoneum enclosing unstriped muscle and fibrous tissue. They may roughly be compared to the halyards which keep the mast of a ship in position, and if they are stretched they will facilitate a malposition of the uterus.

Pelvic Floor.—The position of the uterus is also maintained by its attachment to the pelvic floor (vagina, perineum, certain muscles, etc.), and this attachment may be roughly compared to the relation between the deck of the ship and the mast to which it is fastened. If the pelvic floor is stretched or torn, the uterus will obviously be encouraged to slip down.

Intra-Abdominal Pressure. — The intra-abdominal pressure acts on the back of the uterus, and so helps to keep this in its normal position of anteversion.

If the uterus has been pushed backwards by a very full bladder (partial retroversion), as it can be, and the woman suddenly strains, the intra-abdominal pressure will be applied to the front of the uterus, and forcing this organ still farther back may cause acute retroversion.

Fallopian Tubes.—The Fallopian tubes are two hollow structures composed mostly of muscle, lined with mucous membrane and covered with peritoneum. They are attached to the upper part of the uterine body, one on each side. They are four and a half inches long, and their outer or free ends are fringed, and are known as the fimbriated extremities. It is very important to remember that as this outer end opens into the peritoneal cavity, there is in women a direct channel from the vulva to the peritoneal cavity, and it is by means of this channel (vagina, uterus and Fallopian tubes) that micro-organisms (septic and gonorrhœal) can infect the peritoneal cavity, causing death or lifelong invalidism.

Ovaries.—The ovaries are two solid bodies about the size and shape of an unshelled almond. They are supported beneath the Fallopian tube by a fold of peritoneum,

and they are attached to the uterus by a small ligament. The ovaries are the structures in which the ova or eggs develop. It is calculated that there are in each ovary at birth the germs of 100,000 ova, and at puberty this number has decreased to 30,000.

The ovaries secrete a fluid which has certain beneficial effects on their owner. When this fluid is no longer secreted either as a result of ovarian atrophy through age, or removal of the ovaries by operation, certain changes take place in the female which are collectively known as the menopause or "change of life," and which will be dealt with under this heading.

Urinary Organs.

Bladder.—The bladder is a muscular organ lined with mucous membrane, and lies in front of the uterus, behind the pubic bone and above and in front of the upper part of the anterior vaginal wall. As the urine accumulates, the bladder pushes the uterus somewhat backwards, and eventually rises out of the pelvis, forming an elastic swelling just above the symphysis pubis. In the condition known as retention of urine, so great may be the amount retained that the bladder forms a well-marked abdominal tumour rising at times as high as the umbilicus. The capacity of the bladder is very considerable, and over ten pints have been drawn off in prolonged cases of retention.

Urethra.—The urethra is a muscular tube, lined with mucous membrane, one and a half inches long. Internally it opens into the bladder, externally on to the vestibule, and it forms the canal by which the urine escapes from the bladder.

Ureters.—The ureters are two muscular tubes, fourteen to sixteen inches long, situated one on each side of the body, which convey the urine from the kidneys to the bladder. Occasionally in cystitis the inflammation spreads to the kidneys with a fatal result, and the ureters are the channels along which the infection passes.

Kidneys.—The kidneys are two glandular organs, situated one in each loin. They are very plentifully supplied with blood-vessels, and are able when healthy to extract from the blood as it passes through them, certain poisons which are harmful to the body.

If the kidneys are diseased this power may be seriously hampered or even abolished, when the condition is known as *suppression* of urine.

CHAPTER II.

PHYSIOLOGY OF THE FEMALE GENITAL ORGANS.

Puberty.—Puberty marks the time when the ovaries and uterus first become active, and indicates the commencement of the child-bearing period of the female. The age at which this important event occurs varies in different races, but has nothing to do with the longitude and latitude in which the girl lives.

Puberty is marked in the female by a change in behaviour and temperament, so that she becomes quieter, retiring, and probably bashful. The external appearance also of the girl changes, so that her shape now commences to approach that of a woman, her breasts become developed, the mons veneris and labia majora are gradually covered with hair, the hips broaden, and the buttocks increase in size.

Ovulation.—The process by which an ovum becomes ripe and is then discharged is known as ovulation. The ovary contains thousands of cells, some of which eventually become the ova. The ovary is surrounded by a covering of these cells, and the process of ripening consists in one of these external cells, penetrating into the ovary and becoming converted into a Graafian follicle, which consists principally of the ripe ovum surrounded by fluid. When the fluid has increased to a sufficient extent, it bursts through the covering of the ovary, and the ovum is then discharged into the peritoneal cavity where it may be caught by the fimbriated end of the Fallopian tube, and conveyed along the tube into the

uterus, to be discharged or retained according to whether it has been fertilised or not.

Ovulation occurs at any time in either ovary between puberty and the menopause, except when the woman is pregnant, when it ceases. Ovulation also as a rule ceases when the woman is nursing her child, but not always, and certainly not if she nurses it beyond the proper period.

Fertilisation.—Fertilisation consists in the process by which the male cell or spermatazoon is deposited in the vagina and then passes by its own movements along the vagina through the external os along the cervical canal, through the internal os up the uterine cavity, through the opening of the Fallopian tube until it meets the ovum which it penetrates and thus fertilises. Very rarely the spermatazoon will pass through the Fallopian tube into the peritoneal cavity and then enter a Graafian follicle and fertilise the ovum *in situ*, giving rise to the dangerous condition known as *ovarian pregnancy*.

Development of the Fertilised Ovum.—The fertilised ovum passes along the Fallopian tube into the uterus, and there by means of its outside covering bores its way into the endometrium of the uterus or decidua, as the mucous membrane of pregnancy is called. After penetrating a certain distance the fertilised ovum comes to rest, and then at one of its ends certain changes take place (development of the chorionic villi), as they also do in the decidua in its immediate neighbourhood, with the result that the placenta is formed, an organ which nourishes the child till its birth.

Menstruation is the physiological manifestation that the mucous membrane of the uterus is being renewed so that any fertilised ovum which comes in contact with it may have the best chance of developing. It is characterised by a periodical discharge of blood and mucus from the uterus, due to the rupture of small blood-vessels in the mucous membrane with the result that part of its superficial layer is torn up. The blood together with mucus

from the uterine glands and shreds of mucous membrane is then expelled, the mixture of all three constituting the menstrual flow.

In addition certain constitutional and local symptoms, such as depression, tiredness, headache, irritability, backache, tenderness of the breasts, and nausea, mark its incidence in some women. In the United Kingdom menstruation first occurs, in the majority of cases, at about fourteen years of age. Rarely it commences before twelve, or after twenty. The "period" as a rule recurs once a month, and in most instances twenty-eight days from the commencement of the previous period. Individuals may, however, present considerable variation from this and yet be perfectly healthy; thus some women menstruate regularly every three weeks, and others every five.

In most instances the flow lasts from three to six days. The quantity of blood lost, which varies widely in different women, is on an average five ounces: but on considering this point in any particular patient the amount she generally loses must be ascertained and a comparison made with that, since some women in perfect health regularly lose an amount that in others would be considered quite excessive. Normally the discharge is dark red, and is not clotted because of its mixture with mucus from the uterine glands. If, however, the loss is excessive, then it is bright red in colour, and clots may be present. As a rule menstruation ceases during pregnancy. The fertilised ovum does not completely fill the cavity of the uterus till the end of the third month. Up to this time, therefore, there is a cavity which is lined with the decidua (the uterine mucous membrane modified by pregnancy). In some women small blood-vessels in this decidua may rupture at the time when menstruation would occur; there is, in consequence, some bleeding, and to this extent menstruation may be said to take place. Under these conditions there may be a loss for the first three months, but most commonly only for the

first. After the third month, there being no cavity from which the blood can flow, any loss must be due to a threatened miscarriage, as, in most cases, is any loss during the first three months. Miscarriage is more likely to occur when the period would have come on, since there is increased congestion of the pelvic organs at this time. Menstruation as a rule does not take place during lactation, provided the latter is not protracted beyond the ninth month.

The Menopause, Climacteric or "Change of Life" takes place in the majority of women between the ages of forty-eight and fifty, though it may occur earlier or later than this.

Rarely, the period, which has been quite regular, fails to come on at the proper time and never appears again. More commonly, menstruation is altered both in its regularity and amount: the intervals between the periods may become longer, so that several months may elapse before the appearance of the last period; on the other hand, the frequency may be increased, so that the periods, for a short time, come on more than once a month. The same irregularity is noticed in the amount lost. In some the quantity becomes less and less, in others there may be one or more profuse losses, or again, after missing several periods the woman has a final and profuse loss.

Accompanying these changes in menstruation certain symptoms of a well-recognised character supervene.

The woman complains of hot flushes or cold sensations; nausea, sickness, dyspepsia, constipation, headache, giddiness, mental depression, irritability, neuralgia, backache, or pains in various parts of the body. She may become stouter, and there is a disinclination for exercise. The menopause is a dangerous period of a woman's life, because it is at this time that cancer most commonly occurs, and also, since in most cases the menopause supervenes with some irregularity of menstruation, any increase in frequency or loss about this time

is apt to be put down to the "change of life" when in reality it may be due to some serious disease, the early recognition of which might be the means of saving her life.

It is, therefore, a safe rule to disregard the fact that at the menopause the periods may become more frequent and profuse, without there being any discoverable cause, and to advise any woman who is complaining of these symptoms to seek medical advice.

Premature Menopause.—In certain women the menopause appears much earlier than it should. In some patients no cause for this can be determined; others will give a history of a severe illness or shock to the nervous system, and occasionally after the birth of a child the menopause supervenes.

CHAPTER III.

PATHOLOGY OF THE FEMALE GENITAL ORGANS.

There are certain symptoms which are common to many gynæcological diseases, and these will now be discussed.

AMENORRHŒA.

The term *amenorrhœa* signifies absence of menstruation when this function should be present, that is between puberty and the menopause, but it has also, by custom, been given to certain conditions in which, although menstruation takes place, the discharge cannot escape from the genital passages.

Amenorrhœa may therefore be classified as follows: real amenorrhœa, apparent amenorrhœa.

Real Amenorrhœa.

By this term we mean that the woman does not menstruate.

Causes:—

Physiological.—Pregnancy, lactation.

Constitutional Disease.—Chlorosis, anæmia, constipation, insanity, the acute fevers.

Local Disease.—Ovarian tumours.

Congenital.—Absence of the uterus, the ovaries, or of both; infantile uterus and ovaries; delayed development of uterus and ovaries.

Emotional.—Fright, grief, desire for maternity, fear of pregnancy.

Operative.—Hysterectomy and oophorectomy.

Among these causes are some which give rise to amenorrhœa from the first, such as ill-developed genital organs, anæmia, and these are classed by some writers under primary amenorrhœa, whilst the term secondary amenorrhœa is reserved for those cases of amenorrhœa in which the woman has previously menstruated on one or more occasions, and these include the great majority.

Ovarian tumours cause amenorrhœa when they have impaired the health.

Physiological.—A woman who is pregnant should not menstruate. Some few women lose blood from the decidual cavity during the first three months of pregnancy, and this has been called menstruating, though it is not scientifically comparable with it. After the third month any loss from the uterine cavity must be due to some partial separation of the afterbirth.

The amenorrhœa of pregnancy is in most cases sudden; that is, up to the time of fertilisation the woman has been quite regular, or, to put it another way, supposing a woman has been quite regular, and menstruation does not appear when it is due, then be she married or single, rich or poor, the most likely cause of her amenorrhœa is pregnancy. Rarely women become pregnant when suffering from amenorrhœa due to some constitutional cause, and very rarely girls will become pregnant before menstruation has ever appeared.

As a rule a woman does not menstruate whilst she is suckling her baby, supposing lactation is not continued beyond the proper time—nine months. In a certain percentage of women menstruation reappears after a few months' nursing; nevertheless, if the child thrives and the mother is healthy, and keeps her weight, there is no necessity to discontinue this important function. When lactation is continued over the normal period, as it often is among the lower classes from the mistaken idea that conception will thereby be prevented as long as the amenorrhœa continues, menorrhagia not infrequently results.

It is not at all uncommon for women to become pregnant in spite of the fact that they have been suckling their babies for eighteen months or longer, and in whom menstruation has not reappeared since the birth of their last child.

Constitutional.—The commonest causes of amenorrhœa are constipation, chlorosis and anæmia. In these cases the cessation of the menstrual function takes place, as a rule, gradually—that is, the amount lost at successive periods decreases until amenorrhœa results. Other causes are tuberculosis, the acute specific fevers and insanity.

In fact, practically any serious constitutional disease may cause amenorrhœa, and it is interesting to note that in women suffering from mental disease improvement is often ushered in by the reappearance of menstruation.

Local Disease.—Of the various local diseases of the genital organs which cause amenorrhœa, ovarian tumours are the most common, but then only when the health is impaired by the tumour. Regular menstruation is not uncommon when the tumour is small.

Congenital.—Of course, if the uterus or ovaries are absent menstruation cannot take place. This abnormality is, however, very rare. On the other hand, there is a condition in which the uterus and ovaries remain similar in size and shape to those of an infant, and amenorrhœa results.

In a woman with an infantile uterus and ovaries the other signs of sexual maturity may be absent. The breasts remain small, the vulva and mons veneris ill-developed, and the pubic hair is very scanty, or the woman may approximate to the male type, hair appearing on the upper lip, the voice becoming harsh, and the pubic hair reaching towards the umbilicus.

Closely associated with these cases are those in which the genital organs do not develop as they should at puberty, and menstruation is delayed, perhaps beyond the twentieth year, until they have become more normal.

Emotional.—Fright, grief, the fear of pregnancy, or

the desire to become a mother, especially in elderly childless women, are well-known causes of amenorrhœa.

Operative.—If the uterus is removed (hysterectomy) permanent amenorrhœa results, and in a large number of cases, when the ovaries are ablated (oophorectomy) the same obtains; not always, however, in the latter case, as witness the old operation of oophorectomy for fibroids, the bleeding in many cases continuing as severe as ever, a result probably due to the fact that some minute particle of ovary has escaped the surgeon's notice.

Apparent Amenorrhœa.

CAUSES.—**Congenital.**—In rare cases the hymen at birth is imperforate, it has no orifice piercing it; more rarely the vagina is closed at some spot, generally just at its entrance, by a membrane stretching across it; rarer still some portion, or even the whole, of the vagina may be absent; and, lastly, the cervical canal may be obliterated.

In all these malformations the body of the uterus may be healthy, and therefore at the proper time menstruation may take place. The discharge, however, does not appear, because there is no hole in the hymen through which it can escape, or the membrane across the vagina prevents its exit. The result is that although the girl is supposed not to menstruate, she really does so, and therefore the condition has been given the name of apparent amenorrhœa.

SYMPTOMS.—Taking the commonest cause of this condition, imperforate hymen, the history one obtains is very instructive.

The mother brings her daughter to the doctor because she thinks it is quite time her daughter started menstruating, and the girl gives a history of abdominal pain, backache, and the other general symptoms of menstruation, occurring once a month. As time passes on, especially if the mother is careless and delays seeking

advice, the girl's abdomen will commence to enlarge, and it may have been noticed that this enlargement increases slightly each month. This enlargement is due to a gradual accumulation of the menstrual fluid in the uterus and vagina.

Lastly, some girls are so uncomplaining, and some mothers so ignorant or careless, that advice is not sought until the accumulation of menstrual fluid in the vagina has become so great that the urethra is pressed upon, and retention of urine results.

Acquired.—In this variety of apparent amenorrhœa the cervical canal or some portion of the vagina has become obliterated by inflammation; this may be due to one of the acute specific fevers when the patient was a child, the local condition remaining unnoticed on account of the severity of the general symptoms; or to the vagina or cervix being torn and bruised during labour; and if sepsis follows the result may be that the inflamed surfaces become adherent, and the canal is closed.

In these cases the symptoms will be similar to those described under the congenital variety only, menstruation may have taken place at one time normally, and there will be a history of some cause.

TREATMENT.—There are a large number of patent medicines advertised for the cure of amenorrhœa, but few of these are of any value, and many are positively harmful.

The only safe method of treating amenorrhœa is to first discover the cause by a careful examination of the patient. A patient suffering from amenorrhœa should therefore most certainly consult a medical practitioner.

In cases of apparent amenorrhœa, where the membrane has to be incised to evacuate the retained fluid, the nurse must be most particular and careful that the discharged fluid does not accumulate on the vulva and diapers for any length of time, since the great danger of this operation—and it is a very pressing one—is that septic microbes on the dirty diapers or vulva may infect

the genital tract. In pre-antiseptic days death so frequently followed this operation that, simple as it was, many surgeons refused to perform it.

MENORRHAGIA—METRORRHAGIA.

Menorrhagia signifies a loss of blood from the uterus which is more than usual during menstruation. The average loss in different women varies from two to nine ounces, but each case must be judged on its own merits, for obviously if a woman having usually lost two to three ounces commenced and continued to lose eight or nine she would be suffering from menorrhagia. The amount of blood lost by women suffering from menorrhagia varies with the cause. For instance, a patient with a fibroid tumour of the uterus may lose so much that she nearly dies of hæmorrhage. This is commonly termed "flooding".

Metrorrhagia signifies a loss of blood from some part of the genital passage in the interval between the periods. Menorrhagia and metrorrhagia in the majority of cases own the same cause, the condition that gives rise to too profuse a period being most likely also to cause bleeding between the periods; and it is therefore not customary, when dealing with these symptoms, to separate them. Nevertheless there is one important point of difference between these two symptoms in respect to their cause—since, whereas menorrhagia may be due to some cause other than local disease of the genital organs, metrorrhagia can only be due to such disease. It will therefore be best to enumerate the causes of these symptoms under three headings: Menorrhagia only; Metrorrhagia only; Menorrhagia and Metrorrhagia.

Menorrhagia only.

Causes.—1. Diseases of the liver and kidneys.
2. Purpura, anæmia.
3. Alcohol and rich living.
4. Constipation, abdominal tumours.

5. High altitudes, hot climates.
6. Puberty, menopause.

1. With liver and kidney disease venous congestion may occur in different parts of the body, and among them the uterus, so that when menstruation occurs an increased loss results.

2. Although anæmia is most often associated with amenorrhœa, yet in certain cases the opposite obtains.

3. Alcohol and rich living tend to cause flushing of the pelvic organs, and so congestion of the uterus.

4. Constipation and abdominal tumours, by pressure on the pelvic veins, give rise to venous congestion in the uterus, and so at times to increased loss.

5. Congestion of the uterus may occur in women living under these conditions.

6. At the two extremes of the reproductive period the loss at menstruation may be profuse. But whereas with respect to puberty the increased loss need not cause any alarm and no local examination is necessary, it is always safer to regard menorrhagia at the menopause as due to local disease till the contrary has been proved, since it is unfortunately a well-known fact that the majority of cases of cancer of the uterus do not apply for advice early enough for any radical operation to be undertaken, because the increased loss has been regarded as due simply to "the change of life".

Metrorrhagia only.

Causes.—1. Ulceration of the vulva due to cancer, tubercle or syphilis.

2. Ulceration of the vagina due to cancer, tubercle, syphilis, foreign bodies, or prolapse of the uterus.

3. Ulceration of the cervix due to prolapse of the uterus, cancer, tubercle, syphilis.

4. Erosion of the cervix.

5. Cancer of the urethra.

In some of these instances bleeding may only take

place when the diseased part is touched. The commonest foreign body to cause ulceration is a pessary which the woman has neglected to have removed and cleaned at the end of three months, either through carelessness, or ignorance because the doctor did not impress upon her that this was necessary. There is a case on record where a pessary was retained in this way for over forty years, and in former times it was not very uncommon for a neglected pessary to ulcerate either into the bladder or rectum, causing a fistula and giving rise to a stinking discharge which was mistaken for cancer.

Menorrhagia and Metrorrhagia.

Causes.—1. Cancer of the uterus.
2. Fibroid tumours of the uterus.
3. Polypus of the uterus.
4. Inversion of the uterus.
5. Misplacement of the uterus.
6. Inflammation of the mucous membrane of the uterus (endometritis).
7. Subinvolution.
8. Inflammation of the Fallopian tubes (salpingitis).
9. Inflammation of the pelvic peritoneum (perimetritis).
10. Inflammation of the pelvic cellular tissue (parametritis).

Treatment.—It is the nurse's duty to advise any woman who may be suffering from menorrhagia or metrorrhagia to consult a doctor forthwith, since it may be that on recognition of its cause early treatment will be the means of saving the woman's life.

Hæmorrhage due to Pregnancy.

We are not at present concerned with hæmorrhage occurring in intra-uterine pregnancy, but it should be remembered that in extra-uterine pregnancy there is an important symptom, the irregular discharge of a small quantity of brown-coloured blood, which has often been mistaken for metrorrhagia, with serious results.

DYSMENORRHŒA.

Dysmenorrhœa signifies painful menstruation, but it is customary to apply this term also to pain in the genital region during the week before the flow appears.

Seventy per cent. of women complain of pain during or just before menstruation, but in only 10 per cent. is the complaint of a serious nature, or does it interfere with the customary avocation of the woman.

It has to be remembered that tolerance of pain varies within wide limits in different women, what one finds comparatively easy to bear another succumbs under, but as we have no means of estimating the severity of any particular case of dysmenorrhœa, each case has to be treated on its own merits.

It is a common observation that in the majority of cases those women who complain the most of their dysmenorrhœa have the least to think about, and the pain is more easily tolerated by women who have to earn their own living.

Women who suffer from dysmenorrhœa may be divided into three groups, containing :—

1. Those in whom the pain is intermittent and colicky in nature.
2. Those in whom the pain is continuous and dull-aching in character.
3. Those in whom with a dull-aching pain there are intermittent periods of sharp intensity. This class is a combination of the first two.

1. **Colicky Dysmenorrhœa.**—In the majority of cases the reason why the painless or slightly painful and regular contractions of the uterus are substituted for those of a sharp and painful character is easily discovered. The uterus contains some substance which it is endeavouring to expel, either blood clot, mucous membrane or a tumour.

Blood collects in the uterus during menstruation, and clots when the flow is excessive or when the cervical

canal is narrowed. In either case, the blood does not escape quickly enough. Clots having formed, the uterus has to contract harder to expel them.

Any disease, therefore, in which menorrhagia is a symptom or in which the cervical canal is narrowed, such as atresia, cancer or a fibroid, may give rise to colicky dysmenorrhœa.

A reference to the remarks on normal menstruation will remind the reader that only a small portion of the mucous membrane is shed during this period, and then only in small pieces.

In the disease known as *membranous* dysmenorrhœa the mucous membrane is so altered that it does not break up into little pieces, but is detached by the hæmorrhage either in large pieces or even as a cast of the whole uterus. To expel these large pieces the uterus has to contract strongly, hence the pain.

Lastly, if there is a polypus in the uterus it contracts from time to time, in its endeavour to expel it, and these contractions become especially marked during menstruation.

In a minority of cases no adequate cause can be found for the uterine colic, and the condition is then known as *spasmodic* dysmenorrhœa. The pain in these cases has been thought to be due to a neurosis, but it is often present in women in whom such a diagnosis could not be entertained. In many cases the shape of the uterus has not changed with puberty, and corresponds to that found in the infant, so that it is markedly anteflexed, and its cervix has a pin-hole os and is conical in shape. It has been thought, therefore, that the pain may be due to this peculiarity, but such a shape is found very well marked in women with painless menstruation. It may be that some cases are due to a neurosis and others to a maldevelopment.

2. **Congestive Dysmenorrhœa.**—In all women the genital organs become congested during the week preceding the flow as a result of the extra amount of blood

which flows to them at that time. This blood is accommodated by the genital organs becoming firmer, distended or erect, and as long as they are not the seat of any disease this congestion in most cases causes but little discomfort.

This variety of dysmenorrhœa may be subdivided into two classes, one in which local disease is present and the other in which it is absent.

Local Disease Present.—In cases of chronic congestion and inflammation such as perimetritis, parametritis, salpingitis, endometritis, fibroids, fibrosis and fibro-adenoma of the uterus and displacements of that organ, the additional amount of blood flowing to the diseased areas causes increased pressure on the nerves supplying them and pain results, as also it may if the uterus, ovaries or Fallopian tubes are bound down by adhesions and unable to become erect with the congestion.

Local Disease Absent.—This variety of congestive dysmenorrhœa is common in young people. Why they suffer so much it is impossible to say; for want of a better explanation it has been thought that the nerves supplying their genital organs are unable to withstand this premenstrual flushing without originating a dysmenorrhœa. These are particularly the cases where a necessity for earning a living appears to minimise the complaint.

Diagnosis.—The character of the pain will indicate whether the dysmenorrhœa is of a colicky or congestive variety. As to the cause, that must be left for the doctor to determine.

The commonest variety of dysmenorrhœa in young girls is colicky in nature, and is known as *spasmodic*. In these the pain appears as the flow commences, and last a varying period up to the first twenty-four hours or so. It is the severest variety of dysmenorrhœa known, at times causing the patient to vomit, perspire or even to faint. Whilst the pain is on the flow is generally scanty.

Spasmodic dysmenorrhœa is not uncommonly associated with sterility.

3. **Colicky and Congestive.**—Many women who suffer from colicky dysmenorrhœa have as time goes on the congestive variety added to it. There is no need to discuss this third variety separately since its symptoms and signs are a combination of the first and second.

Treatment.—The only proper method of treating dysmenorrhœa is to ascertain, if possible, the cause, which may necessitate a pelvic examination.

A nurse will not be capable from her training of arriving at a proper diagnosis.

It is as well to mention here that the treatment of dysmenorrhœa by opium or hot alcohol is to be severely condemned, the relief obtained may lead to a habit of taking these drugs, and a nurse, therefore—should opportunity occur—must endeavour to prevent their use unless they have been prescribed by a fully qualified medical practitioner, a most unlikely event.

Spasmodic dysmenorrhœa can often be controlled by appropriate drug treatment; if this fails dilatation of the cervix will in most cases effect a cure or at any rate much relieve the pain, and has this additional advantage, that if sterility is complained of it will in a certain percentage of cases cure that also.

LEUCORRHŒA.

Leucorrhœa signifies a condition generally known as "the whites". Its use is not restricted to a white discharge, but is applied also to one that is green, yellow, or watery.

CAUSE.—Leucorrhœa, which is a symptom of many abnormal conditions, is due to—

1. An increased secretion of the mucous membrane lining the genital passages resulting from overgrowth, congestion, or inflammation.

2. Ulceration of some tumour of the genital organs or of some portion of the genital tract.

3. A combination of the one and two.

The importance of leucorrhœa from a diagnostic point of view depends on the character of the discharge and the age and civil state (married or single) of the patient, and its causes can be most easily arranged under the following classes : from infancy to puberty ; from puberty to marriage ; from marriage to the menopause ; after the menopause.

From Infancy to Puberty.—Before puberty the vagina, uterus, and Fallopian tubes, being undeveloped, are very rarely the seat of disease. In most instances, therefore, under this heading the discharge flows from the mucous membrane of the vulva, and may be due to dirt, thread-worms, anæmia, debility, injury, or gonorrhœa. Rarely the mucous membrane of the vagina may be at fault, in which case the discharge is due to inflammation, caused by scarlet fever, measles, or smallpox ; foreign bodies which have been inserted into the vagina by the child, such as hairpins, pebbles, fruit-stones ; or gonorrhœa may also be a cause.

In a large number of instances no apparent cause can be found for the discharge.

Gonorrhœa may be due to assault, or it may be caused by infection from towels which have been soiled by some adult suffering from this disease, and there are on record several epidemics which have spread in this way in institutions for girls.

It is also well to remember that mothers, especially in the poorer classes, are wont at times to falsely accuse men of assaulting their daughters because the latter are suffering from leucorrhœa.

From Puberty to Marriage.—From puberty onwards a number of females suffer from leucorrhœa a day or two before or a day or two after menstruation. This is due to congestion of the uterus, and is so common that it may almost be accounted as normal.

Other causes may be anæmia, chlorosis, diabetes; constipation; tumours of the genital organs; misplacement of the uterus; erosion of the neck of the uterus; endometritis; foreign bodies in the vagina; or a chill giving rise to congestion.

By far the commonest causes in young women are chlorosis, anæmia, and constipation, which, in fact, account for nearly all the cases. In diabetes the sugary urine trickling over the vulva gives rise to intense irritation, and, as a result of the scratching to relieve this, the mucous membrane is damaged.

In constipation the loaded rectum presses on the pelvic veins, and causes congestion.

With advancing age comes the increased liability to tumours of the genital organs, such as cancer, fibroids, and ovarians, which cause congestion, inflammation, or ulceration.

Misplacement of the womb (retroversion and prolapse) is much commoner after childbirth, as is also erosion, an overgrowth of the mucous membrane of the neck of the uterus, incorrectly termed "ulceration". Nevertheless these conditions do occur in single women. The secretion comes from the overgrowth of the glandular lining of the uterus. Endometritis signifies inflammation of the lining membrane of the uterus.

Foreign bodies may be placed in the vagina by hysterical girls; by women to prevent conception; as the result of some brutal assault; to hide stolen property, or by feeble-minded females; and the following comprehensive list of articles that have been removed from the vagina is given by Bland-Sutton and Giles[1]: sponges, cotton-wool, pomade-pots, pewter pots, cotton-reels or spools, candle-extinguishers, small indiarubber balls, pessaries, pipe-bowls, thimbles, clock-weights, gems, bank-notes, jewellery, pocket-books, a rose-bud, a small bust of Napoleon the Great, a cork, a rag, a needle-case,

[1] "Diseases of Women." Rebman, Limited. 1907.

a boot-lace, and on one occasion, in which a patient was admitted to the Middlesex Hospital suffering from a fœtid discharge for "stone cancer," a piece of brick was removed from the vagina. In most cases the articles have been removed from married women.

From Marriage to the Menopause.—After marriage leucorrhœa, although it may be due to one or more of the causes mentioned above, is most commonly due to the results of childbirth, such as subinvolution of the uterus and vagina; misplacements of the uterus and vagina; septic infection, or puerperal fever as it is termed; it may also be due to gonorrhœa.

The term subinvolution of the uterus means that this organ has not returned to its healthy condition and proper size after the birth of the child. As a rule six to eight weeks is required for involution to take place, and when, as the result of some abnormal condition, this does not occur, the increased area of mucous membrane accounts for the leucorrhœa.

In misplacement the discharge is due to congestion and the increased size of the organ, or to ulceration of the vagina and neck of the uterus should they protrude outside the vulva.

In puerperal fever microbes gain access to the genital tract, and set up inflammatory changes, which may become chronic.

In gonorrhœa the discharge, which is profuse and yellow or green, is composed of pus, and is due to the acute inflammation.

It must be remembered that cancer, fibroids and erosions are much commoner in married women.

After the Menopause.—In addition to many of the conditions mentioned above, leucorrhœa at this age may be due to inflammatory conditions of the uterus and vagina known as senile endometritis and senile vaginitis.

It is, however, most important to remember that the menopause is the commonest time for cancer of the geni-

tal organs to appear, and that, therefore, any woman who at this time of life is suffering from a leucorrhœal discharge should at once consult a doctor.

While the doctor must of necessity diagnose the cause of leucorrhœa, some idea of its origin may be gathered from the character of the discharge, thus :—

A clear watery non-offensive discharge as a rule comes from the body of the uterus.

A clear glairy tenacious discharge, resembling the unboiled white of egg, comes from the neck of the uterus, but if it is mixed with vaginal discharge it will not be so clear.

A thick non-tenacious white discharge comes from the vagina.

A purulent discharge, green or yellow, is due to inflammation of the genital tract.

A stinking watery discharge points to cancer or ulceration.

Treatment.—The treatment, which, of course, varies with the cause, comes under the province of the doctor, and it will generally include some form of vaginal douching which the nurse may be directed to carry out.

At times the discharge flowing over the vulva will give rise to such irritation that some local treatment will be necessary. Useful remedies are to smear the vulva with vaseline or to place in the vagina a small plug of cotton-wool, which will soak up the discharge between the intervals of douching.

PRURITUS VULVÆ.

Pruritus vulvæ, which is characterised by severe itching of the vulva, is a very distressing complaint. It may be primary or secondary to some local condition.

Primary.—No cause can be found for this. It is due to a neurosis.

Secondary.—

CAUSES: **Congestion.**—The congestion of the vulva caused by pregnancy or during the few days preceding menstruation may give rise to pruritus vulvæ. Ovarian and fibroid tumours originate this symptom, which act in a similar manner by pressure on the veins.

Parasites.—Threadworms, pediculi pubis, and scabies will cause pruritus.

Leucorrhœa.—As already mentioned, a discharge from any part of the genital tract flowing over the vulva may cause intense irritation.

Urinary Diseases.—Cystitis will cause pruritus, as also may diabetes. It is very important to remember the latter, which is the principal cause of pruritus in young girls.

Skin Diseases.—Eczema and herpes.

Menopause.—The pruritus which at times appears with the onset of the menopause, and lasts till the symptoms of the latter have subsided, may or may not be associated with senile inflammation of the vulva.

SYMPTOMS.—The itching may be paroxysmal in character, or more or less constant. It is generally worse at night or after exercise, when the patient is warm. It tends to become gradually more troublesome, and the scratching, which the sufferer finds necessary for her relief, only makes matters worse.

The irritation may become so intolerable that the patient will shun all society and even keep to one room, whilst there are cases on record where the patient has become insane and committed suicide from the great distress and loss of sleep occasioned by the constant irritation.

TREATMENT.—If a cause can be found, the appropriate treatment will give very satisfactory results; but in those cases associated with the menopause, old age, or neurosis, in which no cause can be discovered, the effect of treat-

ment is often most disappointing, and excision of the whole or portion of the vulva has before now been found necessary.

It is most important that the urine of any female who suffers from pruritus vulvæ should be examined.

CHAPTER IV.

DISEASES OF THE VULVA.

The most frequent cause of a swelling on the vulva is one of the following conditions; cyst; abscess; hæmatoma; inguinal hernia; cancer; varicose veins.

Bartholin's Cyst.

The commonest cyst of the vulva is known as Bartholin's cyst, from the name of the anatomist who first described the gland that is affected.

The swelling is situated on one or other labium majus, just posterior to the corresponding labium minus, and may attain the size of an unshelled walnut.

Cause.—The duct leading from Bartholin's gland becomes obstructed as the result of inflammation, and the secretion being unable to escape, accumulates in the gland, destroys it, and converts it into a cyst.

Symptoms.—Discomfort in sitting or walking, and pain. In some cases the cyst becomes inflamed and suppurates, and a condition then arises which is known as a Bartholinian abscess.

Treatment.—The whole of the cyst wall must be dissected out, otherwise the condition may recur.

Bartholinian Abscess.

Cause.—This is most commonly due to gonorrhœa, but it may rarely be due to any other form of septic infection, to a blow, or to injury of the cyst.

Symptoms.—Pain, heat and tenderness in the swelling.
Redness and œdema of the surrounding parts.
Very great pain on walking or sitting.

Treatment.—The abscess will be treated by incision, scraping and swabbing its lining with pure carbolic acid, packing the cavity with gauze and the application of hot fomentations.

Hæmatoma of the Vulva.

A swelling on any part of the vulva, caused by an extravasation of blood due to the rupture of some vessel by a kick or fall, or by the pressure of the fœtal head during delivery.

Symptoms.—There will be a history of traumatism.
The swelling is tender and discoloured.
In labour it may form a serious obstruction to birth of the child.
Rarely it suppurates.

Treatment.—The doctor will order cold lead compresses.

Inguinal Hernia.

Symptoms.—This is characterised by a swelling which appears at the anterior end of the labium majus.
It disappears when the patient lies down.
There is probably an impulse on coughing.
The swelling, as a rule, can be pushed back into the abdominal cavity and kept there by a truss. Occasionally the bowel gets nipped and gives rise to symptoms of strangulated hernia, which if not relieved will kill the patient.

Treatment.—The condition should be cured by operative treatment.

Cancer.

As a rule cancer first appears on the labium majus or clitoris when the woman is between fifty and sixty years of age.

Symptoms.—The disease, which commences as a nodule, first of all causes pruritus. Later the nodule ulcerates, and then the patient complains of great pain ; there is an offensive watery discharge, and bleeding may occur.

In the last stages ulceration spreads over the vulva, causing the greatest misery, and very often retention of urine.

With the appearance of ulceration the glands in the groin enlarge.

Treatment.—The patient should consult a medical practitioner at the earliest moment, with a view to operative treatment, as this is her only chance of cure.

Varicose Veins of the Vulva.

Causes.—Pregnancy ; pressure of abdominal tumours on the veins of the pelvis.

Symptoms.—This condition is easily identified, and, as a rule, it does not cause much trouble, except an aching, and occasionally pruritus.

If the patient becomes pregnant, however, the varicose veins may be a source of great danger, for they may burst, and the woman bleed to death before help can be obtained, or they may cause difficulty with childbirth.

Treatment.—If during pregnancy the veins are very marked, forming cords as large as the little finger, obscuring the vulva, stretching up on to the abdomen and down on to the thighs, labour has to be terminated prematurely, lest the veins should cause an obstruction during labour, or bursting give rise to furious hæmorrhage.

CHAPTER V.

DISEASES OF THE VAGINA.

VAGINITIS.

Causes.—Inflammation of the vagina may be due to the following :—

1. Irritation of foreign bodies, generally neglected pessaries.
2. A sloughing polypus, sepsis after labour, abortion or vaginal operations.
3. A vaginal douche being too hot.
4. The chemicals in a vaginal douche being too strong.
5. Gonorrhœa.

Symptoms.—Feeling of heat and pain in the vagina.
Discharge which may be offensive.
Perhaps swelling of the vulva.
Perhaps pain on micturition.

Simple Vaginitis is not a very troublesome disease, and a few days' rest in bed, together with vaginal douches, is generally sufficient to cure it.

Gonorrhœal Vaginitis, however, is a much more serious condition. Unless efficiently treated, it is dangerous because it may spread up through the uterus into the Fallopian tubes, thence to the peritoneum, and so cause death from general peritonitis—this is rare—or it may much more commonly spread up into the Fallopian tubes and cause salpingitis and pyosalpinx. In fact, after sepsis due

to labour or abortion, gonorrhœa is by far the commonest cause of diseased tubes and all their attendant ills.

There are some marked differences in the symptoms between a simple and gonorrhœal vaginitis, and from these alone a very shrewd idea may be gathered as to the cause.

In **Gonorrhœal Vaginitis** the attack commences suddenly.

The inflammation is very acute, the pain being very intense.

Pain on micturition, due to involvement of the urethra, is always present.

The vulva is generally swollen and tender, so that there is pain on walking or sitting.

The discharge is very profuse, of a greenish colour, and often offensive.

The glands in the groin commonly become involved (bubo).

And a series of complications are liable to follow in its train, such as a Bartholinian abscess, endometritis, salpingitis, pyosalpinx, perimetritis, cystitis, kidney disease, ophthalmia, septicæmia, pyæmia, or gonorrhœal rheumatism.

If there is any necessity to ascertain the cause for certain, some of the discharge can be collected and examined for the gonorrhœal microbe (gonoccus).

TREATMENT.—Rest in bed is absolutely necessary, together with warm injections, whilst the doctor will prescribe in addition certain drugs.

As the results may be so severe, some doctors think that the best treatment is to put the patient under an anæsthetic, thoroughly douche the vagina with mercury solution, and then apply strong carbolic acid locally, with the idea of killing the microbe before it has time to infect the uterus. This treatment, which will in most cases be difficult to carry out, is probably the best.

During the acute stage it may be impossible for the first day or two to administer injections because of the

great pain, in which case all that can be done is to direct the patient to sit in a hot bath three or four times a day for twenty minutes.

If the discharge becomes chronic, it gives rise to a persistent leucorrhœa which may be difficult to cure.

CHAPTER VI.

DISEASES OF THE UTERUS.

DISPLACEMENT OF THE UTERUS.

The uterus is kept in its normal position by certain ligaments, the pelvic floor and the intra-abdominal pressure, and any injury or abnormal condition of these tends to cause its displacement.

The uterus may be displaced backwards, forwards, downwards or sideways. By far the commonest misplacements are backwards and downwards, and these only will be dealt with.

Backward Displacements (Retroversion, Retroflexion).

Retroversion means that the uterus is tilted backwards as a whole, the body and cervix keeping in one straight line.

Retroflexion means that the body is bent backwards, and the cervix remains in its normal position; consequently there is a flexion between the body and cervix.

The commonest variety of backward displacement is a combination of the two, in which the body is bent backwards and the cervix tilted forwards.

Causes :—

1. Stretching or laceration of the pelvic floor and ligaments due to labour.

2. Increased weight of the uterus from a tumour or subinvolution.

3. Pressure on the front of the uterus from a tumour or distended bladder.

4. Sudden fall or strain.

5. Fixation due to salpingitis and perimetritis.

6. Prolapse of the uterus.

Symptoms.—Backache and bearing-down pain due to congestion.

Constipation and painful defæcation due to pressure of the body of the uterus on the rectum. Frequency of micturition due to pressure of the cervix on the neck of the bladder.

Dysmenorrhœa due to the congestion and malposition.

Menorrhagia due to the congestion.

Leucorrhœa due to the congestion.

Sterility.

If the backward displacement is complicated by salpingitis the additional symptoms mentioned under that disease will be present.

Pregnancy in a Retroverted Uterus.

Backward displacement, besides being the cause of a good deal of distress, may become a source of positive danger. Should the woman be pregnant, one of three things will happen :—

1. The uterus will right itself and the gestation will continue.

2. The patient will miscarry.

3. Gestation will proceed, the uterus keeping in its abnormal position.

If this latter event happens, some time between the third and fourth month as a rule, the body of the uterus gets caught under the sacral promontory, and is unable to grow upwards any longer. Consequently it continues to expand in other directions, and soon commences to fill the pelvic cavity.

The first warning of this is that the patient complains of some trouble on micturition. It may be pain, it may

be inability to pass any urine (retention), or it may be frequency with only the passage of a small quantity.

What has happened is that the cervix has been pressed forward upon the urethra, which has then become occluded so that micturition cannot well be accomplished. Retention results, and the pressure of the retained urine rises to such an extent that at last a little forces its way past the obstruction, and the condition is then known as incontinence of retention, and for this complication the patient most commonly seeks relief.

In addition to the trouble with micturition, the patient will give a history of three months' amenorrhœa, morning nausea, swelling of the breasts, and an abdominal swelling.

The abdominal swelling is the distended bladder, and if a catheter be passed an average of about five pints of urine will be drawn off. As many as thirteen pints have been evacuated.

After the bladder is empty the doctor will, as a rule, be able to push the uterus up, and having inserted a pessary to keep it in position pregnancy will continue quite normally.

Rarely the uterus cannot be pushed up, even after a rest in bed for two or three weeks, and in this case it has to be emptied to prevent death from sepsis or kidney disease.

Treatment of Backward Displacement.—In many cases backward displacement of the uterus causes no symptoms, in which case treatment is unnecessary. In others the treatment depends on the cause. Some cases are quite relieved by a Hodge or ring pessary. In others nothing short of stitching the uterus to the anterior abdominal wall (ventro-suspension) does any good. This operation is quite successful in those cases where the body of the uterus is very congested and tender, and the patient cannot tolerate a pessary, but these are the exceptions, and the majority are, at any rate, relieved by pessaries.

A woman should not wear a pessary more than three months without having it taken out and a new one fitted. Whilst the pessary is in position a daily douche should be used, so as to keep the instrument and vagina clean.

Neglected pessaries have been the source of much suffering. Some careless women forget they are wearing pessaries, or will not be troubled to have them seen to. These people run the risk of vaginitis being set up from the irritation, and even of the pessary ulcerating into the vagina and through into the bladder or rectum, causing a vesico-vaginal or recto-vaginal fistula.

Sudden Backward Displacement.

There is a variety of backward displacement which is rare, and which occurs more frequently in young unmarried women, or married women who have never had children.

Cause.—As a result of a sudden strain or fall, such as falling off a bicycle or fence, the bladder being full at the time, the uterus is thrown backwards, and is held in that position by certain of its ligaments.

Symptoms.—Great pain and faintness is caused at the time, and this is succeeded by continual aching in the pelvis, severe pain on defæcation, and when the period supervenes dysmenorrhœa.

Treatment.—The uterus has to be replaced under an anæsthetic.

Downward Displacement (Prolapse Procidentia).

In prolapse the uterus has descended till the cervix reaches the vulval orifice.

Procidentia is the term used when the whole uterus and vaginal walls have escaped through the vulval orifice and project outside.

Causes.—1. Stretching or laceration of the pelvic floor or ligaments due to labour.

2. Increased intra-abdominal pressure due to a tumour

pressing on the uterus, or the constant bearing down efforts called into action by chronic constipation, hard manual work or chronic bronchitis.

Symptoms.—Backache and bearing-down pain.

Constipation and hæmorrhoids from pressure on the rectum.

Frequency of micturition or inability to empty the bladder unless the prolapse is first pressed up with the fingers.

Leucorrhœa due to congestion, and when there is procidentia to ulceration of the cervix and vagina through rubbing against the clothes. Difficulty in walking or sitting because of the protrusion. Rarely menorrhagia. In some cases, although procidentia is present, the patient makes no complaint. The commonest cause of procidentia is laceration of the pelvic floor, including, as a rule, the perineum.

Treatment.—In most cases a ring pessary will suffice to keep the uterus in position. Perhaps a preliminary perineorrhaphy may be necessary.

If this fails there are various patterns of cup-and-stem pessaries which will suffice, the best perhaps being Napier's. These instruments are, however, troublesome, and younger women do not tolerate them very well. Many operations have been devised for the relief of this troublesome complaint, but all of them are unsatisfactory, because the condition is incurable—that is, the parts cannot be replaced in their proper relation and kept in position—and most of them are disappointing, because they fail to relieve all the symptoms. For instance, although ventro-suspension will keep the uterus in position, the vaginal walls may still prolapse, and the patient often complains that she is very little better. Hysterectomy, too, is unsatisfactory apart from its severe nature, as later the vagina is often found to be prolapsed outside the vulva. Ventro-suspension, with removal of as much vaginal wall as possible (colporrhaphy), and a portion of the cervix if necessary, gives the best results.

SUBINVOLUTION.

The term subinvolution of the uterus denotes that this organ has not returned to its proper size after childbirth or miscarriage.

After the completion of labour the uterus measures seven and a half inches in length and weighs two pounds. In six weeks' time it should decrease to three inches in length and weigh a little over two ounces.

Causes.—Not suckling the baby; backward displacement of the uterus; antepartum hæmorrhage; postpartum hæmorrhage; serious constitutional disease; pelvic inflammation; puerperal fever; fibroid tumour; retained placenta.

Symptoms.—Menorrhagia; leucorrhœa; backache.

These symptoms are due to the fact that the uterus is larger than it should be, and there are consequently more vessels to rupture at menstruation, and there are more glands to increase the amount of secretion between the periods.

Treatment.—The medical attendant will probably prescribe rest, ergot and hot douches, and if these do not relieve the condition the patient will have to be curetted.

POLYPI OF THE UTERUS.

The following varieties of polypi may be found in the uterus:—

Fibroid. Mucous. Placental.

Fibroid Polypus.

This condition will be dealt with under fibroids of the uterus.

Mucous Polypus.

The internal lining of the uterus consists of mucous membrane. In some cases the amount and thickness of this membrane becomes much increased, and sometimes

this increase is more marked at certain spots than others, with the result that a small projection of mucous membrane is formed, which is called a mucous polypus. There may be one or more of these projections, which may be situated in the body of the uterus or in the cervix.

Placental Polypus.

If a piece of placenta is retained at childbirth, and remains adherent to the uterus, the subsequent events depend greatly upon whether it dies or not.

If it dies, microbes are apt to infect it, and supræmia results. On the other hand, if it is adherent and well nourished by blood-vessels from the uterine wall, it need not die. Then from time to time the blood trickling over this piece of placenta becomes deposited on it, and at last a small polypus is formed.

Symptoms.—Menorrhagia ; metrorrhagia ; leucorrhœa ; dysmenorrhœa.

In the case of a fibroid polypus there will be the other symptoms of fibroids, and with placental polypus the complaint will date from labour or abortion.

Treatment.—The only treatment is removal of the polypus.

FIBROID TUMOURS OF THE UTERUS.

Exactly how often the uterus of a woman is the seat of a fibroid tumour it is difficult to say. Authorities vary in their estimates, but the statistics of the dead-house, which cannot lie, show that 40 per cent. of women over 50 years of age have fibroid tumours.

These statistics, however, include small fibroids not larger than a pea which never cause their owner any trouble, and which are only found on the routine inspection of the post-mortem room.

Fortunately in the large majority of women whose uteri are thus affected the tumour is small, symptoms are absent, and no one is aware of its presence.

On the other hand, both by growth and by changes taking place in them, fibroids may be directly responsible for the termination of life. The majority of fibroids giving rise to symptoms first cause trouble between the ages of thirty and forty-five.

Classification of Fibroids.

According to their position in the walls of the uterus fibroids are classified as: pedunculated-subperitoneal, subperitoneal, interstitial, submucous, and pedunculated-submucous (fibroid polypus).

By a pedunculated subperitoneal fibroid is meant a fibroid which is projecting into the abdominal cavity, and is attached to the external surface of the uterus by a stalk.

A subperitoneal fibroid is a fibroid growing on the external surface of the uterus, just under the peritoneum, so that the latter is pushed up, and the outer surface of the uterus is uneven.

An interstitial fibroid is one growing in the wall of the uterus, and not projecting beyond either its external or internal surface.

A submucous fibroid projects towards the cavity of the uterus pushing the mucous membrane before it, and causing the internal surface to be irregular.

A pedunculated submucous fibroid—or, as it is generally termed, a fibroid polypus—is in reality a later stage of a submucous fibroid. The tumour now covered with mucous membrane is expelled from the uterine wall into the cavity of the uterus, all except a small portion which forms a stalk.

Symptoms.—Menorrhagia; metrorrhagia; leucorrhœa; dysmenorrhœa; sterility, and those of pressure.

Menorrhagia, Metrorrhagia.—The amount of hæmorrhage caused by fibroids varies greatly in different women. In some the loss is only a slight increase at the periods, in others the menorrhagia and metrorrhagia are so marked

that the term "flooding" is very commonly given to the great hæmorrhage, which may be directly the cause of death.

It is only very rarely, however, that a woman dies from hæmorrhage due to these tumours, and then only, as a rule, because the loss has been spread over a long period, and the patient has been allowed to become exsanguinated by inefficient treatment.

On the other hand, hæmorrhage may be responsible for a large amount of suffering, and in former times especially patients were allowed to spend many years as invalids, each month of their life being divided into two cycles, one in which they were bleeding and the other in which their medical attendant was endeavouring by drugs and rest to patch them up for their next bleeding, and so things went on in a vicious circle until death, the menopause, or some enterprising surgeon, relieved them of their misery.

The different kinds of fibroids vary in the amount of bleeding they are likely to cause, thus, the pedunculated-subperitoneal and subperitoneal varieties do not give rise to any bleeding. A fibroid polypus, as a rule, causes more hæmorrhage than any other variety. The interstitial and submucous fibroids often cause serious bleeding.

If a fibroid becomes septic, cystic or malignant, the amount of blood lost will be increased.

The bleeding is due to the rupture of blood-vessels in the mucous membrane lining the cavity of the uterus, which is enlarged in all cases of bleeding fibroids, in some instances by several inches. The vessels are also likely to rupture because they are diseased.

Leucorrhœa.—This may be due to several causes. As the amount of mucous membrane lining the cavity of the uterus is greater, the number of glands in the membrane is considerably increased, with the result, therefore, that there is much more secretion. Then the leucorrhœa may be due to congestion, or it may be due to a sloughing

fibroid polypus, when the discharge will be horribly offensive, and the case may be mistaken for one of cancer. The leucorrhœa may also be due to the mucous membrane of the uterus being inflamed (endometris).

Dysmenorrhœa.—The pain at the periods associated with fibroids may be due, very rarely, to the fibroid obstructing the escape of blood from the uterus (colicky dysmenorrhœa), and most commonly is due to congestion (congestive dysmenorrhœa). As a rule dysmenorrhœa due to fibroids first makes its appearance between thirty and forty.

Sterility.—Fibroids large enough to be detected on examination, and which give rise to any symptoms, are a hindrance to impregnation, but fibroids develop in married women more frequently than in those unmarried.

Pressure Symptoms.—

Pressure on the Bladder and Urethra.—Pressure on the bladder will cause frequency of micturition, and on the urethra retention. A very significant symptom in a woman is retention of urine for a few hours or a day before the period ensues. A history such as this makes it practically certain that the patient has a very dangerous fibroid, one that is filling the pelvis all but a very little, and will soon be exerting very injurious pressure on the surrounding structures. The extra amount of blood that flows to the uterus and tumour a few days before the period is due causes the tumour to swell sufficiently to occlude the urethra and so retention results.

Pressure on the Ureters.—A fibroid that is lodged tightly in the pelvis—impacted, as it is termed—will press on the ureters, as may also a very large fibroid reaching up into the abdomen. The kidney will then become diseased, and the patient will die of uræmia if the tumour is not removed.

Pressure on the Bowel.—The large intestine may be nipped by a heavy tumour against the brim of the pelvis. The small intestine may become twisted in the stalk of a pedunculated-subperitoneal tumour, and the rectum may

be obstructed by an impacted fibroid. In the latter case constipation results, and in all three intestinal obstruction or perforation of the intestine with fatal peritonitis may occur.

Pressure on the Veins.—As a result the patient may suffer from hæmorrhoids, œdema of the legs, varicose veins of the leg, or thrombosis in the femoral veins, which latter is a dangerous condition.

Pressure on the Nerves.—This may give rise to neuralgia, bearing-down pain, backache, or sciatica.

Pressure on the Diaphragm.—With very large tumours —and tumours over 100 pounds in weight are recorded— the action of the diaphragm is impeded so that the heart and lungs cannot properly perform their functions.

Secondary Changes in Fibroids.

A fibroid tumour may become septic, cystic, cancerous.

Septic Fibroid.—Submucous fibroids and fibroid polypi at times becoming septic, suppurate, and are then discharged, so that a cure results, but the patient may become so dangerously ill meanwhile that she will die before the tumour can be expelled.

A septic fibroid is a very dangerous tumour. The patient is likely to die of peritonitis if the sepsis spreads to the peritoneal cavity, or she may die of septicæmia. A fibroid may become inflamed from disease of the bowel, of the appendix or of the Fallopian tubes. It may become septic from pressure during labour, or it may be infected in a case of puerperal fever after labour. Lastly, a fibroid polypus becomes septic by microbes from the vagina infecting it.

Symptoms.—The patient will have a high temperature, a rapid pulse, perhaps a very fœtid discharge, the amount of bleeding will increase, the fibroid will be tender, and there will be marked abdominal pain.

Cystic Fibroid.—In this complication a peculiar change takes place, so that the solid tumour becomes converted

into a cyst, and has thus often been mistaken for pregnancy or an ovarian tumour.

Symptoms.—The size of the tumour increases rapidly, there is severe pain, and the amount of blood lost is increased.

Malignant Fibroid.—Very rarely a fibroid may become malignant.

Symptoms.—Such a complication would be indicated by very rapid growth, marked bleeding, severe pain and emaciation.

Fibroids may Endanger Life in many Ways.

By hæmorrhage, by sepsis, by pressure, by becoming malignant, by twisting of the pedicle, and by complicating pregnancy, labour, or the puerperium.

The dangers of many of these have already been discussed.

Twisting of the Pedicle.—In a pedunculated-subperitoneal fibroid the stalk may become twisted in the same manner as in an ovarian cyst. Pain results, and the tumour may become inflamed.

Effect of Fibroids on Pregnancy.—The pressure symptoms of pregnancy may be more marked, vomiting more troublesome, and in some cases the tumour may possibly favour the occurrence of albuminuria, and so eclampsia. Pregnant women with fibroids may miscarry from uterine contractions or bleeding set up by the tumours, or because the uterus has become retroverted, and in some cases also impacted. Accidental hæmorrhage is at times due to a fibroid, and it may be that placenta prævia also rarely occurs from the same cause.

Effect of Pregnancy on the Fibroid.—The fibroid grows more rapidly, and in some cases a peculiar and dangerous change known as red degeneration may take place.

Effect of Fibroids on Labour.—A fibroid may cause obstruction to labour, and so, if unrelieved, rupture of the uterus, by being situated below the presenting part

and narrowing the passage, or by causing malpresentation of the fœtus. A fibroid may also cause inertia and post-partum hæmorrhage as a result of this inertia, or because it prevents the proper retraction of the uterus.

Effect of Labour on Fibroids.—The fibroid may be so bruised owing to the passage of the child that it becomes inflamed. Also the stalk of a pedunculated subperitoneal fibroid may become twisted.

Effect of Fibroids on the Puerperium.—Fibroids are a cause of subinvolution. They may also give rise to secondary post-partum hæmorrhage, and if they become septic they may cause septicemia.

Effect of the Puerperium on Fibroids.—A submucous fibroid may, as the uterus shrinks, become converted into a fibroid polypus, and if septic may then become expelled. A fibroid may also undergo red degeneration at this time, and have to be removed. A fibroid may become infected as a result of sepsis due to the introduction of germs during labour, and, lastly, but very rarely, a fibroid may atrophy as the uterus which contains it involutes.

Although the above is a serious list of complications which may ensue should a woman with a fibroid conceive, yet, as a matter of experience, it is found that in a very large majority of cases no harm results either during pregnancy, labour or the puerperium, and, therefore, unless some complication does arise, no operative treatment is necessary.

It is far different, however, in the case of an ovarian cyst, complicating pregnancy, labour, and the puerperium. In this there is a very real danger, so much so that the tumour must be removed as soon as convenient.

Treatment.—Fibroids need treatment either because they are causing serious hæmorrhage, because they are endangering life by pressure, because some complication arises in them, or very rarely because of their size.

In the olden days bleeding fibroids were treated with drugs and rest, together with as much nourishing food as the patient could afford.

In addition the sufferer was buoyed up with the assurance that at the menopause all would be well. The results of such treatment in some cases were disastrous, and the patients died of bleeding and exhaustion before the advent of the promised relief.

In other cases the results were almost as bad, the patient having to lead the life of an invalid all the best years of her life, every month spending a fortnight or more in bed or resting on a couch. In the majority of cases the treatment was more or less successful, the only exception to this method of treatment being in the case of a fibroid polypus, which was removed. Nowadays the treatment of bleeding fibroids has undergone a great change. It is recognised that it is no longer fair or right to allow a woman to remain a chronic invalid from a continual loss month after month and year after year.

We may divide cases of bleeding fibroids into three classes :—

1. In which the hæmorrhage is so bad that a surgical operation, most frequently hysterectomy, is required to save life. Rare.

2. In which the hæmorrhage is severe, but not so severe as to directly threaten life. Comparatively rare.

3. In which the hæmorrhage is comparatively slight, and can be controlled by drugs. Common.

The treatment of those cases that come under the second class has of late years been most open to discussion. On the one hand a large number of authorities think that these women should be restored to an active and healthy life by some operative procedure, most commonly removal of the uterus, and they argue that it is better for the woman to run the slight risk which attends the operation performed by skilled operators than to lead the life of an invalid for many years.

On the other hand, there are still many recognised authorities who consider that a woman should not be subjected to the danger of hysterectomy unless the bleeding is imperilling her life.

There is no rule which can apply to all cases, and if this second class be divided into three groups, then a better idea may be obtained. These groups are: patients near the menopause, patients with a fair income, patients that are poor.

In those cases where bleeding due to fibroids starts within a year or two of the menopause, and the patient is averse to operation, so long as the bleeding is not imperilling life, drug treatment may be tried. It must always be remembered, however, that in a woman with fibroids the menopause is apt to be postponed for some time, and also that *increased bleeding in a woman with fibroids near the menopause may be due to cancer arising in the uterus or to some change in the fibroid.*

Patients who can afford to rest and have medical advice when the bleeding is severe, have servants to look after their comforts, and are able to go away for a change of air if they get run down, may be left to choose for themselves to a greater degree. If they object to the semi-invalid life, and wish for operative treatment, then no obstacles should be put in the way of their obtaining what they desire. If, on the other hand, they do not wish for operative treatment, and their life is not in danger, it is doubtful whether an operation should be insisted upon.

Some authorities think all fibroids should be operated upon, whilst others would not do so unless forced to.

Poor patients who have to earn their own living should be strongly advised to submit themselves to operation, since if they have to stay away from work four or five days in each month their employer will dismiss them.

The proper treatment for a bleeding fibroid that makes a woman a semi-invalid is hysterectomy, unless, of course, any less severe operation will serve the same purpose.

The mortality is so low, and the improvement to health in women after they have undergone the radical

operation is so striking, that the public are beginning to take the matter more into their own hands, and it is now an every-day experience for women with bleeding fibroids to consult medical men with a view to operative procedure.

If a fibroid is endangering life by pressure it should be removed—every one is agreed upon this—but a difference of opinion arises when life is not endangered, and the difficulty is to decide whether a fibroid which is not bleeding, but is of a fair size, should be removed. Many surgeons think that such a fibroid should be removed because it is a mistaken policy to wait until pressure symptoms have developed, since then the patient will not be so well able to withstand the operation, which itself will be much more difficult and severe than if the fibroid had been removed at an earlier date. On the other hand, many medical men do not pay much attention to the size alone.

If, on repeated examination, a non-bleeding fibroid is found to be steadily increasing in size, then it will be in the best interests of the patient to remove it before pressure symptoms have developed, otherwise her chance of recovery will be lessened, not only because of the damage that has already been done, but also because of the more severe nature of the operation.

If a fibroid becomes septic, cystic or malignant, it should be removed forthwith.

These complications are rare. If a patient is under medical observation their onset will be detected, and the tumour can be removed.

The mortality in hysterectomy for fibroids is with skilled operators about 5 per cent. If the results of all operators were collated, the mortality would be found to be nearer 15 per cent.

But even supposing that the death-rate from hysterectomy for non-bleeding fibroids by operators skilled in this special branch of surgery was no greater or even a shade less than if these cases were left alone, this would be no

good reason for the dictum that all non-bleeding fibroids should be removed as a precaution against the chance of the tumour becoming the seat of some secondary change, since, if such treatment became recognised and was carried out by the generality of doctors, the operative mortality would at once very seriously increase, and be out of all proportion to the risk incurred by leaving the tumour.

If a fibroid tumour is by its size causing distress, and prevents the patient getting about, it should be removed. In the case of an unmarried woman the fibroid may lead to a suspicion of pregnancy, in which case she may demand its removal.

CANCER OF THE UTERUS.

Four thousand women die annually of cancer of the uterus in England and Wales, and in nearly one-third of the total number of deaths from cancer in women this organ is affected.

The disease may appear in the body of the uterus or in the cervix. *Cancer of the body* is fairly rare, most patients suffering from it are between fifty and sixty years of age, and as a rule they have not had any children.

Cancer of the Cervix is in comparison with cancer of the body very common, occurs in the majority of cases between thirty-five and fifty, and nearly always the patient has given birth to one or more children.

It is supposed that the local irritation due to a laceration of the cervix at childbirth is a predisposing cause to the cancer.

Symptoms.—Hæmorrhage; leucorrhœa; pain; cachexia.

Hæmorrhage.—This is the earliest symptom both in cancer of the body and cervix. It may make its first appearance at menstruation, causing menorrhagia, or take place independently of menstruation—metrorrhagia.

It is at times severe, but only seldom is it the im-

mediate cause of death, and then only at a late stage when the ulceration has extended into the uterine artery. As a rule the bleeding is due to rupture of the small blood-vessels in the tumour.

Leucorrhœa.—This is at first due to congestion, and is not offensive. In the last stages it is due to ulceration of the growth, and the discharge is horribly offensive. Unfortunately it is often only when the offensive discharge appears that women apply for advice, and then it is too late for any radical treatment.

Pain.—This is a variable symptom. In cancer of the cervix it does not appear till late in the disease, and is due to the growth spreading to surrounding structures. In cancer of the body, on the other hand, pain is much earlier, as this structure is more sensitive.

Cachexia signifies the yellow earthy appearance that patients suffering from malignant disease have in the last stages of the disease. It is accompanied by other symptoms of wasting, loss of appetite, and exhaustion.

Direction in which the Cancer Spreads.

Downwards.—On to the vagina, implicating the urethra, and so causing painful micturition and eventually retention of urine.

Upwards.—To the peritoneum.

Forwards.—Into the bladder, causing a vesico-vaginal fistula.

Backwards.—Into the rectum, causing a recto-vaginal fistula.

Outwards.—Into the broad ligaments fixing the uterus and implicating the ureters.

Causes of Death :—

The commonest cause of death is exhaustion. After this uræmia claims the greatest number of victims, and is due to the cancer growing into the ureters and preventing the proper flow of urine from the kidney.

The remaining causes of death are hæmorrhage, septicæmia, embolism, peritonitis, intestinal obstruction, and

secondary deposits in the brain, lungs, liver, and other organs, but when compared with the first two all of these are rare.

Radical Treatment.—If the patient is seen sufficiently early, removal of the uterus, cellular tissue in its neighbourhood, the local lymphatic glands and the upper part of the vagina (Wertheim's operation) is the proper treatment. Unfortunately only about 10 to 13 per cent. of cases that come under observation seek relief early enough for a radical operation to give any chance of cure.

There are various reasons why this delay occurs. To begin with, cancer very commonly appears about the menopause, and the patient thinks, or is told by her friends, and even, unfortunately, in many cases by her doctor, that the bleeding she complains of is nothing, it is due simply to the "change of life," and so precious time is wasted.

Then many patients only bleed a little and they are not alarmed till the offensive discharge appears, when it is often too late for treatment of a radical nature. Pain, again, in most cases is a very late symptom; whilst many women shrink from consulting a doctor from the dread of a local examination; and, lastly, others have the fixed idea that cancer is incurable, so are not anxious to learn the worst. Patients are generally ignorant of the early symptoms of cancer.

A number of operators all over the world have records of patients who have lived ten, fifteen, and twenty years after an operation performed in the early stages of cancer.

It is now proved beyond doubt that cancer of the uterus is curable if only the patient is operated upon at an early stage of the disease, and therefore it is most important for a nurse to persuade women suffering from the symptoms of cancer to seek advice at the earliest possible moment so that the growth, if present, can be removed. By distributing among nurses and midwives printed circulars containing a few remarks on cancer of the uterus, a better knowledge of the early symptoms and the im-

portance of early operation may become disseminated amongst the public. Some medical men go even further than this and think that such a circular should be distributed to all women over twenty-five years of age, and in favour of such an opinion there is a remarkable experience of Professor Winter, who wrote articles upon cancer of the uterus in the lay press of East Prussia, with the very gratifying result that he increased the percentage of women applying for advice in the early stages of the disease to 57.

Whether public opinion would approve of such extreme measures as these being taken in this country is very doubtful, but at any rate a great change is coming over the professional opinion of England with regard to the subject. For instance, whereas at the Leicester meeting of the British Medical Association in 1905 the proposal to educate women in the early signs and symptoms of cancer was scoffed at, at the meeting held in 1907 at Exeter the following resolution was unanimously passed : " That the Council of the British Medical Association be requested to consider the best means of disseminating knowledge of the importance of the early recognition of uterine cancer ".

It is therefore important that every nurse should have a knowledge of the symptoms of cancer of the uterus, so that when she meets a patient complaining of any of these symptoms she can advise the woman to at once consult a doctor.

Palliative Treatment.—This consists in remedies for the bleeding, discharge and pain.

For the bleeding the doctor will prescribe ergot and other drugs. The nurse may be called upon to treat a sudden severe hæmorrhage, in which case she should give hot douches (110° F.), and if this does not stop the bleeding the vagina may have to be plugged.

Leucorrhœa will be treated by various douches, those helping to destroy the odour, such as iodine, sanitas, permanganate of potash, being most often used.

The discharge may also cause pruritus, which will have to be treated first by douching and then by smearing the vulva with vaseline or placing a wool-plug just in the vagina to soak up the discharge.

The best method of diminishing the odour in advanced cases is found to be scrupulous cleanliness (the pads, sheets, nightgowns being changed whenever soiled), douching and plenty of fresh air in the room. In addition, saucers containing charcoal, and sheets with carbolic lotion sprinkled on them can be placed in the room, but these will seldom be necessary if the other directions are carefully observed.

Pain is a troublesome complaint. It is best treated by changing the nature of the analgesic directly it commences to lose its effect. Towards the end injections of morphia will generally be found necessary as a routine treatment, although in the Middlesex Hospital Cancer Wing it has been found that aspirin gives often the most relief.

What with the pain, bleeding, discharge, emaciation, disorders of micturition and defæcation, and perhaps bed-sores that attend these pitiable cases in their last stages, only a thoroughly trained nurse is capable of properly looking after them.

CHAPTER VII.

DISEASES OF THE FALLOPIAN TUBE.

SALPINGITIS.

Salpingitis means inflammation of the Fallopian tubes. Of the serious diseases that are peculiar to women, salpingitis occurs most frequently.

Causes.—Sepsis after labour or abortion; gonorrhœa; sloughing fibroids; cancer of the uterus; tubercle; appendicitis; sepsis due to the use of dirty instruments (sounds, dilators).

The large majority of cases are due to the first two causes in the order named.

Salpingitis is much commoner among the poor than the rich. In fact, it is a comparatively rare disease among the well-to-do, the reason being self-obvious.

The disease is due to a microbe, which in most cases first causes an endometritis and then infects the tubes. The tubes may then become merely inflamed (salpingitis) or the abdominal opening may become closed, and pus collecting, a pyosalpinx is formed.

The inflammation often spreads from the tubes to the surrounding structures, so that rarely acute peritonitis may supervene and the patient very likely die.

More commonly the intestine, ovary, and uterus become bound together by adhesions and fixed, and because of these adhesions the removal of the tubes later on may be very dangerous and difficult.

Symptoms.—The symptoms depend mostly on whether the case is an acute or chronic one.

Acute.—In this instance the onset is sudden, the temperature rises to a high figure (103° F. or more), the illness may be ushered in by a rigor, the patient complains of severe abdominal pain, and the belly is distended and very tender. The condition is nearly always due to sepsis after labour or abortion, and more rarely to gonorrhœa. It is due to pus escaping from the Fallopian tube before the abdominal opening is closed.

Chronic.—The chronic cases are much the commonest. In these the inflammation gradually spreads through the walls of the tube, the abdominal opening having been closed by inflammation, and the patient complains of menorrhagia, metrorrhagia, dysmenorrhœa, leucorrhœa, painful defæcation, and perhaps a frequency of micturition. Salpingitis is a common cause of sterility. A usual history in these cases, especially when there is pus present, is that the patient has for years been living the life of a semi-invalid, and hardly, if ever, feels quite well, is unable to do much work, and any extra exertion is likely to bring on what she calls an attack of "inflammation of the bowels," for which she has to go to bed for a few days.

These attacks, which gradually increase in frequency, are due to the fact that microbes have escaped from the tube and are setting up fresh inflammation. A pyosalpinx may rupture into the abdominal cavity and cause general peritonitis, or it may rupture into the rectum, bladder or vagina, giving rise to great misery.

Treatment.—In the acute variety, if there is general peritonitis an operation must be performed and the tubes removed. If there is only a local peritonitis it is safer to wait till the inflammation has quieted down.

The treatment of the chronic form will depend upon the history and the condition found on local examination. If there have been several attacks of inflammation, then the proper treatment is to remove the tubes. If on local examination the surgeon does not find a distinct lump he will treat the patient with rest, douches and tampons, which treatment is very often successful.

If, however, any distinct and tender swelling can be detected, then it will probably have to be removed.

EXTRA-UTERINE GESTATION.

An ovum can become fertilised in the Fallopian tube or ovary and develop to a certain stage in these situations. Ovarian gestation is, however, so extremely rare that it need not further be discussed.

Tubal Gestation.

Tubal gestation is due to the fact that the fertilised ovum in its passage from the ovary to the uterus becomes arrested in the Fallopian tube and there continues to develop. Why the ovum becomes arrested in this situation is unknown.

Investigators are divided into two groups, those who think the Fallopian tube must be healthy, and those that it must be diseased. It is therefore apparent how very little is known on the subject of causation.

Tubal gestation is a very serious and interesting condition. Supposing a fertilised ovum remains in the tube and continues to develop, the following complications may occur :—

1. It may burst through the tube, the result being that the ovum perishes and the mother may die, or, on the other hand, live with a condition known as pelvic hæmatocele, which signifies a collection of blood in the pelvic cavity.

2. It may abort through the abdominal opening of the tube with similar results to the above.

3. It may erode through the tube, that is to say, gradually bore its way through the tube without injuring any large blood-vessel, in which case the ovum becomes adherent to intestine or omentum and continues to develop even in some rare cases to full term. The mother at the time of the erosion may experience some slight abdominal pain, but nothing more.

4. It may absorb, having died in the tube, and the mother remain well.

Of all these events tubal rupture is the commonest, then tubal abortion, whilst tubal erosion is rare. It is interesting to note what may happen subsequent to a tubal erosion. The fœtus may die and become dried up and converted into a mummy. The dead fœtus may become impregnated with lime salts and what is known as a lithopædion result.

The fœtus may remain in one of these states for many years; in fact, the woman may live to old age and die of some other condition.

The mummy or lithopædion may be infected by microbes from the intestine and suppuration result, the pus and bones escaping into the bowel, bladder, vagina, or through the abdominal wall, the patient dying or not as the case may be.

The sac surrounding the fœtus may rupture and furious internal bleeding take place, the fœtus being destroyed and the mother dying unless rescued by immediate operation.

The fœtus may continue to develop till term when a false labour will take place, then either the fœtus will die and the further changes will be similar to those described above, or the sac will rupture, and the result will be similar to that mentioned above.

Symptoms of Tubal Gestation. — **Before Tubal Rupture or Abortion.**—Tubal rupture or abortion takes place before the twelfth week of pregnancy, as a rule between the sixth and the tenth week. It has taken place ten days after impregnation.

The woman in the majority of cases will give a history of having missed one or two periods, perhaps of a little morning nausea, and maybe of the breasts having become tender and a little swollen. In addition she will certainly complain of pain in the lower abdomen on one or other side.

At Tubal Rupture or Abortion.—A history similar to that noted above may be obtained : in addition the woman is suddenly seized with great abdominal pain and she will most likely faint, break out into a cold perspiration, and on recovering consciousness she may be sick.

Her pulse will be very rapid, feeble and soft. She will be deathly white, her temperature may be subnormal, and she may be restless. She will complain of faintness, noises in the ears, and perhaps of want of breath—"air hunger".

She has a feeling of sinking through the bed, respiration may be hurried and of a sighing character, the surface of the body is cold ; in fact, all or many of the signs and symptoms of serious internal hæmorrhage may present themselves.

So great can the loss of blood be that the patient may suddenly fall back dead, or she may die in a few minutes, or in less marked cases she may die in a few hours unless rescued by operation.

Just before or at tubal rupture or abortion a dark brown discharge may flow from the uterus, and if special care is taken to examine carefully all that comes away a membrane which is the lining of the uterus will be found either whole or in pieces.

The identification of this membrane is most important, as at times the diagnosis between tubal gestation and an ordinary miscarriage may be very difficult to determine, and the examination of the piece of membrane will settle the matter. The nurse must therefore be careful to save anything that is passed from the vagina.

After Erosion.—The symptoms would be those of pregnancy corresponding to the period to which the fœtus has developed, together with, as a rule, some abdominal pain, and the woman may seek advice because "the child is all on one side".

If during any time the sac ruptures, then all the signs and symptoms of internal hæmorrhage will be present.

If the pregnancy goes to term a false labour comes on with regular pains and discharge.

Treatment.—Tubal gestation is a very dangerous disease.

There is still a great difference of opinion as to the best treatment under certain conditions, as much difference as may be found concerning the treatment of fibroids.

If the condition is diagnosed before rupture or abortion every one is agreed that the diseased tube should be removed in order that none of the aforementioned complications may take place.

If the patient is apparently dying of internal hæmorrhage, of course all are agreed that an immediate operation is necessary.

But it is in those cases where the first shock has passed off and the patient is apparently getting better, with the formation of a hæmatocele, that the great difference of opinion exists.

Some authorities consider all these patients should be operated upon, because, as they rightly say, there is no knowing for certain whether the ovum is dead, and if not it may continue to grow and an extension of the tubal rupture result, or if tubal abortion is taking place the ovum may not have escaped from the tube, and further hæmorrhage will occur before it does so. Others consider that these cases should be left to recover naturally unless any further complication arises, because they contend that the mortality is not so great as in those cases which are operated upon.

The latest work on the subject shows that there is little to choose on the score of mortality between the two methods of treatment, but if anything the figures are in favour of operating. Whilst it is true that if operated upon the patient will have a scar, nevertheless she will probably be well a month earlier than if she were treated by rest, and may in the end have to be operated upon if the effused blood is not absorbed, even if some further complication does not compel operation before that time.

There is no doubt that the danger of leaving a woman who has had the signs and symptoms of a ruptured tube or tubal abortion is a very real one, and most gynæcologists have come across cases where the patient has been left, and during some part of her supposed convalescence a further hæmorrhage has taken place which has killed her, or would have done so if an immediate operation had not been performed.

Taking all these points into consideration, therefore, the safest treatment is to operate.

CHAPTER VIII.

DISEASES OF THE OVARY.

OVARIAN TUMOURS.

Tumours of the ovary are either cystic or solid. The solid tumours in comparison with the cystic variety are rare, and will not be further considered.

Tumours of the ovary, whether cystic or solid, may be cancerous or non-cancerous, and of the two, the former is much the rarest.

Cystic Ovarian Tumours.—The different kinds of cystic ovarian tumours may roughly be divided into simple, glandular, dermoid, and papillomatous, the difference depending upon their structure and the nature of the fluid they contain.

Simple Ovarian Tumours.—These tumours do not grow to any large size, the fluid is limpid and clear like water, and is as a rule straw-coloured.

If any of this fluid escapes into the peritoneal cavity no harm results, and many of these tumours are cured if they burst.

Glandular Ovarian Tumours.—These tumours are more complicated in structure. The walls of the cyst are partly composed of glands, and the fluid they secrete (mucus) is thick, tenacious, and greenish in colour if not altered by inflammation or bleeding, when it may be yellow from the presence of pus, or red, chocolate, or black from blood. Should the fluid escape into the peritoneal cavity from rupture of the cyst, it does no immediate harm, but as the glands in the cyst wall continue

to secrete, the mucus escapes into the peritoneal cavity, and the abdomen gradually becomes so full that life is endangered from the pressure the fluid exerts.

Dermoid Ovarian Tumours.—These tumours are very peculiar, inasmuch as they may contain teeth, hair, bones, breast-tissue on which may be situated nipples, nervous-tissue or skin. Teeth are most commonly present, as a rule only two or three, but over a hundred have been found. The length of the hair varies; generally it is short, but it has been found several feet long. The colour does not correspond with that of the patient's hair, but it becomes grey with old age, when it is shed from the cyst wall.

The fluid is liquid fat, and if it escapes into the peritoneal cavity severe inflammation may be set up (peritonitis), causing the death of the patient.

Papillomatous Ovarian Tumours.—These tumours contain little growths having the appearance of warts, hence their name. If these wart-like structures escape into the peritoneal cavity they become adherent to the viscera, and continue to grow, causing fluid to accumulate in the peritoneal cavity from their irritation.

These warty growths are of two varieties, cancerous and non-cancerous. The former continue to grow till the patient dies. The latter only live a certain time and then disappear; but as their place is taken by others the result, if the tumour is not removed, is the same as if they were cancerous. On the other hand, if the tumour is removed, then in the non-cancerous variety the patient recovers, because the growths that are adherent to the viscera at the time of the operation disappear soon afterwards and there are no fresh ones to take their place.

In the case of the cancerous variety removal of the tumour will not cure the patient if any of the growths have once escaped from the cyst, since, although no fresh ones can become ingrafted, yet those already present do not disappear but continue to grow.

Methods by which Ovarian Tumours Endanger the Life of the Patient.

By their size.

By the complications of rupture, inflammation, twisting of the pedicle or hæmorrhage which they may be subject to.

By their being cancerous.

By their association with pregnancy, labour, or the puerperium.

By pressure on the ureter.

By intestinal obstruction.

Size.—It is unusual nowadays to find ovarian tumours of any large size, the reason being that since aseptic surgery has made it possible to remove these growths with safety, this is done as soon as they are detected.

In olden days tumours of enormous size were quite common, and even nowadays in out-of-the-way places where there are no doctors, amongst uncivilised nations, or in women who refuse to consult a doctor or listen to his advice, very large tumours may occasionally be found.

One of the largest on record weighed 103 kilogrammes, the sac weighing 3 kilos, and the fluid measuring 100 kilos (88 quarts).

The tumour was removed from a Chinese, Yu Yung Ne, age twenty-five, by a Dr. Elizabeth Reifsynder, and the patient recovered.[1]

Rupture :—

Causes.—An ovarian cyst may be ruptured by the wall becoming so thin from pressure of the contained fluid that it tears, or the wall of the cyst may become diseased and give way. Rupture may also be caused by blows or falls, labour, twisting of the pedicle, laughing, coughing, "stooping to button the boots," and during examination by the doctor.

[1] "Surgical Diseases of the Ovaries and Fallopian Tubes." Bland-Sutton. 1896. Cassells.

A case is on record in which a patient with an ovarian cyst was descending in a lift, the machinery of which broke. The concussion caused by the lift falling burst the cyst, and the patient recovered.

In another case "a lady with an ovarian cyst stood up in a hansom cab to speak to the driver through the trap in the roof. The horse fell, and she was thrown forward on the sharp angle of the corner of the door, which burst the cyst, and she recovered." [1]

Symptoms.—The symptoms attending the rupture of an ovarian cyst may be divided into immediate and remote.

Immediate Symptoms.—Sudden pain in the abdomen; disappearance of the abdominal swelling; perhaps the passage of a large quantity of urine; perhaps symptoms of internal hæmorrhage.

Of course, if the cyst is entirely situated in the pelvis, the second symptom will be absent, and only if a blood-vessel is damaged at the rupture will the last symptom be present.

Remote Symptoms.—These depend on the nature of the fluid contained by the cyst. For instance, in a simple cyst no harm may result; in a glandular cyst the mucus which is secreted will gradually fill the abdominal cavity, and kill the patient if it is not removed; in a dermoid cyst the contents are likely to set up peritonitis, which may be fatal. In a warty cyst the growths, by their irritation, cause a large amount of fluid to collect in the abdominal cavity.

In the olden days when ovariotomy was not performed, patients were tapped when the accumulation of fluid became too great.

As an idea of how much fluid can be secreted by an ovarian cyst, the following is an account of a specimen preserved in the museum of the Royal College of Surgeons: "The patient was twenty-seven years old when

[1] "Surgical Diseases of the Ovaries and Fallopian Tubes." Bland-Sutton. 1896. Cassells.

the disease commenced, after a miscarriage of her first child. Between the year 1757 and August, 1783, when she died, she was tapped eighty times, and a total of 6,631 pints, or over thirteen hogsheads, were removed from her." [1] Just before her death the fluid accumulated at the rate of three and a half pints a day.

If the patient recovers from the rupture, then the tumour, in most cases, refills.

Inflammation :—

Causes.—In pre-ovariotomy days the cyst at times became inflamed by being punctured with a dirty trocar, when the fluid was being drawn off.

Inflammation may also be due to inflamed intestine, an inflamed vermiform appendix or to an inflamed Fallopian tube becoming adherent to the cyst. A patient with an ovarian cyst and suffering from typhoid fever may have the cyst infected by the typhoid bacillus, which may cause it to suppurate. An ovarian cyst may also be pressed upon during labour and then inflame, or its pedicle may become twisted, with a like result.

If the inflammation is acute the cyst becomes filled with pus, and the patient dies unless it is removed in time, or the pus may burst through into the intestine, bladder, vagina, or through the abdominal wall, and she then may die. In less acute cases adhesions are formed so that the tumour is bound down to any structure in its neighbourhood, and its removal becomes a highly dangerous procedure.

Symptoms.—The symptoms of inflammation are great abdominal pain, tenderness when the tumour is touched, a rapid pulse, high temperature, and emaciation.

Twisting of the Pedicle.—Ovarian tumours are attached to the uterus and broad ligaments by a band of tissue made up of several structures, and this band is called the pedicle. Under certain conditions this pedicle

[1] "Surgical Diseases of the Ovaries and Fallopian Tubes." Bland-Sutton. 1896. Cassells.

becomes twisted, with the result that several well-defined symptoms appear.

Causes.—Twisting of the pedicle is due to a rotatory movement of the ovarian tumour. This may be brought about by the resistance of swellings in its immediate neighbourhood, such as an enlarged pregnant uterus or a fibroid tumour of the uterus, or another ovarian cyst. Twisting of the pedicle has also been thought by some to be due to the alternate filling and emptying of the bladder and rectum, and their occurrence after labour is probably due to the rapid decrease in size of the uterus.

When the pedicle is twisted, the veins in it are occluded, whilst the arteries remain patent. Blood which is pumped into the tumour is therefore unable to escape, with the result that the tumour soon becomes very congested.

The next thing to happen is that some of the small vessels in the wall of the tumour burst, and blood is extravasated into the wall of the tumour, and occasionally, also, a large vessel will rupture when blood escapes into the cyst cavity, which may become so distended that the cyst bursts.

Symptoms.—Sudden and great abdominal pain, accompanied by vomiting in a woman with an ovarian cyst indicates twisting of the pedicle. In addition, if any blood-vessels have ruptured there may be the symptoms of internal hæmorrhage.

In a certain percentage of cases there will also be present in a day or two symptoms of inflammation of the cyst.

Hæmorrhage :—

Causes.—Bleeding from an ovarian cyst may be due to its rupture, to twisting of its pedicle, to suppuration into a blood-vessel, to a warty growth opening a blood-vessel, to a blow, and in the olden times death was sometimes due to the trocar puncturing a large vessel.

Symptoms.—The symptoms of bleeding in an ovarian cyst are those of internal hæmorrhage, together with pain, and if the cyst has ruptured then the additional symptoms of that complication.

Effect of an Ovarian Cyst on Pregnancy.—The pressure symptoms of pregnancy become more marked. Vomiting is likely to be more troublesome. In some cases the onset of albuminuria and perhaps eclampsia is favoured. The tumour may cause retroversion of the uterus, which may then become incarcerated. Miscarriage may occur.

Effect of Pregnancy on an Ovarian Cyst.—The cyst grows more rapidly. It may rupture, its pedicle may become twisted, it may inflame, or it may become jammed down below the uterus, impacted as it is termed, so interfering with micturition and defæcation.

Effect of an Ovarian Cyst on Labour.—It may cause obstruction either by being in the pelvis and so preventing the head from descending or by causing some malpresentation of the fœtus. As a result of this obstruction, the uterus may rupture.

It may cause inertia of the uterus so that labour is delayed and post-partum hæmorrhage likely.

Effect of Labour on an Ovarian Cyst.—The contracting uterus may cause twisting of the pedicle, it may rupture the cyst, or it may injure the cyst so that later it inflames.

Effect of an Ovarian Cyst on the Puerperium.—As a result of twisting of the pedicle or bruising during labour the cyst may become inflamed. The patient then becomes septic, and if the tumour is not discovered the condition is put down to puerperal fever, and the patient dies. There have been many cases of this mistaken diagnosis.

Effect of the Puerperium on an Ovarian Cyst.—The pedicle of the cyst may become twisted, or in cases of septicæmia the cyst may become infected and suppurate.

Pressure on the Ureter.—In very large cysts or in a

cyst tightly impacted in the pelvis the ureters may become dangerously pressed upon.

As a result albuminuria is likely to arise, and later, if the tumour is not removed, the kidneys become irretrievably damaged, and the patient dies from uræmia.

Obstruction of the Bowels.—The bowels may become obstructed by becoming adherent to the tumour or by a portion of them becoming caught in the pedicle as it is twisted.

Symptoms of Ovarian Cysts.—*Enlargement of the Abdomen.*

Amenorrhœa.—In most cases when the health of the patient has become depreciated, amenorrhœa results. After the menopause ovarian tumours may cause a loss of blood from the uterus, and in certain varieties of ovarian tumour the patient may suffer from menorrhagia.

Pressure.—Pressure on the bladder and rectum gives rise to frequency of micturition, constipation, and hæmorrhoids; on the stomach to indigestion; on the diaphragm it impedes the action of the heart and of the lungs, and on the veins it causes œdema of the legs and ascites.

Emaciation.—If the disease is advanced, or if suppuration has taken place in the cyst, the patient becomes emaciated, as also she does if the cyst is malignant.

Treatment.—Every ovarian tumour should be removed as soon after its discovery as possible, for the following reasons:—

With the rare exception of its bursting and becoming cured, it will certainly kill the patient in the end. It is liable to the serious complications already mentioned, including in married women those of pregnancy, labour and the puerperium. The longer it is left the more dangerous probably will be its removal. It may be cancerous, when the only chance the woman has is its removal before the cancer has spread to other structures.

This rule admits of but very few exceptions, which are, if the patient is so desperately ill that an anæsthetic or operation would kill her, it must be tapped, and if the

tumour does not obstruct labour, labour may be terminated first and the tumour removed a few days later.

There are a large number of cases on record in which an ovarian tumour has been removed during the various months of pregnancy, during labour, and during the puerperium, without in the first case disturbing the pregnancy, and in the last interfering with the patient's recovery in any way.

CHAPTER IX.

DISEASES OF THE PELVIC CELLULAR TISSUE AND PERITONEUM.

PERIMETRITIS.

Perimetritis signifies inflammation of the peritoneum covering the pelvic cavity and the organs contained therein.

CAUSES.—Septic infection following labour or abortion; gonorrhœa; cancer; sloughing fibroids; appendicitis; or passage of a dirty sound.

SYMPTOMS.—Those of fever, according to its severity; pain and tenderness over the lower abdomen; pain on micturition.

In the acute stage the patient is in very great pain, lies with both legs drawn up, and is unable to bear the weight of the bedclothes on her abdomen, which is distended and rigidly held. The breathing is thoracic.

RESULTS.—**Absorption** of the inflammatory products, and the patient quite recovers.

Suppuration.—An abscess forms, and after a severe illness unless properly treated by operative measures the pus escapes by the bowels, bladder, or vagina. More rarely, the patient dies.

Organisation.—The inflammatory products become organised into fibrous tissue (adhesions), which bind together the pelvic viscera, and cause trouble for years after.

TREATMENT.—Rest, hot douches, abdominal fomentations and drugs to relieve the pain and regulate the

temperature, which may be very high, will be prescribed. If suppuration occurs the abscess will have to be opened.

PARAMETRITIS.

Causes.—Inflammation of the cellular tissue of the pelvis or parametritis as it is termed, may be due to infection of some wound caused by labour; or infection during an operation on the genital organs.

Symptoms.—Correspond to those of perimetritis, but in an average case they are not so severe.

The tenderness and abdominal pain is much more local, occurring on one or other side just above the groin.

Results:—

Absorption.—The patient recovering without any bad symptoms.

Suppuration.—In at least half the cases an abscess results, which, if not opened through the abdominal wall, bursts as a rule just above the groin, after an illness of at least two months.

Organisation.—In this case the inflamed tissue becomes fibrous, and fixing the uterus may cause trouble for years after.

Treatment.—Similar to that of perimetritis.

CHAPTER X.

DISORDERS OF MICTURITION.

RETENTION OF URINE.

If a woman is unable to micturate (pass her water) the bladder becomes distended, and the condition is known as "retention of urine".

CAUSES :—

Hysteria.—This condition is common in young girls who crave for sympathy and whose nervous system is in an unstable condition. There is no local disease to be found.

Pain in the Urethra or Bladder.—If the act of micturition gives rise to severe pain the woman will prevent its repetition as long as possible, and in this way retention sometimes results. The following conditions may act in this way : inflammation of the urethra ; urethral caruncle ; cancer of the urethra or vagina implicating the urethra ; perimetritis (the peritoneum over the bladder being inflamed, and the pain being caused by contraction of the bladder) ; stone ; and fissure of the neck of the bladder.

Shock to the Central Nervous System.—Retention of urine is very common after operations, especially those on the abdomen, vagina, perineum and rectum. The retention is due to the fact that that portion of the spinal cord which controls the act of micturition is temporarily affected by the shock.

Over-distension of the Bladder or Abdominal Walls.—If a woman holds her water too long, and the bladder

becomes over-stretched, when she desires to micturate the bladder-muscle may refuse to contract, and retention results, which has to be relieved by a catheter. After labour it is not uncommon during the first day or so for the woman to have retention of urine, because the abdominal muscles have been so stretched by the pregnant uterus that they will not contract, and so raise the intra-abdominal pressure sufficiently for micturition to be accomplished.

Obstruction of the Urethra.—The urethra being the canal through which the urine leaves the bladder, it is evident that if anything blocks the canal retention must result. The urethra may be pressed upon and so the flow of urine obstructed by the following: a retroverted pregnant uterus; an ovarian tumour; a fibroid tumour; a collection of blood in the pelvic cavity behind the uterus (hæmatocele); a collection of serum in the same situation; a fibroid polypus filling the vagina. The lumen of the urethra may also be occluded by cancer or a stone.

Disease of the Central Nervous System.—Locomotor ataxy; lateral sclerosis.

TREATMENT.—For hysterical retention relief by catheter may be necessary on the first occasion, but every means should be taken to prevent a further continuance of its use. If a strong purge be given, micturition usually takes place when the bowels act. Another method is to seat the girl in a bath with hot water reaching to the hips, and then without any warning to empty a pailful of cold water over her head and body. For the remaining causes of retention appropriate treatment will be prescribed by the medical practitioner.

INCONTINENCE OF URINE.

Incontinence of urine is a term denoting the dribbling away of urine from the bladder irrespective of any wish of the patient. The urine may also constantly dribble

away in cases where the ureter has been injured in a hysterectomy and its cut end has become engrafted into the top of the vagina. The following varieties of incontinence may be met: true incontinence; incontinence of retention; nocturnal incontinence.

True Incontinence.

In this condition the urine cannot collect in the bladder because there is a hole in it; the urine is, therefore, always dribbling away, causing much soreness, irritation, and offensive odour.

Causes.—The hole in the bladder may be due to—

1. Sloughing of the vagina and bladder from pressure of the head of the fœtus during labour.
2. Laceration of the bladder during the delivery of the fœtal head with forceps.
3. Injury to the bladder during some operation in its neighbourhood.
4. Ulceration of the bladder due to cancer, tubercle, syphilis, or a neglected pessary.

By far the commonest cause is that due to sloughing after labour, when the incontinence does not appear for some few days, until the slough has separated.

Incontinence of Retention.

In some cases of retention, when the urine has collected to a great amount the pressure becomes so severe that a little urine trickles past the sphincter at the neck of the bladder, and so gives rise to the condition known as incontinence of retention.

Nocturnal Incontinence.

In this condition, which generally occurs in young children, the urine is passed while the child is asleep and without its knowledge. It is due to irritation of that

part of the spinal cord which governs the act of micturition. In some patients no cause can be discovered for the irritation ; in others it seems to be due to the presence of worms, stone in the bladder, polypus of the rectum, infection with the colon bacillus, inflammation of the vulva, or very acid urine.

TREATMENT.—The treatment of incontinence must depend upon the cause. In the absence of any cause being discovered, the patient should sleep on a hard bed with very light clothing. If young she should be roused when the parents go to bed and made to empty her bladder.

Very little drink should be allowed with the last meal of the day. A large reel of cotton may be tied round the waist so that it rests on the spine. This will prevent the patient lying on her back, a position which seems to favour the involuntary expulsion of urine.

Cold baths and a cold douche to the spine are often helpful. For the medicinal treatment a doctor must be consulted.

FREQUENCY OF MICTURITION.

CAUSES :—

Excessive Quantity of Urine.—Hysteria, diabetes, chronic Bright's disease.

Pressure on the Bladder.—Pregnant uterus, ovarian tumour, fibroid tumour, pessary.

Misplacement of the Bladder.—Cystocele, prolapse of the uterus.

Disease of the Bladder.—Cystitis.

TREATMENT.—The passage of an excessive quantity of urine is in most cases a serious symptom, and a doctor should be consulted at once. The nurse must be careful to remember that frequency of micturition is also a sign of retention.

PAINFUL MICTURITION.

Causes :—

Urethral Caruncle.—This complaint generally occurs in women over forty, and is commoner in those who have borne children.

The cause is not known. The caruncle consists of a small growth, bright red in colour, situated just inside the external orifice of the urethra. It is composed of small blood-vessels and nerve fibrils.

Symptoms.—The chief symptom is pain on micturition, which may be so severe that the patient, dreading it, is afraid to pass her urine and so has retention.

Rarely an urethral caruncle will bleed a little on being touched.

Treatment.—Removal is the only treatment, and unless this is done very thoroughly the caruncle is very apt to return.

Cystitis.—Retention of urine; septic infection from passage of a dirty catheter; stone in the bladder; cancer, tubercle, and villous tumour of the bladder, bursting of an intrapelvic abscess into the bladder, all these may give rise to cystitis.

Treatment.—Cystitis is a most dangerous disease, and if it is not properly and promptly treated the inflammation may spread up the ureters to the kidneys, with a fatal result.

PART II.

GYNÆCOLOGICAL NURSING.

THE BEARING OF A NURSE.

A fully trained nurse is one who has developed and brought to a fine art the care and management of the sick, having a sympathetic and intelligent grasp of the theory and practice of nursing.

To have reached such a stage, a nurse must have spent at least three years in a recognised training-school where all her faculties should have been exercised to the perfecting of each detail of her work, in no way overlooking the fact that this training is useless unless her character has developed along sound and strong lines, and she has cheerfully responded to the stern discipline which alone can make productive those qualities which are essential to her calling. Taking character as the foundation of a good nurse, an implicit and unquestioning obedience to all instructions received from those in authority is required, together with absolute loyalty, a wise energy, and a forgetfulness of self in the love of the work she has undertaken.

Such a nurse will perform her duties with a freedom from self-consciousness and a quiet reserve which cannot fail to elicit the respect of those with whom and for whom she works, and in so doing will uphold the status of the profession she represents.

Manners are often overlooked in a nurse's training, due probably to the rush of her work, and she may be in danger of losing the confidence of her patient through an

appearance of hurry which must therefore be wholly foreign to her nature.

Towards patients and strangers alike she should be at all times courteous, sympathetic and helpful, but in every way free from familiarity.

The essential qualities then of a fully-trained nurse are sympathy apart from sentimentality; an intimate knowledge of all the details of her work which will serve to inspire confidence in patients and doctors alike; a cheerful self-forgetfulness, holding sacred any information confided to her by doctor or patient, ever avoiding all conversation of a personal nature; and lastly, accuracy and minute attention to detail. These latter qualities a nurse only acquires in her probationer days, when her habits are being formed and her powers of observation developed by the routine ward-work, rough and heavy though it may have seemed, for only by such work can she become alert, quick, and have gained that observant and practised eye by which all details of a sick-room and all wants of a doctor are grasped without effort.

The natural outcome of such attributes will be punctuality, neatness, quietness, cleanliness even to the minutest detail, method and order.

All this is but an outline of what might almost be described as a limitless subject, on the bearing of a nurse towards her patients, doctors, fellow-workers, and the public at large.

CHAPTER XI.

ANTISEPSIS AND ASEPSIS.

ASEPSIS AND ANTISEPSIS IN GYNÆCOLOGICAL PRACTICE.

The success or the failure of gynæcological as of other operations depends largely upon the care with which infective bacteria are excluded from the area under treatment, and as the nurse will be partly responsible for such exclusion it is important to devote a few lines to the various methods by which this bacterial infection can be prevented. The following definitions are important.

Bacteria.—Minute organisms, commonly called microbes, belonging to the vegetable kingdom, and forming one of the lowest of its classes. Certain bacteria give rise to bodies called spores. These spores, which may be compared to the seed of a plant, are much more difficult to destroy than the bacteria.

Asepsis, freedom from or absence of bacteria and their spores.

Sepsis, bacterial infection or contamination.

Antisepsis, substances which hinder the growth of bacteria but do not kill them.

Disinfectants, substances which destroy bacteria but not their spores.

Sterilisation, a method by which all living organisms are destroyed, in other words, bringing about a condition of asepsis.

Necessary Conditions for Bacterial Growth.—In

common with all living objects bacteria require moisture, warmth and food for their growth.

So long as bacteria are kept free of moisture they do not grow. Bacteria in dust are therefore harmless for the time being. For this reason when a nurse has to prepare a room in a private house for an operation, unless there is ample time to carry out the precautions of which full details will be given, she should be careful not to scatter the bacteria about the room by vigorous dusting.

As bacteria feed on dead or living animal matter, wounds must be protected, and all blood-clot and serous discharges must be removed when possible from the neighbourhood of the operation. The infective bacteria thrive at the body temperature, and most bacteria grow best in the dark and are killed by exposure to sunlight. It is obvious, therefore, that the room in which an invalid is lying should have as much sunlight as possible.

Distribution of Bacteria.—Bacteria are found everywhere, and whenever the surroundings are found favourable they will grow. They are present on the skin, in the intestinal canal and in the lower part of the vagina. The uterus, if healthy, is free.

Action of Bacteria.—Some bacteria are harmless, such as those which cannot grow at the body temperature; others are beneficial, as, for instance, certain bacteria which inhabit the vagina and act as a disinfectant to that canal, and, lastly, those that are harmful can only act when the normal resisting power of the patient is lowered and there are wounds through which they may gain entrance into the body, or there is some dead matter in their neighbourhood upon which they can live.

Methods of Infection.—Bacteria may be conveyed to the patient through the medium of the hands or breath of the surgeon or nurse; by catheters, douch-cans, tubes or nozzles; by contaminated wearing apparel, by towels or

by the instruments, swabs, sutures or bowls used in the operation.

Sterilisation.—Sterilisation can be effected by means of—

1. Heat.
2. Chemicals.

Heat :—

Heat may be used for sterilising in three ways :—

Baking. Boiling. Steaming.

Baking.—Dry heat at 150° C. will kill any living organism. Its application for this object has, however, two disadvantages. In the first place it does not penetrate well, and so bacteria in the middle of an article may escape destruction. For gynæcological purposes this method is not a useful one, since the oven will only take small articles, and cotton, linen and flannel goods will be scorched.

Boiling.—For articles that can be boiled this is the most convenient method of sterilisation. Instruments, sutures, and indiarubber gloves are usually so treated, whilst towels and swabs can be. The articles must be boiled for half an hour.

Steaming.—This is the best method, since it instantly kills the bacteria and penetrates right through the articles to be sterilised. Steam is used nowadays for towels, dressings, swabs, operating gowns, and for such articles as bedding and clothing. Leather, felt, skins, and mackintoshes cannot be steamed.

Chemical.—The following chemicals among others are used for sterilising purposes :—

Mercury. Carbolic acid. Lysol.

Mercury.—Mercury is very poisonous ; is decomposed by lead, tin and copper ; corrodes metals and becomes more or less useless in the presence of albumen, forming with it an insoluble compound.

It is the strongest chemical suitable for the purpose known, but care must be taken in its use. As albumen is contained in blood and other discharges from a wound,

these substances must be washed away before the mercury can kill the bacteria. Likewise soap must not be allowed to contaminate the mercurial solution.

Owing to the poisonous nature of mercury the solutions must be prepared with the greatest care.

If a patient is poisoned with mercury she will complain of a metallic taste, sore gums, colic and nausea. She will suffer from salivation and diarrhœa. Her breath may be very offensive, and there may be blood in the motions. In bad cases the pulse is small and rapid, the patient has an anxious expression, her skin is cold and clammy, and she may have suppression of urine.

For the catheter, douche nozzle, vulva and hands a solution of biniodide or perchloride of mercury, 1 in 1000, may be used. For the vagina and uterus a strength of 1 in 4000 is generally sufficient.

Carbolic Acid.—Carbolic acid is an uncertain chemical for sterilising purposes unless it is used at such a strength that it will injure the tissues. It is, however, a good disinfectant. It has the advantage of not injuring the instruments or combining with albumen, so that it can be used in the presence of that substance. It is poisonous, the first sign of which is that the urine becomes green or greenish-black.

Carbolic acid is very useful for sterilising mackintoshes, dishes and porringers, for which purpose its strength should be 1 in 20 (one ounce to a pint of water). For the skin, instruments and hands 1 in 40 is strong enough.

Lysol.—Belongs to the carbolic acid group of chemicals. It is, however, not so poisonous, and rather more efficacious in its bactericidal properties.

For the skin, hands and instruments it can be used at a strength of 1 in 160 (a teaspoonful to a part of water), and for the vagina and uterus 1 in 320.

Because of the poisonous nature of these chemicals the nurse must remember to prepare the solutions for douching in strict accordance with the doctor's orders, and, in

addition, when she is giving a vaginal douche, she must be sure that none of it is retained, and to this end after the douche nozzle is withdrawn she can pull back the perineum and press upon the abdomen.

One of the most important lessons a nurse has to learn is that of surgical cleanliness. A thorough knowledge of the conditions of asepsis and antisepsis will certainly help her a good deal in this, but she must be able to carry into practice what she has learnt. One has often seen a nurse whose knowledge of the principles of surgical cleanliness has been quite sufficient fail in this respect through lack of care and strict routine. Thus a nurse will sterilise all the instruments and appliances, will dress herself in appropriate apparel, will scrub her hands and soak them in an antiseptic afterwards, but will then proceed to touch some object which has not been sterilised, be it the patient, a piece of furniture, or even her cap! After which she may, unless detected, continue to help at the operation without again rendering her hands as aseptic as possible.

A nurse must remember when assisting with the instruments or swabs at the operation, that after having once rendered her hands and forearms as aseptic as possible she must not touch anything that has not been sterilised till the operation is finished. Very rarely with insufficient assistance this may be impossible, in which case the nurse must again prepare her hands, or if, as she should be, she is wearing india-rubber gloves, it is better for her to put on a new pair.

How to Disinfect a Room.

The nurse may be called upon to disinfect the room after it has been occupied by some septic case. The disinfection should be carried out as follows with the additional help that is necessary :—

All the linen that can be boiled should be placed in a solution of perchloride of mercury, 1 in 1000, and then removed from the room.

The windows and fireplace should now be pasted up with brown paper so as to prevent any air from entering the room. Next the blankets, mattress, and bolsters should be spread out, and all the drawers and cupboards should be opened so that their contents are exposed as much as possible.

A formalin lamp (which can be hired at a moderate charge from most chemists) should now be placed in the centre of the room, and after the lamp is lit the room should be left as quickly as possible.

At the end of twelve hours the door, windows and fireplace should be opened and the room exposed to the fresh air for some time.

Everything as far as possible should be sent to the wash.

The room and its contents must then be thoroughly scrubbed with soap and water. If the walls are papered they must be stripped and afterwards washed with some disinfectant. If distempered or painted the walls should be sprayed with formalin and then washed down.

Books and papers should be burnt as they cannot be disinfected unless exposed to a degree of heat which would spoil them.

If a formalin lamp cannot be obtained, the room can be less efficiently disinfected with rock sulphur. Three pounds of this should be placed on a shovel with some red-hot cinders, the whole being placed over a bath of water, so that if any cinders should fall there will be no danger of fire. Sulphur candles are sold for disinfecting purposes.

CHAPTER XII.

POSITION OF THE PATIENT.

In gynæcological practice the nurse will be told to place the patient in various positions according to the nature of the examination to be made and the treatment to be carried out.

For Examination and Minor Treatment.

Recumbent Position.—Doctors examine their patients when suspecting any disease of a gynæcological nature by a routine method. First an external examination of the breasts and abdomen is made, then an external examination of the vulva, and lastly an internal examination of the vagina, uterus, ovaries and Fallopian tubes.

The recumbent position is therefore the first to be assumed by the patient in whom such an examination is necessary.

In this position the patient lies on her back. If in bed her nightgown should be drawn up as far as the breasts, and the lower part of her body covered with the sheet only which should be drawn down so that it just covers the pubic hairs.

If the patient is not in bed she should remove her corsets and also her skirt, after which the strings of the petticoats and drawers should be loosened so that the abdomen can be bared, or if combinations are worn these should be unbuttoned.

Left Lateral Position.—In the left lateral position the patient lies on her left side, her head on a pillow with her knees drawn well up towards her chin, and her back somewhat arched. Her buttocks should be brought right

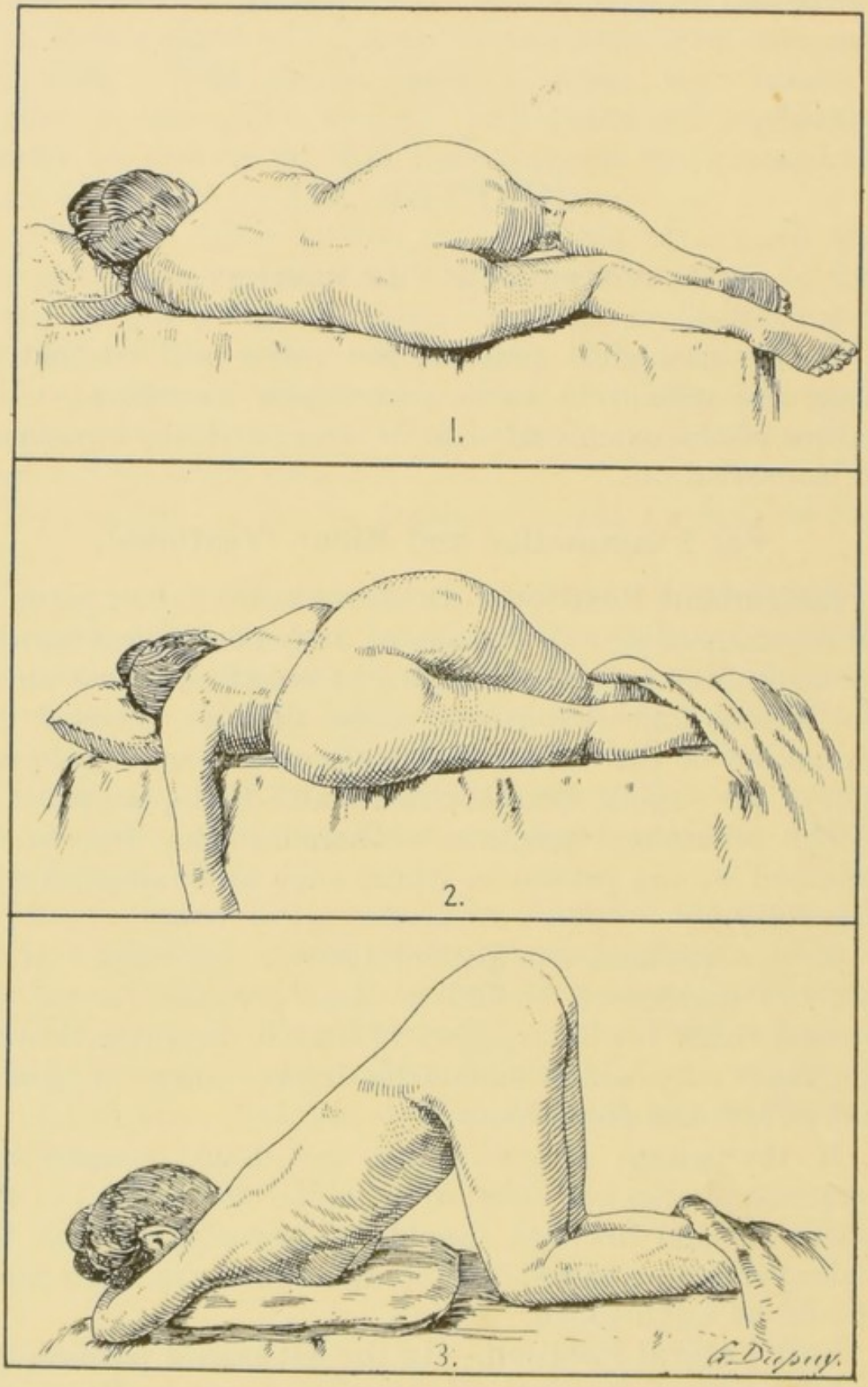


Fig. 1. Left lateral position. Fig. 2. Sims's semi-prone position
Fig. 3. Three-elbow position.

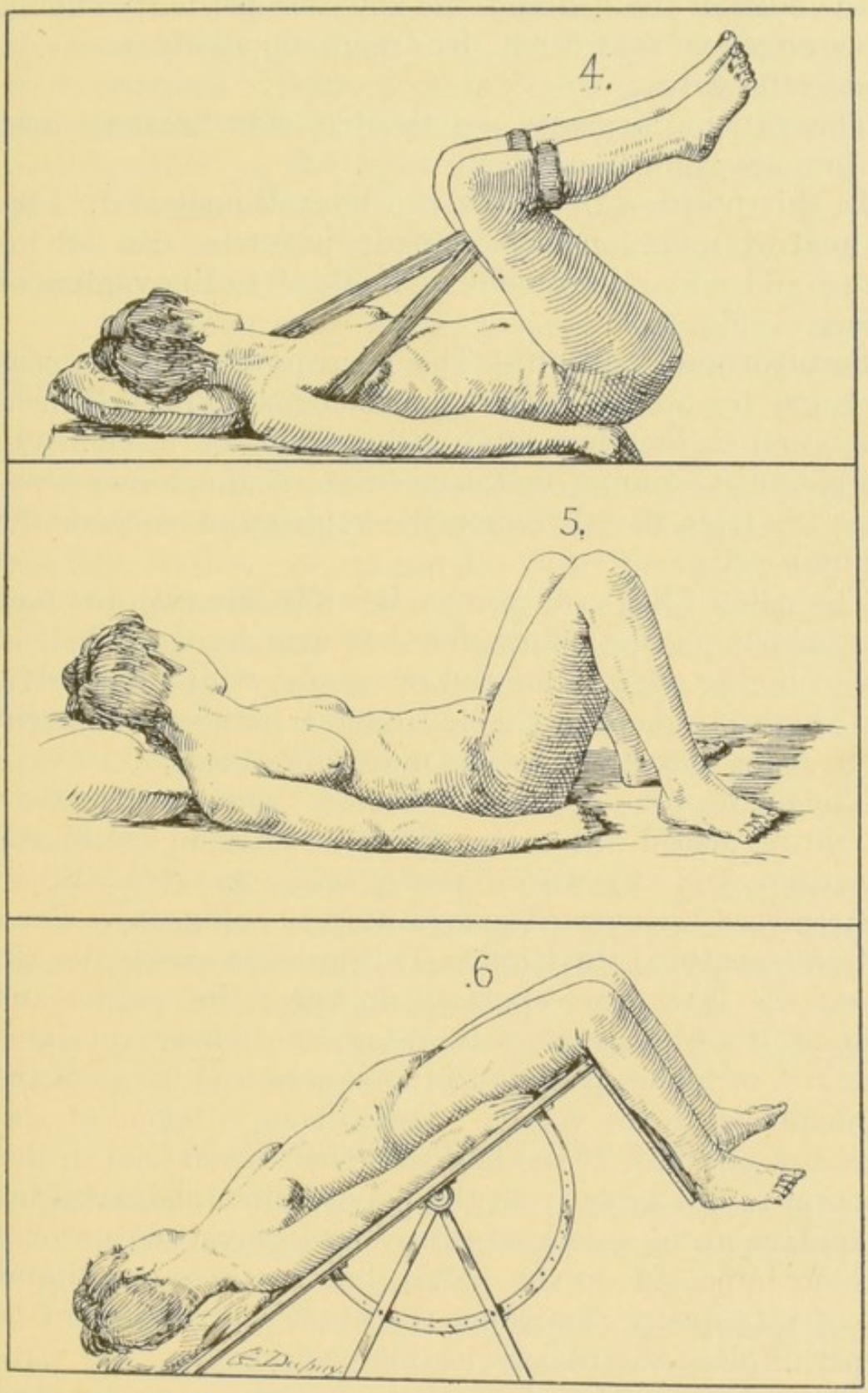


Fig. 4. Lithotomy position. Fig. 5. Dorsal position.
Fig. 6. Trendelenburg position.

to the edge of the bed and the sheet or petticoat should be arranged so that it can be drawn up easily so as to expose the vulva.

The patient is placed on the left side because most doctors are right-handed.

In this position the vulva can be well inspected, a bi-manual examination can be made, pessaries can be inserted and minor treatment carried out to the vagina or cervix. (Fig. 1.)

Semi-prone Position.—The semi-prone position was invented by an American gynæcologist named Marion Sims, and is therefore often called after his name. On the patient assuming such a position, if the doctor separates the labia the air enters the vagina and distends the vaginal walls.

The patient lies well over on her left side with her face and breasts on the pillow, her left arm hanging behind her over the edge of the bed or couch; whilst her pelvis and thighs are kept in the left lateral position, the right thigh being flexed somewhat more than the left.

The semi-prone position is that in which the patient should be placed when the doctor wishes to use Sims's speculum, and it is also a good position for replacing an incarcerated retroverted gravid uterus. (Fig. 2.)

Genu-pectoral Position.—This position causes the air, when the labia are separated, to enter the vagina and distend it to its greatest limits, in fact there results a pressure of fifteen pounds to the square inch (that of the atmosphere) in the vagina. Advantage is taken of this pressure and also of the fact that the viscera tend in this position to fall away from the pelvis, when endeavouring to replace an incarcerated retroverted gravid uterus or a tumour impacted on the pelvis, but as these conditions are of infrequent occurrence the nurse will not often be asked to place the patient in this position.

The patient is placed so that she kneels on the bed or couch and at the same time her breasts rest on the pillow. (Fig. 3.)

Dorsal Position.—In this position the patient lies in the recumbent position with her knees well drawn up and separated. Some doctors prefer to make a bimanual examination with the patient in this position. The doctor stands either at the right side of the patient, or if the patient is placed across the bed or brought to the end of the couch with the buttocks overhanging, then he stands between her legs.

In this latter case the legs must be held or may be placed on two chairs, or on extension brackets if the couch is fitted with these. The patient's head and shoulders should rest on a pillow, her nightgown or petticoats must be drawn up under her buttocks and her knees should be covered with a sheet or shawl. The advantage of this position is that an examination can be made with the pelvic organs more or less in their natural position, and if the doctor stands in the second position indicated, a very complete examination can be made of the vulva, whilst treatment to the vagina or cervix can be easily applied. This is also the best position for passing the catheter, in which case the sheet should be drawn up above the pubes. (Fig. 5.)

One of the most useful positions of all for the bimanual examination, and one which does not expose the patient to such an extent as that last described, is for the patient to lie with the upper half of her body in the recumbent position and with her pelvis and thighs in the left lateral position, or as near to this as she is able.

For Minor and Major Operations.

Recumbent Position.—In this position the patient lies flat on the operating table; it is used when the Trendelenburg position is not required.

Trendelenburg Position.—The Trendelenburg, named after the surgeon who invented it, is the position in which the patient is most often placed for an abdominal operation on the pelvic organs. The patient is so tilted that her knees are the highest point and her head is the

lowest. This position to be perfect requires an operating table that is made to tilt especially for this purpose. If such a table is not available a modified Trendelenburg may be obtained by resting the back of the patient against a chair turned upside down, allowing her legs to hang over the rail below the seat. The great advantage of the Trendelenburg position is that the intestines and omentum fall back towards the diaphragm, leaving the pelvis free and exposing the pelvic organs. (Fig. 6.)

Lithotomy Position.—In this position the patient is placed in the dorsal position, and her buttocks are drawn a little over the end of the table. The thighs are then well flexed on the trunk and the legs on the thighs. The patient is kept in this position as a rule by means of Clover's crutch, and the nurse must particularly remember when applying it that the iron bar is strapped to the legs below the knee, and not to the thighs above the knee. If an operating table is being used it may have uprights at its end to which the feet can be strapped, which will obviate the necessity of using a Clover's crutch. (Fig. 4.)

After Operation.

Minor Operations.—The exact position of the patient in bed after a minor operation does not in most cases signify, though after perineorrhaphy the patient will be more comfortable on her side owing to the swelling and tenderness at the site of the operation.

Major Operations.—When the patient is first returned to bed she should be placed upon her back, her legs should be raised and her knees kept flexed by means of a pillow placed under them. In this way strain on the abdominal muscles is prevented.

After the shock of the operation has subsided the patient if she wishes may be turned on her side and kept in that position by pillows placed under her shoulder and legs.

On the day following the operation the patient may

be propped up by means of a bolster placed across the bed just below her buttocks. The bolster is kept in position by pieces of bandage, one end of which is sewn to the end of the bolster and the other tied to the head of the bedstead (Fowler's position). If the case is a septic one or if the patient is elderly and subject to bronchitis, Fowler's position should be assumed as soon as possible.

If the patient is very anæmic she must be kept very quiet and must not be allowed to exert herself in any way.

CHAPTER XIII.

VAGINAL DOUCHING AND TAMPONADING—CATHETERISATION—WASHING OUT THE BLADDER.

The Administration of Douches.

The following articles are required: a douche-can, a bidet, and a bath thermometer.

The douche-can should hold two quarts, should have six feet of tubing attached to it, a glass nozzle, and a tap near the nozzle so that the patient can if she likes stop the flow.

As a rule only two quarts of fluid are used at a time, which take about five minutes to run through, and the bidet should hold this quantity. If, however, for some reason the doctor wishes the patient to be douched longer, say for fifteen or twenty minutes, then, in addition, a pail will be required to empty the contents of the bidet into, or a bidet may be obtained to which is affixed a piece of rubber tubing, the free end of which on being put into the pail carries the douche from the bidet into the pail, without the patient having to be disturbed.

Douches are used for rendering the vagina aseptic, for controlling hæmorrhage, and for inflammatory conditions of the pelvis.

The temperature generally employed for aseptic purposes is 110° F., and that for bleeding or inflammation is 115° F. to 120° F. Most patients can stand a temperature of 106° F. to 110° F., but when the temperature rises above this and the douche runs for any length of time some distress may be caused by the fluid as it escapes

into the bidet burning the inner surfaces of the thighs. This can be greatly modified by smearing the parts involved with vaseline.

In the preparation of these douches the nurse must be most careful that the antiseptic used is of proper strength and the temperature the correct height. A nurse may sometimes be seen to pour in the antiseptic without having the least idea of what the real strength of the douche will be, whilst to gauge the temperature she will make a rough guess by inserting her fingers into the fluid.

Nurses should remember that it is quite easy to poison or scald a patient with a douche improperly prepared.

The douche should always, therefore, be mixed in a separate jug, and the temperature tested before it is emptied into the douche-can. All the appliances for douching should be rendered as aseptic as possible by a thorough washing and swabbing with carbolic acid (1 in 20), and the glass nozzle should be boiled both before and after use, and between whiles kept in a solution of carbolic acid (1 in 20).

All pillows should be removed in order that the pelvis may be suitably tilted. The nurse having thoroughly washed her hands, cleans the vulva with biniodide of mercury (1 in 1000), and then again making her hands as aseptic as possible, prepares the douche and introduces the nozzle—the patient being on her back—by separating the labia with her left fingers and pushing the nozzle into the vagina with her right hand.

Tamponading the Vagina.

Vaginal tampons are prescribed for inflammatory conditions of the vagina, uterus, ovaries, Fallopian tubes, pelvic peritoneum, and pelvic cellular tissue, or as a means of controlling hæmorrhage from the uterus.

For Inflammatory Conditions.—A vaginal douche should be given both before the tampons are inserted and after they are removed, the vagina being dried very

carefully with swabs, and any discharge that may still be clinging to its walls removed, in order that any drug with which the tampon is impregnated may be brought in contact with the inner surface of the vagina.

One method of making a tampon is to take a piece of absorbent wool 12 inches long and 5 inches broad, and sew a piece of tape to one end. Whatever solution has been prescribed is poured over this strip of wool and allowed to thoroughly soak into it, the wool is then twisted up like a rope and is ready for use.

Another method is to make several small tampons about the size and shape of a hen's egg, or perhaps a little smaller, to which are attached pieces of silk or tape by which they can be removed.

When using tampons it is most important to see that the whole vagina is carefully packed and everywhere in contact with them.

Tampons may be introduced either with a Sims's speculum and forceps or by placing the first and second fingers of the left hand in the vagina, separating the labia a little, and then inserting the tampon with the right hand. The fingers of the left hand are then withdrawn, and the tampon pushed up as far as possible with the first finger of the right hand. The tampons should always be carefully and firmly packed round the cervix, gradually filling up the vagina from above downward. The tampon is, as a rule, put in at night, and removed in the morning, and as the secretion caused by the tampon is very often rather profuse, a diaper should be worn.

For Hæmorrhage.—In the case of hæmorrhage from the uterus or vagina a douche at 120° F. should first be given, and then iodoform gauze or plain gauze dipped in biniodide of mercury (1 in 4000) may be packed into the vagina supposing tampons are not handy. If time is of great value and gauze is not obtainable, then it is best to use what is known as a kite-tail tampon. This is made by tying a number of pieces of cotton-wool about the size of hen's eggs to a tape, so that there shall be 4

inches of tape between each piece of wool, and this should be wrung out of an antiseptic solution.

Catheterising the Bladder.

Although one of the simplest procedures, catheterisation may, if carelessly performed, cause the patient many weeks of misery, and perhaps kill her, the great danger being that microbes may be introduced into the bladder. If this happens cystitis is set up, and the inflammation may then extend up the ureters to the kidneys and kill the patient, or infecting one kidney so disorganise it that its removal is imperative.

To prevent, therefore, microbes being carried into the bladder, the nurse must make sure that her hands are clean, by thoroughly washing and scrubbing them, and then dipping them into a solution of biniodide of mercury (1 in 1000); that the catheter is sterile, and, lastly, that the vulva is clean.

The best catheter to use is a glass one; if it is impossible to use this on account of some tumour pressing on the urethra, then a soft rubber one should be used. In either case the catheter should be well boiled before and after use, and in the interval it should be kept in carbolic acid (1 in 20). Special care must be taken with the soft rubber catheter to see that the eye is quite clear, and in both a stream of water should be passed through after use in order that the channel may be properly sluiced.

The nurse having made her hands aseptic, the vulva is cleaned as follows: The patient being on her back with her legs drawn up and separated, the labia are held apart by the first and second fingers of the left hand, the wrist resting on the pubes.

By this means the vestibule, a triangular surface at the anterior part of the vulva, containing the orifice of the urethra, will be exposed. This is well swabbed with biniodide of mercury (1 in 1000), by which means any microbes contaminating this area may be removed and

the risk of their being carried in by the catheter excluded. The catheter should then be passed by sight.

A porringer should be placed between the patient's legs to receive the urine, and the catheter should be held in position with the labia separated until all the urine has passed. On the stream of urine diminishing and the fluid escaping in drops, the catheter is pulled out a little till the stream recommences to flow, and when a second time the drops appear then the bladder is practically empty, and the catheter should be withdrawn, the thumb being kept over the free end so that any urine remaining in the catheter will not be spilt over the patient or bed-clothes.

The only difficulties that may arise are due to some tumour preventing the passage of the catheter, or, much more commonly, to the nurse, especially if she be inexperienced, failing to recognise the orifice of the urethra and passing the catheter into the vagina. If this happens, it need hardly be said that the catheter should again be sterilised before being used. To prevent this latter mistake it is a good plan, especially for probationers, to place a swab in the vaginal orifice before passing the catheter. If the catheter has been used for a septic case it is much safer not to use it for any other.

Washing out the Bladder.

When washing out the bladder the same precautions are taken in passing the catheter as have just been noted. In this case a No. 10 rubber catheter is used, and a glass funnel or irrigator fixed to its free end, the urine having first been drawn off. A solution of boracic acid (1 in 40) is then prepared at a temperature of 100° F., and four ounces of this is poured into the funnel, which is raised. After the solution has remained in the bladder a short time the funnel is lowered and the solution allowed to run out. This is repeated until at least two pints of the solution have been used, the bladder being washed out twice daily until the cystitis is relieved.

CHAPTER XIV.

PREPARATION OF THE ROOM—INSTRUMENTS—SWABS—SUTURES AND DRESSINGS.

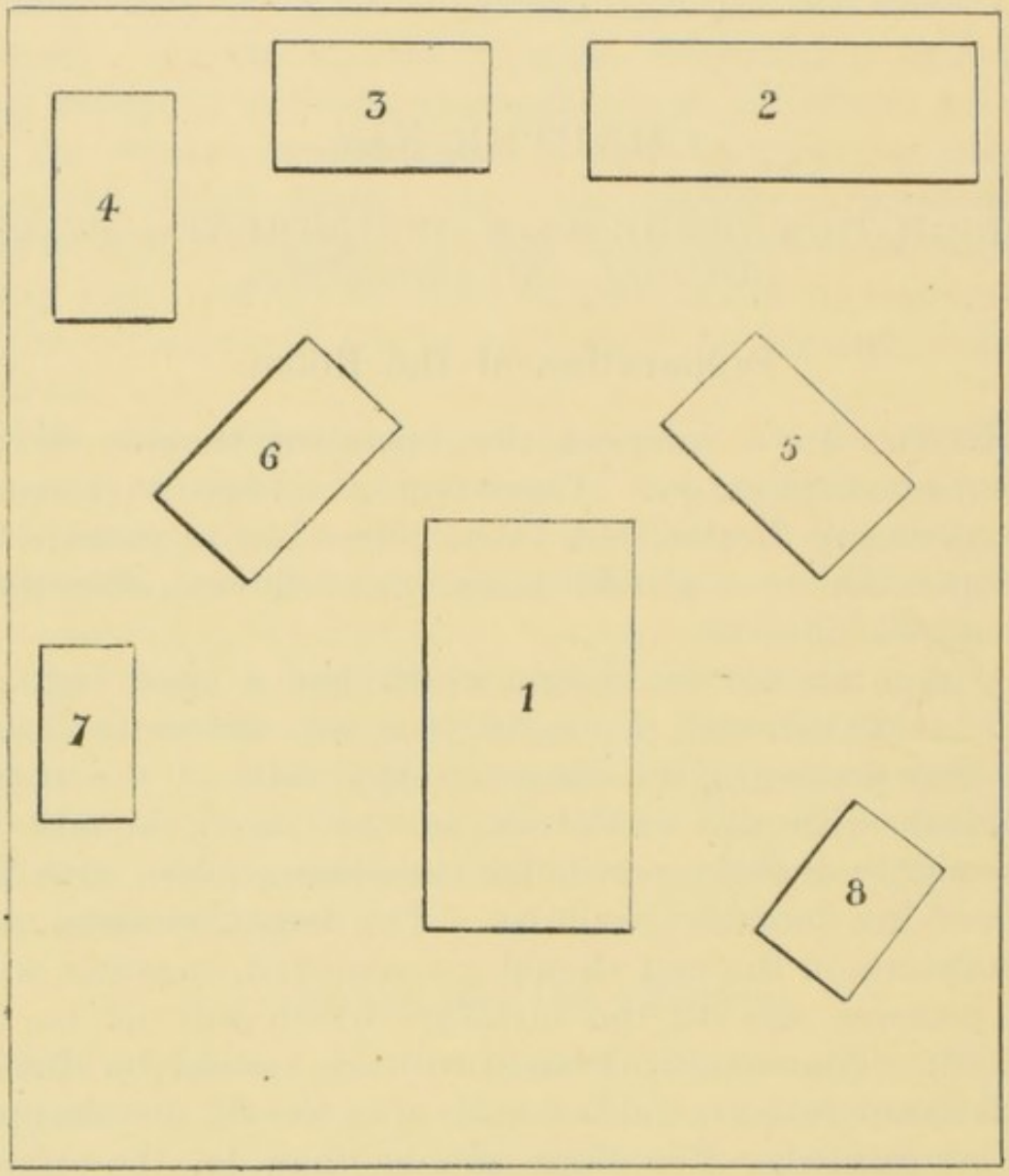
Preparation of the Room.

Room.—In a hospital the operating theatre should always be kept ready. There is no need here to describe an operating theatre, but if the nurse has to prepare for an operation in a private house the following directions should be followed.

A room should be chosen which has a good light, is well ventilated, and, if possible, not near the water-closet. The day preceding the operation the walls of the room, together with all woodwork in the room, should be thoroughly dusted; particular care being taken with the tops of the door and windows. The carpet, curtains, and upholstery on the bed should be removed, together with the pictures and all the furniture which will not be required. The woodwork and furniture should be dusted with damp dusters, and the walls also, should they happen to be painted. The floor should then be thoroughly scrubbed with a solution of perchloride of mercury (1 in 1000). The furniture and woodwork should again be dusted with a damp duster on the morning of the operation.

If, however, the operation is one of emergency and sufficient time cannot be allowed for the servants to do all this, then great care should be taken not to disturb any dust by dusting, the furniture which will not be used should be removed as gently as possible, and a drugget

or sheet wrung out in perchloride of mercury (1 in 1000) should be tacked down over the carpet, beneath the operating table. The following articles should then be procured and arranged in convenient situations :—



Plan of Operating Room (see Frontispiece).

1. Operating table.
2. Bedstead.
3. Table for dressings, etc.
4. Washstand.
5. Instrument table.
6. Swab table.
7. Steriliser.
8. Anæsthetist's table.

A table about four feet long, two feet broad, and twenty-eight inches high for the patient to lie on during the operation. An ordinary kitchen table will be found to be the best substitute for this.

Four small square tables, one for the basins in which the swabs or dabs will be rinsed, one for the instruments, one for the anæsthetist's apparatus, and one for the dressings. Tea-tables, work-tables, washstands, or dressing-tables will do, and if these are not available, very good substitutes can be made with ironing boards, or leaves from an extension table resting on chairs. These tables should be thoroughly dusted with a damp cloth, and then covered with clean sheets or towels.

Two chairs with wooden or cane seats, dusted like the tables, one for the anæsthetist and one for the operator if he needs it.

A washstand to hold a basin for washing the hands and a basin of biniodide of mercury (1 in 1000) to finish the preparation of the hands.

A nail-brush sterilised by boiling or immersion in a solution of biniodide of mercury (1 in 1000).

A cake of germicidal soap.

Two clean blankets and one sheet for the operating table.

Twelve clean towels, not new.

Two dishes, one for the instruments, measuring, if possible, twelve inches square, and a smaller dish, six inches square, for the ligatures and sutures. Meat dishes will do very well. Washhand basins will do if others are not obtainable.

Three bowls, one for the lotion for the hands and two for the swabs.

These dishes and bowls should be thoroughly cleaned and scalded before use, and then turned upside down and covered with towels until they are required, in order that dust may be excluded. Just before they are to be used the dishes and bowls can be boiled, or having been scalded and dried they can be effectually sterilised by burning in them a little methylated spirit.

Three gallons of cold water which has been boiled.

Three gallons of boiling water just before the operation, and provision must be made for a further supply in case

it may be required. The mouths of the jugs containing the water should have gauze tied over them.

A foot-bath or pail, properly cleansed, for receiving any soiled water, etc.

All the towels should be sterilised. If the nurse has not got a proper steriliser, and the surgeon does not bring sterilised towels with him, they must be boiled.

A piece of mackintosh sheeting for vulval and vaginal operations.

The bedstead should be thoroughly cleaned, the mattress aired, and the bed made up with clean sheets, a piece of mackintosh sheeting over the lower sheet, and a clean drawsheet over this.

Hot-water bottles carefully covered with flannel so that they shall not burn the patient (especial care being taken that the metal stopper is not in any way exposed) will be required.

Unless properly looked after, hot-water bottles are a source of the greatest danger to the patient, who, being unconscious after the operation, is unable to feel any burning, with a result that very serious ulcers are caused, which may take at least two months to heal.

After an abdominal section and vaginal hysterectomy a cradle will be wanted. If a proper cradle cannot be procured a very good substitute may be made by buying some wooden hoops, of a suitable size, as used by children, cutting them in half, and then joining the pieces together by strips of wood one to two inches broad. This could be done in quite a short time by some male member of the household.

A douche-can, bottle of brandy, nutrient enema-syringe for giving brandy enemata, a little table-salt for making a saline injection (the strength of which is a teaspoonful of salt to a pint of water), a jug to mix it in, and a bath thermometer will, in addition, be necessary in any case where the operation is of a serious nature.

It is better, of course, that the patient should occupy another room until the time arrives for the operation, but

if this cannot be managed, screens should be provided to prevent the patient seeing the preparation of the instruments, operating table, etc., and when the time comes for the screen to be taken away all dishes containing the instruments should be covered over with towels for the same reason.

For operations in private the surgeon will bring his own instruments, but in hospital work the nurse is in many cases expected to select the proper instruments and sterilise them.

It is impossible to make up any lists of instruments which would satisfy every surgeon; some require so many and such special patterns that one often wonders how the patient fares when they are called upon to operate in an emergency and cannot obtain their own particular outfit.

A skilled surgeon needs only a small number of instruments, and most of them of such a pattern that they can be obtained in the hospital or at any surgical instrument shop on the slightest notice.

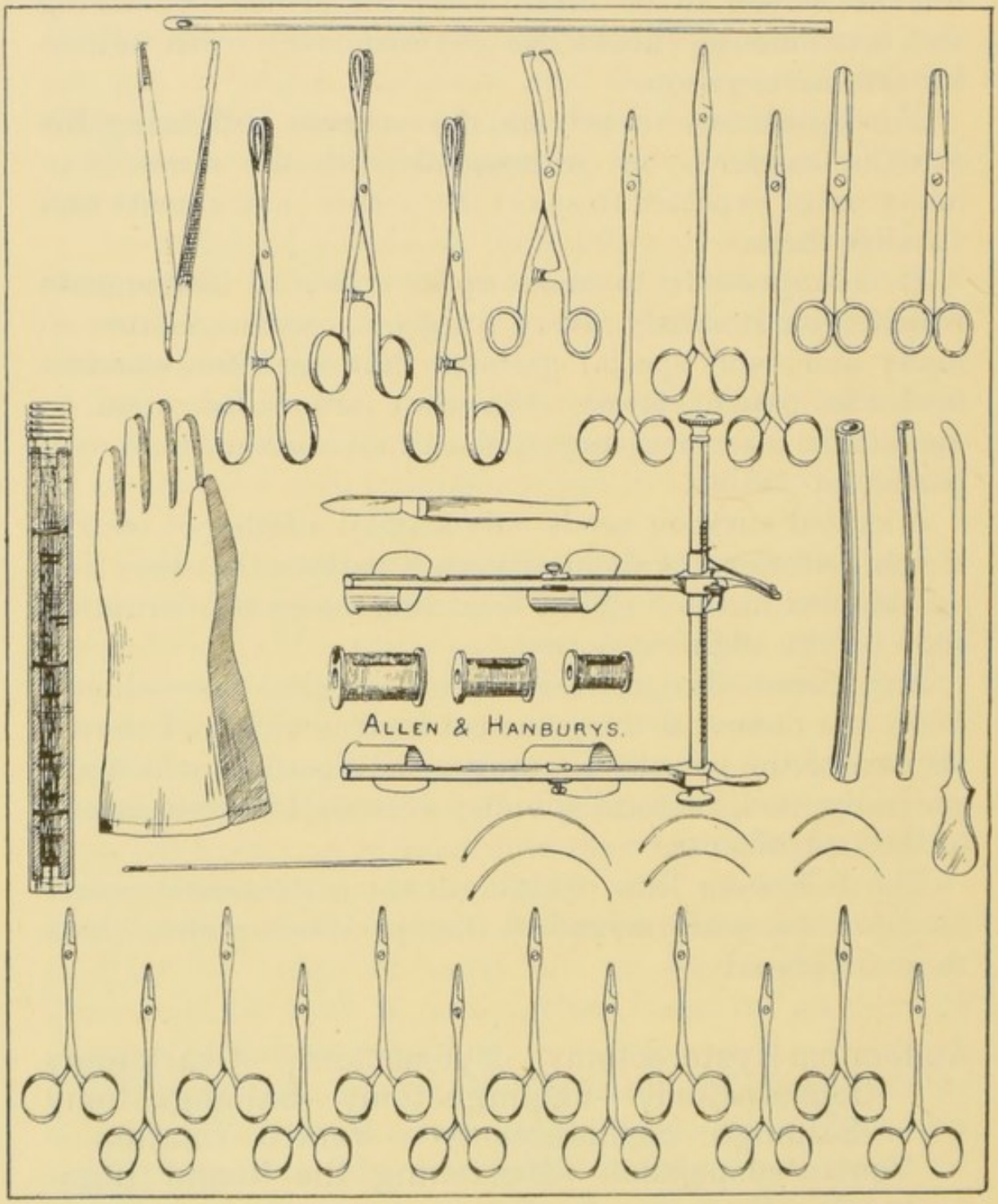
Any nurse who professes to take surgical cases should know the names of the principal instruments and should also know the lengths of sutures and ligatures which are generally used, because she may very well have to attend to the instruments.

The following lists contain all the instruments necessary for the performance of the operations under which they are placed :—

Abdominal Hysterectomy—Myomectomy—Ovariotomy—Oophorectomy—Salpingectomy—Salpingostomy—Salpingo-oophorectomy—Ventro-fixation—Ventro-suspension—Shortening the Round Ligaments—Cæsarean Section.

One scalpel.
One dissecting forceps.
Two scissors.
Bladder sound.

Twelve short pressure forceps.
Three long pressure forceps.
Three ring forceps.



Volsellum forceps.
Self-retaining retractor (Berkeley's).
Six curved needles—two No. 5, two No. 9, two No. 13 (Bonney's).
One straight needle—4 inch.

Sutures—silk, three reels, Nos. 1,2 and 4—catgut.
Drainage tubes—rubber, $\frac{1}{4}$ in. and $\frac{3}{4}$ in.
Catheter—rubber or glass.
Gloves—rubber.

Many surgeons also like bowel-clamps put out in case a portion of the bowel has to be removed. In the absence of bowel-clamps the ring forceps can be used in their stead.

Some of the operations mentioned could be performed with only two or three of the instruments in the above list, but as no surgeon can be certain until he has opened the abdomen what the exact condition will be, it is safer for the nurse to put out sufficient instruments for the most serious of the operations enumerated.

Whether silk or catgut sutures will be used depends of course on the directions of the surgeon operating.

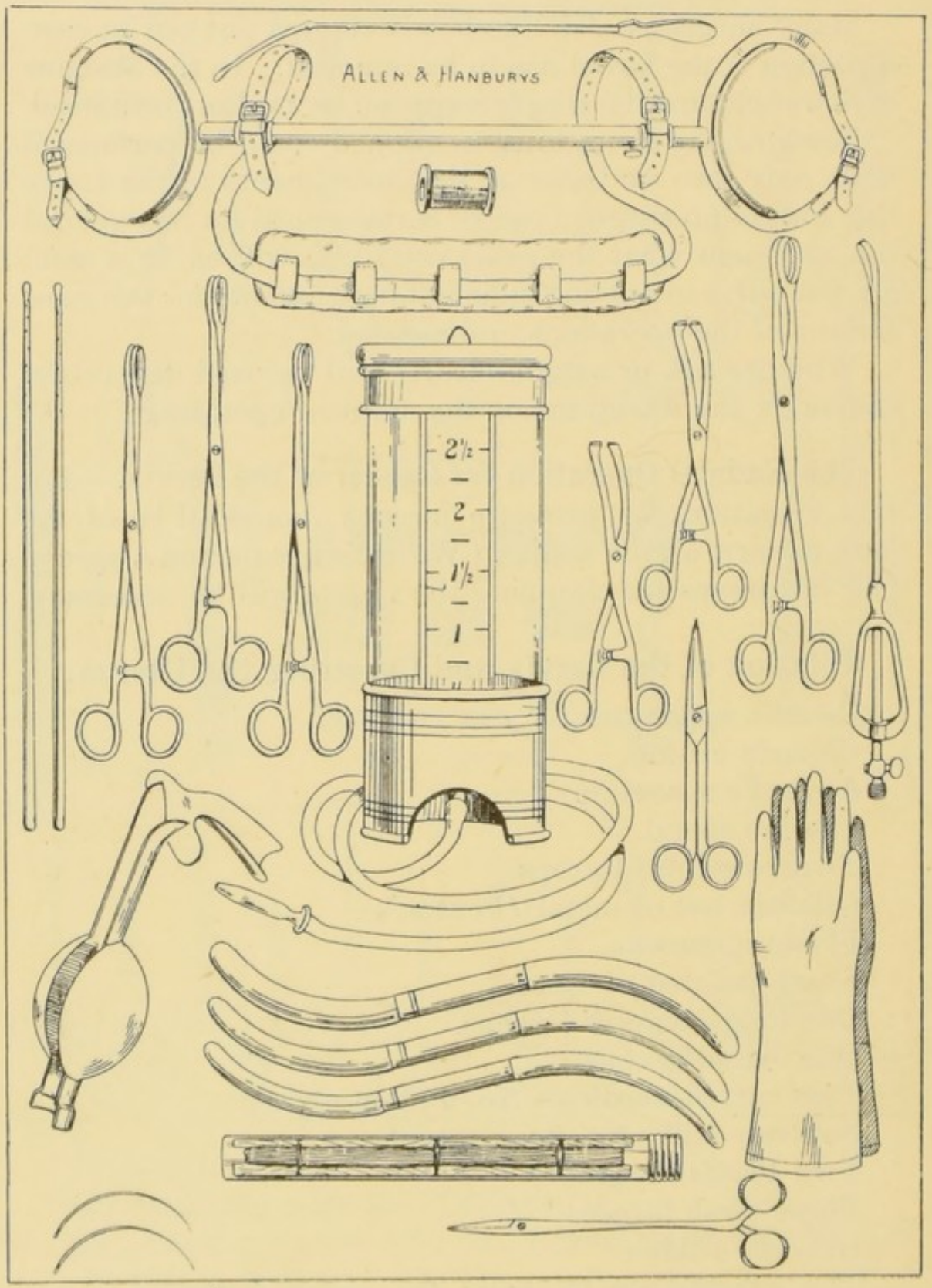
The Radical Operation for Cancer of the Cervix.—For this operation the pressure forceps should all be of the long pattern, and in addition Worral's needle and a special pair of forceps for clamping the vagina will be necessary.

Dilation of the Cervix and Curetting the Uterus.

Douche apparatus.
Clover's crutch.
Auvard's speculum.
Uterine sound.
Two volsellum forceps.
Dilators, set of metal (Fenton's).
Flushing curette.
Sharp-pointed scissors.
One long pressure forceps.
One ovum forceps.
Two curved needles—No. 9 (Bonney's).
Sutures—silk, No. 2, or catgut.
Two Playfair's probes.
Three swab forceps.
Gloves—rubber.

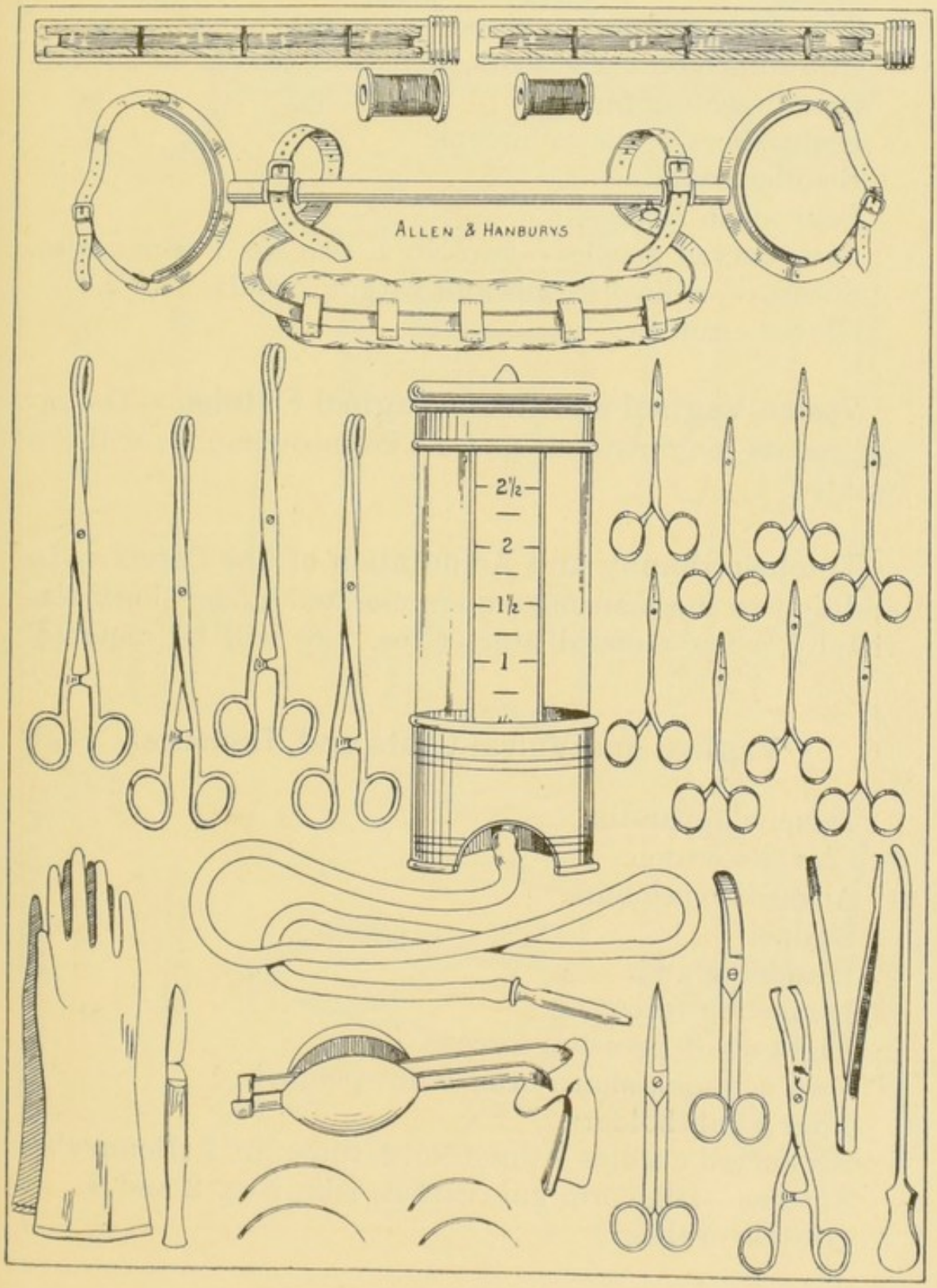
The scissors are to incise the cervix if the os is too small to admit the dilators. The pressure forceps, needle

and sutures are to suture the cervix if during the dilatation it has been lacerated, and the bleeding is too free for packing to be of any use.



Fibroid Polypus and Submucous Fibroid, Mucous Polypus.—The instruments required will be found in the list given for Dilatation and Curetting.

Perineorrhaphy and Colporrhaphy.



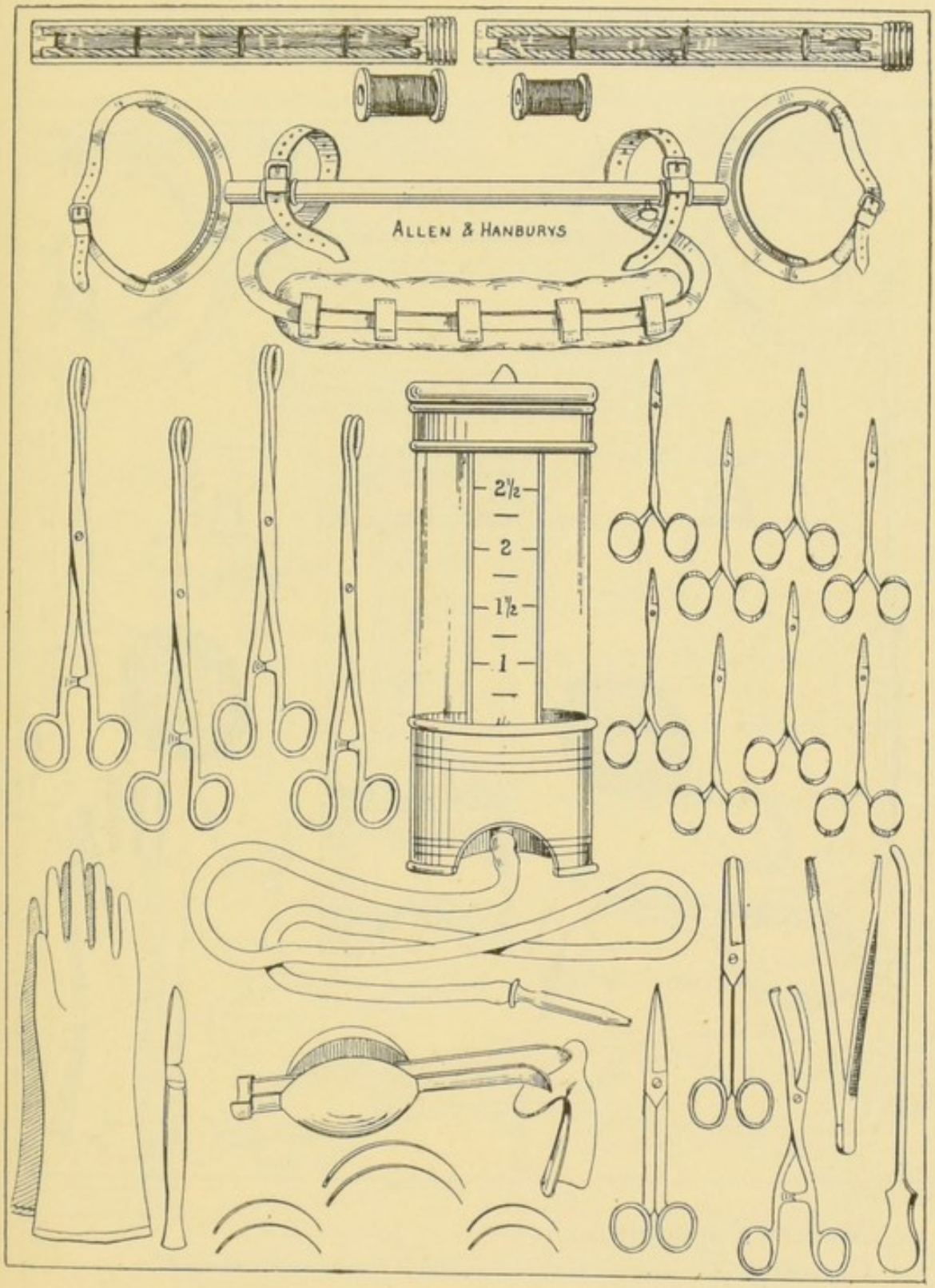
Douche apparatus.
Clover's crutch.
Auvard's speculum.
Volsellum.
Scalpel.
One sharp-pointed scissors.
One blunt-pointed scissors, preferably curved on the flat.
One dissecting forceps.
Eight short-pressure forceps.
Bladder sound.
Four swab forceps.
Four curved needles—two No. 1, two No. 7 (Bonney's).
Sutures—silkworm gut and catgut, or silk, No. 2.
Gloves—rubber.

Vesico-Vaginal and Recto-Vaginal Fistulæ.—The instruments enumerated under Perineorrhaphy will be wanted.

Trachelorrhaphy and Amputation of the Cervix.—In addition to the instruments enumerated under Perineorrhaphy, a few metal dilators (Nos. 1-6) will be required.

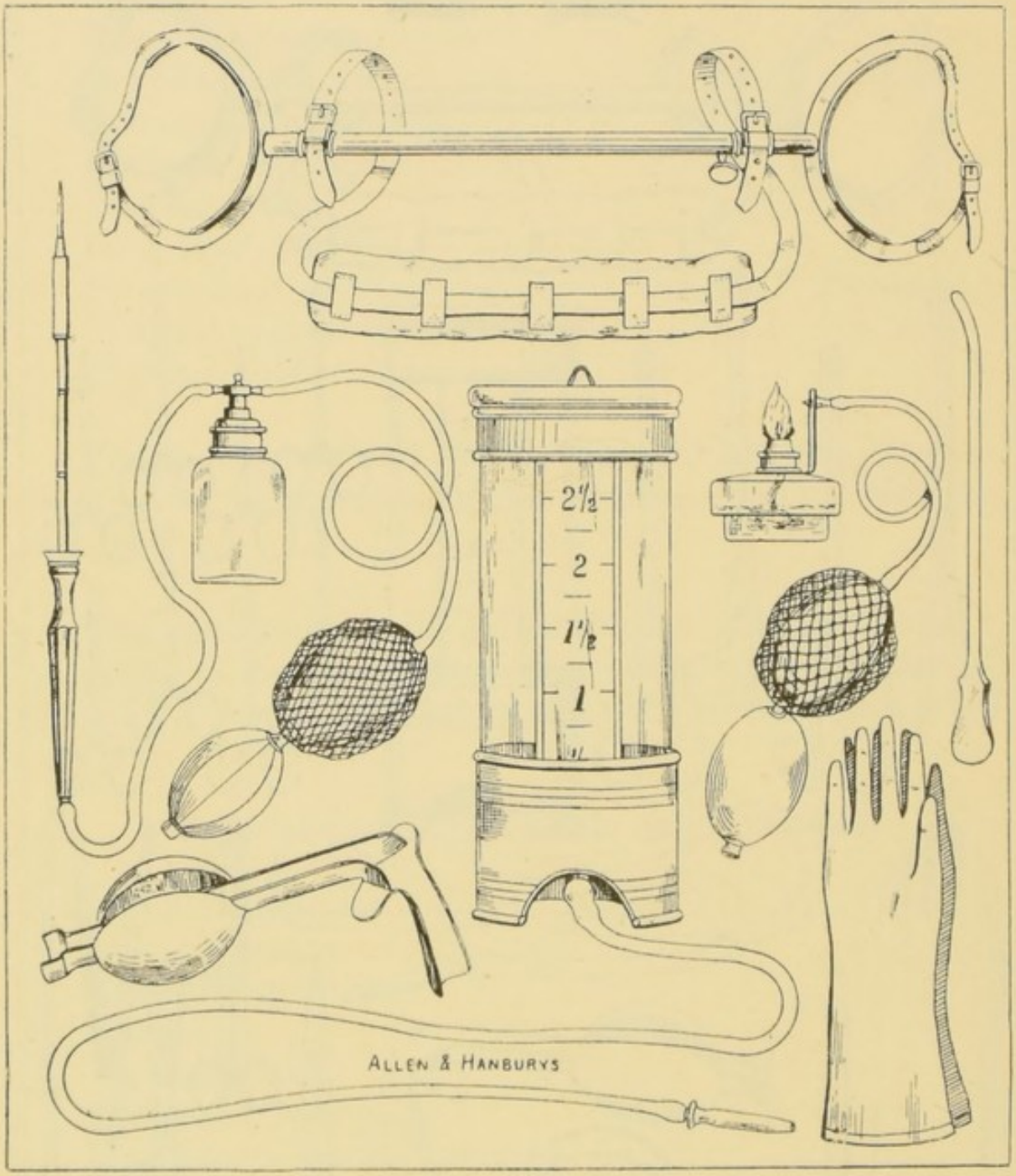
Vaginal and Vulval Cysts and Tumours.

Douche apparatus.
Clover's crutch.
Auvard's speculum.
Scalpel.
Bladder sound.
Dissecting forceps.
Eight short pressure forceps.
Two scissors, sharp- and blunt-pointed.
Four swab holders.
Six curved needles—three No. 3, three No. 7 (Bonney's).
Sutures—silkworm gut, catgut, silk, Nos. 2 and 4.
Gloves—rubber.


ALLEN & HANBURYS
2½
2
1½
1

Urethral Caruncle.

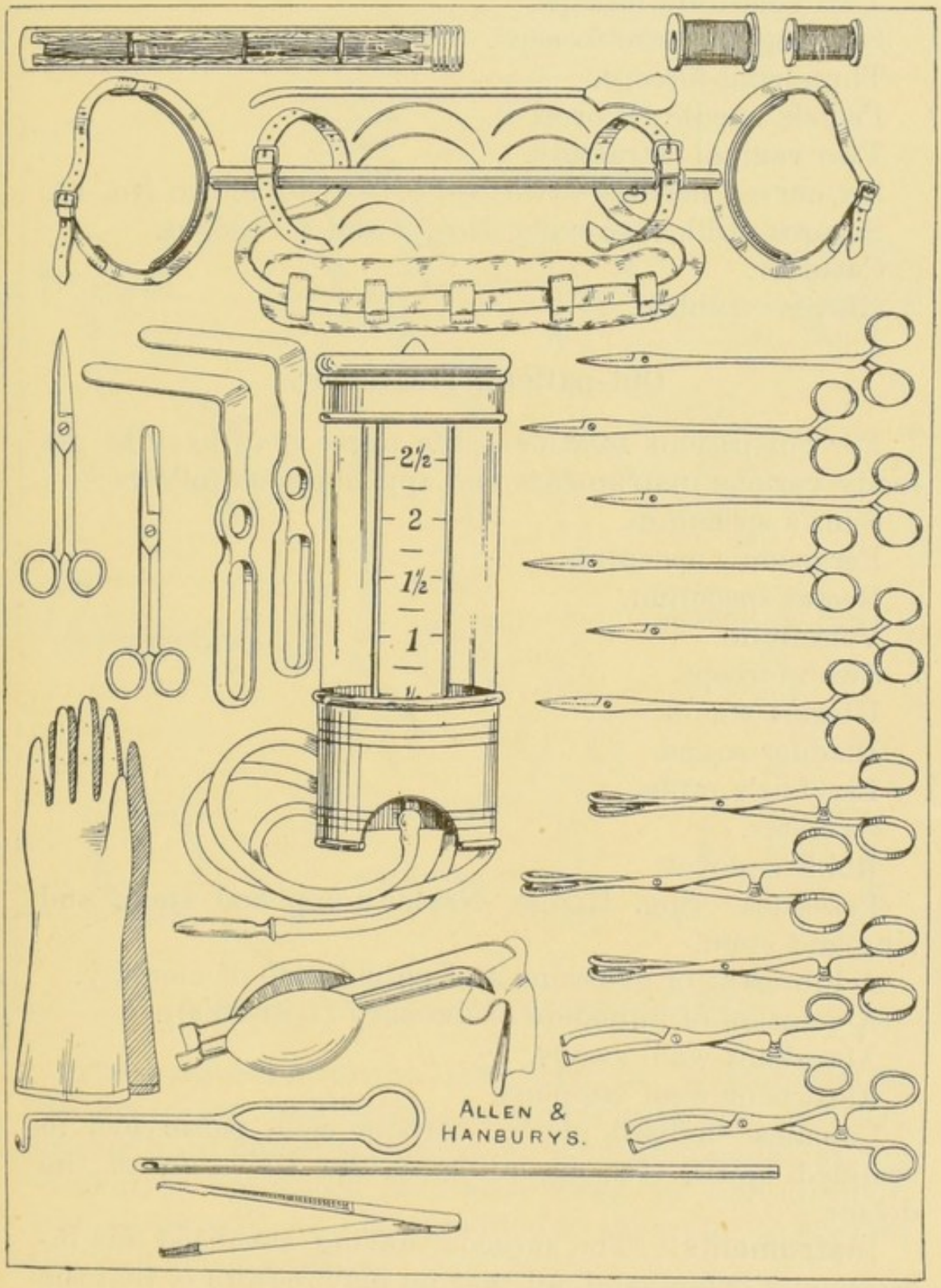
Douche apparatus.
Clover's crutch.



Auvard's speculum.
Cautery.
Bladder sound.
Gloves—rubber.

Vaginal Hysterectomy.

Douche apparatus.
Clover's crutch.



Auvard's speculum.
Bladder sound.
One dissecting forceps.
Two scissors, sharp- and blunt-pointed.
Two volsellum forceps.
Six long pressure forceps.
Three ring forceps.
Pedicle needle (Worral's).
Two vaginal retractors.
Six curved needles—two No. 5, two No. 9, two No. 13.
Sutures—silk, two reels, Nos. 2 and 4; catgut.
Catheter.
Gloves—rubber.

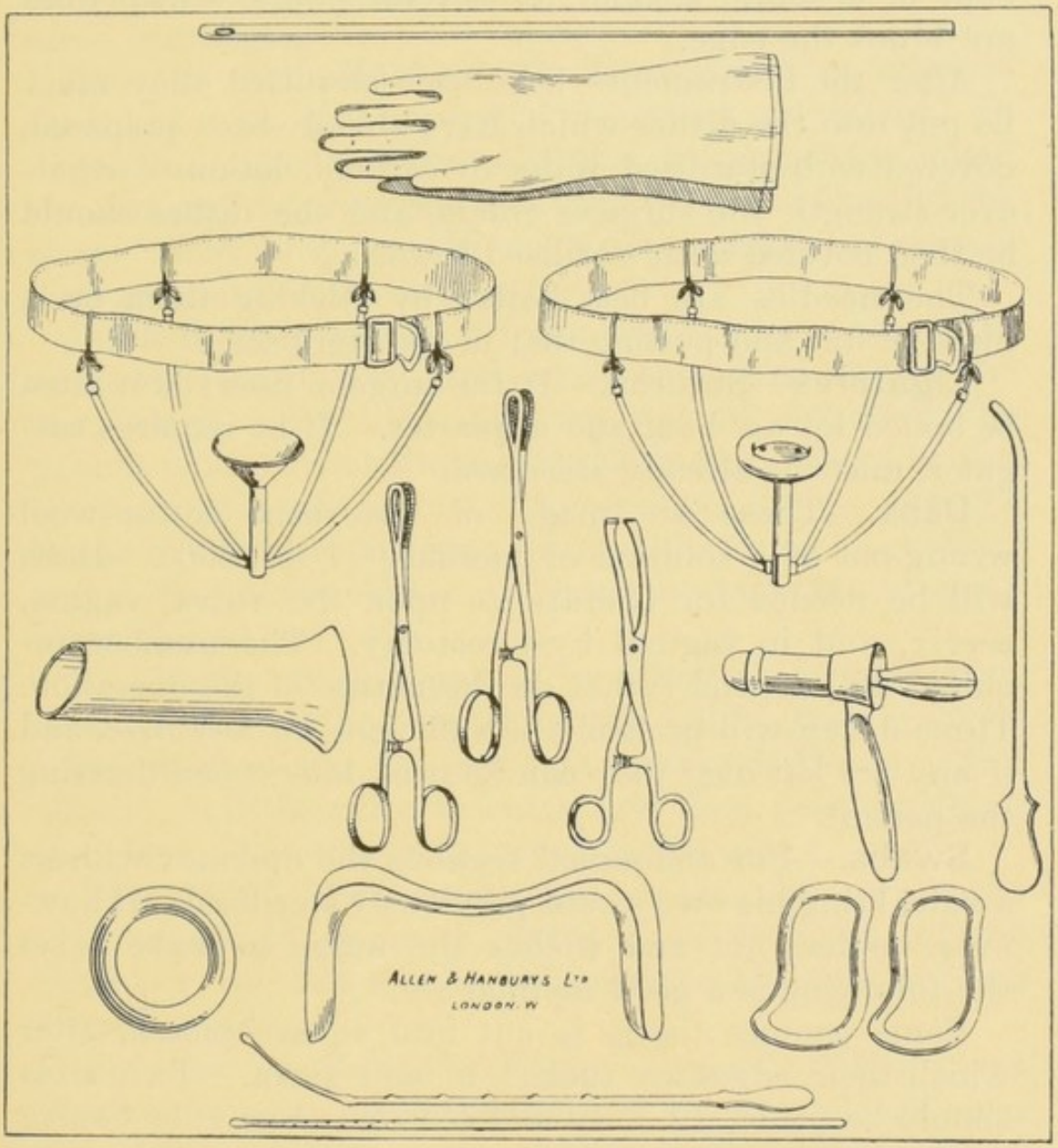
Out-patient Treatment.

For out-patient treatment the nurse may have to get ready various instruments and appliances as follows:—

Sims's speculum.
Ferguson's speculum.
Rectal speculum.
Volsellum.
Swab forceps.
Uterine sound.
Bladder sound.
Playfair's probe.
Catheter.
Rubber gloves.
Pessaries—ring, Hodge, Napier's cup and stem, and ring and stem.
A lubricant of glycerine and perchloride of mercury.
A solution of biniodide of mercury (1 in 2000).
Absorbent wool swabs.
Absorbent wool tampons.
Caustics—iodised phenol, carbolic acid, picric acid in rectified spirit, etc., according to the directions of the doctor.

Instruments.—The surgeon, having sterilised his instruments beforehand, all that he may require is that the

nurse should give them a final boiling, and it is always well, therefore, in the absence of a proper instrument-steriliser, for the nurse to have a fish-kettle or some such utensil ready with boiling water for this purpose.



The surgeon, however, may send his instruments to the house for sterilisation, in which case the steriliser, having been properly cleaned, all the instruments, except the knives, are placed in it and boiled for half an hour, a small piece of soda being added to the water to prevent the instruments rusting.

Boiling spoils the temper of the knives, and, therefore, they are either treated by being momentarily dipped into boiling water, and then put into a solution of carbolic acid (1 in 20) for half an hour, or, best of all, by being kept in absolute alcohol for several hours, which does not blunt the edge.

After the instruments have been sterilised they must be put into the dishes which have already been prepared, covered with sterilised water or carbolic lotion of whatever strength the surgeon orders, and the dishes should be then covered with sterilised towels.

The needles are best boiled by sticking them on a piece of lint and putting that in the steriliser.

Ligatures—Sutures.—If the surgeon uses silk it must be boiled for an hour and a quarter. If he requires catgut it must be already sterilised.

Dabs.—These are made of absorbent cotton-wool wrung out of a solution of mercury (1 in 1000). Dabs will be needed for operations upon the vulva, vagina, cervix, and in vaginal hysterectomy. The number required will depend rather on the nature of the operation. Three dozen will probably be sufficient for any case, and if any are left over they can be used later when dressing the patient.

Swabs.—For abdominal sections the operator will, as a rule, bring his own swabs previously sterilised. If however, he does not and wishes the nurse to make a set the following is a good method :—

Some gamgee tissue is cut into square pieces, after which their edges are tucked in and sewn. Two sizes should be made, 12 × 12 and 5 × 5. As a rule twelve swabs will be quite sufficient for most operations, two 12 × 12 and ten 5 × 5. In many cases not half this number will be used. The squares should be sewn together like a mattress. If the nurse has to sterilise the swabs and has no efficient instrument for so doing, she must boil them for an hour and place them in carbolic acid (1 in 20) until they are required for use, when they

should be wrung out in sterilised water. When the swabs are sterilised by dry heat they are not put into the carbolic-acid solution. Some surgeons use squares of muslin only, in which case there must be eight layers of the same size and sewn together in a similar way to those made of gamgee.

Overalls and Masks.—Sterilised gowns or overalls should be worn by the operator, assistants and nurses. In the absence of overalls towels must be pinned up round the chin and so arranged that they cover the front of the body. Many surgeons also use gauze masks, and require their assistants and nurses to do so.

India-Rubber Gloves.—India-rubber gloves should be worn at all operations, and by all concerned except the anæsthetist. By their use the risk of infecting the patient is very much diminished since they can be boiled, whereas the hands cannot. In addition, they protect the hands of the operator from any pus that may be present, and so lessen the chance of conveying infection to some other patient.

The gloves are best put on by filling them with sterilised water and then inserting the hand; they are best taken off by raising the part that surrounds the wrist and allowing a little water to enter, and then gently pulling the glove off so that it is turned inside out.

Dressings.—*Perineorrhaphy.*—A piece of cyanide, or plain sterilised gauze is placed upon each side of the stitches; over this a pad of absorbent wool, kept in place by a T bandage.

Excision of Bartholin's Cyst, Cancer of Vulva.—A piece of cyanide or plain sterilised gauze is placed over the parts, and then a pad of absorbent wool, which is kept in place by a T bandage.

Curetting.—Three or four wool tampons are inserted into the vagina, and in some cases the operator may wish, in addition, to pack the uterus with cyanide or sterilised gauze before placing the tampons in position. In this case he will require the gauze, which should be

ready and suitably protected, to be handed to him in a long, continuous strip about two inches broad, the pieces being tied together if necessary.

Excision of Vaginal Cyst or Tumours.—Unless there is any troublesome oozing (when the vagina can be packed for a few hours with gauze or tampons), a pad of absorbent cotton-wool and T bandage is all that will be necessary.

Operations on the Cervix.—As for operations on the vagina.

Vaginal Hysterectomy.—As a rule, most surgeons insert a small quantity of gauze which acts as a drain into the pouch of Douglas.

Abdominal Section.—The wound is dressed with dry dressing, consisting of cyanide gauze, absorbent wool, and a many-tailed bandage. Rarely, consequent on some oozing of blood or escape of pus, the operator may wish to drain the pelvis, in which case he may require a strip of gauze, which will be brought out through the abdominal incision. Gauze for draining the pelvic cavity should be prepared beforehand; it should be put up into rolls one yard long, two inches broad, with the edges carefully turned in, after which it should be sterilised. Rubber tubing is better for the purpose. A safety-pin should also be boiled, so that it may be ready to tether the drain or tube.

The patient should be measured for the bandage prior to the day of the operation, in order that it may fit nicely.

CHAPTER XV.

PREPARATION OF THE PATIENT.

Before all operations the patient has to be prepared, and such preparation should include rest in bed, a report on the pulse, temperature and respiration, douching, shaving, bathing, surgically cleaning the skin over the operation area, and, in addition, the bowels, bladder, and dress have to be attended to, and the urine should be tested, whilst the patient must not take any solid food for several hours before the operation.

Rest.—In all cases, if possible, the patient should be kept in bed for the twenty-four hours before the operation. For abdominal operations it is better to increase this period to two or three days at least, so that the nervous system may be quieted and the bowels well emptied. Lastly, in certain cases where there is cardiac, pulmonary or renal mischief a prolonged rest may be advisable.

Pulse.—The rate and character of the pulse should have been noted carefully as long as possible before the operation and its frequency charted regularly twice daily. Such a procedure is most important. Nurses are apt to be careless in charting the pulse before the operation, and it may be that during this time the rate has been above or below normal. After the operation a similar rate continuing, the operator may be puzzled as to its cause when after all it may be the normal for that particular patient.

Respiration.—The respiration rate should be charted.

Temperature.—The temperature should be charted

twice daily unless the doctor orders this to be done more frequently. The same remarks apply as to the importance of taking the respiration and temperature as to that of taking the pulse.

Mouth.—It is most important that the mouth and teeth should be attended to before the operation, so that if the teeth are decayed and if there is time a dentist should be consulted. Certainly some cases of septic pneumonia after operations can be traced to the filthy state of the patient's mouth.

The patient must be made to clean her mouth and teeth with some efficient mouth wash, and if she is too weak to do this the nurse must do it for her with dabs of wool soaked in glyco-thymoline and held on forceps.

Urine.—It is most important that a proper examination should be made of the urine before the operation. Should this not be done cystitis if present may be attributed to the carelessness of the nurse if she has had to pass a catheter, or any albuminuria or other disease may be put down to the effect of the operation. Also it is highly dangerous to operate in some diseases such as diabetes or severe Bright's, and these can be diagnosed by an examination of the urine.

The following tables will serve as a very good guide for the examination of urine.

1.—Ascertain the Quantity from which the Specimen is taken.

Normal amount is from 40 *to* 60 *ounces in twenty-four hours.*

The quantity of urine is decreased in :—

Fevers.
Heart disease.
Acute nephritis.
Some cases of chronic nephritis.

Peritonitis.
Severe hæmorrhage, vomiting or diarrhœa.
By certain drugs as opium or ergot.
Some surgical diseases of the kidneys.

It is increased in :—
Diabetes.
Hysteria.
Most cases of chronic nephritis.
When a quantity of fluid is taken and by the action of certain drugs such as acetate of ammonia, potassium citrate, digitalis, etc.

2.—Notice the Colour, the Clearness, and the Presence or Absence of Deposit.

A slight cloud due to mucus is normal.

(*a*) *The specimen is clear.*
Normal urine is a clear straw colour.
It is darkened if the quantity of urine is diminished and pale when the quantity is increased.
Bile colours urine very dark olive green.
Blood either colours it red or gives it a smoky appearance.
Certain drugs colour urine, *e.g.*, carbolic acid turns it olive green.

(*b*) *The specimen is not clear.*
The cloudiness or deposit may be due to :—
Urates (when the cloud will disappear on boiling).
Pus.
Mucus.
Phosphates.
Blood in quantity.
Urates are usually yellow or brick-red in colour. Their presence is of little importance.

They occur in febrile states and in health in concentrated urines.

3.—Test the Reaction.

Acid urine turns blue litmus paper red and has no effect on red.

Alkaline urine turns red litmus paper blue and has no effect on blue.

Normal urine is acid.

It may be alkaline after a meal, especially of vegetable food; in cystitis and while taking certain drugs such as citrates, and also from decomposition on exposure to air. If alkaline it must be made acid by a few drops of dilute acetic acid before applying further tests.

4.—Take the Specific Gravity.

See that the urinometer floats and stands clear of the sides of the vessel: read the number with the eye on a level with the surface of the urine.

The normal specific gravity is between 1·015 and 1·025.

A low specific gravity suggests kidney disease, or it may be only temporary.

A high specific gravity with pale urine suggests diabetes.

5.—Examine for Substances in Solution.

These may be:—

Phosphates.
Albumen.
Blood.
Bile.
Grape sugar (also called glucose and dextrose).

The presence of one substance does not preclude that of another.

A. Begin with the heat test.

Fill a *clean* test tube for about three inches with the specimen: hold the tube over a spirit lamp so that the upper half of the urine is boiled, leaving the lower half cool to compare it with. If the boiled portion be *clear* the urine does *not* contain *phosphates, albumen, blood, or pus.* If the boiled portion be *cloudy* it probably contains phosphates or albumen. Add a few drops of dilute acetic, or one drop of nitric acid, when if the cloud is due to phosphates it will disappear, as the acid dissolves phosphates and not albumen.

Phosphates and Albumen become apparent at boiling-point and Urates disappear.

B. If albumen is suspected *and the urine is clear, the nitric acid may be applied.*

Pour a small quantity of nitric acid into a clean test tube; allow a similar quantity of urine to trickle steadily down the side of the test tube.—Where the two fluids meet a layer of coagulated albumen is seen.

The quantity of albumen may be ascertained by Esbach's Albuminometer. This is a graduated corked test tube. Filter the urine if not already clear, and if alkaline render slightly acid with dilute nitric acid. If the specific gravity is 1·010 or over dilute the urine sufficiently to reduce the specific gravity below that level. Fill the tube with urine up to the mark "U". Add the reagent (Esbach's solution of picric acid and citric acid) up to the mark "R". The tube is then gently inverted a

few times to allow the fluids to mix, after which it is kept standing upright for twenty-four hours. The albumen is deposited and is read off on the graduated marks, which represent grammes of dried albumen per litre of urine. The percentage of albumen is obtained by dividing by 10. Allowance must be made if the urine has been diluted before the estimation was undertaken.

C. *Test for blood.*

If urine containing albumen is "smoky," red or coffee-coloured, blood may be suspected. Pour some urine in a test tube and add one drop of tincture of guaiacum, then add an excess of ozonic ether: if blood is present *a blue ring* will form where the fluids meet.

D. *Bile in the urine* in any quantity always colours it suggestively. Run a few drops from a pipette on to a white tile and beside them a few drops of strong nitric acid; allow the urine and acid to run together; where the two fluids mix a passing play of colours, of which one *must* be green, will appear if bile be present.

E. *Test for sugar.*

If the urine is pale, increased in quantity, and of high specific gravity, sugar must be suspected.

A small quantity of freshly made Fehling's solution is poured into a test tube and boiled, an equal quantity of urine is then added and heated—an orange-red deposit proves the presence of sugar. Instead of Fehling's

solution, its component parts may be used separately—the liquor potasse and the urine being boiled together and a few drops of sulphate of copper solution then added—the result will be the same.

The test fluid and the urine may be boiled in separate test tubes and allowed to flow together down the inclined tubes.

The quantity of sugar may be estimated by the *fermentation test*. Take the specific gravity and place the urine in a corked bottle with a small quantity of German yeast, leaving a hole in the cork. Leave the bottle in a warm place for twenty-four hours, then use the sugar test to be sure that the sugar has all disappeared, and if such be the case subtract the present specific gravity from that of twenty-four hours ago and the difference is a rough estimate of the number of grains of sugar in each ounce.

The specimen for this estimation must be taken from the collected quantity passed in twenty-four hours.

6.—Examine the Deposit.

Having excluded urates, the deposit may be *pus* or *mucus* (with phosphates), or *blood* in quantity.

Pour the fluid away and to the deposit add an equal quantity of liquor potasse and shake. If pus is present the mixture will become thick and ropy.

Douching.—The proper method of giving a douche has already been described.

The patient should be douched twice daily as long as possible before all operations upon the genital organs.

The best antiseptic to use is biniodide of mercury (1 in 4000).

Shaving.—It is much better that the vulva should be shaved before all operations on the genital organs. When the peritoneal cavity is to be opened, as in abdominal or vaginal sections, the vulva must be shaved, otherwise it will be sufficient, though not so safe, if the pubic hair is cut quite short. It is impossible to sterilise the pubic hair; therefore it is better out of the way, when there will be no chance of a vaginal discharge contaminating it after the operation. In minor operations upon the vulva, vagina, cervix, the hair covering the mons veneris need not be removed if the patient has any objection; the vulva can be shaved posterior to this. The points to remember in shaving are, first of all, to have a very sharp razor, a blunt razor is much more liable to cut the patient.

Secondly, to well lather the part for some time, and, thirdly, to dip the razor momentarily into boiling water before using it. Undoubtedly the best kind of razor to use is a safety razor, since with it all the angles and folds can be very closely shaved by the most inexperienced nurse without any danger of cutting the patient.

In some instances, especially where the patients are fat, the nurse will experience great difficulty in properly shaving the necessary area, and in these cases this can be successfully accomplished either by placing a pillow in the hollow of the patient's back so that the pelvis is tilted, or, better still, by making the patient kneel. When the shaving is finished any excess of soap and loose hairs are removed with swabs of absorbent wool, after which the patient has her bath.

Bath.—On the afternoon before the operation the patient should, after being shaved, have a hot bath of about ten gallons of water, to which has been added five pints of a solution of carbolic acid (1 in 20), and she

should well scrub and soap herself all over. Of course the nurse should always ask the doctor whether he wishes this bath to be given, because in some cases, in which she will, perhaps, be unable to judge, it may be very dangerous for the patient to be moved out of the bed; for instance, in cases of extra-uterine gestation, where bleeding has taken place internally, or in some acute inflammatory condition; if so, the nurse must wash the patient in bed.

Surgically cleaning the skin over the operation area.—There are two methods of surgically clearing the skin, one by compressing, and the other by painting it with iodine.

Compressing.—For vulval and vaginal operations after the parts have been thoroughly prepared a pad of cotton-wool wrung out in a solution of mercury biniodide (1 in 1000) is applied locally and kept in position with a T bandage.

Abdominal Section.—In abdominal sections a compress is applied to the abdomen both the night before the operation and the morning of the operation, but before this is done the abdomen each time undergoes a special cleansing process.

The manner and thoroughness with which this is carried out is of the greatest importance, since, if the skin is properly cleansed, not only will stitch abscess, a troublesome condition which often causes more distress and trouble than the original operation, be rare, but what is of ever so much greater importance, there will be less risk of the operator conveying any septic matter from the skin to the peritoneal cavity, and so infecting the patient with, perhaps, a resulting fatal peritonitis.

The patient then having returned from her bath, is put to bed. Her nightdress is rolled up all round to her chest, and the bedclothes covering her are removed with the exception of a blanket which is turned down below the pubes.

As the cleansing of the abdomen will necessitate some exposure, the nurse must see that the temperature of the room is not below 65° F., and that all the windows and doors are closed.

Compressing.—

1. Wash the hands thoroughly with soap, hot water, and nail-brush (when possible under a stream of running water).
2. Collect all the materials required on a dressing table or "trolley".
3. Shave the skin for a good distance round the operation area.
4. Unseal the compress and towel tin.
5. Wash the hands again.
6. Spread sterilised towel over the chest covering the nightgown and over the legs covering the blankets.
7. Rub in over the abdomen, pubes, and sides ether soap or soft green soap *until it is dry*, in order to obtain its penetrating action upon the skin.
8. Scrub the skin gently but thoroughly with hot sterilised water, being careful not to excoriate the skin. If red points appear the scrubbing has been too violent. Special care must be given to the umbilicus, which in stout patients may have to be cleaned with wool held in dressing forceps.
9. Remove the lather with a sterilised (small) towel, swab, muslin, or lint. Be careful after wiping the outer limits of the cleansed area not to re-wipe the more central parts.
10. Thoroughly rub the cleansed skin with turpentine, ether, or methylated spirit on a sterile swab until the swab remains quite white, removing any excess with another dry swab.
11. Spread sterile wool, which has been soaked in an antiseptic solution as ordered by the surgeon, over the area, seeing that the covering is adequate. Cover *completely* with jaconet, and bandage the dressing firmly in position.

12. The whole process should be carefully and thoroughly repeated on the morning of the day of the operation. When possible the washing with ether soap should be done thoroughly twice on the day before the operation.

Iodine Treatment.—

Some surgeons prefer the iodine method of rendering the operation area surgically clean to that of compressing. It has many advantages, since it is probably more efficient, is as a rule more comfortable for the patient, and can be used in an emergency without the abdomen being washed.

In a few cases iodine causes much irritation of the skin and annoyance to the patient. The chemical acts by soaking into the subcutaneous tissues, penetrating between the cells forming the skin and so destroying any microbes that may be present.

The nurse must remember that iodine is of no use for this purpose unless the skin is quite dry. For if the skin is wet its cells swell and will prevent the iodine soaking in. If, therefore, the case is an urgent one the parts must either be dry-shaved or not shaved at all. When there is sufficient time, the operation area is properly prepared as for "compressing," after which it is covered with a piece of sterile lint until the morning of the operation, when it is painted with tincture of iodine, again covered with lint and painted a second time just before the operation.

Bowels.—*Perineorrhaphy.*—Two nights before the operation a strong aperient should be given to the patient, so that the bowels may act thoroughly. Some surgeons prefer castor oil, others a mixture corresponding to the following which is very useful and efficacious :—

Sulphate of magnesia	4 drachms
Sulphate of soda	1 drachm
Extract of liquorice	20 grains
Essence of peppermint . . .	10 minims
Infusion of senna to	2 ounces

The night before the operation a copious soap-and-water enema is given, and this is repeated on the morning of the operation.

Other Operations.—For any other operation on the genital organs the patient is treated in a way similar to the above, but only one enema need be given and this on the morning of the operation.

Bladder.—*Operations on the Vulva, Vagina, Cervix.*—The patient is directed to pass her urine just before she is taken into the operating room.

Vaginal and Abdominal Hysterectomy.—In these operations it is most important that the catheter should be passed just before the operation and all the urine drawn off, since if it is not there is a great danger of the operator cutting into the bladder owing to its distended condition.

In some cases of abdominal tumour the latter will so press on the bladder or urethra that the nurse may have some difficulty in passing the catheter, and if so she should always inform the operator of her difficulty, since it often transpires that she has been unable to properly empty the bladder.

Dress.—The patient should be dressed in a clean nightgown and flannel dressing-gown, she should have long woollen stockings reaching well up the thighs, or flannel drawers, and in addition if possible a jacket of Gamgee tissue well covering the chest and which can be made by the nurse beforehand. If the nature of the operation necessitates its being performed in the lithotomy position, then a pair of sterilised linen stockings should be slipped over the feet and legs, since the operator, assistant or nurse are very apt to accidentally touch these parts with their hands during the operation.

Food.—At 5 A.M. the patient is given a cup of tea and a rusk and butter. Previous to the operation the condition of the patient will be the guide as to how she should be fed, whether, for instance, on account of weakness, stimulants and extra feeding will be necessary.

CHAPTER XVI.

PREPARATION OF THE NURSE—ASSISTANCE DURING AND DUTIES AFTER THE OPERATION.

PREPARATION OF THE NURSE.

The nurse should be quite healthy, and not suffering from such conditions as sore throat or septic wounds about the fingers.

She should have on a clean linen dress, the sleeves of which can be rolled up well above the elbows; she should have on a clean apron. All rings should be removed from the fingers, even wedding ring.

On entering the operating room the nurse should remove her cuffs, and roll up the sleeves of her dress above the elbow.

She should wash the hands and fore-arms up to the elbow with soap, nail-brush, and, if possible, running water.

After which she should put on a sterilised overall if one is available, and see that it covers the clothes at the back as well as the front, again washing her hands and arms as before.

Care of the Hands.—Great attention should be paid to the hands at all times, and not only just before a dressing or in the theatre. The nails should be kept so pared that they can be cleaned effectively with the nail-brush. It is harmful to scrape beneath them just before a dressing or an operation. The skin should be kept smooth. This is best done by always drying the hands carefully

after washing, and by a regular use of a little diluted glycerine.

The fingers should not be contaminated with pus, and all dirty dressings should be removed with dressing forceps.

On entering the operating room, and before helping in any way with the instruments, etc., the hands are to be thoroughly washed for a period of *not less than three minutes* by the clock; ether or soft soap in order to be effectual must be rubbed into the hands and arms until it is dry. The hands and fore-arms should be scrubbed with a sterilised nail-brush until a good lather is obtained, using plenty of hot running water, particular attention being paid to the nails and clefts between the fingers. Dry the hands on a fresh sterilised towel which is *not* to be used for the purpose again. If the hands are to be washed in an antiseptic or if rubber gloves are to be worn this drying is unnecessary.

General Rules.—Regard everything not fresh from the steriliser as *surgically unclean*, and repeat the washing of the hands whenever they have touched any such article.

An overall, when once it has left the tin, must, as regards touching with the hands or sterilised articles, be looked upon as surgically unclean.

If a nurse is asked to swab she should see that her fingers never touch the wound, and must not shift her hold on the swab so as to bring the part she has touched into contact with the wound.

In abdominal sections it is customary to have two nurses, and in these cases it is better for the nurse who is going to manage the swabs, having once prepared her hands for the indiarubber gloves, not to touch the patient again, whilst the second nurse who has helped the patient into position, etc., may be employed in getting fresh water for the dabs and attending to various other duties that may be required.

Assistance during the Operation.

Placing the Patient in Position.—*Abdominal Section.*—When the patient enters the operating room the nurse directs her to remove her slippers and dressing-gown, after which she assists her on to the table, and as she lies down she separates her nightgown which has been divided down the back so that when the patient is under the anæsthetic it can be turned up and placed in a position where it will be unlikely to get soiled.

A pillow is placed under the patient's head and a blanket over her body, and the nurse should then stand by the patient's side, perhaps holding her hands until she is under the anæsthetic, since it sometimes happens that the patient becomes restive as she is passing under the influence of the anæsthetic and interferes with the anæsthetist or even incurs the danger of falling off the table. When the patient is anæsthetised the nurse pulls down the blanket till its top rests just below the pubes, pulls up the nightgown well on to the chest and awaits the direction of the surgeon before removing the compress.

The nurse has also to fix the arms of the patient securely to her side, which is best done by folding them in a towel and tucking it under the back; and if the operator requires a Trendelenburg position then the legs must also be efficiently fixed by straps or bandages.

Everything being now ready the compress is removed and the instrument nurse or surgeon removes the sterilised towels from the tin which is held by the other nurse, and places them in position.

If the Trendelenburg position is used the nurse will require help from the operator, assistant or swab nurse to raise the patient.

If the surgeon does not use dry swabs one nurse will be required to wash them as they become soiled. Before the operation, she should make a most careful note of the number of swabs which have been prepared, in order that she may be able to tell at any moment how

many are wanted to make the number correct. Two basins of sterilised water are required, one as hot as the hands will tolerate, the other tepid, and the nurse first rinses out the swabs in the tepid water to remove as much blood as possible, and then in the hot water, and keeps them in it until they are wanted, when they are removed and squeezed as dry as possible before being handed to the operator.

Many surgeons prefer to use dry sterilised swabs, in which case the assistant only handles them.

At the end of the operation the surgeon, if he does not count the swabs, will ask the nurse how many swabs she wants to make the number complete, and she must be perfectly certain about this, since, if she makes a mistake, and the abdomen is closed with a swab inside, an accident which generally kills the patient, unless the wound is re-opened and the swab recovered, she will be responsible for the patient's death.

The second nurse will be employed in getting ready douches, fresh water for the swabs, rectal enemata, or saline infusion should they be needed, clean towels, etc., and the many things that have to be done whilst an abdominal section is in progress.

Vulval and Vaginal Operation.

The nurse helps the patient in the way already described until she is under the influence of the anæsthetic. The nurse then draws the nightgown well up over the abdomen and above the buttocks behind, and assists in lifting the patient to the bottom of the table and adjusting her in the lithotomy position.

After this is done the nurse will apply sterilised overalls or towels to the legs of the patient, a sterilised towel over her lower abdomen and pubes and under the buttocks.

The nurse will be principally concerned in attending to the douches, handing swabs and instruments, and getting the dressings that are required.

Duties after the Operation.

Tidying the Room after Operation.—After the operation and before the patient recovers consciousness, the soiled linen, operating table, and instruments should be removed and the room re-arranged, two tables being left, one for the dressings and one for the use of the nurse. An armchair and a camp-bed or sofa for the nurse to sleep upon if there is only one and it is necessary for her to remain in the room during the night, should also be supplied.

A lamp, candle or electric light properly shaded so that the nurse can read or write her report without disturbing the patient, will be required, and the blinds must be drawn and the room kept as quiet as possible, so that the patient may sleep when she comes out of the anæsthetic.

The room must be well ventilated and kept at a temperature of 65° F. The best way to accomplish this is to leave the window a little open, and have a fire; but great care must be taken that the patient is not in a draught, and this may be obviated, if necessary, by a judicious arrangement of screens.

The best way to admit air through the window is to place a piece of wood six inches high and the breadth of the window under the bottom sash, by which means the air will pass into the room up to the ceiling between the two halves of the window.

Relatives or friends must not be admitted unless and until the doctor gives permission, and the nurse must never leave the patient alone, so that if she wants help she must summon it by bell.

Cleansing the Instruments.—This duty may have to be left for some little time, as the nurse will probably have to attend to the patient at first; meanwhile, if the surgeon wishes his instruments cleaned, the best plan is to put them all into a basin and cover them with cold water.

When there is time to clean them the instruments should be well washed with cold water, soap, and soda to remove the blood-stains, after which, if necessary, they should be polished with some plate powder, and then again washed with hot water and scrubbed, all the joints being carefully examined to see that no *débris* is adhering to them; they should then be boiled for half an hour. A fine wire should be passed through the curette to remove any blood, and the instrument is then boiled, after which it is a good plan to run through it a little ether or absolute alcohol, which will prevent any rust forming. Lysol forms a very good medium to wash the instruments in; it is of a soapy nature, antiseptic and helps to polish them.

Cleaning the Gloves.—The gloves are scrubbed with soap and water inside and out, then rinsed in clean water, boiled for ten minutes, and then dried with a towel.

Attention to Patient.

On her return to bed the patient should be covered with a hot blanket and the hot-water bottles should be again inspected to see that they are efficiently protected. An unconscious patient cannot feel that she is being burnt, and fearful wounds, taking many months to heal, have resulted from carelessness in this respect.

The patient's head must be kept low and turned to the left side, a pillow should be placed under her knees and if necessary a cradle over her abdomen.

A towel should be adjusted round the patient's neck and a small porringer placed in position so that if she vomits the nightgown and bed-clothes need not be soiled.

If the operation is an abdominal one and there is retching or vomiting the nurse must support the abdomen with a hand on each side of the incision to prevent undue straining of the sutures and this will also lessen the pain. When the vomiting has ceased, the nurse should

cleanse the mouth with small wool dabs wrung out of a solution of glyco-thymoline and held in forceps.

As already mentioned the nurse must never leave the patient till she is well out of the anæsthetic, since she may be very restless and throw herself out of bed.

The nurse should pay no attention to what the patient may have said under the influence of the anæsthetic, and should of course never repeat it either to the patient or any one else.

Pulse.—The pulse should be taken every four hours and charted. The pulse is by far the most important means we have of estimating how the patient is progressing after an operation, and all nurses would be wise to practise taking it on every suitable opportunity.

The pulse is quickest for the first twelve hours after the operation, but during this time should not exceed 120. After this, as a rule, if everything is progressing satisfactorily, it falls below 100. If the pulse does not fall, but continues to rise, this is, as a rule, a bad sign. In shock and hæmorrhage the rate may be increased to 140 or more, becoming at times uncountable, whilst in hæmorrhage the pulse is very soft and weak. Distension, if marked, will increase the frequency, and in peritonitis the pulse rapidly increases in frequency to above 120, and is hard and wiry; it gradually becomes running in character, and at the end cannot be counted.

Temperature.—The temperature should be taken under the patient's tongue every four hours and charted. The temperature must never be taken just after the patient has had a hot drink, as this may raise it a degree. As a rule, in about eight hours after the operation the temperature rises to nearly 100° F. During the next twelve hours it keeps at this level, and then gradually falls to normal.

A subnormal temperature points to shock or bleeding.

A rapidly rising temperature, especially on the second day, is of very serious import, pointing, as it does, to peritonitis as a cause, although in many cases of this

complication the temperature remains subnormal if the disease is so rapidly fatal as to cause death in the first two or three days.

A persistently high temperature without any apparent cause is often found on examination to be due to a stitch abscess, whilst in cases where the patient is very neurotic the temperature may rise for a few hours. In many cases a raised temperature will become normal after the bowels have been opened.

Respiration.—The nurse must notice the respiration rate. If rapid soon after an abdominal section it points towards shock or hæmorrhage, and later an increase in its rate is associated with bronchitis, pneumonia and peritonitis.

Tongue.—For the first twenty-four hours after an abdominal section the tongue is generally dry and rather brown. After this it should be moist and rather white. In peritonitis and intestinal obstruction it becomes dry, brown or red, glazed or ulcerated.

Bladder.—*Perineorrhaphy.*—Some surgeons prefer their patients to micturate naturally after the operation, kneeling up to do so, whilst others prefer the catheter to be used regularly until the bowels have acted.

Other Minor Operations.—There is no need for the catheter to be used.

Abdominal Section and Vaginal Hysterectomy.—The catheter is passed six hours after the operation, and then, unless there is retention, it is not used, except in the case of vaginal hysterectomy, when clamp forceps have been left on, and then the catheter, which must be used with the greatest care for fear of disturbing the forceps, is passed every eight hours until they are removed. In cases of abdominal hysterectomy the catheter is used for the first twenty-four hours to prevent the bladder becoming distended, and so causing traction on the stump.

It is very important to measure the amount of urine passed and note any peculiarities in it, such as blood. The amount drawn off after the operation should be four

to five ounces; a less amount than this implies shock, hæmorrhage, suppression of urine, or injury to ureter, and in the latter case, or in injury of the bladder, it may be mixed with blood.

Bowels.—*Perineorrhaphy.*—A dose of aperient medicine corresponding to half the quantity of the mixture already indicated may be given at 2 A.M. the morning following the operation, and should be repeated every four hours till the bowels have acted, after which sufficient should be given to enable the patient to have an evacuation night and morning. Or an ounce of castor oil may be taken on the fourth night following the operation, after which a calomel and colocynth pill is given daily as required.

Other Minor Operations.—On the second night following the operation the patient is given an aperient, and an enema in the morning if necessary, and then the bowels are kept acting as required.

Abdominal Section and Vaginal Hysterectomy.—At 4 A.M. on the morning of the fourth day following the operation an enema of warm olive oil, four ounces, is injected, after which a soap and water enema is given at 7.30 A.M. An aperient is then administered once daily if necessary.

Rectal Tube.—After vaginal hysterectomy and abdominal section the rectal tube is first passed about ten hours subsequent to the operation, and then every four hours for as long as it appears necessary. The rectal tube has to be passed very carefully, the end being first smeared with vaseline, as it so easily becomes kinked on itself when pushed into the bowel, and should this happen it must, of course, be taken out and passed again. The tube must be pushed as far as possible, using ordinary care; it will go farther in some patients than others, but an average distance is about 21 inches, the total length of the tube being 31 inches. There are various patterns made, the best is one with the hole at the end, and not, like a catheter, at the side.

As a rule, very little discomfort is caused by passing the tube, whilst the relief to the patient is often very marked. Occasionally, however, if the patient has hæmorrhoids, great distress is caused by the passage of the tube, and in these cases it is best to introduce a little gall and opium ointment some time before passing it.

Having passed the tube as far as possible, it is kept in position as long as any flatus is passing; if no flatus passes it is usually left *in situ* for about five minutes. The free end of the tube is kept under Condy or mercury solution in a porringer.

Dressing.—*Perineorrhaphy.*—The successful termination of this operation depends probably more upon the nurse than any one else, the reason for this being the great difficulty that is experienced in keeping the wound aseptic, so that practically all the failures of this operation can be traced to the wound becoming septic and partly breaking down. In the majority of cases when this happens a good result is still obtained, the wound healing by granulation, but the convalescence is greatly prolonged and the discomfort to the patient much increased. In a few cases the wound sloughs, and the patient finds that after going through all the worry, pain, and expense, the operation has been a failure, and will have to be repeated.

The reason the wound is so difficult to keep aseptic is apparent when its situation is remembered, since it can be so easily contaminated with fæcal matter, urine, leucorrhœa or the menstrual flow.

The wound, then, must be redressed whenever it is soiled, and in those cases where the urine is drawn off by catheter till the bowels are opened the wound is dressed twice daily.

After removing the old dressing, and before applying the new, the wound should either be carefully swabbed with perchloride of mercury (1 in 1000) or irrigated and dried, whilst some surgeons order the vagina to be douched in addition, in which case the vagina should be

carefully dried afterwards by wool on forceps, and the strength of the mercury solution should be 1 in 4000. The stitches are taken out as a rule on the twelfth to fourteenth day after the operation, and the patient gets up a day or two later.

Removal of Cysts and Tumours from the Vulva.—The dressing is practically the same as for perineorrhaphy.

Trachelhorraphy.—Removal of Vaginal Cysts or Tumours.—Amputation of Cervix.—After these operations a piece of gauze is left in the vagina till the next morning. The stitches are taken out on the twelfth day, unless catgut sutures have been used, and the patient gets up on the fourteenth.

Curetting.—The tampons are usually removed the next morning after curetting.

If the uterus has been packed the packing is left in for twenty-four hours or longer, according to the directions given, and if the nurse is directed to remove the gauze she must do so very gently, in order that she may not break it off short and leave a piece in the uterus. The patient gets up on the ninth day.

Vaginal Hysterectomy.—After vaginal hysterectomy the gauze is, as a rule, left in for thirty-six hours, and then it will be necessary to carefully swab the lower part of the vagina every four hours or so with a little absorbent wool soaked in perchloride of mercury (1 in 4000) and held in a pair of forceps.

Supposing clamp forceps have been left on, the nurse must be very careful that the patient does not interfere with them, especially when recovering from the anæsthetic, and she must also be very careful when attending to the patient for fear of detaching them. The patient gets up on the seventeenth day.

Abdominal Hysterectomy.—As a rule no dressing will be required until the seventh day, when the stitches are taken out, then a fresh supply of dry dressing must be ready, and also some long strips of adherent plaster, about two inches broad and twelve inches long, in case

the surgeon wishes to strap the wound after the stitches have been removed.

If a gauze drain or rubber tube has been left in the abdomen it will be necessary to change the dressings when they get soiled by the blood or discharge. The drain is, as a rule, removed on the day after the operation if it was used for hæmorrhage, but if for pus then on the third day, after which the wound soon closes. The patient sits up on the thirteenth day, and gets up at the seventeenth day.

Douching.—*Perineorrhaphy.*—Some surgeons order vaginal douching after this operation.

Operations on the Vagina.—Cervix.—Curetting.—Douching is prescribed twice daily.

Vaginal Hysterectomy.—After vaginal hysterectomy, about the tenth day, the discharge commences to be very offensive. This is due to some sloughing of the injured parts and separation of the ligatures. It is then customary to order a vaginal douche twice daily. If this is ordered it must be given with very little pressure, the douche-can being held but very little higher than the patient.

Abdominal Section.—After abdominal section douches are not given.

The douches generally used are tincture of iodine one drachm to a pint of hot water or perchloride of mercury 1 in 4000.

Food.—*Perineorrhaphy.*—Eight hours after this operation the patient should be given four ounces of tea and milk or hot milk and water. The subsequent feeding depends on which day the surgeon orders the aperient, the first, the fourth, or the seventh, because, before this, ordinary liquid diet is prescribed. After the bowels have been well open the patient is given bread and butter, custard and sole, and quickly returns to ordinary diet.

Other Minor Operations.—Eight hours after the operation the patient is given four ounces of tea and milk or

hot water and milk, and as soon as she is able to take it ordinary diet is prescribed.

Vaginal Hysterectomy and Abdominal Section.—After these operations the patient has to be fed most carefully, and a note made of all she takes. The following tables show exactly how a patient may be treated and fed every hour from the time of the operation until she is again on ordinary diet. Every surgeon has his particular method of treating patients after an abdominal section. The tables here appended include the experience gained from the treatment and nursing of several thousand abdominal sections.

CHAPTER XVII.

TIME TABLE FOR NURSING AND FEEDING A PATIENT AFTER AN ABDOMINAL OPERATION FOR THE FIRST FIVE DAYS AND NIGHTS, AS USED BY THE AUTHOR.

First Day.

4 a.m.—Simple enema Oj.
5 a.m.—Cup of tea and a rusk.
8.30 a.m.—Douch of biniodide of mercury, 1 in 4000.
8.45 a.m.—Catheter.
9 a.m.—Operation.

When patient is returned to bed she must be covered with a warm blanket and packed with hot bottles well protected. A pillow should be placed under her knees, a cradle over her abdomen and her head is to be kept low. If retching or sickness supervenes patient is to be turned slightly on the left side and her abdomen supported on each side of the stitches.

2 p.m.—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline solution ʒvi, glucose ʒi per rectum.	
5 p.m.	Hot water ʒi
6 p.m.—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ʒvi, glucose ʒi. Pass catheter, measure urine. Patient may have a pillow. Replenish hot-water bottles if necessary.	,, ,, ʒi
7 p.m.	,, ,, ʒi

First Night.

8 p.m.	Hot water ʒi
9 p.m.	,, ,, ʒi
10 p.m.—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ʒvi, glucose ʒi.	,, ,, ʒi
11 p.m.	,, ,, ʒi
Midnight	,, ,, ʒi

1 a.m.	Hot water ℥i
2 a.m.—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ℥vi, glucose ℥i.	,, ,, ℥i
3 a.m.	,, ,, ℥i
4 a.m.	,, ,, ℥i
5 a.m.	,, ,, ℥i
6 a.m.—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ℥vi, glucose ℥i.	,, ,, ℥i
7 a.m.	,, ,, ℥i

The patient's hair to be brushed and plaited. Her hands, face, shoulders and lower part of her back to be washed. The back and shoulders to be rubbed with eau-de-Cologne and boric powder. Mouth to be cleansed. Draw sheet and top sheet to be changed. The amount of nourishment taken, sleep obtained, and urine passed to be entered in the report book. The patient should be encouraged to pass her urine naturally. If only a small quantity is evacuated the catheter must be passed to ascertain if there is any residual urine, and if so the catheter must be used till all the urine is naturally evacuated.

Second Day.

8 a.m.	Tea ℥ii, milk ℥i
9 a.m.	Milk ℥iv, hot water ℥iv
10 a.m.—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ℥vi and glucose ℥i. Mouth to be cleansed.	,, ,,
11 a.m.	,, ,,
Midday	Milk ℥i, hot water ℥i
1 p.m.	,, ,,
2 p.m.—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ℥vi and glucose ℥i. Face and hands to be washed. Mouth to be cleansed.	,, ,,
3 p.m.	,, ,,
4 p.m.	Tea ℥iv, Milk ℥i
5 p.m.	Milk ℥i, hot water ℥i
6 p.m.—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ℥vi and glucose ℥i.	,, ,,
7 p.m.	,, ,,

The patient's hair to be brushed and plaited. Her hands, face, shoulders and lower part of her back to be washed. The back and shoulders to be rubbed with eau-de-Cologne and boric powder. Mouth to be cleansed. Draw sheet and top sheet to be changed.

The amount of nourishment taken, sleep obtained, and urine passed to be entered in report book. The patient may be propped up on the second day.

Second Night.

8 p.m.		Milk ℥i, hot water ℥i
9 p.m.		,, ,,
10 p.m.	—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ℥vi, glucose ℥i. Mouth to be cleansed.	,, ,,
11 p.m.		,, ,,
Midnight		,, ,,
1 a.m.		Tea ℥iv, milk ℥i
2 a.m.	—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ℥vi, glucose ℥i. Mouth to be cleansed.	Milk ℥iss, hot water ℥ss
3 a.m.		Milk ℥iss, hot water ℥ss
4 a.m.		Milk ℥iss, hot water ℥ss
5 a.m.		Milk ℥ii, hot water ℥ii
6 a.m.	—Pulse, respiration, temperature. Rectal tube followed by rectal injection of saline ℥vi, glucose ℥i.	Milk ℥ii, hot water ℥ii
7 a.m.		Milk ℥ii, hot water ℥ii

The patient's hair to be brushed and plaited. Her hands, face, shoulders and lower part of her back to be washed. The back and shoulders to be rubbed with eau-de-Cologne and boric powder. Mouth to be cleansed. Draw sheet and top sheet to be changed. The amount of nourishment taken, sleep obtained, and urine passed to be entered in report book.

Third Day.

8 a.m.		Tea ℥iv, milk ℥i
9 a.m.		Milk ℥ii, hot water ℥ii
10 a.m.	—Pulse, respiration, temperature. Mouth to be cleansed.	,, ,,
11 a.m.		,, ,,
Midday		,, ,,
1 p.m.		Milk ℥ii, hot water ℥ii
2 p.m.	—Pulse, respiration, temperature. Mouth to be cleansed. Wash hands and face.	Milk ℥ii, hot water ℥ii
3 p.m.		,, ,,
4 p.m.		Tea ℥iv, milk ℥i

5 p.m.	Milk ℥ii, hot water ℥ii
6 p.m.—Pulse, respiration, temperature.	,, ,,
7 p.m.	,, ,,

The patient's hair to be brushed and plaited. Her hands, face, shoulders and lower part of her back to be washed. The back and shoulders to be rubbed with eau-de-Cologne and boric powder. Mouth to be cleansed. Change draw sheet and top sheet. The amount of nourishment taken, sleep obtained, and urine passed to be entered in the report book.

Third Night.

8 p.m.	Milk ℥ii, hot water ℥ii
9 p.m.	,, ,,
10 p.m.—Pulse, respiration, temperature. Mouth to be cleansed.	,, ,,
11 p.m.	,, ,,
Midnight	,, ,,
1 a.m.	,, ,,
2 a.m.—Pulse, respiration, temperature. Mouth to be cleansed.	,, ,,
3 a.m.	,, ,,
4 a.m.—Six ounces of olive oil to be injected into the rectum.	,, ,,
5 a.m.	,, ,,
6 a.m.—Pulse, respiration, temperature. Simple enema Oj to be given.	,, ,,
7 a.m.	,, ,,

The patient's hair to be brushed and plaited. Her face, hands, shoulders and lower part of back to be washed. The back and shoulders to be rubbed with eau-de-Cologne and boric powder. Draw sheet and top sheet to be changed. The amount of nourishment taken, sleep obtained, and urine passed to be entered in report book.

Fourth Day.

8 a.m.	Tea ℥iv, milk ℥ii, thin slice of bread and butter.
10 a.m.—Pulse, respiration, temperature. Mouth to be cleansed.	
11 a.m.	Milk ℥vi. Boiled sole, custard pudding, piece of bread.
1 p.m.	
2 p.m.—Pulse, respiration, temperature. Mouth to be cleansed. Wash hands and face.	
4 p.m.	Tea ℥vi, milk ℥ii, two slices thin bread and butter.
6 p.m.—Pulse, respiration, temperature. Mouth to be cleansed.	
7 p.m.	Milk ℥vi

The patient's hair to be brushed and plaited. Her face, hands, shoulders and lower part of back to be washed. Her back and shoulders to be rubbed with eau-de-Cologne and boric powder. Draw sheet, top sheet and bottom sheet to be changed. The amount of nourishment taken, sleep obtained and urine passed to be entered in report book.

Fourth Night.

10 p.m.—Pulse, respiration, temperature.
Mouth to be cleansed.

2 a.m. — Milk ʒvi

6 a.m.—Pulse, respiration, temperature.

7 a.m.—

The patient's hair to be brushed and plaited. Her face, hands, shoulders and lower part of her back to be washed. Her back and shoulders to be rubbed with eau-de-Cologne and boric powder. Mouth to be cleansed, draw sheet, top sheet and bottom sheet to be changed. The amount of nourishment taken, sleep obtained and urine passed to be entered in report book.

Fifth Day.

8 a.m. — Tea ʒiv, milk ʒii, two slices bread and butter, boiled egg.

10 a.m.—Pulse, respiration, temperature.
Mouth to be cleansed.

11 a.m. — Milk ʒvi or beef-tea ʒvi

1 p.m. — Fried sole, custard, piece of bread, glass of water.

2 p.m.—Pulse, respiration, temperature.
Mouth to be cleansed. Wash hands and face.

4 p.m. — Tea ʒiv, milk ʒii, two slices bread and butter, crust.

6 p.m.—Pulse, respiration, temperature.

7 p.m.—

The patient's hair to be brushed and plaited. Her face, hands, shoulders and lower part of her body to be washed. Her back and shoulders to be rubbed with eau-de-Cologne and boric powder. Draw sheet and top sheet to be changed. Mouth to be cleansed. The amount of nourishment taken, sleep obtained and urine passed to be entered in the report book.

Fifth Night.

8 p.m. Milk ℥vi or soup ℥vi
10 p.m.—Pulse, respiration, temperature.
2 a.m.—Pulse, respiration, temperature. Milk ℥vi
6 a.m.—Pulse, respiration, temperature.
7 a.m.—

The patient's hair to be brushed and plaited. Her face, hands, shoulders and lower part of her body to be washed. Her back and shoulders to be rubbed with eau-de-Cologne and boric powder. Draw sheet and top sheet to be changed. The amount of nourishment taken, sleep obtained and urine passed to be entered in report book.

Sixth Day.

The pulse, respiration and temperature are to be taken twice daily and the patient is attended to as before.

In addition to the milk the patient may be given chicken and light pudding.

Seventh Day.

Diet as before and mutton may be substituted for the chicken. The stitches are taken out on this day. For the following days the ordinary diet may be renewed.

Fifteenth Day.

Patient is lifted on to a couch.

Twenty-First Day.

Patient goes home.

This table is meant to serve as a guide only.

Many surgeons treat their patients somewhat differently. Any particular patient may be unable to take so much fluid at first, and in some cases it is better to allow longer intervals between the "feeds," which may then be given in larger quantities. Thus many patients can commence taking, eight hours after the operation, two ounces of milk, and water or barley water every two hours; and on the second day and after, five ounces every two hours with tea and milk as an alternative occasion-

ally. On the third day meat jelly, custard and bread and butter may be given in addition, together with fish on the fourth day, and chicken on the fifth day.

If the milk and hot water does not agree with the patient lime-water may be added, barley-water substituted for the hot water or the milk peptonised.

CHAPTER XVIII.

NURSING OF COMPLICATIONS.

The nurse will have to watch for any complications occurring after an operation, so that she may report it to the doctor as soon as possible.

The following chief complications will briefly be dealt with: thirst; pain; vomiting; distension; shock; hæmorrhage; peritonitis; cystitis; venous thrombosis; pulmonary embolism.

Thirst.—This is a very distressing symptom, and the following methods may be tried to relieve it. The mouth may be swabbed out with hot water or glycerine and borax. The patient may be allowed to wash her mouth out with hot water or a weak solution of Condy's fluid; the rectal injections will probably relieve the thirst to a great degree.

Sucking ice is not a very good plan; in most cases the relief is only momentary; it seems to make the thirst worse, and predisposes to flatulence.

Pain.—Patients complain of pain mostly on the night of the operation in their back and abdomen. The pain in the back can be greatly relieved by putting a pillow under the legs, which allows the back to lie flat on the bed, and not arched, as is otherwise the case; great relief is also generally afforded to pain in the back by placing a small air-cushion, pad, or rubber bottle under it. It is best to encourage the patient to put up with the abdominal pain, if possible, but if it is bad some aspirin, a morphia suppository or morphia injection may be ordered by the doctor. After the first night morphia is contra-indicated, since it favours distension, and masks peritonitis and obstruction.

In some cases when the patient is very neurotic, throwing herself about and complaining of the greatest pain, although an examination shows the temperature and pulse to be normal, sickness absent, and no distension, a fair dose of morphia is of the greatest value, and will quiet her at once.

Vomiting.—This may be due to irritation of the anæsthetic, to peritonitis, or obstruction of the bowels.

Irritative Vomiting.—This comes on early, and lasts, as a rule, about twenty-four hours. It is very often more of a trying to be sick than actual vomiting. The patient retches a good deal, and when she does bring up anything it is only a small quantity, a drachm or so at a time, and light green in colour. There is no tenderness of the abdomen, no fever, or increase in the pulse-rate. It is often associated with flatulent distension, and sometimes is complicated by a neurotic condition of the patient. It may be treated by making the drinks colder or hotter, by peptonising the milk, or by giving a draught containing—

℞	Bicarbonate of soda	1 drachm
	Essence of peppermint . . .	5 minims
	Warm water	1 ounce

which at times makes the patient very sick, and in this case effectually washes the stomach out, and seems to give great relief. Another good remedy is to give a minim of tincture of iodine in a drachm of water directly after the milk drinks. If these remedies fail the condition can always be cured by putting the patient on rectal feeding for a few hours, and nearly always, especially in neurotic cases, by giving a simple soap-and-water enema, which seems to act in some way reflexly on the stomach.

Or, lastly, a very good method of treatment is to wash the stomach out, first of all emptying the stomach, and then running in a pint of warm boric solution, letting it run out, and repeating till the solution comes back clear.

Peritonitic Vomiting.—This comes on during the second or third day, is dark green or brown in colour, and sometimes offensive, while the amount may be very considerable, the patient vomiting as much as half a pint at a time. With it there is no feeling of sickness or effort to eject the vomited fluid as in the irritative vomiting; the fluid simply wells up and runs out of the mouth. The other signs and symptoms which accompany peritonitis are also, as a rule, so evident that no mistake can be made of the significance of this variety of vomiting.

Obstructive Vomiting.—This is due to some portion of the gut having become accidentally included in a ligature during the operation or in adhesions forming after the operation, or to the gut becoming adherent to the stump in a hysterectomy.

This variety of vomiting, which comes on gradually at first and only at intervals, continues to increase in frequency, till at the last it is practically continuous. Although fæcal vomiting is said to be diagnostic of it, it often does not become fæcal in character till the end is at hand, and on many occasions it does not become fæcal at all.

It is always accompanied by distension, which gradually becomes more and more marked, commencing, as a rule, over the left abdomen, as it is here, in the region of the sigmoid flexure, that the obstruction generally takes place.

Distension.—*Irritative Distension.*—This is due to the anæsthetic, and may be treated on the same lines as irritative vomiting. It is more especially situated in the epigastric region, and may be further treated as the following:—

Distension Due to Loss of Tone in the Intestinal Walls.—This is not an uncommon condition, especially when the operation has been at all prolonged and there has been much handling of the intestines. The distension is uniform and soft; there is no tenderness or

rigidity of the abdominal walls, and unless it becomes very marked there is no alteration in the pulse or temperature, although if it is not relieved the patient may die. This variety of distension may be treated by frequent application of the rectal tube, by a turpentine or rue enema, or a rectal wash-out.

A turpentine enema consists of

Turpentine	½ ounce
Castor oil	1 ounce
Soap and water	½ pint
Water and gruel	½ pint

and is made as follows, the enema being injected as warm as possible: Either by mixing the turpentine in a porringer with a piece of soft soap as large as a hen's egg, then stirring in the oil, and adding the remaining ingredients last, or by beating up the turpentine with the white of an egg, and then stirring in the ingredients.

A rue enema consists of

Oil of rue	20 minims
Mucilage of acacia	2 drachms
Soap and water to	6 ounces

In either case if the enema is not returned the rectal tube is passed to draw it off.

Rectal Wash-out.—To give this a rectal tube is passed in the ordinary way, and a glass funnel fitted to its free end. Two pints of soap and hot water containing one ounce of turpentine are then made up, and six ounces of this solution are poured into the funnel, which is held as high as possible. The fluid is then allowed to remain in the rectum for a few minutes, after which the funnel is lowered into a basin of water and the solution allowed to run out with a consequent aspiration of flatus from the intestine. This is repeated till the two pints are used up, and, as a rule, this method of treating the distension is very successful. At times it may be necessary to use as much as ten pints.

Peritonitic Distension.—There is great abdominal pain, the walls are very rigid, and the patient soon becomes

collapsed. As a rule treatment is of no avail, but rectal feeding with "wash-outs" and enemas afford the best means of relief. Patients suffering from this will often pass flatus with the tube, but not naturally, till the end.

Obstructive Distension.—This distension cannot be relieved until the obstruction is dealt with, the treatment of which does not come within the province of a nurse.

Shock—Hæmorrhage.—These two complications will be dealt with together because there is a certain resemblance between them to the untrained eye, and even the trained observer may occasionally be in great doubt as to which the patient is really suffering from. A great responsibility devolves upon the nurse, however, with respect to these two conditions, since she will have the first opportunity of diagnosing them, and her failure to send for the surgeon when the patient is bleeding will result in the patient's death, whereas by an early intimation many a life has been saved.

It will be better to take the signs separately and compare them.

Shock.	*Hæmorrhage.*
Signs date from the operation.	Signs develop after the operation.
Signs tend to get better.	Signs tend to get worse.
Face may be blanched.	Face and lips are markedly blanched.
Pulse fast, 140.	Pulse fast, 140 and feeble.
May at times have a slow pulse.	Fast pulse.
Patient is quiet.	Patient is very restless.
Respirations are quick and shallow.	Respirations are sighing and gasping.
Does not feel particularly faint.	Always feels faint.
Brandy enemata improves shock.	Brandy enemata increases hæmorrhage.

Treatment.—In cases of shock, hot-water bottles, an enema containing one ounce of brandy and ten ounces of hot water, and a hypodermic injection of strychnine, five minims, will be of great service, and may be repeated if necessary. If the patient does not improve with these measures a saline infusion of two or three pints should

be at once administered. With hæmorrhage the only treatment is to tie the bleeding point, after which saline infusions, strychnine and brandy will probably be given.

The shock may be due to irritation of the sympathetic nerves during the operation, or to great loss of blood, and it is more especially in these latter cases that the difficulty of deciding between shock and hæmorrhage is so great.

Peritonitis.—This, the most frequent cause of death after vaginal hysterectomy or abdominal section, is due to some septic matter contaminating the peritoneum. It may be, and generally is, due to some flaw in the aseptic technique, and on its occurrence the strictest inquiry must be made into the various details connected with the operation in order that the source or the infection may, if possible, be discovered.

Every case of peritonitis, however, is not due to faulty technique. It may be that the abdominal tumour is already inflamed before the operation for its removal takes place, or during the operation some pus which has been locked up in an abscess may be disturbed and soil the peritoneum. Under these circumstances, the complication is, of course, most unfortunate, though no one can be blamed for it.

As regards the diagnosis of peritonitis from the nurse's point of view, the main features have already been outlined under the peritonitic pulse, peritonitic temperature, peritonitic vomiting, and peritonitic distension, and, therefore, nothing more need be said on the subject.

There are probably many channels of which we have no idea by which sepsis infects a patient, but it has been proved over and over again in so many institutions and by so many nurses and operators, as to become a truism, that the greater care one takes in making everything aseptic so much the less chance will there be of peritonitis attacking a patient; in fact, in most hospitals nowadays peritonitis from being one of the commonest

complications seen after abdominal section has become one of the rarest.

Cystitis.—After vaginal hysterectomy or abdominal section about the end of the second week the patient may complain of pain on micturition. The urine will be found to be acid and to contain a little pus. Salol, or urotropin in doses of 10 grains three times a day, will, as a rule, at once cure this form of cystitis. At times, after this condition has lasted for a few days, the urine becomes alkaline and ammoniacal, and this form of cystitis will have to be treated by washing out the bladder.

Femoral Thrombosis.—About the thirteenth day the leg becomes swollen and very painful. The swelling may be limited to the lower part of the leg or the whole leg may be swollen. This swelling pits on pressure, and a hard, tender lump can be felt in the vein.

There is, as a rule, tenderness over the femoral vein, and because of the pain the patient is unable to move the leg. The temperature will be somewhat raised. The leg remains in this condition as a rule for a few days, and then gradually gets better, although in some cases the leg remains permanently swollen.

The condition may occur after any operation, and, as a rule, the left leg is affected.

The surgeon will direct that the leg be painted with glycerine and belladonna, covered with lint, cotton-wool, and a bandage loosely applied. The leg will be rested on a pillow, a cradle will be put over it, and sand-bags will be placed each side, while the nurse will be directed to see that the patient does not move her leg, and that it be kept perfectly quiet, the great danger being that the clot in the vein, on account of some movement, may get loose, escape into the circulation, and being carried to the heart, the patient suddenly falls back dead, an accident which has happened times without number.

Pulmonary Embolism.—As mentioned above, the great danger of thrombosis of the veins is that the clot will be-

come detached, and being carried in the circulation to the heart may block the blood-vessel through which the blood is sent to the lungs to be aerated. The clot is called an embolus, and this particular complication is known as a pulmonary embolism. If the vessel is entirely blocked the patient dies practically suddenly. If partially blocked, death may be slower, or rarely the patient may recover. The embolus need not necessarily come from a vein in the leg, it may come from some other vein. If death is not sudden the patient experiences the greatest difficulty in breathing. She will sit up in bed, gasp, struggle to get her breath, throw her arms about, and the colour of her face, at first blue, gradually becomes grey. The nurse can only administer brandy, and if the patient stops breathing perform artificial respiration.

Delayed Chloroform Poisoning.

This condition is induced by the action of the chloroform on the liver cells so that they become degenerated. It is more likely to occur in young children, and in nearly every case the patient has been in a septic condition before the anæsthetic was administered, and the anæsthesia has been prolonged.

The effects of this poisoning declare themselves in two ways. Either the patient retches or vomits and becomes jaundiced, drowsy and in the end comatose, or the complication is characterised by persistent and uncontrollable vomiting and there is no jaundice.

The diagnosis is completed by the discovery in the urine of acetone and diacetic acid.

Ether may act on the liver in a similar way, but its effects are not nearly so grave.

Treatment.—Bicarbonate of soda and glucose are given by the mouth or by intravenous injection to neutralise the poison.

There are many other complications that may follow an abdominal operation, but a discussion of them does not come within the scope of these lectures.

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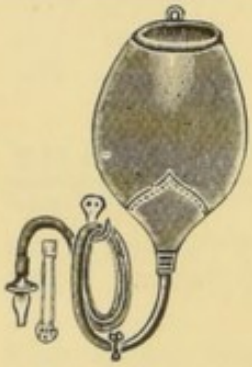

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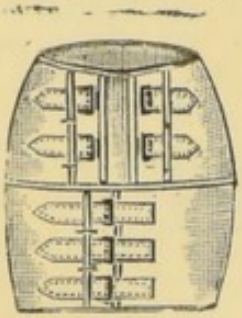

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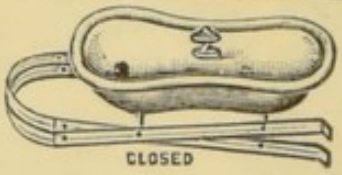

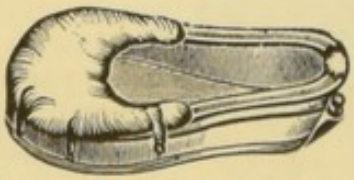

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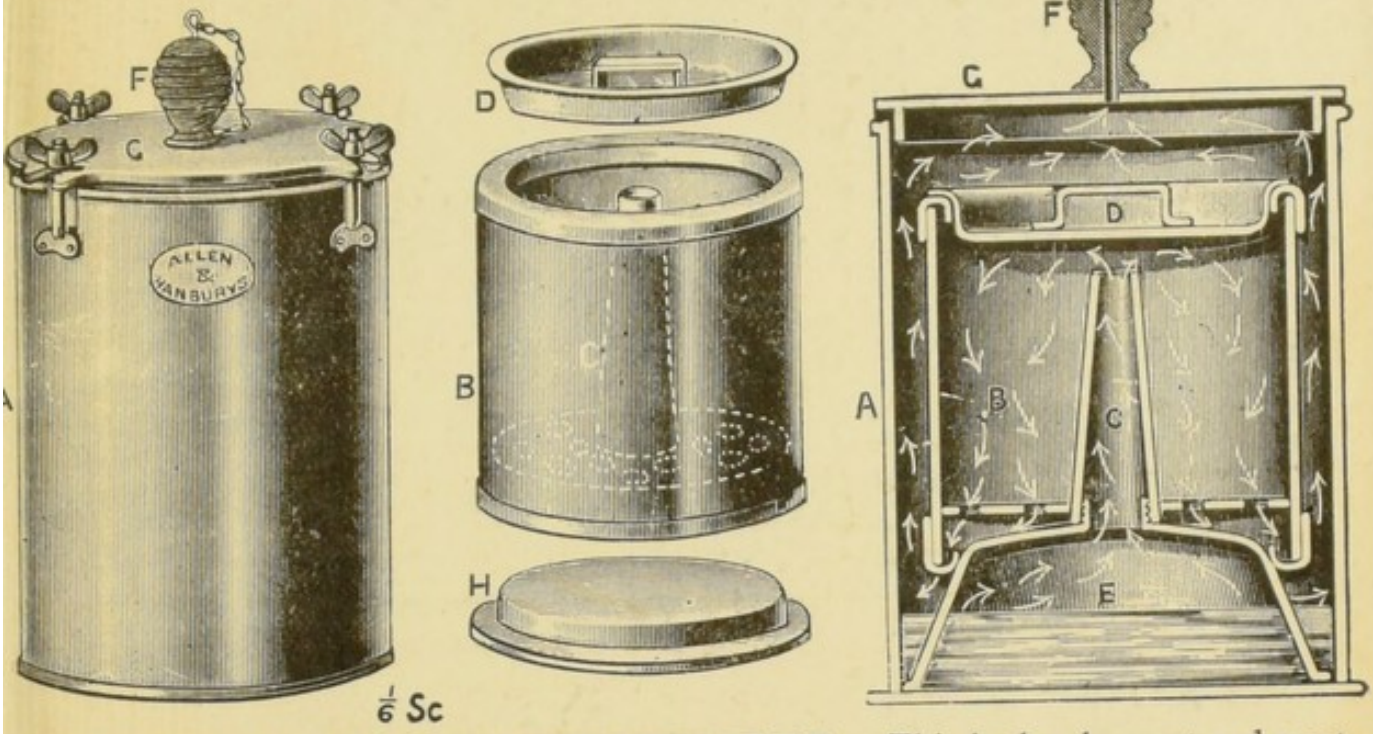

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