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MANUAL

OF

Obstetrics, Gynæcology and Pediatrics.

BY

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PREFACE.

The object of this little book is to furnish an outline of the main facts in Obstetrics and the Diseases of Women and Children, and includes a synopsis of the physical signs of Diseases of the Chest and Diseases of the Skin.

It is really a syllabus of my sessional lectures with such additions and alterations as I thought would make it more valuable for reference in emergencies.

While seeking to meet the wants of the medical student in general, and my own class in particular, the work does not pretend to originality, nor does it aim at supplanting the larger text books on the subject which are not always within the reach of every medical student.

Elegance of expression has often been sacrificed to conciseness, for obvious reasons.

In conclusion, I wish to acknowledge my indebtedness to Mr. J. R. Shannon, B.A., for valuable assistance in revising proofs.

141 King St. W.,
Kingston.

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OBSTETRICS,

GYNÆCOLOGY AND PEDIATRICS.

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OBSTETRICS.

A.—The Female Organs of Generation.

I. EXTERNAL.

1. **The Pudenda** include all those parts which are visible externally, viz. :—Mons Veneris, labia majora, labia minora, clitoris, vestibule, hymen, carunculæ myrtiformes, and fossa navicularis.

a. The *Mons Veneris*, or "mount of love," is an irregular triangular prominence, situated in front of the symphysis pubis. After puberty it is covered with a thick growth of coarse hair and is sharply defined above by a line at the lower part of the hypogastric region.

b. The *Labia Majora* are two cutaneous folds beginning at the lower part of the mons veneris, constituting the anterior commissure; and extending downwards on each side of the vulvar cleft, terminate by blending with the integument of the perineum. Unless the thighs are abducted the inner sides of the labia are always in contact.

c. The *Labia Minora*, or nymphæ, are two muco-cutaneous folds springing from the inner surfaces of the labia majora, and have been compared to a cock's comb. They begin just below the anterior commissure as double folds which meet above and

below the clitoris, forming the prepuce and frenulum of the clitoris; and descending on each side of the vestibule and on the inner side of the labium blend with its middle part. They however unite again by a muco-cutaneous commissure below known as the fourchette.

d. The *Clitoris* is a small curved oblong-organ, analogous to the penis in the male, situated just below the anterior commissure. It appears as a small pear-shaped projection, the glans, covered above by the prepuce, and attached by its body to a point immediately under the anterior edge of the arch of the pubis where it divides into two crura. It consists of cavernous or erectile tissue, surrounded by a firm fibrous coat over which is an extremely sensitive tissue.

e. The *Vestibule* is a triangular space bounded on each side by the labia minora, below by the vaginal orifice, with its apex immediately below the clitoris. In the median line of this space, three quarters of an inch below the clitoris, is the *meatus urinareus* or urethral orifice, which appears as a dimple or pucker in the mucous membrane and serves as a guide in introducing the catheter.

f. The *Hymen* is a circular or crescentic fold of connective tissue, covered by mucous membrane, which immediately surrounds the orifice of the vagina.

g. The *Carunculæ Myrtiformes* are fleshy eminences found at the mouth of the vagina, the result of sloughing and cicatrization after childbirth, and are not, as formerly supposed, the remains of a ruptured hymen.

h. The *Fossa Navicularis* is a depression formed between the hymen and fourchette, when the labia majora are drawn apart.

2. The Vagina is a musculo-membranous canal situated between the rectum and bladder, and connects the pudenda with the uterus. It runs obliquely upwards and backwards, its

anterior and posterior walls being in contact with one another. Its length is anteriorly $2\frac{1}{2}$ in. and posteriorly $3\frac{1}{4}$ in.

The fornix or upper part encircles the cervix uteri, extending higher on its posterior than its anterior aspect. It has three coats, mucous, muscular (consisting of circular and longitudinal fibres) and fibrous. A circular bundle of muscular fibres surrounds the lower part and is called the sphincter cunnæ.

The mucous membrane is thrown into folds or transverse ridges which are well marked in virgins, especially on the anterior wall, but become obliterated in multiparæ and in old age.

II. INTERNAL.

1. The Uterus is a pear-shaped, thick-walled, hollow organ, flattened antero-posteriorly, convex behind, and plain in front. It differs in the virgin and in multiparæ. It consists of fundus, body and neck; measures 3 in. in length, 2 in. in breadth, and one inch in thickness. It weighs 1 oz. Its cavity is triangular and opens laterally into the fallopian tubes by orifices 1-25 in. in size.

The lower extremity or cervix projects into the vagina, and presents a transverse aperture called the os tincæ, from its fancied resemblance to a tench's mouth. The os is bounded by two thick lips, of which the anterior is longer than the posterior. The cavity of the cervix extends from the external to the internal os, and its mucous membrane presents folds called the arbor vitæ, and contains a large number of glands called the follicles of Naboth.

The peritoneum is reflected over the uterus, covering it anteriorly and posteriorly, meeting at the lateral borders and spreading to the ilia of each side, dividing the pelvis into two halves, and constituting the *ligamenta lata*, or broad ligaments. The *round ligaments* are two bands of smooth, muscular and elastic fibres, which extend first into the broad ligament, then

pass outwards and forwards, enter the inguinal canal with the epigastric artery, and are attached to the tissue of the labia majora. They were the former inguinal ligaments of the Wolffian bodies.

On the posterior surface the peritoneum descends over the supra-vaginal portion of the uterus, and over that portion of the vagina which covers the posterior lip of the intra-vaginal portion, then becoming continuous with the peritoneal investment of the rectum. This forms a deep excavation between the uterus and the rectum, called the *cul-de-sac of Douglas.*

The uterus possesses a large degree of mobility, and its position is largely influenced by neighboring organs: thus, a full bladder pushes the fundus backwards; a full rectum pushes the cervix forwards, etc.

The muscular fibres of the uterus are arranged in three layers The superficial covers the back and front like a hood, leaving the sides free; the median layer forms the great bulk of the walls, the fibres being longitudinal and transverse; while the inner layer is circular and insignificant. The mucous membrane measures 1-25 in. in thickness, is covered with an alkaline mucous and when slightly magnified presents the orifices of the uterine glands which extend through the whole thickness of the mucous membrane. The mucous membrane of the body of the uterus is covered with ciliated epithelium producing a current towards the fallopian tubes.

The mucous membrane of the cervix is of a yellowish red color, firm, and presents rugæ. It is covered with columnar epithelium, and tubular glands are present in large numbers, the Nabothian follicles.

The blood vessels to the uterus are the uterine from the hypogastric and aorta, which pass over to the cervix and ascend to the uterus.

2. **The Fallopian Tubes** pass outwards from the fundus of the uterus laterally. They are 3 to 4 in. long, contained in the folds of the broad ligament, and consist of the isthmus, admitting a bristle, the ampula admitting a sound, and a free extremity or pavilion communicating with the abdominal cavity and large enough to admit a small goose quill. The free extremity is surrounded by 10 to 15 fimbriæ all of which are free but one, which is larger than the others, and is attached to the outer angle of the ovary presenting a little gutter or furrow from the ovary to the opening of the tube. The fallopian tubes consist of a peritoneal, fibrous, muscular and mucous coat, the last arranged in folds and covered with ciliated epithelium, the direction of the current being from the ovary to the uterus.

3. The *Ovaries* are two flattened, nearly ovoid bodies which lie on each side of the uterus, attached to the broad ligament, and project from its posterior surface. They are about the size of an almond, $1\frac{1}{4}$ in. long, $\frac{3}{4}$ in. broad, and $\frac{1}{2}$ in. thick. Their outer border next the broad ligament presents a hilum for the passage of vessels. The outer extremity is rounded and attached to one of the fimbriæ of the fallopian tube.

The inner extremity is pointed and attached to the side of the uterus by the ovarian ligament.

Each ovary weighs 75 grains. The surface is marked by rounded translucent elevations produced by distended Graaffian follicles and often cicatrices and corpora lutea in various stages of atrophy.

Externally the ovary is surrounded by a fibrous coating called the tunica albuginea which is internally adherent to the subjacent tissues. Beneath this the parenchyma of the ovary is divided into a cortical and medullary substance: The medullary substance is reddish and spongy and contains an abundance of blood vessels.

The cortical portion is of a grayish color and consists of lay-

ers of connective tissue continuous with the medullary portion, and imbedded in this layer is a multitude of Graaffian follicles.

The *Graaffian Follicles* contain the ova, and at certain periods they enlarge, approach the surface of the ovary, and finally rupture, discharging their contents, which are carried by the vortex into the fimbriated extremity of the fallopian tube. These follicles exist only in the cortical substance of the ovary where they number several thousands, some of which never reach maturity. Though they exist from the earliest period of childhood, and even before birth, yet it is only at the age of puberty that the important stage in their development is noticed. Then from 12 to 30 of them enlarge, so that at that period we have all sizes between the smallest primordial follicle 1-800 in. and the largest nearly $\frac{1}{2}$ in. in size. In the fully sized follicles we have fully developed ova, one or very rarely two, of the pretty uniform diameter of 1-125th of an inch.

In the largest follicles then we have an outer layer of connective tissue called the *tunica propria*, which is lined with epithelial cells called the *membrana granulosa*, and at a certain point in this membrane is a mass of cells called the *discus* or *cumulus proligerus* in which the ovum is embedded.

The follicle also contains a liquid which is alkaline, slightly yellowish, not viscid, and containing a small quantity of albuminoid matter coagulable by heat.

The *Parovarium* or organ of Rosenmüller is the remains of the Wolffian body lying in the folds of the broad ligament between the ovary and the fallopian tube. It consists of from 12 to 15 tubes of fibrous tissue lined by ciliated epithelium and is often the seat of so-called Parovarian cysts.

The *Germ Cell or Ovum* when ripe is 1-125 in. in size, globular in shape and consists of :—

(*a*). *Zona Pellucida*, or external membrane, clear, structureless, strong and resisting, 1-2,500 in. in thickness. This with

radiating striations becomes the vitelline membrane. In fishes and molluscs there exists a micropyle or porus for the passage of the spermatozoa, and though this has not been demonstrated in the mammalia or in man, it probably exists.

(*b*). The *Vitellus*, c lled the principal or formative yolk, contains the elements which are to undergo development into the embryo. It is a semi-fluid mass containing besides the germinal vesicle, numerous granules which are large strongly-refracting globular bodies, very bright ; and between these are smaller and not so distinct albuminous granules.

(*c*). The *Germinal Vesicle* is the enlarged nucleus of the primordial ovum, and is clear, globular, 1-700 in. in size, embedded in the vitellus, its position varying. In its interior are a number of fine granules and a large dark spot,

(*d*). The *Germinal Spot*, which is 1-3,000 in. in size.

III. PERIODICAL OVULATION.

1. The Discharge of the Ovum. A ripe Graaffian follicle about 2 5 in. in size presents a rounded elevation with enlarged blood vessels upon the surface of the ovary, and at the most prominent portion is an ovoid spot which is entirely free from blood vessels, called the *macula folliculi*, where for a time before rupture a process of fatty degeneration is going on. At the same time at other portions of the follicle there is a growth of cells which projects into the interior, as well as an extension of blood vessels in the form of loops. These changes, together with the increase in pressure of the liquid contained in the follicle, causes the latter to burst, and with the liquid the discus proligerus and ovum are expelled.

The periodical ripening of the ova and their discharge constitutes "ovulation" and may be considered as the primary act of reproduction. It is necessary to bear in mind then that the ova exist originally in the ovaries as part of their natural struc-

ture ; that they only become fully developed at a certain age, viz : that of puberty, when the generative function is about to be established ; that successive crops of these ova ripen and are discharged in the adult female independently of sexual intercourse. Furthermore the ripening and discharge of the ovum are accompanied by a peculiar condition of the general system known in the lower animals as "rutting" and in the human female as menstruation.

2. Menstruation. During infancy and childhood the sexual system is inactive, but at the age of 14 or 15 the human female undergoes a remarkable change and arrives at what is termed the age of puberty. There is then a marked increase in the general development of the body ; the limbs become fuller and more rounded ; a growth of hair appears upon the mons veneris ; the mammary glands increase in size and take on a new stage of development ; Graaffian follicles enlarge and appear ready to rupture. At this time is also noticed a change in the moral as well as the physical attributes of the female ; a seeming consciousness of a capacity for new functions and a change in feeling towards the opposite sex which gives rise to that modesty so becoming and lovely in the true woman.

The female now becomes capable of impregnation and continues so, in the absence of pathological conditions, until the final cessation of the menses, known as the menopause or climacteric which usually occurs at 45 years of age. Puberty occurs earlier in warm than cold climates, and its onset is earlier in some girls than in others.

Together with these changes then in the female at puberty a discharge or flow from the genital organs is established, and this recurs every 28 days, corresponding to the period of discharge of the ovum. Each period begins with a feeling of general malaise, a sense of fulness and weight in the pelvic organs, and an increase of vaginal mucus, which has a peculiar fishy

odour. These feelings are soon relieved by a discharge of blood which is usually kept fluid by the acid vaginal mucus. It lasts on an average four days, and measures about 6 oz., becoming gradually less in amount, and lighter in color until it stops. The mucous membrane of the uterus at this time is thicker and softer and smeared with blood. From the 1-25 in. in thickness it becomes 1-5 in. thick, loosely attached, thrown into folds, and its glands enlarge. A fatty degeneration of the surface of the mucous membrane and of its blood vessels gives rise to the hemorrhage. Except a considerable desquamation of epithelium there is no true exfoliation of the mucous membrane in normal menstruation although there is in membranous dysmenorrhœa.

The process of menstruation may be thus explained: An ovum ripens; the swelling of the Graaffian follicle irritates the nerve termini in the ovary, which irritation is propagated to the central organs. Through reflexes by vaso-motor processes an arterial congestion of the internal female sexual organs is set up. This in turn increases the liquor folliculi, so that the theca folliculi bursts and allows the ovum to escape,—ovulation. At the same time the uterine mucosa becomes so hyperæmic that there occurs a bursting of the peripheral vessels, hemorrhage occurs upon the surface of the uterine mucous membrane, constituting menstruation. It is immediately after the menses that sexual desire is decidedly marked and at this time impregnation is most apt to take place. As we should naturally expect removal of the ovaries prevents ovulation and menstruation and usually removes sexual desire. The ovum when discharged from the ovary enters the fimbriated extremity of the fallopian tube, the fimbriæ being covered with vibratile ciliated epithelium, inciting a kind of vortex in the peritoneal fluid which carries toward and into the tube everything lying near it. This is seen experimentally in the lower animals with coloring matter which is even drawn from one side to the other when the opposite tube is occluded. The ovum then passes

along the tube to the uterus by the movement of the ciliated epithelium. Accidental causes may arrest it at the surface of the ovary, and if impregnated, give rise to "ovarian pregnancy;" if it drops into the abdominal cavity, we have "abdominal pregnancy," or if arrested in the fallopian tube, "tubal pregnancy."

If sexual intercourse do not take place the ovum passes down to the uterus unimpregnated, loses its vitality after a short time and is carried away with the uterine discharges. The menstrual flow is therefore only the external manifestation of a more important process taking place within. Its disorders constitute amenorrhœa, dysmenorrhæa and menorrhagia.

3. The Corpus Luteum. Let us see now what takes place in the Graaffian follicle after the expulsion of the ovum. Its office of providing for the formation and growth of the ovum is now over and it passes through a process of obliteration. The bloody cavity left becomes converted into a peculiar solid spheroidal body called the corpus luteum, the growth and retrocession of which are modified by pregnancy, so that we have two varieties, that of menstruation and that of pregnancy.

(*a*). The *Corpus Luteum of Menstruation*, often called the false corpus luteum. After rupture, blood fills the cavity of the Graaffian follicle and soon coagulates. This begins to contract and the serum separates from the clot and is absorbed, while the clot becomes smaller and denser, and its coloring matter becomes partially absorbed. At the same time the vesicular membrane becomes thickened and convoluted, beginning at the deeper part of the follicle. This hypertrophy reaches its maximum at the end of three weeks, and the ruptured follicle has now become completely solidified, showing a prominence upon the ovary and a minute cicatrix. After this it diminishes in size, its central coagulum continues to be absorbed, loses still its coloring matter, and the whole goes on atrophying. The

convoluted wall assumes a more decidedly yellow color, undergoes fatty degeneration and at the end of eight or nine weeks the whole is reduced to an insignificant yellowish cicatricial mark, and finally all traces of it disappear. At a post mortem several of these may be seen in various stages of growth and atrophy.

Such then is the process that takes place independently of sexual intercourse or impregnation.

(*b*). The *Corpus Luteum of Pregnancy.* The true corpus luteum presents a difference in the rapidity and degree of its development, due to the sympathy which exists between the uterus and the ovaries. As soon as pregnancy takes place menstruation is arrested, no more ova come to maturity and no more Graaffian follicles are ruptured during the whole period of gestation. Hence we might expect that the corpus luteum would be affected by an influence which affects the system in general so profoundly.

During the first three weeks its growth is the same as the false variety, but during the fourth week instead of retrograding it continues developing, the external wall growing thicker and more convoluted. This growth goes on until by the third and fourth month it reaches its maximum, about the sixth month it begins to retrograde, and after delivery atrophy goes on rapidly, and after lactation has come to an end the ovaries resume their ordinary function as before.

IV. FECUNDATION OF THE OVUM.

The last change and one which indicates its complete maturity, is, that the germinal vesicle comes to the surface and disappears from view, as also the germinal spot. In place of the germinal vesicle a spindle-shaped body appears. The granular elements of the vitellus arrange themselves around each of the two poles of the spindle in the form of a star. When this takes place the peripheral pole of the nucleus or altered germinal vesicle, along

with some of the cellular substance of the ovum, protrude upon the surface of the vitellus, where they are nipped off from the ovum in the form of small corpuscles just like an excretory product. These bodies, which are not made use of in the further development and growth of the ovum, are called polar or directing globules. The remaining part of the germinal vesicle stays within the vitellus and travels back towards the centre of the ovum to form the female pronucleus. As a rule only one spermatozoon penetrates the ovum and as it does so it moves towards the female pronucleus while its head becomes surrounded with a star; it then loses its head and tail, the latter only serving as a motor organ while the remaining middle piece swells up to form a second new nucleus, the male protonucleus. The union of these two elements forms the first embryonic segmentation sphere or blasto-sphere. (*Landois*).

Should union of the sexes have taken place by the fusion of the germ cell and sperm cell, a new stimulus is imparted to the growth of the former, and the fecundated ovum starts on a peculiar course of development by which it is finally converted into the body of the young animal.

Many questions of great interest arise in connection with fecundation such as hereditary influence; maternal influence; determination of sex, and effect of previous pregnancies.

V. DEVELOPMENT OF THE OVUM.

It is probable then that the ovum is fecundated either in the fallopian tube or in the pavilion near the ovary. The ovum as it passes down the fallopian tube becomes covered with an albuminous secretion which in birds is very abundant and constitutes the "white of egg." This serves to protect and nourish the ovum for a short time, and if the spermatozoa have not penetrated the vitelline membrane near the ovary, it prevents their doing so now.

The next thing noticed, whether the ovum has been fecundated or not, is that the vitellus gradually withdraws itself from certain portions of the vitelline membrane or becomes deformed and often rotates upon itself by amœboid motion.

1. We have said the sign of complete maturity of the ovum is the disappearance of the germinative vesicle. The deformed vitellus resumes its original rounded appearance and again fills the cavity of the vitelline membrane. The granules collect in a large zone around the centre of a clear spot in the vitellus and in the centre itself a clear rounded body makes its appearance, called the nucleus of the vitellus. This is positive evidence of fecundation and appears at from 15 to 30 hours.

2. Segmentation of the Vitellus. Almost immediately, segmentation takes place, the vitellus dividing into 2, 4, 8, 16, 32, 64, etc., until the whole forms an external membrane of polygonal cells containing a small quantity of fluid, the former being called the blastodermic membrane. The albuminous covering of the ovum gradually liquifies and is absorbed by the vitelline membrane for the nourishment of the vitellus.

The ovum now passes from the fallopian tube into the uterus about the eighth day after fecundation, having increased in size about 5 times, and being now composed of an external covering, the vitelline membrane, then the blastodermic membrane, and a certain amount of fluid in its interior.

Soon after the formation of the blastodermic membrane, at a certain point on its surface appears a rounded elevation or heap of cells called the *embryonic spot* which soon becomes elongated or oval, is then surrounded by a clear oval area called the *area pellucida*, with a dark line in its centre called the *primitive trace*. The latter afterwards becomes the headfold and groove for the neural canal.

Next the blastodermic membrane separates into two layers, an external or serous called the epiblast, and an internal or

mucous called the hypoblast. The layers thicken at the primitive groove and by elevation of ridges and their union posteriorly the canal for the spinal cord is formed.

At the same time another layer is formed from the inner surface of the external layer, and the adjoining surface of the internal layer, called the mesoblast. From the epiblast are developed the epidermis and its appendages, the great nerve centres, the principal parts of the eye, ear, nose aud one layer of the amnion.

From the hypoblast are formed the epithelial lining of the whole alimentary canal and of the lungs, and one layer of the allantois. From the mesoblast are formed the bones, muscles, fasciæ, peripheral nerves, vascular system, connective tissue, muscular coat of the alimentary canal, the outer layer of the amnion, and the other layer of the allantois.

3. The Formation of the Membranes. As the ovum is received into the uterus the vitelline membrane developes upon its surface little villosities formed of amorphous matter with granules, but non-vascular, and not permanent, merely assisting in fixing the ovum to the uterine cavity.

At this time a fold of the external layer makes its appearance, most prominent at the cephalic and caudal extremity of the neural canal, which gradually increases, passing over the dorsal surface of the embryo, and finally meets so as to completely enclose the embryo ; and this is called the *amnion.* When it has been completely formed, the vitelline membrane has been encroached upon by the external amniotic membrane and disappears, leaving this layer of the amnion as the external covering of the ovum which still possesses non-vascular villosities.

Soon after the development of the amnion, the *allantois* is formed, before the two layers of the amnion have fused. It appears as a small pear-shaped vesicle which springs from the mucous layer near the caudal extremity of the embryo. It rap-

idly increases until it forms a membrane of two layers situated between the two layers of the amnion. It becomes vascular and very soon encloses the internal layer of the amnion and the embryo. Then the two layers of the allantois blend into one, invade, and supercede the external layer of the amnion, becoming now the external layer of the ovum and called the *chorion*. That portion of the allantois included in the embryo forms the bladder and is connected for a time with the rest of the allantois by the urachus.

The allantois is a vascular membrane, at first containing two arteries and two veins. The arteries persist and form the two arteries of the umbilical cord, but the right vein becomes obliterated, the left remaining as the umbilical vein. These vessels are connected with the permanent vascular tufts of the chorion.

While this is going on the blastodermic vesicle becomes divided into two parts, the lower being embryonic, the layer above forming the *umbilical vesicle* which is cut off as it were from the abdominal cavity, but still communicates freely with the intestine. It gradually diminishes as the embryo increases and becomes farther removed from the embryo by elongation of its pedicle and finally becomes compressed between the amnion and chorion.

The chorion now becomes marked by a multitude of compound villi over its whole surface which gives it a shaggy appearance. The amnion is separated from the chorion by a gelatinous layer in which is embedded the umbilical vesicle, but the former gradually disappears until about the fourth month the amnion comes in contact with the internal surface of the chorion, when it forms a lining for the chorion and secretes a fluid in which is suspended the embryo. The amniotic fluid consists of water, albumen, urea and various salts, and has great power of resisting putrefaction. The uses of the liquor amnii are to facilitate the development and maintain the form of the ovum and uterus; to protect the embryo from pressure and lessen the influence of

falls, blows, and other accidents to the mother; to facilitate the growth of the fœtus and allow of its active motions; to aid the dilatation of the os uteri during labor, and after the membranes are ruptured to favor relaxation of the vagina and perineum, thus facilitating the passage of the child and the easier performance of obstetric operations.

The amnion then gradually becomes distended by increase in the quantity of amniotic fluid and reaches the internal surface of the chorion about the end of the fourth month, and extends over the umbilical cord to form its external covering.

4. Preparation of the Uterus to receive the Ovum. As the fecundated ovum enters the uterus, being shaggy with the villosities of the chorion, it becomes engaged in one of the furrows of the hypertrophied mucous membrane of the uterus. The hypertrophied mucous membrane lining the uterus is called the *decidua vera*, and the new growth springing from the border of the furrow in which the ovum is received is called the *decidua reflexa*, because it folds over and finally envelopes completely the ovum. That part of the decidua vera which afterwards becomes the placenta is called *decidua serotina*.

These changes do not take place in the mucous membrane of the cervix uteri, the glands there secreting a semi-solid transparent viscid mucus, which closes the os and is called the *uterine plug*.

Afterwards both decidua vera and reflexa diminish in activity of growth, and lose their importance as a means of nourishment for the embryo, while that part in contact with the vascular tufts of the chorion continues to grow and finally takes part in the formation of the placenta.

5. Formation of the Placenta. Our knowledge of the development and structure of the placenta is derived largely from its study in the lower animals.

The villi of the chorion all atrophy except at that part which is to become the placenta. These villi penetrate into the follicles of the uterine mucous membrane and become developed into a tufted capillary loop. At the same time the uterine follicle into which the villus has penetrated enlarges, sending out branching diverticuli corresponding to the ramifications of the villus. Every uterine follicle is soon covered with a network of dilated capillaries, which enlarge, and encroaching upon the spaces between them, fuse and become dilated into sinuses which communicate with the arteries in the muscular wall of the uterus, the sinuses extending through its whole thickness. The vascular tufts of the chorion still grow outwards and extend through the entire thickness of the placenta. By and bye the four membranes fuse into one, viz: the membrane of the fœtal villus, that of the uterine follicle, the wall of the fœtal blood-vessel and the wall of the uterine sinus. So that the tufts of the fœtal blood-vessels are bathed in the blood of the maternal sinuses, by which means both absorption and exhalation go on, but there is no direct communication.

At the end of the third month the limits of the placenta become distinct and the organ soon becomes fully developed. At the full period it occupies nearly one third of the uterine mucous membrane, is round or ovoid with thin edges, measures 7 to 9 in. in diameter and weighs from 15 to 30 oz.

Its fœtal surface is covered with smooth amniotic membrane and its uterine surface is rough and divided into irregular lobes or cotyledons separated by dissepiments.

The uterine arteries enter the maternal sinuses obliquely, so that when the uterus contracts after delivery and expulsion of the placenta these vessels are more completely closed by the muscular contraction.

The functions of the placenta are:—as a respiratory organ it provides for the interchange of gases between the fœtal and

maternal blood; as an organ of nutrition the epithelial cells of the fœtal villi possess a selective power and absorb nutriment, and it is in this way that medicines are absorbed and zymotic diseases communicated; while as an excretory organ, urea is eliminated so that it discharges the function of the kidneys, and lastly it possesses a glycogenic function until the liver is sufficiently developed to undertake that work.

The Umbilical Cord. The attachment of the embryo to the investing membranes of the ovum is at first a short and wide funnel-shaped connection, consisting of the commencement of the chorion, part of the amnion, and between the two a gelatinous material containing the stem of the umbilical vesicle. As the amniotic cavity enlarges the embryo recedes and its connecting part elongates, beginning to present the appearance of a cord, and as it emerges from the embryo at a point where the abdominal walls afterwards close round it to form the umbilicus it is called the umbilical cord. The fully developed cord is about the thickness of the finger, about 20 in. long, its external covering being the amnion, beneath it a gelatinous layer, the gelatine of Whorton, which surrounds the two arteries and vein protecting them from compression or obliteration. The arteries are twisted round the vein, and the cord itself is often twisted. The cord also contains the relic of the umbilical vesicle and the urachus, which is the connection between the allantois and bladder.

The decidua reflexa is being constantly distended by the growth of the ovum, and is finally pressed against the opposing surface of the decidua vera, so that by the end of the seventh month they are in contact and soon blend so as to form a single thin friable semi-opaque layer in which no trace of glandular structure can be discovered.

During the process of development then the product of fecundation is nourished, first as an ovum by the albuminous secre-

tion on its surface, then by the umbilical vesicle; as an embryo by the villi of the chorion, and as a foetus by the placenta.

VI. DEVELOPMENT OF THE EMBRYO.

1. Of its Various Parts. The product of fecundation is called an ovum until some form becomes apparent, and then it is called an embryo, and after the third month, at the time the placenta has formed and quickening is about to occur, it is called a fœtus and retains that name until delivery.

The bladder is formed from that portion of the allantois contained in the abdominal cavity after the closure of the abdominal plates.

The intestine is at first a straight tube and becomes convoluted. The anus is at first closed. The liver buds from the intestine.

The front of the upper part of the body is open and developes by four arches, the first forming the face and bones of the ear, the second and third forming the hyoid bone and parts adjacent, while the fourth forms the larynx. At first the face is open as far back as the ears, and cleft palate is thus caused by a deficiency in the union of the lamellæ which form the palatine arch.

The genital and urinary organs are preceded by two large symmetrical structures called the Wolffian bodies, which at about the 30th day develop rapidly at each side of the spinal column and are as large as to almost fill the cavity of the abdomen. Very soon two ovoid bodies appear at their side, the testes in the male, the ovaries in the female. At the external border are two ducts, one of which in the male becomes the vas deferens and in the female the fallopian tube. The kidneys are behind and until they are fully developed their office is undertaken by the Wolffian bodies. The scrotum corresponds to the labia and hence inguinal hernia in the female passes down into the labia.

2. As a Whole.—*First Month* (4th week). Its length is 4 lines, weighs 20 grains, size of a maggot or barley corn, and the form of a serpent coiled. The mouth on the cephalic extremity appears as a cleft, and the eyes as two black points. Nipple-like protuberances mark the position of the extremities.

The heart can be seen and the liver is disproportionately large.

Second Month (8th week). It measures 15 to 18 lines and weighs from 2 to 5 drachms. Is the size of a kidney-bean. The head is disproportionately large. The nose, lips and external parts of generation are visible. The anus appears as a dark point. The abdomen encloses the internal organs. The extremities project slightly from the trunk. Ossification occurs in the clavicle and lower jaw about the end of the seventh week; in the frontal bone and ribs, towards the end of the eighth week.

Third Month (12th week). It measures 2 to 4 inches and weighs 1 to 2 ounces. The eyes and mouth are closed, the fingers well separated, the nails recognizable, the sex can be detected by the aid of a lens, the supra-renal capsules and thymus gland are formed, the cavities of the heart and divisions of the brain are distinct, the placenta is isolated, the umbilical vesicle, allantois, etc., have disappeared, and the membranes are larger than a goose egg.

Fourth Month (16th week). It measures 5 to 6 inches and weighs from $2\frac{1}{2}$ to 3 ounces. The skin is rosy and tolerably dense, the sex is seen without the aid of a lens, the mouth is large and open, the umbilicus is near the pubis, the large intestine contains a greyish white meconium, and the muscles possess contractility.

Fifth Month (20th week). It measures 10 to 11 inches and weighs from 6 to 10 ounces. From the fifth month on the length of the fœtus is approximately exactly double the number of lunar months. The nails are distinct, the head, liver, heart

and kidneys are disproportionately large. Hair appears as a light down, meconium is of a yellowish-green color, and points of ossification appear in the pubis and os calcis.

Sixth Month (24th week). It measures 12 inches and weighs 1 to 2 pounds. Down and sebaceous matter cover the skin, the skin is of a cinnabar red color and the umbilicus is further from the pubis, the meconium is of a darker color, the scrotum is empty, the testes being close to the kidneys, the pupillary membrane is still present and the prepuce has appeared.

Seventh Month (28th week). It measures 14 inches and weighs 3 to 4 pounds. The skin is of a dirty red color, the hair is half an inch long and plentiful, the pupillary membrane is disappearing, the eyelids are non-adherent, meconium is of a dark olive-green, the fontanelles are distinctly felt, the liver is still large, and the fœtus is now "viable," i. e., capable of maintaining a distinct existence from the mother.

Eighth Month (32nd week). It measures 16 inches and weighs 4 to 5 pounds. The skin is more of a rosy flesh color and is covered with soft hair, the pupillary membrane has disappeared and the testes have descended into the scrotum. The open vulva disclose the clitoris to view. The nails almost reach the tips of the fingers, the eyelids are open and the cornea is transparent.

Ninth Month (36th week). It measures 18 inches and weighs 6 pounds. The head is covered with hair, the down on the body is disappearing, the scrotum is corrugated, and the vulva closing.

Tenth Month (40th week), nine calendar months. It measures 20 inches and weighs from 7 to 10 pounds. The skin is firm, not wrinkled, the fontanelles are large, hair on head, the nails are hard and reach the tips of the fingers, and the cartilages of the ears feel elastic. The true sign of complete maturity is the appearance of a centre of ossification in the inferior

extremity of the femur; this may be of use in medico-legal cases to determine the maturity of a dead child. To find it make a horizontal incision through the knee joint, remove the patella and make thin slices until a colored point is found, and still carefully slice, until a red spot is noticed. This osseous nucleus measures from $\frac{3}{4}$ to 3 lines in diameter.

B.—Pregnancy.

I. CHANGES OCCURRING IN THE MOTHER.

1. In the Sexual Apparatus. The *uterus* increases in vascularity, the arteries increasing in size and becoming tortuous. The veins dilate and become intimately united with the walls of the uterus. The mucous membrane becomes soft and thickened, and the muscular fibres increase in size and amount. The uterus increases in weight from 1 ounce to 2 pounds. At first this increase is not due to expansion of the ovum, for the same change occurs during the first four months in extra-uterine pregnancy; later on, however, it is due to expansion from pressure of its contents. In the early months of pregnancy the increase of the size of the uterus is in the antero-posterior and lateral, rather than in the longitudinal diameter, so that it is not until the fourth month that the fundus can be felt through the abdominal wall above the symphysis pubis. At the fifth month it fills the hypogastric region, and at the ninth month it reaches the epigastrium. During the last two weeks it sinks in the pelvis.

The *cervix* also hypertrophies, but its development is completed by the fourth month and is the result rather of loosening of its structure and swelling from serous infiltration due to hyperæmia. An apparent shortening of the cervix takes place, which was thought to be due to a gradual unfolding from above downwards, as the uterine cavity enlarged; but no real shortening takes place, however, for the internal os remains closed, as a

rule, up to the last two weeks of pregnancy, and the apparent shortening of the cervix is due to a spindle-shaped dilatation of the cervical canal causing an approximation of the external and internal orifices, and also to the swelling of the vaginal mucous membrane, and of the loose tissue surrounding the vaginal attachment of the cervix.

In the *vagina*, the muscular fibres hypertrophy, the veins increase and give it a blue color, the mucous membrane thickens and secretes more mucus, and there is thus often a pouting or protusion of the anterior vaginal wall between the vulva.

The vulva are turgid and the labia gape, the abdominal walls stretch, the navel protrudes, the linea albicantes appear and these are also often seen on the thighs.

The mammary glands increase in size, the nipple elongates, and changes occur in the areola. The capacity of the bladder is diminished from pressure and there is increased frequency of urination. Constipation is common, cramps in the legs are frequent from pressure on the sacral nerves, and œdema of the legs and varicose veins are common.

2. In the System at Large. There is an increase in the total quantity of blood. The red blood corpuscles, albumen, iron and salts are diminished, while the white blood corpuscles, the elements of fibrin, and the water of the blood are increased. As the amount of blood is increased the balance of the circulation would require either increased frequency of the heart-beat or increased capacity of the ventricles. Now as frequency is not increased the dilatation of the cavities is necessary. So also arterial tension is increased and the pulse is fuller. As the heart then has to do more work, eccentric hyertrophy of the left ventricle takes place.

Then the thyroid gland enlarges, there is an increased amount of CO_2 discharged by the lungs, the thorax is increased in breadth and diminished in depth, the breathing is often oppressed, indigestion is frequent, especially nausea and vomit-

ing, due to spasmodic contraction of the stomach and diaphragm; the appetite is capricious. Besides pigmentation of the areola, often dirty brown looking spots or patches appear on the face, especially the eyelids, root of nose and upper lip.

Increased blood pressure causes abundant and watery urine. The nervous system is very impressionable; the whole character is changed, neuralgic affections are common, the special senses are often disordered, and there is often dizziness and syncope.

II.—THE SIGNS OF PREGNANCY.

In the early periods of pregnancy no decided diagnosis can be made, but as it advances it is not long before certain phenomena clearly show the presence of the embryo. The signs of pregnancy then become a part of every physician's outfit to be used as a means of differential diagnosis for the satisfaction of himself and his patients; for there are several diseases of the uterus and its appendages, and of contiguous abdominal organs which it is essential to distinguish from pregnancy.

1. Cessation of the Menses. In married women, if previously healthy, this is a positive sign. In newly married persons menstruation is often very irregular, so that they may miss a period and yet not be pregnant. Cases again occur rarely where menstruation goes on during pregnancy, but it is scanty, comes from the cervix and is likely to be hemorrhagic and frequently results in abortion.

When conception occurs immediately before the menses it frequently does not arrest the discharge though it usually diminishes the amount.

All the causes of amenorrhœa must be borne in mind.

2. Mammary Sympathies. At a very early period of pregnancy the breasts become full and sensitive and tender. The superficial veins become larger, and visible under the skin.

Towards the seventh month a serous or milky discharge exudes from the nipples. These changes, however, may occur in displacements and uterine tumors.

Then after fecundation, the nipple, which in the virgin is short and the areola pink, becomes turgid, enlarged, and prominent, and its color deepens owing to increased vascularity and development of the lactiferous tubes. The areola enlarges, darkens from deposit of pigment, and becomes elevated, soft and puffy. The sebaceous follicles of the areola also enlarge and become prominent.

3. Abdominal Enlargement. After conception and the consequent uterine development there is a gradual enlargement of the whole of the lower part of the body, not merely of the hypogastric region, but also of the sides and nates. The woman is conscious of a sense of fullness, weight and pressure, and often perceives an increase in the size of the waist, her clothes become too tight and oppressive even before she notices any swelling in the abdomen.

Subsequently the distension is proportionate to the development of the uterus, much depending on the size and height of the woman, her degree of emaciation or obesity, gaseous accumulations in the bowels, diseases of liver or spleen, tumors, dropsy, deformity, quantity of liquor amnii, size of child, or multiple pregnancy.

The enlargement of the abdomen from pregnancy might be mistaken for other conditions :—

(*a*). *Distension from retained Menses.* Here the previous history and the presence of imperforate hymen or atresia of vagina or uterus would show what it was. The existence of a pelvic tumor in a girl who has never menstruated will of itself give rise to suspicion, as pregnancy under such circumstances is of extreme rarity. Then general symptoms will be found to have existed for a longer period than if pregnancy were

present, such as periodic attacks of pain at the menstrual periods. There will also be absence of mammary changes and other signs of pregnancy.

(*b*). *Uterine and Ovarian Tumors.* Menstruation does not cease in ovarian disease and is usually increased in fibroids. Then the character of the tumor, fluctuation in ovarian tumor, and the hard nodular masses in fibroid, the history of the case, the length of time, the absence of cervical softening and auscultation. There is great difficulty when these growths are complicated with pregnancy.

(*c*). *Tympanitis, or "Phantom Tumor,"* is recognised by the percussion-note and the absence of uterine tumor, as demonstrated by placing the hand on the abdomen and directing the patient to make alternate deep inspirations and prolonged expirations. During each expiration press the hand more firmly, until by and bye the hand feels the spinal column and no intervening body.

In some cases it is of advantage to put the patient under chloroform.

4. Ballottement. Is a manipulation by which the fœtus may be felt floating in the fluid contents of the uterus.

The patient lying upon her back, introduce one or two fingers of one hand up to the anterior fornix of the vagina, at the same time steadying the uterus outside by the other hand. Then by a sudden impulse of the fingers against the anterior part of the uterus above the cervix the fœtus is felt like a ball floating loosely in a bag of water. When distinctly felt this is a positive sign of pregnancy.

5. Quickening. This sign, which simply means the movement of the fœtus as felt by the mother, is the first satisfactory proof that she is pregnant with a living child. It usually occurs at four and a half months, but may be earlier or as late as the fifth month. The first sensation is trifling and is often

described as like flatulence, but more frequently as being peculiar, sudden, vibrating or like the fluttering of a bird held in the hand. As pregnancy advances the intervals of these motions become shorter, and the sensations more decided. Palpation, especially with a cold hand, often detects motion. The woman may be deceived by flatulence, corpulency, pulsations of abdominal aorta, impulse of the heart felt in the epigastric region, aneurism, or irregular action of the abdominal muscles; so it is better to trust to your own senses rather than those of the patient.

6. Auscultation. This may be direct or indirect and by it we may detect :—

(*a*). *Pulsations of the Fœtal Heart.* We can in this way detect the rhythm, strength and frequency. The average beat is 130 per minute, and it is best heard when the dorsum of the child is anterior, and is most frequently heard best over the left groin of the mother about midway toward the umbilicus, because the first position of the vertex is most common. Should you not detect the fœtal heart sounds, do not be too hasty in denying pregnancy, nor rashly suppose the child is dead. Auscultation also assists in detecting twins.

(*b*). *Uterine Souffle.* This is a murmuring, cooing, hissing, or bellows-like sound, and corresponds to the pulsations of the mother's vessels; hence it is really dependent, not on the placenta as formerly supposed, but on the blood-vessels of the uterus. It is believed that during pregnancy the uterus is analogous to an erectile tissue, and that the sound depends on the rapid passage of blood from the arterial into the distended venous sinuses. Hence when the circulation is excited, or the mother very nervous, the sound can be detected over the whole body of the uterus, but it is generally confined to that portion of the uterus where the placenta is located, and the circulation is most active.

This sound may not be detected at all in some cases, or it may appear and disappear. As an auxilliary sign it is one of importance.

7. Jacquemier's Test. The violet color of the vulva and vagina is due to the pressure of the uterus on the large veins of the pelvis. It can often be seen early in pregnancy upon the cervix, but this may also arise from a tumor.

8. Intermittent Uterine Contractions. These painless contractions of the uterus, followed by regular periods of relaxation, occur during pregnancy, and are owing to periodic discharges of nerve force. They may be increased by manipulation and often serve as a valuable means of diagnosis.

9. Kyestine in the Urine. This is a gelatino-albuminous pellicle which forms on the surface of urine of pregnant women after it is allowed to stand a few hours. It is seldom seen before the second month and is most marked between the third and seventh months.

These signs which we have thus far described are sometimes known as sensible or positive signs, but there are others not infrequent which are not peculiar to pregnancy as they may be found in other states. If, however, they are noticed in healthy married women, when there is no evident disease, they would render it very probable that pregnancy had occurred. They have hence been called rational or probable signs. They may be trifling, or they may be distressing and severe, and they gradually merge into the diseases peculiar to pregnancy.

10. Morning Sickness. This is usually a feeling of nausea or sinking at the epigastrium, or vertigo, felt on rising in the morning. It may be slight or go on to violent vomiting. It usually occurs early in pregnancy and lasts three months. It may occur in the evening, or it may be absent altogether.

11. Salivation or increased flow of saliva is a common indication in pregnancy.

Besides these we may have frequent desire to micturate, pruritis vulvae, nervous irritability, etc.

It is impossible to draw a line between the rational signs and the disorders of pregnancy, between the normal and the abnormal. Thus the simple nervousness of pregnancy may be so augmented as to result in convulsions; the nausea may result in distressing and dangerous vomiting; the fullness of the blood-vessels may lead to general plethora or local congestion; the normal merges into the abnormal; the healthy into disease, and this brings us naturally to a consideration of:—

III. THE DISORDERS OF PREGNANCY.

1. Local.—(*a*). *Œdema of Labia.* This is caused by pressure upon the veins, and especially if the pelvis is large, the uterus sinking lower and pressing upon the veins. The labia are swollen and there is stiffness in walking. Treatment consists in rest in the recumbent position, attention to the bowels, and bathing with warm water and acetate of lead lotion.

(*b*). *Pruritus of Vulva.* This is intollerable itching caused by acrid discharges or uncleanliness, or by diabetes.

To be treated similarly to the last.

(*c*). *Metritis.* Is usually caused by cold or violence and is confined to the muscular coat. The pain is severe, continuous, and increased by pressure. It often gives rise to adhesion of the placenta.

It is treated by hot fomentations with turpentine, by morphia and rest.

2. Reflex.—(*a*). *Neuralgia.* Treated by tonics and quinnine.

(*b*). *Salivation.* When excessive, treated by atropia.

(*c*). *Vomiting.* Often becomes distressing and in some cases even dangerous. It is best treated first by simple remedies as bismuth, oxalate of cerium, ingluvin, hydrocyanic acid. This

failing, chloral, or tincture of iodine in drop doses may succeed. If not, paint the os with solution of cocaine 4 p. c., or with nitrate of silver, or use the spinal ice bag. Failing with this dilate the os with steel dilator, and in rare cases it may be necessary to induce abortion.

(*d*). *Constipation.*

(*e*). *Syncope.*

(*f*). *Insomnia.*

3 Mechanical. Ventral hernia, prolapse of rectum and piles, enuresis and dysuria, cramps, varicose veins, anasarca, and albumenuria.

Hygiene of Pregnancy. As the respiratory activity is increased and more CO_2 eliminated, pure air is essential. Country air is better than town, and close confinement is to be avoided. The diet should be nutritious and easily digested, and a large appetite should be restrained.

The dress should be loose and easy, garters and tight corsets should be avoided, but flannel drawers should be worn. Gentle exercise should be encouraged, such as quiet walks and drives. Special care should be taken to avoid over-exertion at the menstrual periods. Railway journeys should be interdicted, and the marital relations should be infrequent, as this in newly married persons is a frequent cause of abortion. Frequent bathing is beneficial as it relieves the kidneys of a portion of their work. The genitals should be frequently washed.

The friends should be instructed to exercise forbearance and gentleness on account of the increased irritability of pregnancy.

IV. ABNORMAL PREGNANCY.

1. Due to Peculiar Conditions of Uterus.—(*a*). *Double Uterus.* There are various forms, such as uterus and cervix double and vagina single; uterus double and cervix and vagina single; uterus double, cervix single and vagina double;

or the uterus, cervix and vagina double throughout. All these forms permit of normal utero-gestation on either side or on both sides simultaneously, provided each half of the genital canal be sufficiently developed. If pregnancy occur on one side only, a decidua vera is developed on the other side and expelled at the end of pregnancy.

(*b*). *Displacements.* During the first few months of pregnancy the uterus may be retroverted and this may go on until it becomes incarcerated behind the sacrum, resulting in retention of urine or abortion. It should be replaced and held up for a few months by a pessary or in some rare cases it may be necessary to induce abortion.

2. Due to Peculiar Conditions of Decidua. Endometretis deciduae may be acute, resembling Asiatic cholera, or chronic, and give rise to hydrorrhœa gravidarum.

This may be the result of previous endometritis existing before pregnancy; the result of syphilis; irritation of diseased ovum; or retention of a dead fœtus. It may result in abortion or adherent placenta.

3. Due to Peculiar Conditions of the Placenta.—(*a*). *As to Form.* Instead of being round it may be horse-shoe shape, or like a battledore.

(*b*). *As to Position.* It may be attached over the os, constituting placenta prævia; over the fallopian tubes; or in extra-uterine pregnancy at various points in the abdominal cavity.

(*c*). *As to Development.* It may be abnormally large, due to hydramnion or hyperplasia; and if too small it may give rise to defective development of the fœtus.

(*d*). *As to its own Nutrition.* It may have undergone fatty, calcareous or pigmentary degeneration.

4. Due to Peculiar Conditions of the Amnion and its Fluid.—(*a*). *Excess of Amniotic Fluid or Hydramnion.*

Causes. Usually results on the fœtal side from mechanical disturbance of the placenta and umbilical circulation.

Symptoms. It impedes locomotion and produces discomfort and pain from distension. The lungs and heart are pressed upon causing dyspnoea and palpitation. There are also neuralgic pains and œdema of labia and legs.

It usually results in premature expulsion with slow and prolonged first stage and mal-presentations; in precipitate second stage; and inertia in the third stage, leading often to post-partum hemorrhage.

Diagnosis. It may be mistaken for twins, but the tenseness of the uterine and abdominal walls, the feebleness or absence of fœtal heart sounds, and the difficulty in perceiving the fœtus on palpation will assist in distinguishing it.

Treatment. The abdomen should be supported, and active exercise prevented. If symptoms should be urgent premature labor should be induced.

(*b*). *Defective Amount of Amniotic Fluid.* This is apt to limit the movements of the fœtus and so cause discomfort to the mother. It is also apt to cause abnormal foldings of the amnion and adhesions between it and the fœtus, which give rise to various deformities, to intrauterine amputation, etc.

5. Due to Peculiar Conditions of Cord. May have twisting, knots, or coiling of the cord

6. Due to Peculiar Conditions of the Chorion.—*Hydatidiform Mole.* Is produced by a proliferative degeneration of the villi of the chorion, a hypertrophy of their investing epithellum and connective tissue cells, which undergo mucoid degeneration. This gives them the appearance of cysts with translucent semi-fluid contents, varying in size from a millet seed to that of a walnut, and forming in mass a growth which may attain the size of a child's head or even larger. The fluid

of the cysts is albuminous closely resembling liquor amnii. If the mole is found, as it usually is, during the first month, while the villi are equally developed on its entire surface, the degeneration will involve its whole surface. The fœtus then dies, disintegrates and may undergo complete absorption, leaving the amniotic cavity empty.

It is more frequent in multipara, probably owing to a morbid maternal condition such as cancerous or syphilitic dyscrasia.

Symptoms. Failure of correspondence between the uterine enlargement and the computed period of utero-gestation; the doughy feel of the uterus; the lower segment of the uterus is abnormally tense; absence of ballottement and fœtal cardiac sounds; the passage of cysts; abortion usually occurs before the sixth month.

Treatment. If the diagnosis is doubtful, non-interference but careful watching would be best, but if certain, there is always great danger of hemorrhage and the sooner the uterine contents are removed the better. The tampon and ergot should be employed, and in some cases the os may be dilated and the fingers used to scoop out the cysts. Bear in mind the great danger of hemorrhage and meet it actively and promptly.

V. PREMATURE EXPULSION OF THE OVUM.

An interruption of pregnancy any time before the sixth month is spoken of as an *abortion* or *miscarriage*, after that as a *premature delivery*.

There is little hope of the fœtus living before the end of the twenty-eighth week, or seventh lunar month, or 196 days.

Abortion is very frequent and is said to occur as often as one to every 10 labors. The number of fœtal lives lost is therefore enormous. They occur more frequently in multipara, and many cases of early abortion are mistaken for dysmenorrhœa and unrecognised. Their influence on the future health of the

patient is important; they are rarely fatal, but from loss of blood often lead to great debility and are one of the most fruitful sources of uterine disease, probably because the patient is more careless during convalescence and thus involution of the uterus is interfered with.

Up to the end of the third month the ovum is cast off in mass, the decidua afterwards coming away in shreds or in one membrane. After that, the placenta being formed, the amnion is first ruptured, the fœtus is expelled and the membranes are shed as in natural labor. Often, however, the placental adhesions are firm and the secundines being retained give rise to hemorrhage or septic poisoning, so that abortion is more dangerous than natural labor.

Causes. The premature expulsion of the ovum is affected by contraction of the uterine fibres; the causes of abortion therefore are all those which produce this effect.

1. Maternal.—(*a*). *Predisposing.* Over-heated and ill-ventilated rooms; over-fatigue and excessive indulgence in the pleasures of society; alcoholic indulgence; over-frequent coitus; fevers; zymotic diseases; bronchitis; pneumonia; syphilis; lead-poisoning; in short, all those circumstances that increase the susceptibility or irritability of the cerebro-spinal nervous system.

(*b*). *Exciting.* Anything that directly or indirectly excites the uterus to contract and expel its contents, such as fright, anxiety, sudden shock, over-suckling, excessive vomiting, falls, accidents, presence of a fibroid tumor in the uterus, old peritoneal adhesions, and displacements of the uterus, especially retroversion or flexion.

2. Fœtal. Death of the fœtus, which may occur from effusions of blood into the structure of the placenta, from degenerations of its structure, or from atrophy, rupture, twisting or knotting of the cord.

Symptoms.—The two symptoms are hemorrhage and pain. After the third month there are often premonitory symptoms such as fulness, and weight in the pelvis, sacral pains, frequent micturition, periodic labor-like pains, and a mucous or watery discharge. These symptoms, followed by hemorrhage, indicate a threatened abortion, the hemorrhage and pain increasing in amount until the ovum is finally expelled. During the first three months, if the death of the fœtus has occurred before the completion of the abortion, it often happens that every vestige of the embryo may disappear and you cannot find it among the clots or secundines. In cases where there are abnormal adhesions to the walls of the uterus, retained portions of the secundines may remain after the ovum is expelled. In other cases, especially after the third month, the membranes rupture and the embryo escapes with the liquor amnii. While usually the retained portions quickly follow, it often happens that the cervix contracts upon the contents and a period of rest follows. This gives rise to what is commonly known as an incomplete abortion. The hemorrhage may cease for a time, and then recur with expulsive pains and force out the contents; or more frequently there is putrid decomposition of the retained portions, the woman being thus exposed to septicæmia which, although rarely fatal, gives rise to continuous fever, recurrent and exhaustive hemorrhages or perimetritis. There is, perhaps, no more fruitful source of uterine disease than a mis-managed abortion.

Diagnosis. Hemorrhage, pain, dilatation of cervix, and descent of the ovum, are sure signs of an abortion. When called to a case of hemorrhage occurring during pregnancy, at once examine the clots, even breaking them up under water, for traces of the ovum.

Prognosis. All cases of spontaneous abortion, if uncomplicated, are, under proper treatment, devoid of danger, and fatal cases are usually due to the ignorance, imprudence or wilfulness

of the patient, or else to malpractice on the part of the physician.

Treatment.—1. **The Prevention of Habitual Abortion.** If it is due to syphilis, mercury or potass. iodid. are indicated. If to retroflexion, use a pessary after replacing the uterus; this should always be removed after the third month.

In the newly married, if abortion accidentally occurs, it frequently recurs, being kept up by a morbid condition of the endometrium caused by the shortness of the interval between the pregnancies, which does not allow the restoration of the mucous membrane to a normal condition. A six weeks rest from coitus will often cure such cases. In many cases of so-called habitual abortion, fluid extract of viburnum prunifolium (black haw) in dr. ss—i doses 4 times a day is very beneficial.

2. The Arrest of Threatened Abortion. This may be affected where the death of the ovum has not taken place, and where the hemorrhage arises from a slight detachment only of the decidua or placenta.

Pain in the back during pregnancy should always be a warning to rest. If ever so slight a hemorrhage should occur the patient should lie down and keep perfectly still on her back. Restlessness, pain and anxiety should be allayed by a full dose of opium or a hypodermic of morphia. Then the black haw may be given and the patient should be kept in bed a full week after the final disappearance of all threatening symptoms.

3. The Management of Inevitable Abortion.—(*a.*) *Where the Sac is not Ruptured.* In these cases the hemorrhage is rarely profuse. The ovum is forced into the cervix by the uterine contractions and acts as a plug, the effused blood-coagulating between the ovum and the uterine wall.

In such a case, interference with the finger or tampon is

unnecessary and does harm, unless you are at a distance from the patient and fear to leave her on account of the dread of hemorrhage coming on, or if it is long retained in the cervix; then you may dilate with the finger and hasten its exit.

(*b*). *Where the Sac is Ruptured.* Here the liquor amnii escapes and removal of pressure allows profuse hemorrhage. The indication is to check hemorrhage and empty the uterus, and the most effectual method to stop the former is to further the latter. If possible, remove the ovum by introducing the finger, sweep the cavity of the uterus and withdraw its contents, pressing on the outside with the left hand. Then wash it out with a stream of warm bichloride solution (1-5,000). If the os is not sufficiently dilated use a steel dilator, which can only be properly done with a speculum.

4. The Management of Neglected Abortion. If a patient comes to you two or three weeks after the supposed completion of an abortion, with a history of recurrent hemorrhages, you may be sure the ovum is there yet and the fetid discharge and absorption of septic matter may lead to chills, fever, and uterine or perimetric inflammation. In such cases the hemorrhage, septicæmia or perimetritis may terminate fatally.

You should at once empty the uterus and wash it out, and in some cases it may be necessary to use a dull wire curette.

5. Management of Premature Labors. Here the tampon may be usually discarded, and after rupture of the membranes and expulsion of the fœtus, hemorrhage may be controlled by grasping the fundus and compressing the uterine walls. You may introduce the fingers and remove the placenta assisted by compression with the left hand.

In any of these manipulations the physician's hands should be scrupulously clean and then washed in bichloride solution (1-1,000) and smeared with carbolized vaseline or salicylic cream (vaseline 8 parts, acid salicyl. 1 part).

VI. EXTRAUTERINE PREGNANCY OR ECTOPIC GESTATION.

As the spermatozoa travel along the fallopian tube towards the ovary to meet the ovum, the latter after fecundation may be arrested and undergo development at some point outside of the uterus, and so we may have tubal, ovarian, or abdominal pregnancy.

1. Tubal Pregnancy. This is the most frequent of the three varieties.

Causes. Catarrhal affections of the tube attended with loss of ciliated epithelium; dilatation of the tube; anything which causes obstruction, such as flexions, constrictions, presence of polypi, etc.

As the ovum developes, the mucous membrane of the tube thickens like the decidua and receives the club-shaped extremities of the villi; a decidua reflexa is rare; the placenta is purely a fœtal organ. As the ovum developes, the tube stretches. If allowed to progress, at any early period, usually within the first three months, rupture of the sac occurs at the point of least resistance and usually at the site of the placenta, death occurring from hemorrhage or acute peritonitis.

Tubal pregnancy has been produced artificially in a bitch by exposing and ligating the fallopian tube.

2. Ovarian Pregnancy. Cases are on record where fecundation and development take place in the Graaffian follicle, the walls of which, together with the ovarian stroma, furnishing a membranous envelope like an ovarian cyst.

Rupture of the sac usually occurs within three or four months.

3. Abdominal Pregnancy. In those rare cases where the ovum has been fecundated and dropped into the abdominal cavity, whenever the ovum comes into contact with the peritoneum, a connective tissue proliferation is set up which

surrounds it with a vascular sac. The walls of this keep pace with the growth of the ovum, and form adhesions to the intestines, mesentery and omentum.

Symptoms of Extrauterine Pregnancy. The earlier stages resemble those of the intrauterine form. Menstruation usually ceases. Up to a certain point the hypertrophic changes occur in the uterus in the same manner, the mucous membrane being converted into a decidua and a mucous plug fills the cervix. Then there are paroxysmal pains in the sac and uterine pains like those of labor which are often followed by the expulsion of portions of decidua. When rupture occurs the symptoms are those of internal hemorrhage, and shock, viz.:—yawning, languor, pallor, fainting, clammy perspiration, rapid feeble pulse, intermittent vomiting, collapse and acute anæmia.

Termination. Although the usual ending of these cases is the rupture of the sac causing death from hemorrhage or peritonitis, sometimes they terminate in recovery. Thus a dead fœtus may be retained for years, or when it dies previous to rupture the ovum may degenerate into a mole, or the fœtus may undergo mumification and be converted into a lithopœdion. So that we may thus have:

1. The death of the fœtus and its becoming encysted in its own membranes.

2. The rupture of the sac, and the death of the mother from hemorrhage, shock or inflammation.

3. The rupture of the sac and the encysting of the fœtus in the cavity of the abdomen.

4. The occurrence of inflammation and abscess which may destroy the patient, or result in a fistulous communication between the sac and intestines or bladder, through which the fœtus may be evacuated in pieces, and subsequent obliteration of the sac and complete recovery of the patient.

Diagnosis. The existence of the signs of pregnancy; the presence of a tumor external to the uterus; the occurrence of

paroxysmal pains; and the exclusion of an ovum from the uterine cavity as determined by the sound.

Treatment. Varies with the stage of pregnancy and the condition of the fœtus.

1. Cases of Early Gestation. The indication is to imitate nature, for spontaneous recovery commonly follows the accidental death of the embryo. This may be accomplished in various ways, such as puncturing the sac with a trocar or Pacquelin's cautery, to inject the sac with atropia or morphia; or, best of all, and the only method which should always be resorted to in these cases, is by means of electricity. The faradic current is applied for five to ten minutes daily for one or two weeks Some recommend laparotomy.

2. Cases of Advanced Gestation.—(*a*). *Fœtus Living.* In many cases extrauterine pregnancy escapes detection until too late to employ a fœticidal method, and she may have gone nearly or quite to her full time before the diagnosis is made. Now although it may be very desirable to endeavor to save both mother and child by laparotomy, the history of the primary operation shows that there is only one chance in nine of saving the mother, and one out of two in saving the child The elements of danger are the functionally active condition of the placenta up to the moment of separating it from the fœtus; the abnormal characteristics of the placenta itself; the vascularity of the cyst wall; and the peculiar position and non-contractile basis on which the placenta is attached.

(*b*). *Fœtus Dead.* It is found by experience that if the woman passes through the period of danger, viz., pseudo-labor, without rupture of the sac, and the child dies, a longer delay of *ten weeks*, on the average, will enable a *secondary* laparotomy to be performed with a prospect of saving the woman in over 70 per cent of the cases.

The reason is that after fœtal death the placental functions cease, the vessels of the cord gradually close, as well as those

directly concerned in the oxygenating process of the child's blood; the placenta undergoes a process of carnification, becoming more solid and tough and less vascular, and the vessels which enter it from the mother are only of a number and calibre sufficient to keep its tissue from decomposition. Hence, if the fœtus be now removed by laparotomy, exfoliation may slowly take place without opening any important blood-vessel or necessarily favoring septic absorption. The placenta should be left to come away spontaneously, the wound being closed above, and left open below for the passage of the umbilical cord, and the introduction of antiseptic injections.

C.—Labor

Is the process by means of which the fully developed fœtus is extruded from the mother's body, and as it is accompanied by suffering and muscular exertion it has been termed labor, travail or child-birth.

I. THE DURATION OF PREGNANCY.

Is often a moral and a legal question. The average period is 280 days or 40 weeks or nine calendar months. Cases have been prolonged to 10 months. The laws of France, Scotland and Austria allow a possible limit of 300 days, and no case beyond this from a single coitus has been scientifically established.

A simple rule to determine the period of expected onset of labor is to count back three calendar months from the last menstrual period and add seven days.

II. THE CAUSE OF THE ONSET OF LABOR.

During the first three months the growth of the uterus is more rapid than that of the ovum, which is freely movable within the uterine cavity except at its placental attachment. In the fourth month the decidua reflexa becomes so far adherent to the chorion that it can only be separated by some degree of force, and the amnion is in contact with the chorion.

After the fourth month the amnion and chorion become agglutinated, though even at the end of pregnancy they may be with care separated from one another. After the fifth month the agglutination of decidua vera and reflexa takes place. In the last half of pregnancy the rapid development of the ovum causes a corresponding expansion of the uterine cavity, the uterine walls become thinned, so that by the end of gestation they do not exceed two or three lines in thickness. The great extension of the uterine cavity is not owing simply to overstretching, as is proved by the fact that the uterus toward the close of gestation is increased nearly twenty fold in weight, and by the histories of extrauterine gestation in which up to a certain period the uterus enlarges progressively in spite of the absence of the ovum. The increase in weight is due to increase in size and amount of muscular fibre cells, blood-vessels and connective tissue.

At the same time that these changes in the uterus are being completed there is increased irritability of the uterine tissue, and finally a fatty degeneration takes place in the decidua serotina which soon gives rise to separation of the membranes, the contents of the uterus then acting as a foreign body, contraction takes place, and all being ready labor sets in. Another element in the causation may be a periodicity inherent in some way that we cannot yet explain in the nerve centres, like the menstrual periodicity of 28 days.

III. SYMPTOMS OF LABOR.

Premonitory. Subsidence of the abdominal tumor takes place a few hours or a few days before labor sets in, followed by a sense of relief about the heart and lungs.

Then a relaxation of the soft parts takes place, followed by increased secretion, and a discharge of a small amount of bloody mucus, known as a "show." "False pains" are frequent, and there is tenesmus of the rectum, increased fulness of the mammæ, and frequent micturition.

The nervous system is often affected and she has tremors, and is anxious, depressed and fretful.

For clinical convenience actual labor has been divided into three stages :—

1st Stage.—*Dilatation of the Cervix.* The pains become intermittent and regular, and are felt in the back or abdomen or both, and the patient expresses a feeling that they "do no good." There is often nausea, vomiting, perspiration and greatly increased secretion.

On examination the secretion of the vagina is felt to be abundant, the os is felt enlarging, the membranes protruding and soon the presenting part can be felt.

As the pains increase in intensity and frequency the external os is put upon the stretch, its edge becoming thin and sharp. As the pain subsides the os relaxes and the membranes retreat. At the same time the softening, relaxation and hypersecretion of the soft parts increase. There are three elements in the opening of the os : 1. The mechanical stretching by the bag of waters ; 2. The contraction of the longitudinal fibres of the uterus, which draw the cervix open, and 3. The relaxation of the circular fibres.

The membranes then rupture and that part of the fluid in front of the presenting part escapes, while the rest may be retained for a while. The head then presses down into the cervix so that finally this and the vagina become one continuous canal. Should the membranes be late in rupturing, and be stretched over the child's head and face when born, this is known as a "Caul."

2nd Stage.—*Expulsion of the Child.* The symptoms of the first stage gradually and insensibly glide into those of the second stage, the contractions of the uterus rapidly becoming more frequent, returning every two or three minutes and becoming more prolonged. The uterine pains are now reinforced by

the abdominal muscles and the woman feels that they are easier borne because she can help herself. The glottis serves as a sort of safety-valve action, for if the pains are weak she holds her breath and bears down, and if they are excessive she cries out, the glottis opens and the muscles do not have the same purchase. The head now makes progress, the perineum bulges, the labia gape, the head recedes during the interval and then advances during the pain, the pressure on the rectum leads to evacuation of the bowel, the perineum thus stretches over the head and finally the head is born with great agony, a gush of amniotic fluid and usually more or less laceration of the fourchette, especially in primipara. There is usually an œdematous swelling on one or other parietal bone caused by pressure of the circle of contact, which is known as the caput succedaneum.

The second stage is one of danger to mother and child; to the mother from all those accidents which may arise from disturbance of the vascular and nervous systems, to irritation of uterus, vagina and perineum, and most of those complications which give rise to tedious and difficult or impracticable labors.

The child's life may be endangered or destroyed by pressure on its body or on the cord or placenta.

3rd Stage.—*Expulsion of Placenta.* After the birth of the child there is a short respite from pain, seldom longer than 10 or 15 minutes when the pain and bearing down recurs. A hard and tense tumor is felt through the abdomen, a finger in the vagina feels the placenta at the os or in the vagina.

The placenta then usually presents its fœtal surface or edge, and is soon expelled with the membranes and more or less blood.

IV. DURATION OF LABOR.

The average time for a primipara is 17 hours, for a multipara, 12 hours.

The *first* stage occupies 10 out of the 12 hours. Although

longer and more tedious it is generally a safe stage for the mother as well as the child, the mother not being usually at this time liable to any of the accidental complications of labor, and the child, if the membranes are unruptured, is very slightly disturbed by the contractions of the uterus which have no effect in compressing its tissues or injuring the attachments or functions of the placenta.

The *second stage* is short compared with the first, occupying two hours or less in a labor of 12 hours, depending on the strength of the woman, the relaxation of her tissues, her age, constitution, etc.

The *third stage* is short, usually only 10 or 15 minutes, but may take half an hour. It is a stage of danger to the mother from exhaustion, syncope, collapse, but especially from hemorrhage. Hysteria, puerperal convulsions, etc., may complicate this stage.

Delivery being now accomplished the nervous and vascular excitement rapidly disappear, and the mother feels weak, and often faint and exhausted. She also feels cold and chilly and often has a tremor or rigor, accompanied by depression and anxiety of mind. The pulse becomes less frequent, small and weak, hands and feet are often cold. In less than half an hour there is a reaction, the surface becomes warmer and the pulse full and natural, and she has a tendency to sleep which will refresh her exhausted system.

V. THE EXPELLENT FORCES.

These are the essential and the accessory.

1. The Uterine Contractions (essential). That the uterus is a contractile organ, is proved by its hardness and rigidity and its alteration of form; the sensations of twisting, grinding and contraction; the rigidity and alteration of the size of the os; the tension and protrusion of the membranes; the

descent of the child; the pressure of the uterus on the hand when introduced in version; and by the rapid diminution and obliteration of its cavity after evacuation of its contents.

Sometimes there is a general and uniform contraction of the uterine muscular fibres by which the walls are rendered more firm and tense, and its contents compressed. It is this tonic rigidity or contraction of the uterus which compresses the placenta after the birth of the child, and when this is expelled the walls regularly condense and obliterate its cavity, so preventing hemorrhage. This tonic contraction is usually painless and is dependent entirely on the sympathetic nervous system.

Nervous Mechanism of Labor. The uterus is independent of direct volition, for its rythmic contractions go on in insensibility from apoplexy, coma, anæsthesia, etc. It is, however, under the influence of emotions, as is seen when the pains leave by the excitement of the physician's presence, and come back when he retires. It is in this manner that encouragement and hope tend to help the progress of labor.

The causes of uterine contractions are :—

1. Periodic Centric Discharges of Energy. This is seen during pregnancy in the alternate contraction and relaxation of the uterus, and in the contractions induced by ergot, by excess of CO_2, and zymotic diseases.

2. Reflex Stimulus. — (*a*) *Through the Cerebro-spinal Nerves.* Examples of this are the contractions of the uterus caused by suckling, cold to the body, the pressure of the head on the perineum, or the hand drawing back the perineum.

(*b*) *Through the Sympathetic.* Examples of this are where a dead ovum acts as a foreign body; the beginning of ordinary labor; the use of the bougie to induce premature labor; and the dilating pressure of the bag of membranes or the fœtal head.

Nerve Centres and Nerves. There are two centres in the cord, one in the medulla and one in the lumbar region, and there are also nerve centres situated in the uterus itself.

The centre in the medulla is for reflex stimuli, transmitted by the cerebo-spinal nerves of the upper part of the body; from the action of CO_2, etc. The centre in the lumbar region immediately governs the uterus. Stimuli are transmitted to it through the cord from the centre in the medulla, and also indirectly, as by emotions, from the brain. The nerves carrying the stimuli from the uterus are the sympathetic, but these have filaments from the spinal cord through the lumbar and sacral nerves, and hence the pains of labor.

When labor has fully commenced the uterus takes on a more decided action; the alternate contractions and relaxations at first at long intervals become more and more rapid and vigorous, and the intervals shorter. As these contractions are more or less painful they are known as "pains."

In the first stage they are said to be cutting, grinding, twisting, but in the second stage pressing, bearing down, forcing. The pain is experienced in every part of the uterus during a pain. While the tonic contractions of the uterus are painless and resemble those of the heart and other hollow viscera; the clonic contractions of labor are painful, because the uterus is directly or indirectly connected with the spinal cord. This is especially the case with the nerves of the cervix, thus accounting for the greater sensibility of this portion of the uterus. The first effect noticed of these clonic contractions is that the os becomes rigid, then thinner and slightly open; after the pain it becomes soft, relaxed and yields more readily to the finger. This process goes on until in a few hours the os is dilated, quicker in multipara than in primipara. As a rule when the edges are thin and knife-like, the dilation will be slow, epecially if considerable density remains after the con-

traction has subsided. When the edges are thicker and softer the os enlarges more rapidly.

Should the liquor amnii have escaped prematurely there is often great retardation of the process, especially in primipara, and it is know as a "dry labor."

Dilatation of the os is effected mostly by the longitudinal fibres, by which the length of the uterus is shortened, there is descent of the fundus and elevation of the os, and while the circular fibres of the os also contract, the action of the longitudinal fibres is more powerful, so that the circular ones yield and the os becomes dilated. Then the bag of waters, or the presenting part of the child, may be regarded as a mould upon which the cervix expands. The membranes now usually rupture as the os becomes completely dilated and the expulsive stage begins. The descent and delivery of the child are accomplished by a continuation and increase of the contractions of the longitudinal and circular fibres of the uterus by which its cavity is diminished in every direction, and the child, greatly compressed, is expelled through the only opening which exists at its inferior extremity. The pains increase in severity as labor advances owing to the fundamental law that the contractions of the uterus are inversely as the size of the organ.

The more the longitudinal and circular fibres are shortened, the more efficient is their action. Hence, when the membranes are ruptured and the liquor amnii evacuated the pains become more severe and prolonged. So, as the child descends, they increase, and finally the most severe contractions are felt at the termination of labor, when the last portions of the infant escape from the uterus. The placenta then being detached acts as a foreign body and is expelled by the same forces.

2. Contractions of Abdominal Muscles and Diaphragm (accessory). Some have gone so far as to think that the expulsive stage of labor is mainly performed by this means,

but the fact that labor may be completed under anæsthesia, or in paraplegia, and that in inertia of the uterus no amount of voluntary action of the abdominal muscles will expel the child or arrest hemorrhage is sufficient proof that it is not.

The action of these muscles is of great importance, however, as an accessory force, for by their combined action the viscera of the abdomen can be compressed and a particular direction can be given to this force as required, just as in the acts of sneezing, coughing, vomiting, and defecation.

Before the os is dilated there is not much disposition to strain, and it ought not to be encouraged, for nothing can be gained at this time, but it rather delays dilatation by increasing nervous excitement and rigidity of the os. When, however, the os is dilated, the sense of fulness, weight and pressure in the pelvis causes a disposition to strain which cannot be resisted and ought to be now indulged. The first effect is rupture of the membranes, then the tonic contractions of the uterus are increased, so that the walls of the uterus are brought into close contact with the body of the child increasing at the same time its flexion.

Their next effect is to strengthen and increase the contractions of the uterus by fixing and supporting it and making equable pressure upon its surface, and giving a proper direction to its axis. The uterus being fixed by its attachments and pressing against the brim of the pelvis cannot descend lower, so that the abdominal muscles act through its walls directly upon the child forcing it downward through the pelvis. These forces also facilitate the distension and elongation of the perineum and enlargement of the vagina; they aid in the detachment and expulsion of the placenta and clots, and finally in expelling them from the vagina.

In breech cases it is this force which expels the head and the woman can thus effectually help herself.

VI. MECHANISM OF LABOR.

This comprehends the movements of adjustment by which the fœtus accommodates itself to the dimensions of the bony pelvis, and to the variations in the direction of the parturient canal. To thoroughly understand the process it will be necessary to study the pelvis and the fœtal head :—

1. The Female Pelvis. The bony pelvis is formed by the union of the sacrum, coccyx and the two ossa innominata.

The *sacrum* is shaped like a wedge and consists of a vertebral portion with two alæ or wings. In early life it consists of five vertebræ but afterwards they amalgamate into one single piece. Its base articulates with the last lumbar vertebra with which it forms a projecting angle known as the *promontory* of the *sacrum*. The sacrum measures $4\frac{1}{2}$ in. long by $4\frac{1}{2}$ in. wide, and has two curves, a lateral and a longitudinal.

The *coccyx* is composed of four rudimentary vertebræ. It is attached by a hinge joint to the sacrum, and is pushed back during defecation and child birth. When anchylosed it is a hindrance to labor.

The *ossa innominata* up to the age of puberty consist of three bones, the ilium, ischium, and pubis, and although they are afterwards amalgamated, they still retain the same names.

The articulations are the symphysis pubis, and the sacro-iliac synchondroses. During pregnancy the fibres of the pubic fibro-cartilage become infiltrated with serum and the ligaments elongate, so that at full time the distance between the pubic bones is doubled, and, at the same time, a slight degree of mobility exists at the sacro-iliac joint. This arrangement facilitates labor; thus at the beginning of labor as the head enters the brim the woman naturally chooses to sit up, to walk about, or if in bed to recline with the legs extended, positions which favor the rotation backward of the upper portion of the sacrum, and consequently increase of the antero-posterior diameter of the superior

strait. As the head, however, descends to the floor of the pelvis, the patient instinctively draws up her knees, throws the body forward, and during a pain contracts the abdominal muscles. In this way she succeeds in tilting up the pubis, in pressing the promontory forwards, and in rotating the point of the sacrum backward, thus increasing the conjugate diameter at the pelvic outlet.

The *ligaments* are the obturator membrane closing the obturator foramen, and the greater or lesser sacro-sciatic ligaments which convert the notches into foramina and assist in forming the inclined planes of the pelvis.

The *complete pelvis* is divided by the ileo-pectineal line into two parts, the false above, and the true below. The latter is a basin-like cavity, closed in by soft parts below, and called the *excavation*.

In order to understand the changes in the shape and dimensions of this bony canal it is usual to describe certain planes and axes.

Planes and Axes of the Pelvis. By a plane is meant simply a superficial surface without reference to depth or thickness. The upper and lower openings are termed respectively the upper and lower straits, while the space between is the cavity of the pelvis.

The *plane of the superior strait* or brim of the pelvis is bounded by the linea pectinea and has an elliptical contour with a depression behind produced by the projection of the promontory of the sacrum. Its dimensions are determined by measuring its diameters. The antero posterior or *conjugate* diameter extends from the upper border of the symphysis pubis to the promontory, and measures $4\frac{1}{4}$ inches.

The *oblique* diameter extends, the right from the right sacro-iliac synchondrosis forward, the left from the left sacro-iliac

synchondrosis forward to the acetabulum, and measures 5 inches.

The *transverse* diameter is the widest distance between the ilia, and measures $5\frac{1}{4}$ inches.

The axis of the superior strait is a line perpendicular to the centre of its plane, and extends from the umbilicus to the coccyx.

The *plane of the inferior strait*, or the outlet, is bounded by the subpubic ligament, the pubic rami, the rami and tuberosities of the ischia, the sciatic ligaments and the coccyx.

The *conjugate* diameter of the outlet extends from the lower border of the symphysis to the extremity of the coccyx and measures $3\frac{3}{4}$ inches, but when the coccyx is pushed backward it measures $4\frac{1}{2}$ inches.

The *oblique* diameters of the outlet are unimportant owing to the elasticity of the sciatic ligaments.

The *transverse* diameters of the outlet extend between the inner borders of the tuberosities, and measure 4 inches.

The axis of the outlet, when the coccyx is undisturbed, touches the promontory; if it is pushed backward it touches the lower border of the first sacral vertebra.

The *pelvic cavity* has an irregular cylindrical shape, its diameters being increased by the concavity of the sacrum, its anterior depth being $1\frac{1}{2}$ inches, its posterior being $4\frac{3}{4}$ to 5 inches.

The axis of the pelvic cavity may be represented by a line drawn perpendicular to a series of intersecting planes radiating from the symphysis as a centre, the upper being somewhat parallel to the plane of the superior strait, and the lower somewhat parallel to the plane of the outlet. The axis resembles an ellipse.

The Inclined Planes. The ischiatic spines divide the pelvic

cavity into two unequal sections; in the anterior and larger section the lateral walls slope downwards, inwards, and forwards towards the pubic arch, and are known as the *anterior inclined planes* upon which rotation of the occiput takes place in the mechanism of normal labor. The *posterior inclined planes* are smaller and slope downwards, inwards and backwards, and it is upon these that the sinciput rotates in the mechanism of normal labor.

The *diagonal conjugate* or sacro-sub-pubic diameter reaches from the pubic arch to the promontory of the sacrum and is $\frac{2}{3}$ of an inch longer than the true conjugate and hence it measures 4.90 inches.

Influence of the Soft Parts. The psoas and iliacus muscles diminish the transverse diameter nearly half an inch, so that it becomes the same as the oblique. The sciatic notches are filled by the ~~pyramidalis~~ and the tendon of the obturator muscle.

The outlet of the pelvis is closed by a succession of layers which form the perineal or pelvic floor and include the levator ani and coccygeus muscle, the pelvic fascia, the superficial perineal muscles, including the constrictor vaginæ, ischio-cavernosi, and transversus perinei.

By the bulging of the perineum during labor, both the length and degree of curvature of the pelvic canal are increased, the soft parts posterior to the vulva forming a gutter-like extension, the axis of which is continuous with that of the pelvis.

2. The Fœtal Head. This part presents the greatest mechanical difficulty to the passage of the child. The vault or compressible portion is composed of the frontal and parietal bones and the squamous portion of the temporal, and occipital. The posterior part of this is spoken of as the *occiput* while the opposite extremity of the ellipse is called the *sinciput*. The base or incompressible portion is formed by the union of the

ethmoid, sphenoid, petrous portion of the temporal, and the basilar portion of the occipital.

The Sutures and Fontanelles. The flat bones of the vault are held loosely in position by periosteum and dura mater. The sutures are the frontal, coronal, sagittal, and lambdoidal.

The anterior fontanelle or bregma is rhomboidal, the posterior fontanelle is smaller and triangular.

The Diameters of the Head.

1. Antero-posterior:
   - a. Occipito-mental ..... $5\frac{1}{4}$ inches
   - b. Occipito-frontal ..... $4\frac{1}{2}$ "
   - c. Sub-occipito-bregmatic ..... $3\frac{3}{4}$ "
2. Transverse:
   - a. Bi-parietal ..... $3\frac{3}{4}$ inches
   - b. Bi-temporal ..... $3\frac{1}{4}$ "
   - c. Bi-mastoid ..... 3 "
3. Vertical:
   - a. Fronto-mental ..... $3\frac{1}{4}$ inches
   - b. Cervico-bregmatic ..... $3\frac{3}{4}$ "

The articulation of the head with the spinal column at a point nearer the occiput than the sinciput is of importance in the mechanism of labor. It converts the head into a lever, consisting of two unequal portions. As the child's head passes through the pelvis the resistance to its passage causes flexion of the chin upon the thorax.

VII. EUTOCIA OR NORMAL LABOR.

Vertex presentations alone are to be regarded as normal, as they only realize the mechanical conditions compatible with the highest degree of safety to both mother and child. Perfect acquaintance with all the details of this natural process is necessary to a scientific knowledge of midwifery. The physician

who is well acquainted with the mechanism of labor, can by various measures facilitate such changes as to shorten the progress of labor and thus diminish the anxieties, sufferings and dangers of the lying in woman, and also greatly increase the chances for the safety of her child.

By *presentation* is meant that portion of the fœtal ellipse which is felt toward the centre of the canal of the pelvis or vagina.

By *position* is meant the relation of the presenting part to the pelvic cavity.

There are four positions of the vertex. 1. Left occipito-anterior. 2. Right occipito-anterior. 3. Right occipito-posterior, and 4. Left occipito-posterior.

The mechanism of labor in vertex presentations is usually described as consisting of *several acts*, viz: Descent, flexion, rotation, extension, restitution and expulsion of the trunk.

Let us now study the mechanism of the first position, describing each act, and then we can see how the other positions differ afterwards.

1*st Position, Left Occipito-anterior, L. O. A.* Occiput is to left acetabulum. This is the most frequent and the most favorable of all the positions of the vertex. The reason the long diameter of the head generally enters the pelvis in the oblique and not in the transverse diameter, is that the psoas and iliacus reduce the latter to the same length as the former, and as the child lies usually with its back forward to accommodate its concave anterior surface to the convexity of the mother's spine, so the head more naturally then enters the oblique than by twisting as it would if it engaged in the transverse diameter. Then as the left oblique diameter is partially occupied by the rectum and sigmoid flexure of the colon; as the pregnant uterus generally has a natural obliquity to the right

and is rotated on its axis so that its front looks towards the right and its left is foremost and most dependent, the fœtus is most readily accommodated to the shape of the uterus when its antero-posterior nearly corresponds with the transverse or greatest diameter of the uterine cavity, and hence the first position is most common.

On examination the finger comes in contact with the posterior ~~superior~~ angle of the parietal bone, and detects the right branch of the lambdoidal structure. Following this downwards and backwards you come to the overlapping edges of the posterior fontanelle.

1. **Descent and Flexion.** These movements are usually associated, descent taking place owing to the essential and accessory forces, flexion being due to the vertex meeting some resistance in the parturient canal, the force transmitted through the spine causing the descent of the occiput and flexion of the head on the chest. The head enters the pelvis in the axis of the brim, with the biparietal diameter parallel with the plane of the superior strait. It is a passive movement, and takes place as soon as the occiput has met with sufficient resistance to arrest its further progress, the end being the substitution of a shorter diameter for a previously longer one. Thus the average length of the sub-occipito-bregmatic diameter of the flexed head, $3\frac{3}{4}$ in, is $\frac{3}{4}$ in. less than the occipito-frontal or maximum diameter of the head when midway between extension and flexion.

Another cause of flexion, independent of the bony pressure, depends upon the relation between the shape of the head and the pressure exercised upon it at the girdle of contact either with the os or the imperfectly expanded soft parts, the propelling force being the general fluid pressure transmitted to the fœtus through the liquor amnii. The head forms an unequal wedge, the slope at the occipital end being steeper than at the

frontal, so that the force and resistance just explained result in flexion of the head upon the chest.

2. Rotation. The occiput now impinges on the left anterior inclined plane, gliding downwards, inwards, and forwards, under the pubic arch where it becomes fixed, while the sinciput impinges on the right posterior inclined plane, gliding downwards, inwards, and backwards into the hollow of the sacrum. The object of rotation is to change the head from the oblique diameter of the brim to the conjugate diameter of the outlet.

3. Extension. The lower part of the occiput resting against the under surface of the pubis, the propulsive force acts upon the sinciput causing separation of the chin from the thorax. As soon as the forehead has swept the hollow of the sacrum and passes the apex of the sacrum, the recoil of the coccyx and elastic perineum drives the head forward to the vulva, and as the biparietal diameter passes the vaginal orifice the perineum rapidly retracts, gliding over the face and the head emerges.

4. Restitution. The head now, not being supported by the perineum, falls toward the anal orifice, and performs a quarter rotation, the occiput turning toward the left thigh, the same position it occupied at the brim before it engaged in the pelvis. This movement is due to the rotation of the shoulders.

5. Expulsion of the Trunk. The right shoulder impinges on the right anterior inclined plane, fixes under the pubic arch, the left shoulder sweeps the hollow of the sacrum and the body emerges.

2nd Position, Right Occipito-anterior, R. O. A. Here the occiput is towards the right acetabulum, and the head occupies the left oblique diameter.

The mechanism is precisely the same as in the first position except that the occiput impinges on the right anterior inclined

plane, and the left shoulder on the left anterior inclined plane while the right shoulder sweeps the hollow of the sacrum.

3rd Position, Right Occipito-posterior, R. O. P. Here the occiput is towards the right sacro-iliac synchondrosis, and the head occupies the right oblique diameter. This is the reverse of the first position.

The chief cause of occipito-posterior positions is a partial extension of the head during the early stages of labor, the forehead being thrown anteriorly in accordance with the law that the most dependent portion of the presenting part is moved to the front.

Now one of two things will occur: either it will be converted into the 2nd position, or will become persistent 3rd

1. It may be Converted into a 2nd Position. One cause is the prominence of the promontory of the sacrum which has a tendency to throw the head on to the anterior inclined plane.

Another cause is the spine of the ischium and the greater length of the anterior than the posterior inclined plane. Hence when the head descends in the 3rd position, if the occiput strikes on the spine of the ischium or extreme boundary of the anterior inclined plane, it will be reflected forwards, and impinging on the anterior inclined plane be converted into the 2nd position.

If, however, the point of the occiput should strike posteriorly to the spine of the ischium, it will be reflected backward into the hollow of the sacrum, and we have:—

2. Persistent 3rd Position. Here descent and flexion take place just as in the 2nd position, but there is no extension movement, extreme flexion taking its place. Restitution occurs as in the 2nd position. The difficulties arise from loss of power from the peculiar position of the child, from the

increased resistance met with by the head during its descent, owing to extreme flexion instead of extension. Hence these cases are tedious and there is more danger of rupturing the perineum.

The left shoulder usually impinges on the left anterior inclined plane while the right sweeps the hollow of the sacrum.

4th Position, Left Occipito-posterior, L. O. P. Here the occiput is to the left sacro-iliac synchondrosis, and the head occupies the left oblique diameter. This position is less frequent owing to the presence of the sigmoid flexure of the colon and the rectum.

It may be converted into the 1st position or become persistent 4th, the cause and mechanism being precisely similar to that of 3rd position, but reversing the planes.

MANAGEMENT OF LABOR.

Were labor always the natural physiological process it ought to be, no treatment whatever would be demanded. Thus throughout the world thousands of children are daily born without the least supervision by an instructed physician, in many cases in secresy and retirement, and often delivery is safely effected even in opposition to superstitious practices and ignorant interference. The savage woman retires, it may be to the forest, and secluded even from her female companions brings forth her child, and perhaps in a few hours is sufficiently restored to attend to her own and her infant's necessities, and speedily returns to her usual laborious occupation. While somewhat similar cases rarely occur in civilized society, still the difficulties and dangers of labor are exceedingly augmented as the indulgences and luxuries of life are multiplied.

The diminution of physical power, the nervous excitability, the physical alterations from tight lacing, and the mental and

moral development of the educated lady all predispose to various complications, while at the same time the natural processes are more imperfectly and less efficiently executed.

Now while meddlesome midwifery is bad, it is necessary to know when to interfere as well as when to abstain. It is therefore your business to carefully watch the whole process of labor, to ascertain whether it is perfectly regular, and to detect the least deviation from the natural process, and thus you may often render timely assistance. You should sustain the mind and spirits of the mother and explain to her what sensations she should encourage and what she should resist, and in what manner she can most effectually promote her safe delivery.

Preparatory Treatment. When called to a case you should go at once, for it is better to be a few hours too soon than one minute too late. If it is in the country or any distance from your office go prepared for every emergency, and take your pocket case, enema syringe, hypodermic syringe, the very best fluid extract of ergot, chloroform, perchloride of iron, chloral, your obstetric forceps, and a solution of bichloride of mercury in alcohol (dr. 1—oz. 1).

At the house see that they have brandy, and plenty of hot and cold water. See yourself that the bed is properly made and the patient arranged. After the patient has become at ease with you, suggest an examination to "see if all is right." By the finger in the vagina you will recognise not only the presentation but the condition of the vulva and perineum, the state of the rectum and bladder, the length of the vagina, the degree of dilatation and softening of the cervix, the amount of cervical and vaginal secretion, the hardness of the child's head, and if the membranes are not ruptured the quantity of the amniotic fluid.

It is best to examine the patient while lying on her left side, but in some cases she may best be upon her back, and you

should wait for a pain, but afterwards keep the finger there to see the effect during the interval.

You should also try to map out the position of the fœtus on the abdomen by palpation and if the fœtal movements are absent auscultate.

While this is going on enquire into the history of the case, such as the length of previous labors, her health during pregnancy, the number of previous pregnancies and whether she is now up to full time, when the pains began, as to their frequency and situation and if the membranes have ruptured. If asked as to duration of labor be guarded and possibly ambiguous.

MANAGEMENT OF FIRST STAGE.

Before making any vaginal examination the hands and nails should be scrupulously clean, and then washed in a solution of bichloride (1 to 1000), and the finger smeared with vaseline.

During the first stage, you should make occasional, but not too frequent, vaginal examinations to see if dilatation is going on.

Caution her to pass urine frequently and occasionally retire from the room to allow her to do so. If the rectum is felt to be full use an enema. She should be encouraged to sit up and walk about, but never to bear down during this stage. Warm drinks may be employed. When the os is dilated you may rupture the membranes if that has not occurred spontaneously, since they have finished their work and now only retard labor.

MANAGEMENT OF SECOND STAGE.

You should now insist on the recumbent posture, as the erect is unsafe for both mother and child. The position on the side or back is a matter of indifference, but may be varied with advantage, and now you should make more frequent examinations. So long as the advance is regular do not interfere, but

should the pains slacken you should not let the duration of the second stage exceed the physiological limits. A very rapid second stage is not natural as it endangers the integrity of the vagina and perineum and predisposes to postpartum hemorrhage.

Every adjuvant should be used during this stage to assist the process, such as change of posture, pressure upon the abdomen, drawing up the knees, pressing on a foot board, holding the hands or sheet. In occipito-posterior positions, failure of rotation is always due to insufficient flexion, hence you should try to promote this by pressing on the forehead by the fingers during the pain, try to assist rotation, and during the interval of a pain hook two fingers over the occiput and draw it downwards and forwards.

ATTENTION TO THE PERINEUM.

Direct pressure on the perineum should be avoided by trying to check the two rapid advance of the head and by pressing the head forward to the pubic arch so as to equalize pressure on the ring of the vulval outlet, and by favoring the expulsion of the head during the interval of a pain.

If the pains are very severe at this time the woman should be encouraged to cry out and not to bear down, and if these means are not likely to avoid a tear you should use chloroform. In rare cases episiotomy may be resorted to.

When the head is born wipe the mucus from its mouth and nose, and see that the cord if round its neck is untwisted. Support the child and lift it upwards, being careful not to hurry matters as the shoulders often tear a perineum unscathed by the head.

You should now give the mother a dose of ergot. When the cord has ceased to pulsate tie it about two inches from the navel and again an inch further off for the sake of cleanliness,

cut it between, and hand the child to the nurse. You should now at once place your left hand upon the abdomen over the uterus relieving the nurse who has attended to this all the time that you have been tying and cutting the cord, and never let go of the uterus until the third stage has been fully completed.

MANAGEMENT OF THIRD STAGE.

You should keep your left hand upon the uterus and wait from 15 to 20 minutes for a contraction, not making traction on the cord but simply holding it tense with your other hand, your object now being to guard against hemorrhage, to promote uterine contractions and to secure the expulsion of the placenta.

Should the placenta not be expelled in 20 minutes, Crede's method or a modification of it should be resorted to, viz: apply at first light and then stronger friction to the fundus of the uterus until an energetic contraction is obtained, then grasp the uterus in the palm of the hand and by compressing it downward in the axis of the uterus and repeating this process the placenta is *expressed* from the uterus and vagina.

This method by maintaining contraction prevents hemorrhage, and by promoting speedy expulsion, guards against the dangers of retention.

It is well to retain the hand on the uterus for a short time to see that it contracts firmly and that clots are not retained.

The cloths with discharges are now removed and warm dry ones substituted, and a bandage is applied. A bandage assists in maintaining uterine contraction, in preventing passive congestion, supporting the parts and preventing pendulous abdomen.

Use of Anæsthetics. Chloroform is preferable to ether in labor, and is safer at this time than any other owing to the hypertrophy of the heart and increased aortic blood pressure, which lessens the danger of sudden anæmia of the brain.

In ordinary labor, when called for, it need only be given during the pain, unless some obstetric operation is undertaken, and then the patient should be put thoroughly under it. If the pains are weak or there is any tendency to hemorrhage chloroform should be avoided.

After the patient has been bathed about the labia, a piece of gauze or clean rag soaked in bichloride solution (1-2000) should be applied and over this a pad made of gauze filled with absorbent cotton or tow. These pads are cheaper than napkins and cleaner because they can be burned after being used for a few hours, for a napkin can never be washed so as to be thoroughly aseptic.

VIII. DYSTOCIA OR EXTRAORDINARY LABOR.

1. From Imperfect Uterine Efforts.—(*a*). *Irregular Action.* To understand how this impedes labor it is necessary to bear in mind the principal features of normal labor, viz: regular contractions of the uterus followed by relaxation and distinct periods of repose; stretching and thinning of the muscular fibres of the lower part of the uterus and retraction of the uterus above that point; softening and dilatation of the cervix; fixation of the uterus in the axis of the pelvis and the addition of the accessory to the essential forces.

In the first stage of labor the pains are most frequently defective from their short duration, or exhausting from being too rapid. Premature rupture of the membranes and loss of liquor amnii is apt to cause a "dry labor."

Treatment. Always try to find the cause and then regulate the pains and restore them to their normal character. See that the bladder and rectum are evacuated; secure abdominal support if there is faulty position of the uterus; in hydramnion rupture the membranes; if pains are exhausting use chloroform; if os is rigid the hot vaginal douche or chloral may assist; quinine in gr. v. doses will often strengthen the pains.

In the second stage, if a deformed pelvis is not the cause of irregular action, ergot or forceps may be indicated. You may have spasm of the os around the neck or body of the child, and may have to use forceps. In the third stage irregular action causes hour-glass contraction.

(*b*). *Inertia.* Is a diminution or temporary suspension of uterine action. It may arise from deficient nerve force; powerful emotions; plethora; weakness of the uterine muscular tissue; exhausting disease; constitutional debility; malnutrition; plural births; hydramnion, and fatigue.

Treatment. During the *first* stage there is very little danger to either mother or child especially if the membranes are not broken. The bladder and rectum should be evacuated, and then the hot vaginal douche, gentle friction, hot drinks, digital irritation of cervix and mental encouragement will all assist.

During the *second* stage the danger is to the child from obstruction to delivery. Rupture the membranes on the principle that uterine contractions are inversely as the size of the organ. Change the posture and encourage the patient to bear down. If this is not enough give ergot, use electricity or apply the forceps.

During the *third* stage inertia is most dangerous and is the cause of post partum hemorrhage.

The use of Ergot. It was introduced into obstetric practice by Dr. Stearns, in 1807. It excites very strong and powerful contractions of the uterus which are very persistent and the intermissions are of comparatively short duration. The pains become of a tonic rather than of a clonic character.

Indications. 1. To increase the uterine pains in protracted or lingering labors.

2. To hasten delivery when the life of the patient is endangered by some alarming symptoms, such as convulsions, accidental hemorrhage, etc.

3. To restrain uterine hemorrhage by causing firm contraction of the uterus.

Munde's pill for use in some cases after delivery, consists of ext. ergot gr. i, quinine gr. i, ext. nux. vom. gr. ¼. Take one three times a day.

Contraindications. 1. During the first stage of labor.

2. Rarely, if ever, in primipara.

3. In mal-presentations, or mal-positions of the fœtus.

4. In rigidity of the os, vagina, or perineum.

5. In disproportion between the head of the child and the pelvis.

6. In abortions.

2. From Impeded Uterine Efforts.—(*a*). *Connected with the Fœtus.* (*a*). *From Abnormal Position.*

(*i*). **Face Presentation.** It occurs once in three hundred cases.

Symptoms. You notice the high position of the presenting part, and make out the forehead, nose, eyes, mouth, etc. Be careful not to mistake it for breech, and use the greatest gentleness if you suspect a face for fear of injuring the eyes.

Causes. The cause of face presentation is a furtherance of the slight extension in the early part of labor which is so apt to produce occipito-posterior positions.

This extension movement may arise from congenital enlargement of the thyroid gland which separates the chin from the chest; from increased size of the chest, interfering with flexion; from stricture of the cervix about the neck of the child, the uterine walls adding to the circumference of the thorax; from mobility of the fœtus due to small size or excess of amniotic fluid; from oblique position of the child and uterus especially in cases of rapid escape of amniotic fluid; or lastly from coiling of cord round neck of fœtus.

Mechanism. In face presentations the chin corresponds to

the occiput in vertex presentations, and there are four positions, the two first being possible, the third and fourth being impossible for delivery to take place.

First. Mento-anterior Position. (Possible). *Left and Right-Mento-Iliac.* The movements are somewhat varied from those of the vertex.

(1). *Descent and Extension.* Here extension occurs by the same rules that produce flexion in vertex presentations. The chin sinks deeper and deeper in the pelvis, while the occiput is pushed backward against the dorsum of the child. The descent of the head is normally limited by the length of the child's neck, as it is only in the case of a very small child, or exceptionally roomy pelvis, that the head and upper portion of the thorax can enter the pelvis simultaneously.

(2). *Rotation.* The chin now impinges on the anterior inclined plane, rotates forward and engages under the pubic arch, the vault of the cranium sweeping the hollow of the sacrum.

(3). *Flexion.* The chin now emerges beneath the pubic arch, the shoulders press upon the base of the skull, the perineum is stretched by the cranial vault, the head now flexes upon the chest, the chin rounds the symphysis while the mouth, nose, brow, vertex and occiput appear in succession.

(4). *Restitution.* The shoulders now engage; in first position left shoulder impinges on right anterior inclined plane; in second position right shoulder impinges on left anterior inclined plane, and the chin is thus directed to the left or right thigh according as it has been first or second position.

Second. Mento-posterior Positions, also called Mento-sacral. Here extreme extension takes place and delivery is impossible except with a small fœtus, a dead fœtus, or a very roomy pelvis. At full term, with a fully developed fœtus and a normal pelvis, delivery is an impossibility owing to the simultaneous entrance of the chest and head.

Treatment. Be careful not to rupture the membranes, for the face is ill adapted to dilate the cervical canal, and rupture of the membranes in these cases is apt to be followed by complete escape of the amniotic fluid which would endanger the life of the child.

Manipulations to push up the face and bring down the occiput by pressure of the fingers usually fail. It is better to restore the normal attitude of the child by flexing the trunk and leaving the head to resume spontaneously its proper position as it sinks in the pelvis. It is performed by seizing the shoulder and breast with the hand through the abdominal walls, then lifting the chest upward and pressing it backward, at the same time steadying or raising the breech with the other hand applied near the fundus, so as to make the long axis of the child conform to that of the uterus, and finally pressing the breech directly downwards. As the child is raised the occiput is allowed to descend and then as the body is bent forward, flexion of the head is produced by the side walls of the pelvis.

After the membranes are ruptured exercise great care as to the eyes and admitting air into the mouth. In mento-posterior positions the chin may sometimes be brought forwards by one blade of the forceps acting as a lever.

In these cases, however, if not early rectified craniotomy has usually to be resorted to.

(*ii*). **Breech Presentations.** I have classed these under the head of dystocia, not because there is always necessity for interference, or any danger to the mother, but because there is danger to the child, and in primipara there is usually necessity for some intervention on the part of the physician. otherwise breech presentation might come under the head of natural labor as some have described it. We may have regular breech presentations where the legs are bent up in front of the body, or irregular giving rise to footling and knee presentations.

The proportion of breech cases, (excluding premature births), is as one to sixty.

Causes. The absence of the conditions which determine the presence of the head, or which interfere with the fixation of the fœtus, such as excess of amniotic fluid, lax uterine walls, and contractions of the pelvis. They occur very frequently in premature labors, and when the child is dead.

Diagnosis. The bag of waters is apt to be very large and high up; the sacrum, coccyx, anus, and tuber ischii are felt; and the presence of meconium is positive proof.

Mechanism. The position is defined by the direction of the child's back or sacrum, and we have four positions corresponding to those of the vertex, viz: Left and right dorso-anterior, right and left dorso-posterior.

1*st Position, Left Dorso-anterior.* This corresponds to first position of vertex, and is the most common. The cervix dilates slowly.

Descent and rotation of the hips take place. The *left* hip impinges on the *right* anterior inclined plane and is directed under the pubic arch, while the right hip sweeps the hollow of the sacrum.

The *left* shoulder then impinges on the *right* anterior inclined plane, while the right shoulder sweeps the hollow of the sacrum.

The head now engages, the long diameter of the head being in the right oblique diameter, the occiput impinges on left anterior inclined plane, comes under the pubic arch, while the face sweeps the hollow of the sacrum precisely as in first position of vertex.

2*nd Position, Right Sacro-anterior.* The mechanism is similar to first position, but reversing the planes, and corresponds to second position of vertex.

3*rd Position, Right Sacro-posterior.* This corresponds to 3rd position of vertex, is often converted into 2nd or 1st position

but it may persist and then the chief difficulties are from resistance of coccyx and perineum to flexion, the neck of the child being thus pushed so far forward that it is difficult for the forehead or even for the face to get readily under the pubic arch.

4th Position. Left Sacro-posterior.

MANAGEMENT OF BREECH. Try to preserve the membranes until the os is dilated by avoiding frequent examinations and cautioning the patient not to strain. After the membranes are ruptured expulsion of the body should be allowed to go on slowly, not dragging down a leg as it favors descent of the cord; the arms are apt to slip up by the side of the head, and the head is apt to become extended so that the maximum diameter of the head engages and may become locked. When the hips are at the vulva be ready to hasten delivery by telling the mother to strain downward. As the trunk emerges wrap it in warm flannel and raise it upwards. When the cord appears draw it down in one of the recesses of the pelvis and watch its pulsations. With one hand support the body of the child, with the other, or nurse, sustain a steady pressure on the fundus outside. The arms may be separately hooked down.

There are several ways of *treating the after-coming head.*

1. **The Prague Method** consists in raising the body of the child towards the abdomen of the mother and by placing your fingers on the face of the child, or in its mouth, make traction forwards. This is the usual means resorted to.

2. **Martin's Method** consists, besides the above, in making powerful pressure upon the child's head externally and above with the other hand, thus expressing it as it were.

3. **Deventer's Method** consists of a reversal of the Prague method, in that the body of the child is carried far backwards towards the perineum, with the view of turning the occiput out from under the pubes, the anterior surface of the neck resting on the perineum.

4. By the Application of Forceps. This is Crede's method and is highly spoken of by some authorities.

(*iii*). **Shoulder Presentations,** or "cross births," include elbow, hand and trunk presentations.

They occur 1 : 260 cases. Their management is exceedingly important, for delivery by the natural process is impossible except under very unusual circumstances, and the safety of mother and child depend on their early recognition. Their treatment, easy at first, becomes difficult and dangerous if there is much delay.

Causes. Prematurity, hydramnion, obliquity of the uterus, low attachment of the placenta, and falls during pregnancy. The tendency, however, is for such malpositions to be righted either before labor sets in, or in its early part.

Diagnosis. You will notice at once the high presentation and the absence of the head. You should then palpate the abdomen and you will feel the head in one fossa and the breech in the other. By a digital examination you feel high up the shoulder, and then the clavicle or axilla. The axilla will point to the feet and to one side, indicating that the head must lie in the opposite iliac fossa.

Again, the clavicle indicates the front and the scapula the back of the child, and so we know whether it is a dorso-anterior or dorso-posterior position. If you are still not satisfied of the exact position, and the membranes are already ruptured, you may bring down the arm, and see which one it is, and in which direction the palm points.

Positions. Dorso-pubic of right and left shoulder, and dorso-sacral of right and left shoulder. Thus in dorso-pubic positions, if the head lie in the left iliac fossa, the right shoulder presents, and vice-versa. So in dorso-sacral positions, if head lie in left iliac fossa, left shoulder presents and vice-versa.

Terminations. There are three possible terminations which

may occur naturally although we can never trust nature to accomplish them.

1. Spontaneous Rectification. Here the membranes are unbroken, and it takes place by means of the circular fibres of the uterus, assisted by the patient lying on the opposite side to which the breech is deflected. The head is made to present.

2. Spontaneous Version. Here the membranes have been ruptured, one side of the uterus contracts more vigorously than the other, so that the shoulder is pushed up and the breech brought down as the presenting part.

3. Spontaneous Evolution. The presenting arm and shoulder are tightly jammed down and the head is strongly flexed on the shoulder. As much of the body of the fœtus as the pelvis will contain becomes engaged, and then rotation occurs; this brings the body of the child into the antero-posterior diameter. The shoulder projects under the arch of the pubis, becomes fixed, and the body of the child becomes depressed and curved until it is expelled.

Treatment. This consists in turning, or if impacted may require decapitation, evisceration or embryulcia, for which, see obstetric operations.

(*β*). *Size and Form.* (*i*). LARGE HEADS. May give rise to dystocia and may require forceps, or turning. In these cases great care should be used in giving ergot.

(*ii*). DEFORMITIES. These include hydrocephalus, encephalocele, spina bifida, ascites, and multiple fœtuses like the Siamese twins.

(*γ*). *Number.* MULTIPLE PREGNANCY. Although the human female is said to be uniparous, there are exceptions, and twins occur once in 85 cases, triplets once in 7,000, while quadruplets and quintuplets occur still more infrequently.

A condition closely connected with this subject is *superfœtation*, by which is meant the fertilization of a second ovum belonging to another period of ovulation after the first has been developing for a month or more. Some doubt its possibility and most of these cases may be explained by a double uterus, by retention of one twin, by an interval between insemination and fructification of an ovum, by pre-existing extrauterine pregnancy and inaccurate information.

TWINS. Are often hereditary, and this sometimes runs on the father's side; some races are more apt to have them than others; and women married late in life are apt to have twins.

It may occur by two or more ova being fertilized at the same time, whether they have come from one or different ovaries, as is proved by the fact of two corpora lutea being found equally developed; from the occasional occurrence of pregnancy on both sides of a double uterus, and from the occurrence of twin pregnancy with one fœtus in utero and the other extrauterine.

Again, twins may arise from an ovum having a double yolk, an embryo developing from each.

When twins develop from two ova each fœtus is contained in its own chorion. If the ova are embedded in the decidua at sufficiently distant points the placentæ will be separate and each ovum will have its distinct reflexa. Usually each fœtus has its own membrane and liquor amnii, and although the placentæ are generally united in one mass yet each has its own independent circulation.

Twins from the same ovum are always of the same sex.

The weight of each child in a case of twins is less than that of a single delivery, but the conjoined weight is greater. They usually average five or six pounds each.

It is almost impossible to diagnose twins before birth. The abdomen is more distended and broader and you may hear two distinct fœtal heart sounds.

Twin labors are usually easy, the first stage is apt to be tedious from inertia, the second stage is apt to be rapid, and inertia is apt to occur in the third stage so that post partum hemorrhage is to be dreaded. The interval between the first and second child is usually from five to 30 minutes; sometimes both may present heads, but usually one is head and the other breech. Both placentæ usually follow the birth of the second child.

Management. Tie the cord after the birth of the first child and wait not more than half an hour; if pains do not return, rupture the membranes, and by external manipulation, the second child soon follows. The most serious complication is "locking" i. e., the interference of the second child with the delivery of the first one. Thus the first child presents a head but a foot or hand may be found presenting with it. Try and determine if it belongs to the first or second child, but in all cases it should be pushed up as far as possible until the head has completely engaged in the pelvis.

In all cases of twins there is danger of inertia, and post-partum hemorrhage is to be anticipated and prevented or checked.

(*b*). *Connected with the Passages.*

(α). PELVIS.

A classification of contracted pelvis is difficult; in the great proportion of cases, however, the diminution of space is usually at the brim and it is to these cases that the term "contracted pelvis" is usually applied, the others being irregular forms.

(*i*). *Contracted Pelvis Proper.* 1st. PELVIS ÆQUABILITER JUSTO-MINOR. This is a symmetrically contracted pelvis characterized by a general diminution of all the diameters, but no deviation, or but little, from their relative proportion in the normal pelvis. It is simply below the standard size, and is due to a premature arrest in the development of the bones so that the pelvis retains its infantile type.

2nd. THE FLATTENED PELVIS. Here the conjugate diameter is shortened but the transverse remains normal. It may be rachitic or non-rachitic, and is often due to lifting or carrying heavy burdens before the age of puberty, to arrest of development, or to osteomalacia. The result of these conditions is to produce a shallow pelvis with a contraction at the brim and a widening of the outlet. This deformity, when resulting from rickets, is mainly due to the weight of the super-imposed body, which presses the promontory forwards toward the median line. At the same time the sacrum is rendered more horizontal, the bodies of the vertebræ sink between the alæ so that the concavity of the sacrum from side to side is effaced, and the posterior superior spinous processes are approximated.

3rd. FLATTENED GENERALLY CONTRACTED PELVIS. This is a combination of the other two varieties and there is narrowing in the transverse as well as the conjugate diameter. It may be rachitic or non-rachitic

(*ii*). *Irregular contracted Pelvis.* st. THE NÆGELE OBLIQUE PELVIS. This consists in complete anchylosis of one sacro-iliac synchondrosis, in destruction or defective development of the sacrum on that side, and displacement towards the anchylosed side. The cavity is obliquely ovate. You notice an inequality outside and the patient limps.

2nd. THE KYPHOTIC PELVIS. Is due to posterior spinal curvature or caries of the vertebræ, and as a result of this an unnatural direction is given to the weight of the superimposed trunk, which is communicated to the base of the sacrum, the promontory being thus thrust upwards and backwards, the symphysis is rendered prominent, the transverse diameters are diminished, and the conjugate increased.

3rd. THE SCOLIO-RACHITIC. This accompanies scoliosis or lateral curvature of the spine. There is expansion of the pubic arch, prominence and lowering of the promontory, widening and

elongation of the sacrum and irregular kidney-shaped pelvic inlet, the pelvis being laterally tilted and asymmetrical.

DIAGNOSIS OF CONTRACTED PELVIS. On enquiring into the history you usually find a previous occurrence of rickets indicated by late dentition, square head, pigeon breast, attacks of indigestion and profuse perspiration, tumefied abdomen, small stature, spinal curvature, enlarged joints, and bow-legs. Then an enquiry into the previous labors, if there have been such, will throw light on the case.

MEASUREMENT.

1. Internal Pelvimetry. The patient is placed upon the back and the diameter which is now of importance is the diagonal conjugate or sacro-subpubic, and is the distance from the promontory of the sacrum to the lower border of the symphysis pubis. It may be measured by the pelvimeter, but the fingers are best. While the point of the finger touches the promontory ot the sacrum, mark off on the back of hand the under border of symphysis and deduct half an inch, this will give the conjugate diameter.

2. External Pelvimetry. Measure with a pair of callipers from the upper edge of the pubic symphysis to the depression just below the spinous process of the last lumber vertebra. This is normally $7\frac{3}{4}$ inches and deducting $3\frac{1}{2}$ inches for the thickness of bone and soft parts, you have $4\frac{1}{4}$ inches as the conjugate diameter. Then the distance between the two anterior superior spinous processes should be normally $9\frac{1}{2}$ inches, and between the two most projecting points laterally on the crests of the ilia should normally measure $10\frac{1}{2}$ inches.

I append the c rresponding normal diameters and dimensions, as given by Carl Braun and Schroeder :

		Inches.
Distance between anterior superior spinous processes	26 cm. or	10.2
Distance between iliac crests	29 cm. "	11.4

			Inches.
External conjugate diameter (Baudelocque)	20¼ cm.	or	7.9
Distance from sacro-coccygeal joint to sub-public joint (A. G. E. Breisky)	12.3 cm.	"	4.8
Distance between great trochanters	31½ cm.	"	12.3
Pelvic circumference (Kiwisch)	90 cm.	"	35.4
Diagonal conjugate diameter	13 cm.	"	5.1
True conjugate diameter	11 cm.	"	4.3

INFLUENCE DURING PREGNANCY AND LABOR.

1. During Pregnancy. In the early months it favors retroversion and this gradually merges into flexion and incarceration. In the later months the uterus is elevated more than in normal cases and is more movable, and the abdomen is more pendulous.

2. During Labor. The presenting part is always very high, and faulty presentations are more apt to occur. The pains are apt to be strong and hence if the mechanical obstruction is not removed the uterus is apt to rupture. The mechanism in these cases will depend on the size, form, position, and compressibility of the fœtal head, as well as on the size and shape of the pelvic space. There is usually more lateral obliquity, because the contracted pelvis prevents both parietal bones from entering at once.

Treatment. Our resources in contracted pelvis are the induction of premature labor, forceps, version, craniotomy, and abdominal section, for an account of which, see obstetric operations.

Before deciding the appropriate method it is important to enquire if pregnancy has advanced to the full term; if not, does the case call for the induction of abortion or premature labor; if the term has been reached, is it possible to deliver through the natural passage; if the child is alive or dead; if living, do the interests of the mother require the sacrifice of

the child's life; and lastly, if the conditions are such as to render it impossible for a living child to be born, what method would be best for the interests of both mother and child?

To answer these questions it will assist if we divide contracted pelvis into four degrees:—

First Degree. Where the conjugate diameter is between 4 and $3\frac{1}{2}$ inches, the forceps are indicated.

It is assumed that the child may be born alive by the spontaneous efforts of the mother, but it seems to be forgotten that a large proportion of children will perish and the mothers suffer greatly, and their tissues be lacerated, unless assisted. The dangers to the child result from pressure obstructing the circulation, and the dangers to the mother from long continued pressure on the soft parts, causing inflammation and subsequent sloughing of the bladder, vagina or urethra. These results have been attributed to the forceps but are really due to neglect of their timely use.

Second Degree. Where the conjugate diameter is between $3\frac{1}{2}$ and $2\frac{3}{4}$ inches, version is indicated.

Here labor unassisted is hopeless for both mother and child. By turning you bring the narrow part of the head (the bi-temporal diameter, $3\frac{1}{4}$ inches) to engage first in the narrowed conjugate, which the wider dome of the head could not do, and then after turning, manual abdominal pressure may be applied to the head and traction on the body from below.

If the child is dead it is always preferable in such a case to perforate and deliver.

Third Degree. Where the conjugate diameter is from $2\frac{3}{4}$ to $1\frac{3}{4}$ inches, here craniotomy is indicated, or if the child be alive and not injured by delay or futile attempts to deliver in other ways, and provided the general condition of the mother, her hygienic surroundings and capacity to secure skilled attendants

be such as to give substantial hope of her surviving abdominal section, this operation would be justifiable and preferable, p o-vided also that she and her relatives consent.

Fourth Degree. When the conjugate diameter is less than $1\frac{3}{4}$ inches, abdominal section is, beyond all question, less difficult and dangerous than craniotomy.

To recapitulate :—

When conjugate diameter of brim measures.	The proper mode of delivery is by :
Between 4 and $3\frac{1}{2}$ inches.....	Forceps.
" $3\frac{1}{2}$ and $2\frac{3}{4}$ "	Version.
" $2\frac{3}{4}$ and $1\frac{3}{4}$ "	Craniotomy, or if child alive, by Abdominal Section.
Below $1\frac{3}{4}$ inches.....	Abdominal Section and not Craniotomy.

(β). OS UTERI.

(*i*). OBLIQUITY. This may be lateral or anterior, the latter being more common; the head is thrown toward the promontory of the sacrum, and labor is thus impeded. The uterus is noticed to be thrown forward, the belly pendulous, and it is hard to find the os as it is so far back.

Treatment. Rupture the membranes, draw forward the os with the finger, and press on the abdomen with the other hand or apply a binder.

Lateral obliquity is often relieved by making the patient lie on the opposite side.

(*ii*). RIGIDITY. This is one of the most common causes of delay in the first stage, and is often caused by premature escape of the liquor amnii. It is very often found in those of a nervous and emotional temperament, the pains becoming cramp-like, the edges of the os being thinly stretched over the head.

It often occurs in girls who have been brought up in luxury, and who have had little physical exercise, the exciting causes

being powerful impressions on the mind, over-stimulating food or drinks, or too frequent examinations on the part of the physician.

Treatment. If the membranes are intact, waiting and patience often succeed, but if the membranes are ruptured you may need to assist, for it is often in these cases that laceration of the cervix occurs. Use first the hot vaginal douche, and if this is not sufficient give chloral hydrate in gr. xv doses every half hour for three doses. It often acts well and does not interfere with the strength of the pains. In some cases, where due to severe continuous pains, chloroform is often more useful.

(*iii*). INDURATION. This may be due to cicatricial hardening from former lacerations; to hypertrophy of the cervix from disease antecedent to pregnancy, or to aglutination and closure of the os.

Treatment. Try the same means as in rigidity, and if these fail, it may be necessary to make three or four notches round the margin of the os with a blunt-pointed bistoury. Should these fail, especially in cancerous disease, craniotomy or Cæsarean section may be necessary.

(γ). VAGINA.

(*i*). ATRESIA. This may be congenital or it may be acquired from lacerations, diphtheria, variola, enteric fever, cholera or syphilis. Persistent hymen comes under this head.

Treatment. The same as that of rigidity or induration of the os.

(*ii*). TUMORS. These include œdema of the labia, sanguineous effusions, displacements of the bladder, scybala in the rectum, calculi in the bladder, encysted tumors of the vulva, fibroids, steatoma, polypi, scirrhus and ovarian tumors.

Treatment. This depends on their character and mobility. If they do not interfere with labor let them alone, if they obstruct

they may need removal, but every case will have to be judged by itself.

(c). CONNECTED WITH THE SECUNDINES. (α). LIQUOR AMNII.

(*i*). ABUNDANT. This is hydramnion which has already been considered. It impedes labor in the first stage and by over-distension paralyzes the uterus.

Treatment. Puncture the membranes high up and allow the water to escape slowly if possible.

(*ii*). DEFICIENT. This may delay labor for the same reason as premature rupture of the membranes.

(β). THE MEMBRANES. Thin membranes rupture prematurely and give rise to "dry births," or if tough they may cause delay and require to be punctured.

(γ). THE CORD. (*i*). SHORT. Gives rise to danger to the child if it tears and bleeds, or to the mother from premature separation of the placenta and hemorrhage.

(*ii*). ENTANGLED. It is often twisted round the child's neck. After the head is born it may be slipped over its head, and where this cannot be done it may be tied and cut, and delivery hastened

(*iii*). PRESENTING. "Prolapse of the funis," although not endangering the mother, is serious as regards the life of the child which is very apt to be sacrificed.

Causes. Unusual length of the cord, deep placental site, insertio velamentosa, shoulder and breech presentations, prolapse of the extremities, hydramnion, multiple pregnancies, and above all contracted pelvis.

Prognosis. More than one-half of the children die. It is more serious when it complicates head presentations. It occurs as 1 : 300 cases.

Treatment. If the membranes are not ruptured try and maintain them so, for the expectant plan is best until dilatation

is complete. After rupture of the membranes, if the presentation is still high, the cord should be replaced and held up until the child has engaged.

This is best done by placing the patient in the genu-pectoral position; introduce the hand and place the cord beyond the greatest circumference of the head, and if possible, to the back of the child's neck; sustain the uterus externally by the other hand, and cease during the pains. If this is successful place the patient in the latero-prone position with the hips elevated by a pillow. If this should fail, put a piece of tape through the eye of a flexible catheter, and catching a loop of the cord with this push it into the uterus and leave the catheter there until the head engages so as to prevent prolapse again. If these means fail, especially in face presentations, version may be resorted to.

(δ). PLACENTA. (*i*). ADHESION. 1st. SIMPLE RETENTION. May be caused by spasm of the os; from maluse of ergot; large size of placenta; or from dragging on cord so as to pull placenta against the pubic arch, or invert it so that it is like dragging on an umbrella; this has been styled "student's placenta."

Treatment. There is always danger of hemorrhage while the placenta remains in the uterus, so if Crede's method of removal, together with gentle traction, are not sufficent, introduce the hand, dilate the os, and remove the placenta.

2nd. HOUR-GLASS CONTRACTION. Here portions of the uterus contract feebly, while the circular fibres are thrown into spasm and retain the placenta in the fundus. It may be caused by the maluse of ergot, or by premature dragging on the cord.

Treatment. Place the patient on her back, your left hand on the abdomen to steady the uterus, and with the right hand follow up the cord, gradually dilate the constricted part with two fingers, and seizing the placenta remove it.

3rd. MORBID ADHESION. May be uterine or placental. The

placenta may be thickened, indurated, or have undergone calcareous degeneration. There may have been inflammation, and the placenta may be adherent in whole or in part as a result of it. Though it is rare it may be presumed to exist when the uterus is large, firmly contracted, the os sufficiently opened, and where suitable traction on the cord and external pressure have failed to remove it, and on digital examination you find no spasmodic stricture of the os or uterus.

Treatment. If the means for removing a simply retained placenta are not sufficient, insert your fingers carefully between the placenta and the uterine surface, and by slow and cautious movements of the fingers the adhesions are broken down and the placenta freed.

Exert no force and be careful not to injure the uterine tissue for hemorrhage, rupture, or inflammation may follow. Great care should be taken after these cases to use disinfectants, and the uterine douche with bichloride (1-5,000) should always be employed.

(*ii*). PRÆVIA. Is where the placenta occupies that portion of the uterus subject to dilatation i. e., the internal os and lower segment of the uterus. The stretching of the lower segment leaves the mouths of the sinuses gaping, from which the blood pours until the stream is arrested either by art or by the supervention of syncope. As the hemorrhage in such cases is the natural sequence of cervical dilatation, it is called "unavoidable hemorrhage" in contradistinction to hemorrhage from detachment of the placenta when situated normally at the fundus or on the side walls of the uterus, which is known as "accidental hemorrhage."

Bandl has shown that during labor the uterine body becomes differentiated into a retracting and ever thickening fundus, a stretching and ever-thinning "lower uterine segment," and the cervix. It is not yet finally settled what is cervix and what is

"lower uterine segment." After labor the lower uterine segment and cervix can be felt at the lower part of the hard retracted uterus, hanging loosely like a flabby hose.

Placenta prævia may be central or marginal, called also partial.

It occurs as 1 : 1,000 cases.

Causes. It occurs more frequently in multipara than in primipara in the proportion of 6 to 1; more frequent in those who have had children rapidly, and in pregnancies shortly following abortions. All these conditions favor relaxation of the uterine walls, dilatation of the uterine cavity, subinvolution of the uterus, and defective development of the decidua.

Symptoms. Sudden hemorrhage occurring during the last few weeks of pregnancy without any apparent cause, without warning or pain, often while urinating or asleep. The first outpouring may lead to intense anæmia, and if shortly repeated may cause death. It usually ceases when separation of the cotyledons is completed, and after rupture of the membranes, for then pressure of the presenting part bears upon the bleeding surface. The hemorrhage is usually arrested during the height of the pains.

Diagnosis. It is not usually detected until the first hemorrhage occurs.

A sudden hemorrhage occurring during the last few weeks of pregnancy, without warning, cause, or pain, should always be regarded as suspicious of placenta prævia. On making a digital examination the os is felt to be soft and boggy, balottement is obscure, the cervix is long, wide, soft, and you can often feel vessels pulsating in it, and you can usually feel the rough, spongy, granular texture of the placenta within the os.

Prognosis. Is unfavorable if left to nature or if not promptly assisted. No complication in midwifery is more apt to produce sudden and alarming effects, and none requires more prompt

and scientific treatment. There are few cases more appalling to the young practitioner, and the successful management of a case of this kind at once distinguishes the educated accoucheur from the ignorant midwife.

Treatment. Always remember that there is no safety for the mother as long as pregnancy continues if a placenta prævia exists. When, therefore, you have been summoned to a case of sudden hemorrhage during the latter months of pregnancy and have diagnosed placenta prævia, delay is dangerous. Frequent recurrence of such hemorrhage may be seriously exhausting, or one repetition may be fatal, and if we have not acted promptly, perhaps all we shall then have the opportunity of doing will be to regret that we did not act when we had the chance.

We must remember that a certain number of these cases progress to a favorable termination and require no interference. This is more apt to occur in placenta prævia marginalis, although it is not unknown in placenta prævia centralis, where the child has been known to be born by strong contractions pushing the placenta out like a cap upon its head. It was on this fact that Simpson's treatment, consisting in the previous removal of the placenta with the hand, and Barnes' method of detaching the placenta from the lower uterine segment, depend. We must not, however, leave it to nature, but each case must be treated according to its condition.

If the os is not dilated you must plug, using of course antiseptic precautions. The tampon strengthens the pains and by the compression it exerts, causes coagulation of the blood escaping from the uterine vessels. Having once introduced the tampon you should never leave the patient until labor is ended.

After at most *four* hours, the plug should be removed and the cervix examined. If the attachment of the placenta has

only been slight to the lower zone, hemorrhage may now cease, the presenting part preventing any more, and the case may be allowed to proceed, or you may hasten delivery by ergot or forceps.

Barnes recommends separating at once that portion of the placenta which is attached above the inner orifice of the cervix. By so doing he says "we remove an obstacle to dilatation of the cervix, for the adherent placenta acts as an impediment." "Pass one or two fingers as far as they will go through the os uteri, the hand being passed into the vagina if necessary; feeling the placenta, insinuate the finger between it and the uterine wall, sweep the finger around in a circle so as to separate the placenta as far as the finger can reach. Commonly some amount of retraction of the cervix takes place and the hemorrhage ceases."

Should these means not succeed you can rupture the membranes, give ergot and hasten the engagement of the fœtus and its delivery. Should hemorrhage still persist, turn by Braxton Hicks' method, bring down one leg and let the case go on naturally, as it is quite unnecessary to extract. In placenta prævia centralis the hand should be passed through the least attached portion and the child turned, a leg brought down, and then left to nature.

In all these cases the most careful antiseptic precautions should be employed after delivery, as sepsis is apt to occur from the low placental site bringing it nearer to the outer world, and nearer the accoucheur's fingers, owing to laceration, and perhaps to imperfect retraction of the lower uterine segment.

3. Complications of Labor. (*a*). Hemorrhage.

(*a*). ACCIDENTAL HEMORRHAGE.

This is hemorrhage occurring during pregnancy or labor owing to partial separation of the placenta when normally attached. It is rare in primipara, and usually occurs in debilitated multipara.

Causes. Slipping, straining, lifting heavy weights, stretching, blows, congestion of the uterine vessels, causing the uterus to contract, and the partial separation of the placenta, allowing the blood to escape between the membranes and the uterus.

Symptoms. More or less bleeding, which is often profuse, depending on the exciting cause.

If the blood collects between the placenta and membranes it may be "concealed" or "occult" and is recognised by collapse, pain and distension of the uterus.

Diagnosis. Hemorrhage occurring during the latter months of pregnancy, the bleeding being increased during the pains, and on digital examination an absence of placenta prævia.

Occult hemorrhage is to be distinguished from rupture of the uterus. In the latter, labor has been going on for some time, the liquor amnii has escaped, the severe labor pains cease, there is recession of the presenting part, severe pain in abdomen, and escape of fœtus into the abdominal cavity.

Prognosis. The death rate of the mother is about 15 p.c., but that of the child is very high, so you should always give a guarded opinion as to the child.

Treatment. If very slight keep the patient in bed and perfectly quiet, giving refrigerent drinks.

If it still continues rupture the membranes, and if this does not stop it, use tampon or Barnes' dilators to dilate the os, and deliver by forceps or version, using ergot to hasten the labor.

(β). UNAVOIDABLE HEMORRHAGE.

(See Placenta prævia).

(γ). POST PARTUM HEMORRHAGE.

This is by no means an uncommon complication of labor, and may follow the simplest and easiest labors bringing the patient in a few moments to the brink of the grave, hence the importance of understanding its cause, mode of prevention and treatment.

Symptoms. The bleeding may occur after the birth of the child and before expulsion of placenta, but is usually applied to hemorrhage occurring after the completion of the third stage.

It may commence gradually or it may be sudden, and in severe cases so abundant as to deluge the clothes, bedding and even the floor. The hand on the abdomen misses the hard contracted uterus and instead it is felt large and soft and flabby.

The pulse is rapidly affected becoming thready or imperceptible. There is intense weakness or faintness, yawning, restlessness, gasping, she cries out for air, skin cold and covered with perspiration, loss of vision, ringing in ears, twitching, convulsions and finally death.

Such is the course of a fatal case, but recovery often takes place when the patient is at a very low ebb.

There is probably no complication of labor in which the life of your patient so much depends upon your presence of mind, skill and resources; by your assistance she will generally survive, without it she will usually perish. You must therefore be prepared to act instantly, and decisively.

Causes. The cause is inertia or atony of the uterus which may result from exhausting labor, rapid evacuation of the uterus, excessive distension, nervous depression, severe general ailments, retained placenta, sudden rising up, etc.

Treatment. As the causes arise from disturbances of the mechanism by which hemorrhage is normally prevented, the treatment consists in following nature's method, viz., securing firm contraction and retraction of the uterus.

Retraction is an important factor in the arrest of post partum hemorrhage, and by it is meant that reduction of the size of the uterus and thickening of its walls which is not followed by relaxation and expansion. Hence the blood is squeezed out of the

uterine sinuses and the vessels more thoroughly closed in proportion to the thorough retraction of the uterus.

Prophylaxis. If there has been a history of previous hemorrhage, she should be treated by tonics and general hygienic measures during pregnancy. Then be careful not to deliver too quickly, avoid all unnecessary traction on the cord, avoid the use of chloroform, and try to secure regular contraction of the uterus, giving a dose of ergot as the head comes upon the perineum. Be in no haste to deliver the body of the child. As soon as it is born keep your hand on the fundus, making firm pressure on it or gentle friction.

Remove the placenta by expression and then hold the uterus firmly for half an hour or even longer if necessary.

Should hemorrhage occur in spite of these precautions, remove pillows from under the patient's head, inject hypodermically 2 gr. of ergotine, or ½ dr. fluid ext. of ergot, diluted with an equal quantity of water, into the gluteal region. Introduce fingers or hand into vagina or uterus and remove clots, and then press fingers firmly against cervix making counter-pressure from the outside.

Should this fail place a bed-pan under the patient and inject hot water into the uterus at a temperature of 112° F. This failing, inject in same way a tumbler full of brandy or whisky.

Should the patient be very faint, inject brandy or ether hypodermically.

Lastly ice has been employed, and Barnes recommends the injection of perchloride of iron, and Trask uses iodine, but they are dangerous remedies.

The anæmia resulting from loss of blood may be treated by auto-transfusion, *i.* e., by bandaging the limbs, by the transfusion of blood by Aveling's apparatus or by the transfusion of a saline solution, (common salt dr. i, bicarbonate of soda dr. ½, warm water, 1 pint at temp. 100° F).

SECONDARY UTERINE HEMORRHAGE. May appear several hours, or days, or even a week or two after labor, and usually results from the retention of portions of placenta, or clots, or from partial relaxation or want of tone of the uterus, or to congestion of the uterus from some mental shock, or deficient or absent lactation.

Treatment. Remove clots or portions of placenta, if retained, and give ergot to cause the uterine tissue to condense.

(*b*). ECLAMPSIA OR PUERPERAL CONVULSIONS.

Few of the complications of labor are more terrible or fatal. It is peculiar to the puerperal state, occurring only during pregnancy, labor, or after delivery; it resembles epilepsy, and is not to be confounded with hysteria or apoplexy. It occurs once in 500 labors.

Symptoms. The *premonitory* symptoms are headache, vertigo, loss of memory, flashes of light before the eyes, contracted pupil, ambliopia, ringing in the ears, nausea, vomiting, dyspnœa œdema of the face and extremities, and finally the presence of albumen and tube casts in the urine.

Then the convulsions are ushered in, often suddenly, by twitching of the face muscles, rolling up of eyes, closed jaws, and insensibility, the pulse intermitting, and respiration being suspended. This lasts from one to five minutes and then the lividity of the face diminishes, the skin becomes warmer, the pulse fuller and consciousness partially returns.

In from a few minutes to an hour the fit recurs, and so on, the intervals diminishing and the fits lasting longer, and the unconsciousness becoming more marked.

Prognosis. The mortality is about 25 per cent.

In favorable cases, after expulsion of the uterine contents, the attacks cease or diminish in frequency, and the coma disappears, ending in natural sleep. On awaking the patient complains of

headache and impaired memory, and has no recollection of either the fits or the lucid intervals. The earlier the convulsions occur during labor the longer or more difficult the delivery, the deeper the coma; and the greater the insufficiency of the kidneys the worse the prognosis. Usually one half of the children are stillborn. Even after consciousness returns the danger is still not ended. There is a tendency to post partum hemorrhage, inflammation, hemiplegia, mania, and epilepsy.

Pathology and Causation. The predisposing causes are found in the increased excitability of the nervous system in the pregnant woman so that she is more liable to spasms, cramps, headache, neuralgia and all nervous affections. In this respect the pregnant woman resembles the young child. Then there is a tendency to plethora and a hydræmic condition of the blood, for during pregnancy the red blood discs, the albumen, iron and salts are diminished, while the white blood discs, the elements of fibrin and the water of the blood are increased.

In 1842 Lever noticed the coincidence between the convulsive seizures and renal insufficiency, which may or may not be associated with albumenuria, though the two go pretty constantly together. In 1851 Frericks pointed out the close resemblance between puerperal convulsions and the uræmic convulsions of Bright's disease. "True eclampsia," he says, "occurs only in pregnant women suffering with Bright's disease, and it bears to the latter the same causal relation as convulsions and coma in Bright's disease in general; it is the result of the uræmic intoxication with which also in its mode of manifestation it agrees."

This view was strenthened by Braun, in 1857, so that puerperal convulsions and uræmia came to be regarded as synonymous.

Seyfert thus states the objections to this theory:—

1. That convulsions may occur without albumenuria.

2. That the albumenuria is in many cases the effect and not the cause.

3. That in many fatal cases the kidney lesions were absent or wholly insignificant.

4. That convulsions are rare in chronic Bright's disease which had existed prior to pregnancy.

5. That in true uræmia, such as is necessarily produced by the suppression of urine, as, in uterine cancer, where the ureters are invaded, convulsions no not occur.

Although these propositions are perfectly correct, in drawing conclusions from them unnecessary stress is laid upon the presence or absence of albumen in the urine. It is the renal insufficiency and not albumenuria which causes uræmia and the convulsions.

What then is the *exciting* cause, for convulsions do not occur in every case of Bright's disease, nor even in every case of renal insufficiency. Frericks thought he had found it in supposing a ferment which converted the urea into ammonia carbonate.

A more scientific explanation, and the one now generally received, is the Traube-Rosenstein theory which maintains that "eclampsia takes place when, in persons rendered hydræmic by the loss of albumen, the aortic pressure was suddenly increased (as it is by the pains), the increased pressure giving rise successively to œdema of the brain, then to secondary compression of the vessels, and finally to acute anæmia." An anæmic condition of the hemispheres gives rise to coma, while if extended to the motor centres, it causes convulsions.

Treatment. Prophylaxis. Œdema of the face and legs should lead you to at once examine the urine, and finding albumen, put the patient on milk diet, avoiding meat and albuminous food. Saline cathartics, tonics containing iron, use

of mineral waters, and the Turkish bath. Should all efforts fail in removing the œdema and albumenuria, and should these steadily increase, you should resort to premature labor.

When the convulsions have set in, use chloroform inhalations and fluid extract veratrum viride, gtta. 4 every 2 hours. Venesection is useful in well selected cases, or you may inject hypodermically morphia, gr. $\frac{1}{4}$, or pilocarpine gr. $\frac{1}{3}$. Then the great object is to evacuate the contents of the uterus by hastening delivery. If the os is not dilated use hot water injections and digital manipulation or Barnes' dilators, rupture membranes and apply forceps or turn. Afterwards rectal injections of bromide and chloral, and means to restore the renal insufficiency and remove the œdema and albumenuria.

(*c*). SYNCOPE.

In a large majority of cases this is merely a symptom of loss of blood, or exhaustion, or of nervous origin, and one of the phases of hysteria, in which case it is not alarming. It occasionally happens, however, that syncope is far more serious, and is occasionally followed by collapse and death. In these cases it is caused by the recession of blood from the nerve centres when the intra-abdominal pressure is suddenly diminished by the rapid emptying of the uterus. The arteries, gradually in such cases, become empty, while the large venous trunks fill with blood, and the sluggish current predisposes to the formation of thrombi, which are prone to disintegrate and form emboli, which get into the circulation and become arrested in some venous plexus or obstruct the circulation in the brain or heart.

Whenever the pulse, after delivery, continues feeble, and rapid, it should be, even in the absence of other grave symptoms, a subject of profound alarm.

Treatment. Lower the head, give stimulants by the mouth or a hypodermic of brandy or ether. Hoffman's anodyne

Much can be done in the way of prevention, as by avoiding the occurrence of post-partum hemorrhage, not allowing the labor to be too long continued, preventing the patient from suddenly rising in bed, and applying compression to the abdomen, by the hand and binder.

(*d*). INVERSION OF THE UTERUS.

By the condition of acute inversion of the uterus, is meant the depression of the fundus into the cavity of the uterus, which may continue to increase until not only the fundus but the whole body and cervix have passed through the os uteri, the organ being literally turned inside out.

It is rare, occurring only once in 140,000 cases.

Causes. Predisposing. Inertia is the almost exclusive cause.

The *exciting* causes are traction on cord, especially when placenta is adherent; artificial attempts at extracting placenta, especially when accompanied by bearing down efforts on the part of the woman; and lastly a short or entangled cord may produce it by dragging upon the placental attachment during the birth of the child.

Symptoms. These depend on whether it is partial or complete, but usually there is great distress and severe pain, great depression and often collapse, indicated by fainting, small pulse, cold clammy skin, and she may die from shock.

On placing the hand upon the abdomen a cup shaped depression of the fundus is felt, and in the vagina the uterus can be felt more or less inverted. The patient has a feeling of pressure and bearing down, and usually there is more or less hemorrhage.

Prognosis. If the inversion is slight, spontaneous restoration may occur. The more complete the inversion the more danger, and the patient often dies from shock or hemorrhage.

Treatment. Everything depends upon promptness, decision and skill. If only slight, insert the finger, or a conical bougie and hold it in position until the uterus contracts. If it is introverted do not remove the placenta, but seize the tumor with the hand or push up the fundus with the fingers or bougie. You may require to use chloroform, and afterwards to give opium.

(*e*). RUPTURE OF THE UTERUS.

This terrible and often fatal accident of labor is the result of excessive muscular contractions of the uterus.

It occurs once in 1,500 cases.

Causes. The *predisposing* causes are preternatural thinness of the walls of the uterus, hydramnion, shoulder presentations, deformities of the pelvis, or anything which obstructs the passage of the child; also softening or ulceration of the uterine tissue.

The *exciting* causes are *traumatic*, such as blows or kicks, externally, the maluse of instruments, or improper efforts at turning.

The *idiopathic* causes are violent action of the uterine tissue; hence, if delivery does not speedily take place either exhaustion or rupture must occur. Hence the danger of giving ergot when there may be any obstruction to delivery.

Location of Tear. It may occur at any part, but usually near the cervix. It may be so slight as only to involve the os and cervix, or large enough to allow the child to escape into the abdominal cavity. In very rare cases it may only involve the fibro-muscular tissue leaving the peritoneal covering intact.

Symptoms. The labor pains have been severe and strong, and when the accident happens they cease abruptly, and she complains of a severe, intense, sharp pain in the lower part of the abdomen, the presenting part ceases to advance and frequently

recedes, while hemorrhage, external or internal, ensues. If the tear has been large enough to allow the child to escape into the abdominal cavity it will be felt through the abdominal wall.

The general symptoms are rapid prostration from the shock and hemorrhage indicated by pallor, feeble pulse, cold extremities, oppressed breathing, nausea and vomiting first of the contents of the stomach, and then of coffee ground matter, clammy perspiration and death.

Prognosis. Formerly thought to be always fatal, and although these cases were formerly left to nature and death, it has been observed that some patients recover without assistance, and a still larger number when they have been judiciously treated. When the lesion is in the lower part of the uterus, and the child and placenta are speedily delivered, recoveries are not very infrequent.

Treatment. Preventive consists in moderating or removing the predisposing and exciting causes, and diminishing the excessive muscular action. Be careful in the use of ergot or stimulants during labor.

In cases of dystocia, from impeded uterine efforts, you should always act early, knowing that the mother is always in danger of perishing either from exhaustion or rupture of the uterus.

When rupture has occurred the child should be removed at once by forceps or version, and after removing the placenta see that the rent does not communicate with the abdominal cavity; if not treat the case as after natural labor, giving opium and stimulants, but if it does open into the abdominal cavity and there is the least extravasation of the contents of the uterus, at once perform laparotomy, using all the antiseptic precautions, care of the uterine wound and toilet of abdominal cavity as in a case of Cæsarean section by the Sänger-Leopold method.

D.—Obstetric Operations.

I. THE INDUCTION OF PREMATURE LABOR.

Is indicated in cases in which the continuance of pregnancy or the occurrence of delivery at full term is associated with risks to the mother or child or both, which may be obviated by bringing pregnancy to a close at a period when the fœtus is able to maintain a separate existence from the mother.

The child is said to be "viable" if born during any of the last three months of pregnancy. Of course the probability of its living will be greater the longer it is retained. When you have the choice of time in inducing premature delivery, it should be between the 33rd and 34th week.

The principal indications for the operation are :—

1. *A Moderate Degree of Pelvic Contraction.* The object here is to save the child's life by obviating the necessity for craniotomy ; or to spare the mother the danger of craniotomy or abdominal section that might be required if pregnancy went to full term.

Degree of contracted pelvis in which it is proper to induce premature delivery to save the child's life is where the conjugate is between $2\frac{1}{2}$ and $3\frac{1}{2}$ inches.

A child at the 28th week may be delivered through a pelvis whose conjugate is $2\frac{1}{2}$ inches ; at 32nd week, through 3 inches ; at 36th week, through $3\frac{1}{2}$ inches, and if conjugate is over $3\frac{1}{2}$ inches it may be left to full term and be delivered by forceps.

2. *Diseases which Imperil the Life of the Mother*, such as chronic affections of the heart or lungs, hydramnion, tumors, ascites associated with dyspnœa, pernicious anæmia, uncontrolable vomiting, placenta prævia, chorea, convulsions, albuminuria with excessive œdema.

3. ***Habitual Death of Fœtus***, at a period before which by

experience the fatal ending has occurred. This is often due to syphilis, in which case both parents should be treated constitutionally.

MODES OF OPERATING.

1. *Catheterization of the Uterus.* A gum-elastic bougie is passed into the os and between the membranes and uterus; left in situ it usually causes the onset of labor in 24 hours.

2. *Puncturing the Membranes.* This is the oldest of all methods, but is open to the objection to all cases of premature discharge of the amniotic fluid, viz., tedious labor, absence of dilating cone, and danger to fœtus from pressure of contracting uterus on placenta and cord.

3. *Mechanical Dilatation of Cervix.* Best begun by steel dilator and then Barnes' bags. Never use sponge tents.

4. *Vaginal Douche.* Is a useful adjuvant to the previous methods.

Besides these there are two methods which are uncertain and dangerous, viz., the vaginal tampon, india rubber bag or colpeurynter; and injections into the uterus.

In the choice of methods take them in the order I have given them, and the process may be accelerated by ergot, forceps, or version.

ARTIFICIAL ABORTION. Is justifiable when it offers the only hope of saving the life of the mother, and is called for when :—

1. There is incarceration of a prolapsed or retroflexed uterus which cannot be replaced.

2. In those diseases of pregnancy which immediately imperil life, and which have been vainly combated by all the resources at our disposal.

The operation is performed in the same way as for premature labor, and as it is always accompanied by some risk to the mother, we should weigh carefully every circumstance of the case, and if possible have a brother practitioner to share the responsibility.

It has been condemned as immoral, and illegal, but it is impossible to admit that there can be any immorality in performing an operation to give a chance of saving the life of a woman, when by neglecting to perform it there is almost a certainty that both herself and child may perish.

II. THE FORCEPS.

Is a steel instrument which may be termed a pair of artificial hands, adapted to the form and size of the child's head, which when applied may be used in safely and efficiently accomplishing labor when difficult or otherwise impracticable. It is one of the most valuable of obstetrical instruments and while it shortens the mother's sufferings, it saves the life of the child.

It was invented by a Dr. Chamberlain, who kept it for several years a secret in the family, and in 1672 thus wrote, "My father, brothers and myself (though none else in Europe as I know,) have by God's blessing and our own industry, attained to and long practiced a way to deliver women in this case without any prejudice to them or their infants, though all others (being obliged, for want of such an expedient, to use the common way) do or must endanger, if not destroy, one or both with hooks."

There are three varieties of forceps, the short, the long, and the axis-traction. The forceps consist of handle, shank, blade and lock. The blade has a cephalic and a pelvic curve. They may be used at the superior strait, in the excavation, or at the inferior strait.

They may be used as compressor, tractor, and lever.

The *indications* for the use of forceps are : —

1. When the ordinary forces of nature are insufficient to overcome the obstacles to delivery, such as rigidity of parts, contracted pelvis, large head, inertia, etc.

2. When speedy delivery is demanded in the interests of mother or child, as in puerperal convulsions, accidental hemorrhage, placenta prævia, etc.

The *conditions essential to safety in their use* are :—

1. The os must be dilated, or dilatable.

2. The membranes ruptured.

3. The rectum and bladder empty.

4. The pelvis of sufficient size to admit the passage of the child.

Mode of Application. Patient is placed on back, forceps oiled, warmed and disinfected. Take left blade in left hand, and holding it like a pen insert it between the child's head and the fingers of your right hand, which are inserted into vagina to protect soft parts of mother. The right blade is inserted in same way and the instrument locked. Then make traction in axis of pelvis, and in primipara remove the blades when head stretches the perineum. The traction should be steady and not oscillatory. Chloroform may be used or not.

They are applied to sides of pelvis and not to sides of child's head.

They should be applied during the intervals of the pains and traction made when the pains come on.

III. VERSION, OR TURNING.

Is the altering of an unfavorable into a favorable presentation, by changing the posture of the child in utero so that one or other extremity of the fœtal ellipse shall be brought to the centre of the pelvis, and then assisting delivery.

You should always by a careful examination be satisfied of the necessity of the operation; apprise some judicious relation of the character and necessity of the operation; the os should be dilated or dilatable; if possible the operation should be done before the membranes are ruptured, and if the uterine contractions are powerful give chloroform to diminish them.

1. Cephalic Version. Is useful when it is only required to rectify a faulty presentation, but it is not applicable when there are complications which call for rapid delivery, as prolapse of cord or placenta prævia or contracted pelvis.

(*a*). *By External Method.* By external abdominal manipulation the head is brought into position, and held so by an assistant until it engages, or else by pad and bandage externally.

(*b*). *By Combined Method.* (Braxton Hicks'). Introduce left hand into the vagina, place right hand on outside of abdomen to make out the position of the fœtus and direction of head and feet.

Should the shoulder present, then push it up with one or two fingers in direction of feet. This will bring down the head towards the os, when it may be received on tips of fingers. The head will play like a ball between the internal and external hands, and can be placed in almost any position at will.

2. Podalic Version. Is indicated where cephalic version would be too difficult, or in faulty presentations of the head and face, in prolapse of cord, some cases of placenta prævia and accidental hemorrhage, and in contracted pelvis.

(*a*). *Bipolar or Combined Method.* (Braxton Hicks.) A precise knowledge of the fœtal position is essential.

Two or three fingers are passed through the cervix, the presenting part is pushed upward, the external hand making pressure in the direction to push down the breech. The two hands thus make the extremities of the ellipse move in opposite directions, the movements by which this is affected being a combination of continuous pressure and gentle impulses or taps with the finger tips on the head or shoulder, and a series of half sliding, half pushing impulses with the palm of the hand outside. These manipulations are conducted during the intervals between the pains.

This operation is one of the most important contributions to obstetrical practice during the present century, but requires the membranes intact or at least just evacuated, and the pains not sufficient to cause contraction of uterus upon child.

(*b*). *Internal Method.* This is the operation which was usually referred to under the head of turning, and before the invention of the forceps was oftener done than at present.

The patient is placed upon her back and put under an anæsthetic. The hand and arm are bared, disinfected, oiled, and passed into the uterus during the interval of a pain, and a foot or leg is seized and brought down, while the other hand externally on the abdomen, steadies the uterus and assists in the rotation of the child. When a pain comes on desist, and then during interval proceed, using caution and the utmost gentleness.

It is a good plan, if it be a shoulder presentation, and an arm protrudes, to tie a tape around the latter to use afterwards in drawing down arm during delivery, and preventing it becoming engaged with the head. It will help also to tie a tape round the leg to assist in traction.

There is more danger in this method than in Hicks', because the hand has to be introduced wholly into the uterus, which endangers the mother from septicæmia, shock and the risk of lacerating the uterus.

IV. CRANIOTOMY.

Consists in perforation of the child's head, diminution of its size, and its delivery. It is solely done in the interests of the mother.

Indications. In deformed pelvis, where the conjugate diameter is between $2\frac{3}{4}$ and $1\frac{3}{4}$ inches; in obstruction by irremovable tumors, or cancer; in rare cases of rigidity of the os or cicatrices; in dangerous conditions of the mother, as eclampsia, calling for rapid delivery where the use of the forceps or version is not sufficient to meet the case; and in difficult labors where the child is dead or impacted.

Signs of a dead child. Absence of heart sounds, cessation of signs of pregnancy, the patient feels lighter, and the movements of the child cease; by digital examination the cranium feels flaccid and the bones movable under the scalp.

The Operation of Craniotomy. The patient is placed upon the back, and chloroform administered to prevent pain and save her feelings. Complete dilatation of the os is not necessary.

The bladder and rectum must be evacuated. The perforator, or Smellie's scissors, are plunged into skull, withdrawn and introduced again so as to make a crucial incision. They are then passed down to the medulla so as to destroy the life of

the child, since if it is delivered quickly it may cry, even if some of the brain substance has been evacuated. In some cases the brain substance may be washed out with a syringe. Then the craniotomy forceps may be employed to break up the skull, being careful not to injure the soft parts of the mother by spicula of bone. To extract the child the blunt hook may be inserted into the foramen magnum or traction may be made with the craniotomy forceps.

Cranioclasm is a modification of craniotomy, where after using the perforator the cranioclast, which is simply a large and powerful craniotomy forceps, is introduced, one blade between the scalp and the skull, and the other inside the skull, so that a larger portion of the bone may be crushed, or a firmer hold taken to make traction.

Cephalotripsy is another modification of craniotomy, the best instrument being that of Braxton Hicks, which consists of a powerful pair of forceps having only a slight pelvic curve, and a screw to make powerful compression. The advantage in this instrument is that the skull may be crushed completely within the scalp, and thus avoid injury to mother's soft parts by spicula of bone, and the head may be so diminished as to pass through a comparatively small pelvis, while a firm hold to make traction is effected. Simpson's basilist is also used.

V. EMBRYOTOMY,

Is applied to those operations on the trunk of the child, which are designed to diminish its volume and resistance.

Indications. In extreme pelvic contraction; in fœtal malformation; in neglected shoulder presentation, where version is impossible or cannot be performed without endangering greatly the life of the mother.

1. **Exenteration** is the opening of the abdomen or thorax, and the removal of the contained viscera. It is most commonly

indicated in shoulder presentation where decapitation is not easy, as in extreme pelvic contraction with the head high above the pelvis.

It is performed by using the perforator so as to admit the hand and then removing the viscera, after which it may be possible to seize the feet and turn.

2. Decapitation is to be performed in neglected shoulder presentations where the neck can be easily reached. It may be done by drawing down the prolapsed arm and cutting through the neck with a blunt scissors; by Braun's decollator; or by a string passed round the neck which is cut through by a sawing movement.

VI. CÆSAREAN SECTION.

Is an operation by which the fœtus is removed from the mother by an incision made through the abdominal and uterine walls.

Indications. In extreme degrees of pelvic contraction, where the conjugate diameter is under 2 inches; in cases of solid tumors which encroach on the pelvic space; in advanced cancerous degeneration of the cervix; and it is permissable if the mother is moribund and the child is known to be alive.

Operation. It should be done after dilatation of the os so as to provide a free outlet for the uterine discharges, the pains are then more strong, frequent, hemorrhage is more efficiently controlled, and there is more chance of the child being alive and the natural tissues uninjured.

Formerly, the operation was an exceedingly fatal one, the difficulty arising from secondary hemorrhage at the uterine wound or from septicæmia, but by the modern method, known as the Sänger-Leopold operation, the record now, especially in Germany, is a most brilliant one, it being even asserted that where promptly conducted it is safer than craniotomy in some cases.

The bladder is emptied and an incision is made through the abdominal wall carefully in the linea alba from below the umbilicus to just above the pubis, an assistant steadying the uterus and preventing the escape of the intestines. The uterus is then incised, avoiding the fundus and cervix, the membranes are ruptured through the os and the child is extracted as rapidly as possible, the placenta and clots are removed, and the wound in uterus is now sutured by deep interrupted silver wire or silk sutures, which include all the tissues but the decidua, and should be ½ an inch apart. The peritoneal surface is then closely stitched with silk, the peritoneal cavity sponged out, especially Douglas' pouch, the abdominal wound closed with catgut and treated as after an ovariotomy.

The operation should be conducted on strict antiseptic principles. The operation should be performed as early as possible, and the patient should be examined and disturbed as little as possible previously. The internal and external genitals should be washed with a sublimate solution (1 : 2,000).

Hemorrhage is checked by manual compression or by elastic ligature.

In order to avoid the risks incident to the operation, and in certain selected cases, two operations have been designed to this end :

VII. OVARO-HYSTERECTOMY.—(Porro)

This consists in Cæsarean section, plus removal of the uterus and ovaries. The operation is precisely similar until the removal of uterus, when a constrictor is applied, the uterus and ovaries removed, the stump is mummified with cautery and percloride of iron and treated by the extra-peritoneal method.

VIII. LAPARO-ELYTROTOMY.—(Thomas.)

This consists in avoiding a peritoneal and uterine wound by incising the vagina and removing the child through the os and cervix.

Operation. A slightly curved incision is made parallel to Poupart's ligament on the *right* side, from $1\frac{3}{4}$ inches above and outside the spine of the pubis, to one inch above the anterior superior spinous process, cutting layer by layer upon a hernia director. An assistant holds back the peritoneum and intestines with a warm napkin, another draws the uterus vigorously upwards and to the left; while another holds a catheter in the bladder in the natural position. A long wooden plug or obturator is inserted into the vagina and the latter is cut into upon the obturator by the thermo-cautery or a red hot knife, and this incision is then torn with the fingers carefully so as not to injure the urethra in front or too far backwards. The catheter is then removed, the uterus tilted and os drawn towards the right iliac fossa, the membranes ruptured and the child is removed by traction, version, or forceps. Then the bladder is injected with a little warm milk to see if it is injured, and if so the fistula is stitched up with catgut. Then the vaginal and abdominal wounds are stitched up and treated as after ovariotomy.

E.—Diseases of Childbed.

I. CONVALESCENCE AND ITS DISORDERS.

By "puerperal state" is meant the condition during recovery from labor.

1. The Nervous Shock. The sudden alteration of the eye, the diminished or increased sensibility of the brain, the disturbances of respiration and circulation, the exhaustion, etc., are all evidences of the shock, which is usually in proportion to the severity of the labor and the susceptibility of the patient.

It is one of the circumstances which indicates the necessity of keeping the lying-in patient quiet, and as free from all sources of excitement as possible. After labor the most perfect quiet should be enjoined, the room should be slightly darkened, and no person but the nurse, and a few members of the family, admitted, while little talking and no whispering should be allowed.

The horizontal posture should be strictly enforced and the patient allowed to sleep.

2. The State of Circulation and Respiration. There is usually rapidity of the pulse during the second stage of labor, and after delivery it falls to normal or a little below and so continues for a day or two until the secretion of milk is established. The temperature and respiration follow the same course. A distinct chill often follows labor, but is not serious, and only indicates a nervous influence.

When the pulse remains quick and full, instead of sinking, after labor, beware of some complication.

3. The State of the Uterus and Vagina. After delivery the uterus contracts firmly to the size of a child's head, but shortly relaxes slightly and then contracts, this process having the effect of gradually diminishing the size of the uterus, until about the 8th or 10th day it is small enough to descend into the pelvis. The normal size and condition of the uterus and cervix are not attained until from six to eight weeks after delivery. This is effected by the transformation of the muscular fibres of the uterus into molecular fat which is absorbed into the vascular system of the mother. Should this involution be interfered with as by premature exertion, disease, or perhaps neglect of lactation, it often remains bulky and the foundation for subsequent uterine disease is laid. Immediately after delivery the uterus weighs 33 oz., at the end of a week 16 oz., and its cavity measures $5\frac{1}{2}$ inches; at the end of a fortnight it weighs 12 oz., and its cavity measures $4\frac{1}{2}$ inches.

After labor the vagina is usually hot and tender, and presents abrasions, but it very soon returns to its normal condition.

The contractions of the uterus are accompanied by pains called "after pains," which seldom occur in primipara. They generally begin half an hour after labor and last 30 or 40 hours. They usually have the effect of expelling clots, are increased by the application of the child to the breast, and are salutary within bounds. Sometimes they are of great severity and long continued, giving rise to great distress and preventing sleep, so that anodynes are required.

Should a post-mortem be made a day or two after delivery, the lining membrane of the uterus will be found loose and corrugated, somewhat softened and covered more or less with patches of decidua. The part to which the placenta is attached is raised and the surface uneven like a granulating ulcer. The whole internal surface of the uterus is of a dark ash color, while the discharge upon it is greenish or brownish, giving the appearance of a morbid condition of the parts which has even been mistaken for gangrene.

4. The Lochia. Is the discharge which comes from the internal surface of the body of the uterus together with the secretions of the cervix and vagina. At first it is almost pure blood and clots, then it is mixed with serous exudation, leucocytes, epithelial cells, shreds of decidua, and fatty granular cells. About the 9th day it becomes greenish. It has an alkaline reaction and a peculiar smell, readily decomposes and varies in quantity, quality, odour and duration.

5. The Secretions. The skin is usually moist; urine plentiful, and often retained after severe labors. Bowels are usually constipated. The milk comes usually on the 2nd or 3rd day, and the child should be early put to the breast.

6. The Diet, Cleanliness, etc. Diet should be light and nutritious, but not much meat for first few days.

The patient should remain in bed for ten days, for more mischief arises from premature exertion than from almost any other cause, and when you remember that it takes from six to eight weeks for the uterus to regain its natural size, the reason for prolonged rest will be understood.

Immediately after the expulsion of the placenta, apply a warm antiseptic pad to the vulva, the external parts having been washed with warm water by the nurse, and see that this is attended to twice a day. If the lochia smell in the least degree offensively, use a vaginal douche of bichloride and carbolic acid. The patient should always be visited within twelve hours of the confinement, and the urine enquired about, for if it is not passed the catheter should be used, taking every precaution that it is perfectly clean and aseptic.

Some prefer to use the vaginal douche after every case, and although it may be unnecessary as a rule, yet in hospital practice it should be insisted upon, and it is always soothing and comforting to the patient.

An aperient should be given on the third day.

II. DISEASES OF THE BREAST.

1. Sore Nipples. *Causes.* The too frequent application of the child removes the sebaceous secretion, so that when the skin dries it contracts, hardens and cracks.

Another frequent cause is nursing a child suffering from thrush.

Symptoms. The nipples become dry, rough, present cracks, and become excoriated, and a serous discharge exudes. There are often deep fissures and even ulceration. The pain is often intense, and it frequently leads to mastitis.

Treatment. It should be prevented by bathing the nipples during pregnancy with some stimulating lotion.

For sore nipples it is best to bathe them with cold water after nursing, and then use Goulard's lotion, or paint them with tincture of catechu, tincture benzoin co., glycerole of tannin, or ung. zinci. ox., always using a nipple shield to protect them while the child is nursing.

2. Mastitis. *Causes.* Although the excessive irritation and congestion which occur at the onset of the secretion of milk, exposure to cold, mental emotion, etc., are all supposed to give rise to it, sore nipples furnish, with perhaps rare exceptions, the starting point from which the inflammation extends to the glands either by the lymphatics or lactiferous ducts. It occurs more frequently among primipara, and during the first two months after delivery.

Symptoms. Their severity depends upon the depth and extent of the inflammation. When the gland and fascia are involved the pain is very severe, as well as the swelling and tension, and the constitutional symptoms are marked by a quick full pulse, hot skin, headache, thirst, etc.

After the inflammation has continued some time, and resolution does not take place, suppuration occurs, being indicated by a chill followed by perspiration, and locally fluctuation and pointing.

There are three varieties:

(*a*). *The Subcutaneous.* Is the mildest form and may be confined to the areola. When suppuration occurs, it may lead to fistulous communication with the lactiferous ducts.

(*b*). *The Glandular or Parenchymatous.* Is the most common variety. The skin becomes reddish over the hardened breast, and the pain is often severe. There is usually a chill and always more or less fever.

(*c*). *The Submammary.* Is the rarest form and is usually produced by an extension of the suppurative process from the deep parts of the gland through the connective tissue between the gland and the pectoral muscle. The breast is sometimes lifted up by the pus as on a water-bed. The skin is often not reddened, but is usually œdematous; the pain is deep seated and dull; and the constitutional symptoms are marked.

Treatment of Mastitis. The first thing is to take the child away from the breast, and apply a firm pad and well applied bandage so as to compress the affected breast; give a dose of opium to relieve pain, and a saline cathartic to relieve hyperæmia. The bandage should be left on for from 24 to 48 hours; if done in time the inflammation will be found to have undergone resolution, and the bandage may or may not need re-application. If it has been too late and suppuration is imminent, apply hot poultices until fluctuation is felt, then with antiseptic precautions incise taking care to always cut parallel to the milk ducts; wash out the cavity with warm bichloride solution (1-5,000) and apply a compress of gauze soaked in warm bichloride solution (1-2,000) under oiled silk. This can be changed twice a day, but do not use any linseed poultices after the pus has once been evacuated.

In the submammary variety the incisions should be deeper and freely made.

3. Defective Secretion of Milk. May be due to lack of mammary development, extreme youth, or polysarca. These of course are not amenable to treatment.

Temporary insufficiency may be remedied by nitrogenous diet, outdoor life, the consumption of a large amount of fluid, especially milk and gruel, and tincture of iron. Cataplasms of castor oil leaves are said to be beneficial. Tight lacing, by depressing the nipples and breast, frequently results in defective secretion of milk.

4. Galactorrhæa. A too free supply of milk sometimes is a source of annoyance, and sometimes after lactation is suspended, a constant dribbling of milk occurs, which is a great drain on the system.

Treatment. Belladonna, compresses, salines and pot. iodid.

III. PUERPERAL FEVER.

Puerperal fever, or puerperal septicæmia, is an infectious fever due to the septic innoculation of the wounds which result from the separation of the decidua and the passage of the child through the genital canal in the act of parturition. (Lusk.)

When one considers the frightful mortality from this single cause, that "not fewer than 1 in 120 women delivered at or near the full time dies within the four weeks of childbed," and that the condition is now to a large measure amenable to prevention, the responsibility is great devolving on anyone who neglects the precautions necessary to avoid such a terrible scourge. While we do not hold that in every case of puerperal fever the physician, or midwife, is responsible by reason of sins of omission or commission, it is certainly true that as the cause of puerperal fever has been practically demonstrated, a great revolution has taken place in regard to its prevention and treatment.

No subject has created more discussion than this, and, perhaps, no subject has given rise to a greater diversity of views in regard to its cause. Thus some have thought it essentially a local inflammation producing secondary constitutional effects; that it might be due to suppression of the lochia, to circulation of milk in the blood, or that it was a zymotic fever peculiar to and only attacking puerperal women. The latter view, still held by some eminent authorities, is unlikely for several reasons, viz., the symptoms and lesions have no definite character; a retained and decomposing placenta gives rise to a disease indistinguishable from puerperal fever; the same although less

dangerous may follow an abortion, and it may originate from various kinds of septic material especially from post-mortems or erysipelas and scarlet fever. It was in 1850 that Sir James Y. Simpson published a paper "On the Analogy between Puerperal Fever and Surgical Fever," and the researches of Pasteur, Lister, et. al., laid the foundation for the modern view of its true nature. It is now held that puerperal fever is identical with surgical septicæmia, and that it is produced by absorption of septic matter into the system through solutions of continuity in the generative tract such as always exist after labor. The septic poison itself need not be specific for just as in surgical septicæmia any decomposing organic material, whether homogenetic or heterogenetic, may give rise to it. Thus by one grand swoop have been demolished the various theories of a disease which has been the theme of enormous volumes, and endless discussions in the past. To-day we stand in the presence of an enemy whose stength we assume to have measured. The best obstetricians of the present day hold that we have to deal with certain micro-organisms whose vulnerability by certain germicides will enable us to vanquish the foe.

Let us see now upon what arguments this view is founded :—

1. It can be proved that septic poisons are capable of producing the lesions usually associated with puerperal fever. Thus a small bit of membrane or placenta if retained within the uterus after labor will cause offensive lochia, and then give rise to fever which subsides as a rule with the expulsion of the offending substance, and the use of disinfectant washes. Furthermore we find that septic poisons introduced after delivery produce lesions similar to those of puerperal fever, in one case causing pyæmia, in another partial peritonitis, general peritonitis, diphtheritic inflammations, etc., depending on the quality of the poison, the point of entrance, and the resistance of the invaded tissues.

2. Both puerperal fever and surgical septicæmia are diseases characterized by the presence of bacteria.

It is now a well-established biological law that air and water are peopled with organized microscopical beings, of a nature imperfectly determined, but which are generally conceded to be vegetable matters called microbes or bacteria, which live and multiply at the expense of organized matter, causing it to undergo incessant transformations, and giving rise to fermentation, putrefaction and septicæmia. Thus if we expose fresh apple juice to the air the species of bacteria which are fond of sugar find a suitable soil, multiply rapidly, demanding some of the elements of the sugar molecule, allow the remaining atoms to arrange themselves into alcohol and carbon dioxide, and cider results; other species attack the alcohol and leave acetic acid in its place, and vinegar results; all this constituting fermentation. Again, when a large wound is exposed to the air those bacteria which feed on albumenous material, set to work destroying the plastic lymph which has been thrown out, leaving sulphur-alcohols and ethers in their track, all this constituting putrefaction, and its concomitants, inflammation and suppuration. So again if septicæmia or erysipelas spores are present, the blood becomes infected, and the result is general septicæmia or "blood poisoning."

These bacteria are constantly found present in infected wounds, and they are also present in puerperal fever in the proportions and groupings that we find them in other diseases due to putrid infection. They are found to be swarming in the peritoneal exudation, in the blood, and all the tissues, and in this way we can explain the protean phenomena of puerperal fever, as well as the close relationship which it bears to diphtheria, and erysipelas, and scarlet fever.

3. The differences between surgical and puerperal septicæmia are due to structural and physiological differences in the wounded

surfaces exposed to infection. Thus while there is an analogy between the exposed stump after an amputation and the interior of the uterus after delivery, there is this difference, that in the puerperal state you have to take into consideration the blood changes induced by pregnancy, the effects of shock and exhaustion, of hemorrhage, the presence of clots and decidua in a state of disintegration or decomposition, the ease with which poisonous matters are absorbed by the wide lymphatic spaces, the serous infiltration of the pelvic tissues, the large size of the lymphatics and veins, and the proximity of the peritoneal cavity.

Puerperal septicæmia may be autogenetic or heterogenetic.

1. Autogenetic. The blood itself is a fruitful source of puerperal fever, for after labor the absorption of the products of uterine involution gives rise to a large amount of effete material in the blood, and this may be increased in amount after excessive muscular exertion and expenditure of nerve energy, the result of a difficult labor or one long unassisted. Again the decomposition of retained portions of membrane, or placenta, or lochia may give rise to it. Again, in some cases exposure to cold, shock or emotion has been known to give rise to the fever.

In some of these cases where a relatively large amount of putrid material has been absorbed, death may take place from a form called putrid intoxication or sapræmia, and in these cases no bacteria may be found in the blood, and the blood is not infectious. The reason is that the material has undergone chemical decomposition or putrefaction, but has not taken on septic changes; but if a sufficient time is allowed, the bacteria will have had time to multiply in the blood and tissues, and we then have all the ordinary phenomena of puerperal fever. It must be remembered, however, that in the autogenetic variety, the poison is generally produced by germs received from the air or in some way from outside, and therefore that the sanitary con-

dition of the house or locality may have a large influence in its production. Many cases of this kind have been traced to stationary washstands in a bedroom, which have allowed sewer gas to gain admittance to the room.

2. Heterogenetic. Includes those cases in which the poison is due to special contagion. The most dangerous contagion is that due to some forms of puerperal fever itself. All cases of puerperal fever are not contagious; thus a case of sapræmia is not, and cases of heterogenetic origin are more or less contagious according to circumstances.

Puerperal fever may also arise from zymotic diseases, such as scarlet fever, erysipelas, smallpox, or from post mortem poison, especially if the patient has died from peritonitis; and lastly, from insanitary surroundings such as defective drains and want of cleanliness.

Pathological Anatomy. The local lesions are very various and depend on the seat of absorption and the form of the disease; thus we have endocolpitis, endometritis, metritis, parametritis, perimetritis, phlebitis, phlebo-thrombosis, and lastly septicæmia proper where death is produced before there is time for the development of local lesions. The only changes then found are an altered state of the blood, a staining of the blood vessels, and a softening and swelling of glandular organs, such as the spleen, liver and kidneys.

Symptoms. These vary according to the part implicated, the character of the infection, and the amount and virulence of the poison.

There is usually a distinct period of incubation. The fever first appears within three days of the birth of the child, and usually on the third day. After the fifth day an attack is rare, and at the end of a week the patient may be regarded as having reached the point of safety. It is usually ushered in by a chill, but this may be absent, or there may be

repeated chills which usually indicate pyæmia and phlebitis. The pulse rises, and may reach 120 to 140. The temperature rises up to 102° or in bad cases to 104° or 106°. Where the rise of temperature is gradual, as from the slow decomposition of something retained within the uterus, the chill may be absent. When a chill accompanies the rise it may suddenly go up to 102°. As a rule the temperature tends to rise progressively towards a fatal issue, but in some of the most virulently septic forms, especially in purulent peritonitis, the temperature falls again after an initial rise, while the pulse continues to become more rapid, and the general condition becomes aggravated. The pulse is therefore frequently a more reliable sign of danger than the temperature. As the patient becomes moribund, the temperature often becomes subnormal.

The symptoms vary according to the local lesion accompanying it. The milder cases are characterized by inflammations of serous membranes, mucous membranes, or the results of the impaction of infected emboli, or secondary inflammations and abscesses. In other cases the fever is so intense that no appreciable morbid phenomena are found after death. It is this variety which was so prevalent and fatal in the older lying-in hospitals, and which was likened to cholera in the severity, suddenness and fatality of its onset.

The pain and tenderness over the uterus may be slight or severe according to the local lesion. As it advances the intestines become distended with gas, the countenance becomes sallow and sunken; the expression is anxious; as a rule intelligence is unimpaired to the last; diarrhœa and vomiting frequently set in, the latter even becoming coffee ground; the lochia are offensive usually, and are soon arrested; the milk dries up; these symptoms last usually a week, the pulse becoming more rapid, weak and thread-like, and the patient sinks with all the indications of profound exhaustion.

Treatment. 1. **Preventive.** It is not always possible to carry out all the directions indicated, but when possible you should endeavour to promote the health of the patient before delivery, bearing in mind that a woman in low and debilitated condition presents a more suitable soil for the seed or bacteria of sepsis to take root and develop. The sanitary condition of the house and the lying-in room should be seen to, especially as to the condition of the drains, permanent wash-stands, if they exist, and ventilation. She should have a bath before labor sets in and if possible a vaginal injection of bichloride solution (1-2,000). She should never be allowed to suffer too long without the timely use of forceps, but the greatest care should be used not to cause laceration or unnecessary contusions. Care should be taken that the nurse has not been in attendance at any case of zymotic disease, nor should the physician himself have come directly from any such case.

The physician should always wash the hands with coarse soap, and bichloride solution (1-1,000), using the nail brush, and applying some antiseptic lubricant before making any vaginal examination.

By the most rigid antiseptic precautions it may not even be necessary to give up midwifery practice while attending a case of puerperal fever.

After delivery the parts should be washed with bichloride solution (1-2,000), and a piece of gauze soaked in the same applied, and over this an antiseptic pad consisting of absorbent cotton or tow sewed up in gauze, and used instead of napkins. These are cheaper and more cleanly, for they can be burned after being a few hours in use.

2 **Curative.** We should watch for any elevation of temperature or pulse after labor, and remember that all cases of so called milk fever are really mild septicæmia, and treat them as such. The indications are to neutralize the poison at

the point of production and so prevent its causing further mischief, and to adopt measures calculated to enable the patient to tolerate its presence until it is eliminated or inert.

Pain, if present, should be first allayed by a hypodermic injection of morphia, and a vaginal injection of bichloride (1-2,000) thoroughly given by the physician *himself*. Then give quinine, gr. x., and repeat gr. v. every 3 or 4 hours if necessary. If the temperature still keeps up use the intra-uterine douche of bichloride (1-5,000), and if there is any suspicion of retained secundines introduce the fingers, or blunt curette, and remove them. All abrasions should be touched with sol. ferri persulph. and tinct. iodine equal parts.

Locally hot fomentations with turpentine, especially if there is a tendency to typanitis, but in other cases Townsend's rubber tube coil may be placed over the abdomen and ice water allowed to flow through it. If a purgative is indicated give castor oil or calomel. After using the intra-uterine douche introduce a pessary of iodoform gr. 20 or 30. In sthenic cases fluid ext. veratrum viride may be given in drop doses.

The strength must be sustained by beef tea, broths, egg-nogg, milk and whiskey.

A convenient solution of corrosive sublimate can be made by dissolving one drachm of the salt in one ounce of alcohol. One teaspoonful of this solution added to one quart of warm water will give almost to a fraction one part in two thousand, and will be sufficient for each injection.

IV. PUERPERAL VENOUS THROMBOSIS AND EMBOLISM.

A *thrombus* is a blood clot formed within a blood-vessel during life, and the entire process, of which the thrombus is the essential element, is designated *thrombosis*. The thrombus is made up of fibrin and corpuscles.

The causes of thrombosis are an abnormal condition of the epithelium, a rapid destruction of the white blood corpuscles, or a stagnation of the blood, and there is always a tendency to this after delivery owing to the excess of the elements of fibrin in the blood, and because it is charged with a quantity of effete material due to involution of the hypertrophied uterus. It is still more apt to occur in the exhaustion following excessive hemorrhage.

An *Embolus* is a foreign body in a blood vessel, usually too large to pass through the smallest capillaries, and the disturbances resulting from its presence are included under the term *Embolism*. Although most emboli are detached portions of thrombi, any foreign body of suitable size may become an embolus.

1. Pulmonary Obstruction. A clot of blood in the right side of the heart or pulmonary artery, either formed in situ, or carried there from another part of the circulation, is a cause of sudden death after delivery.

Owing to the state of the blood and system above described a thrombus forms in some part of the circulation, a portion of the clot is detached and is carried as an embolus to the pulmonary artery where it is arrested.

Symptoms. The patient is suddenly seized with severe dyspnœa, pain in the præcordia, she starts up and gasps for breath, the face is usually livid or may be pale, there is great distress, anxiety, and restlessness; she feels that she is dying and calls out for air; there is cold clammy skin; the pulse is almost imperceptible, and death usually occurs in a few minutes. A few cases have been recorded where the clot has not been sufficiently large to entirely obstruct the circulation in the lungs, absorption taking place and ultimate recovery, but this is infinitely rare.

Cause of Death. It is due to asphyxia : the blood cannot get to the air to be purified.

Treatment. Almost every case is so rapidly fatal that there is no time for treatment, but if called to a case, place the patient at absolute rest, the head lower than the body, to favor the flow of blood to the brain, and give brandy, ammonia or sulphuric ether, hypodermically.

Emboli sometimes occur in the arterial system and may become arrested in the cerebral, humeral or femoral arteries, giving rise to hemiplegia, blindness, gangrene, etc.

2. Phlegmasia Alba Dolens. Is a swelling of one or both legs, characterized by pain, tension of the skin, brawny hardness, absence of pitting on pressure, and a shiny whiteness of surface. It affects the left more frequently than the right leg, probably because that side of the pelvis is more frequently subjected to pressure and bruising than the other from the comparative frequency of right lateral obliquity of the uterus. It affects multipara more often than primipara, and is very apt to recur. It usually comes on between the 2nd and 4th week after delivery and seldom subsequently.

Symptoms. It is often preceded by slight pyrexia, then severe pain and tenderness in the groin along the course of the femoral vein, or in the calf of the leg extending upwards over the whole limb, and you can often feel the femoral vein hard like a whipcord. The swelling then spreads and increases in hardness, which is unlike ordinary œdema or anasarca, for after it is fully developed it does not pit on pressure, but is elastic and feels like solid rubber. Its color is pale or sallow and hence the name "white-leg;" it looks also glossy or greasy and hence the term "marble leg." All movement is painful and voluntary motion is nearly lost. In about nine days it makes no further progress, the pain and swelling diminishing.

Pathology. It was at one time thought to be due to arrest of

the secretion of milk and its extravasation in the limb, and hence the term "milk leg." The view which is now held is that it is due to thrombosis of the femoral vein and lymphatics.

(*a*). *Morbid Anatomy.* 1. On opening the limb it is found to be distended with coagulable lymph effused into the cellular tissue.

2. The vein is obliterated by clots, and the walls are thickened, and of a dark red color, coated with coagulable lymph, showing inflammation.

3. There are evidences of inflammation of the lymphatics.

(*b*). *Nature of the process.* It requires more than thrombosis of the femoral vein to account for the hardness and want of pitting on pressure, and the fact that the tissues are filled with coagulable lymph and not serum. This can only be accounted for in one of two ways: either that there exists obstruction of the lymphatics as well as the veins, or that some toxæmic condition of the blood exists in consequence of which the fluid poured out is irritating to the tissues, and sets up a kind of quasi-inflammation, leading to the production of coagulable lymph. Probably both views are true, for that it is of septic origin is probable, as it occurs in other states such as ulcerated cancer of the cervix, and in late stages of phthisis. Tyler Smith records the case of a physician who attended a patient suffering from erysipelatous sloughing sore throat, and shortly afterwards three confinements, each of which had phlegmasia dolens.

Terminations. It may end in resolution; persistent aching and œdema of the limb; in suppuration, which is rare; in relapse with slow recovery; and there is always danger, by rubbing, of an embolus being set free and causing pulmonary obstruction.

Treatment. Locally, rest in the most comfortable position, hot fomentations with opium under oil silk, or poultices.

Subsequently gentle inunctions with ung. iodini co., or ung. hydrarg. c. belladonna are useful.

Medicinally opium for the pain, quinine, tonics, good diet, and change of air complete the cure.

V. PUERPERAL INSANITY.

When one recollects the excitable and altered state of the nervous system during pregnancy, partly due to reflex causes, to disordered digestion and to alterations of the blood, it is not to be wondered at that the same conditions which give rise to alterations in character, to loss of memory, to hysteria, or hypochondriasis should sometimes lead to mental derangement. In some women, again, there exists a hereditary predisposition to insanity, and the events of pregnancy and child-bed act simply as the sparks that fire the mine.

The term puerperal mania is hardly correct, as many of these cases are characterized by melancholy.

From 3 to 5 per cent. of all females admitted into asylums suffer from puerperal insanity, and at least one out of every 1,000 lying-in women becomes insane. It is equally prevalent among rich and poor.

It may for convenience be divided into three forms: that occurring during pregnancy, after labor, and during lactation.

1. The insanity of Pregnancy. This is the least common form, usually assuming a form of melancholia, developing out of the ordinary hypochondriasis of pregnancy, especially in those of a hereditary neurosis. It usually shows itself between the 3rd and 4th month, and the suicidal tendency is often well marked. The prognosis, however, is more favorable than in any other form.

2. Puerperal Insanity (proper). During delivery and at the last part of the second stage, a kind of acute delirium is

sometimes met with just when the suffering is most intense, while the patient in her agony, if not watched, might injure herself or her child. This is not really puerperal mania, and should be rarely seen in these days of anæsthetics, but it may be of importance in a medico-legal point of view.

Causes. There is in nearly all these cases a hereditary taint, not always insanity, but she may have inherited an irritable, unstable, or impressionable nervous system. Thus the family history will often show hysteria, epilepsy, chorea, asthma, or stuttering, if not actual insanity. Most of these cases are anæmic, and show signs of a sluggish alimentary canal, especially constipation, and impaired digestion.

Grief, shame, anxiety, and sudden fright, are among the moral causes, and some have even held that it had a septic origin.

Symptoms. It may assume either the form of mania or melancholia, the former coming on usually within the first three weeks after labor, the latter not until later. The patient first appears out of health, has dyspepsia and sleeplessness, is fretful and anxious, and as the melancholy deepens she has delusions about her husband and child, and has suicidal tendencies. In mania there is an intolerance of restraint, irritability and either unconcern or open hostility to her infant. They often have religious delusions, and some cases are raving mad, tearing their clothes and requiring to be restrained.

3. Insanity of Lactation. Is twice as common as the insanity of pregnancy, but much less frequent than puerperal insanity proper. The causes are the same, and the form of melancholia is more common than mania.

Prognosis. More than two thirds of the cases of puerperal insanity recover. Maniacal cases get well on the average in from three to six months, while the meloncholic take longer. "Mania is more dangerous to life, melancholia to reason."

Treatment. Something may be done towards preventing the disease by improving the health during pregnancy, by warning the patient and her friends against all irritating mental or moral influences, and guarding against septic infection during and after labor, and seeing that the patient has a sufficient amount of sleep.

With the first sign of trouble the child should be taken from the breast, liquid food should be administered at regular intervals, the room slightly darkened, furniture or pictures which disturb the patient by their associations should be removed; if possible a trained nurse should be secured to administer food, to attend to the bowels and bladder, to keep the patient covered, and to prevent her doing harm to herself or others.

If poor, the asylum is the best method of treatment, but if she can afford it, home treatment is preferable since there is always apt to be a reproach connected with any one who has once been in an insane asylum; "though the recovery is rapid and satisfactory, still she has been insane, and this is never forgotten by her children. Henceforward there is a certain dread of what may be in the future a skeleton in the closet, not mentioned, but always there," whereas if home treatment is successful, she will only be thought to have been a little queer, the confinement will account for that, and nothing more will either be said or thought of it.

GYNÆCOLOGY.

Is the study and treatment of the diseases peculiar to women, and does not usually include those occuring at the puerperal period.

Most of these diseases occur during her sexual life, *i.e.*, during the period of functional activity of the uterus and ovaries. Before this she is a child, when her diseases are few and may be regarded as accidental or developmental, and when the child-bearing period is over the sexual organs shrivel up and their function no longer influences the system at large. Towards the climacteric there is often developed a tendency to morbid nutrition or degeneration, and hence the frequency of cancer and fibroids at this time. But even when no tissue changes occur, at this period various distressing phenomena are met with which often become pathological. The sexual apparatus no longer dominating the system, the balance of healthy action and reaction being lost, the nervous force not finding its long accustomed use wanders off in other paths and often leads to nervous disturbances such as neuralgia, hysteria, syncope, vertigo, convulsions or even insanity. These are merely exaggerations of those "hot flashes," tingling, numbness, burning feet, etc., so common to every woman at the change of life.

Most of these diseases, which are infrequent in uncivilized women, are due to the customs of civilized life. There is first the neglect of exercise and physical development. Thus in a young ladies' boarding-school most of the time is taken up in sedentary study, and the hours of recreation which should be spent in walking or calisthenics, are employed in music or painting. This very application leads to excessive development of the nervous system resulting in precocious talent, refined taste and vivacity, but at the same time developing

morbid impressibility, feebleness of muscular system, excessive uterine and ovarian congestion, often resulting in "neuralgic dysmenorrhœa."

Then again the dress adopted by the "girl of the period," and especially the corset, so compresses the abdominal organs that the muscles become atrophied, and the viscera displaced, the full play of the abdominal wall and the descent of the diaphragm are interfered with; this leads to obstruction of venous blood and congestion of the pelvic organs. The uterus itself being freely movable is displaced and distorted.

Again, imprudence during menstruation is a frequent source of disease. A host of women, either through ignorance or recklessness, by ignoring this physiological function, have incited congestive dysmenorrhœa or endometritis, while a word of timely warning might have saved them a life of suffering, misery or sterility. Imprudence after parturition, too early getting up, tight bandaging, neglect of injuries occurring during labor, such as laceration of cervix or perineum, the prevention of conception, the induction of abortion, and, lastly, habitual constipation are all sources of uterine disease.

Diagnosis. Manifestly in the study of uterine disease one of the first pre-requisites to successful treatment is a correct diagnosis. The two principal sources from which information is to be derived are, 1st, the subjective symptoms as related by the patient, and 2nd, the objective symptoms as made out by a physical examination.

In examining any female patient let her begin the account of her illness in her own way, and although she may wander from the point, it will afford you some hints, and give you a clue to follow out in your subsequent more special questioning.

You should begin by taking a general survey of the principal

functions, enquiring about the nervous system, the circulation, and the digestion; if the bowels are regular, and, lastly, if she is unwell every month. This will be better than to begin abruptly with an enquiry about the uterine system, as, especially if the patient is young and unmarried, she would only be flurried and annoy you by unsatisfactory or even incorrect replies. Always follow some systematic plan in your enquiries, such as the following:—

Name.....Age.....
Address.....
Married?
No. of Children. Date of last Confinement.
No. of Miscarriages. Date of last Miscarriage.
Age at first Menstruation. Date of last Catamenia.
How long ill.
Principal symptoms:
.....
.....
.....
Supposed cause.
Present condition:—

Menstruation	Regular.
	Amount.
	Duration.
	Pain.
Discharge	Character.
	Amount.
	Constancy.
Pain	Locality.
	Degree.
	Character.

Physical Examination { Digital. Speculum. Sound.

Diagnosis.

Treatment:

.....

.....

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Result.

The symptoms which would chiefly attract your attention to the pelvic organs are:—a sensation of weight, bearing down or falling in the abdomen and pelvis; pain in the hypogastric, inguinal, or sacral regions, darting or radiating pains from the pubis down the thighs or into the inguinal or hypochondriac regions, pain on defecation or micturition, dispareunia, difficulty in walking, going up and down stairs or in sitting down, itching of the external genitals, leucorrhœa, disorders of menstruation. In menorrhagia the amount of blood lost is guaged by the number of napkins changed in a given time, and in leucorrhœa the character of the discharge, whether white, sanguineous, serous, ropy or offensive, is of importance in indicating the seat and nature of the affection.

Having thus obtained all the information you can by this subjective examination, you must, in order to accurate diagnosis, make an objective or physical examination of the patient.

A.—Non-Instrumental Examination.

I. EXTERNAL ABDOMINAL.

1. Inspection. Loosen the clothing about the waist and bare the abdomen. See if it is distended; note its shape, color, the prominence of the umbilicus, linea albicantes, skin eruptions, Examine the breasts and areola.

2. Palpation. Place the patient in the dorsal position with the thighs bent up, and with both hands and the tips of the fingers paw each region in order. By this means you can detect tumors arising from the uterus, ovaries, kidneys, liver, spleen, omentum, etc

The resistance of the abdominal muscles is often an obstacle, and in doubtful cases it may be necessary to give chloroform. The presence of fat, inflammation or fluid in the abdominal cavity may also render the examination difficult. You must also be careful not to mistake for pathological growths certain normal conditions, such as a pregnant uterus, a distended bladder, and an overloaded rectum. The latter is usually soft, pultaceous and displaceable.

3. Percussion. The patient should be examined in this way on her back, on both sides, and while sitting up. The extent and attachment of a tumor may be detected by its area of dulness. Typanitis and ascitic fluid may also be made out.

4. Auscultation. The fœtal heart sounds, uterine souffle, and friction sound may be heard. A uterine souffle without heart sounds is either pregnancy with a dead child, or a uterine fibroid. Ovarian cysts have no souffle.

II. INSPECTION OF THE EXTERNAL GENITALS.

This need not be done as a routine practice, but may be required to detect chancres, mucous patches, condylomata, labial abscess, tears of the perineum, external piles, protrusions of the vaginal wall, presence of varicose veins, œdema of labia, condition of the hymen, presence of carunculæ myrtiformes. Always examine the secretions.

III. DIGITAL EXAMINATION.

1. Vaginal. The dorsal position is preferable, but the lateral, the knee-elbow or genu-pectoral, and the erect positions are sometimes resorted to. Digital examination is rarely necessary before puberty, because the diseases calling for it seldom arise before the onset of menstruation, and in fact are in the large majority of cases the result of parturition. If possible this examination, especially in the young and unmarried, should be deferred until we try the effect of medicine and hygienic measures. If these fail after reasonable trial, a vaginal examination should be proposed and gently insisted upon. A vaginal examination should not be made during the menstrual flow, not because it is injurious, but because it is unpleasant to any woman to be handled while she is soiled. You should not hesitate however to examine when the persistence of a sanguinous flow requires immediate diagnosis and treatment.

Use the index finger well anointed with vaseline, and if the vagina is very patulous, use two fingers, folding the other fingers and abducting the thumb. Note the state of the vaginal orifice, the presence of spasm, whether the hymen is intact, the walls of the vagina if rough or smooth, the temperature of the vagina, the cervix and external os and their direction and mobility. In the *posterior fornix*, feel for fæces, a retroverted uterus, blood-clot, inflammation, cystic ovary or extrauterine fœtation; in the *anterior fornix* for normal uterus or one enlarged from pregnancy or fibroid; and in the *lateral fornices* for prolapsed and cystic ovary. The cervix may be long with pinhole os indicating congenital sterility, or a cicatricial contracted rigid os indicating acquired sterility. The os may be patulous, indicating abortion; or soft and pulpy, as in pregnancy; or lacerated; or may present an ulcerated surface, as in cancerous disease.

2. Rectal. Before making this examination, see that the bowel is evacuated by a purgative or enema. This examination should be made if the symptoms point to disease there, and then the retro-uterine tissues and the posterior wall of the uterus are more accessible through the rectum. Strictures, polypi, cancer, syphilitic ulceration, retro-uterine tumors, etc., may thus be detected. Digital eversion of the mucous membrane of the rectum will often be useful in detecting piles, fissures, etc.

3. Vesical. As this requires dilatation of the urethra, the patient should be prepared for it, and should have an anæsthetic. The interior of the bladder and even the mouths of the ureters may thus be felt.

IV. BIMANUAL EXAMINATION.

This is a very important mode of examination, and consists in placing one hand upon the abdomen, while the finger of the other hand is in the vagina. You can thus feel any motion imparted to the hand by the interior examining finger, and determine the shape and position of the uterus or ovaries, or the presence of tumors. For this purpose the dorsal position is best.

The recto-abdominal and the recto-vagino-abdominal modes of examination may also be resorted to.

B.—Instrumental examination.

1. The Speculum. Is not always necessary, for the finger may have given you all the required information, but never omit this mode of examination if it will give any further insight into the case, and if it is not otherwise contra-indicated. It should never be used in acute inflammations, or cancer, rarely in menorrhagia, and still more infrequently in young virgins.

There are three varieties, all the rest being modifications of

these :—1. The Cylindrical or Ferguson's. 2. The Bivalve or Cusco's, and 3. The Duckbill or Sims'.

1. The *Cylindrical Speculum* is usually made of glass, silver plated inside, or of hard rubber, or of white porcelain. It may be used for the application of caustics which might act upon a metal instrument, but it is now nearly discarded.

2. The *Bivalve Speculum* is the most useful for general purposes, being more durable, and giving a much better view of the cervix and vagina. It may be introduced either in the lateral or dorsal positions, although the latter is usually preferable.

3. *The Duckbill Speculum* is absolutely essential to the proper study and treatment of many of the diseases of women. It acts upon the principle of admitting air to the vagina, so that as the woman lies in the lateral prone position, the weight of the viscera assists in giving a good view of the parts, and the cervix can be seen in a natural position, being movable, and the os with its lips uneverted. The disadvantage of this instrument is that an assistant is required usually to elevate the superior buttock, or to hold the anterior vaginal wall forward with a depressor. Operations on the cervix and vagina are only possible by means of this speculum.

II. THE UTERINE SOUND.

This was the invention of Sir Jas. Y. Simpson, and consists of a flexible copper rod electro-plated, 12 inch long, and graduated $2\frac{1}{2}$ inches from the point.

Before using the uterine sound, you should ascertain by the digital and bimanual methods, the true position of the uterus, and if there are no contra-indications, pass it gently and carefully into the uterus, holding it like a pen. Be careful not to use any force lest it cause abrasion of the mucous membrane

with absorption of septic material which might result in para- or perimetritis.

Uses. It is used to ascertain

1. The length of the uterine cavity.

(*a*). Which may be lessened by super-involution or atrophy.

(*b*). Which may be increased by subinvolution, hypertrophy and uterine fibroids.

2. The direction of the uterine axis.

This is to detect retroversion, anteversion, and lateroversion.

3. The relation of the uterine to the cervical axis.

This is to detect anteflexion and retroflexion.

4. The presence of stenosis or atresia of the os.

5. The mobility of the uterus.

6. The condition of the endo-metrium or mucous membrane of the uterus.

7. It may be used as a means of treatment as in dilating atresia, in rectifying an anteflexion or retroflexion, or in replacing a retroversion.

Contra-indications. It should never be used during the menstrual flow; during an acute inflammatory attack of the uterus or ovaries; in cancer of the cervix or body of the uterus; nor if the patient has missed a period.

The sound may be used in combination with the bimanual method to more accurately determine the fundus of the uterus, or to diagnose tumors of the uterus from ovarian cysts.

Other Instruments. A long flexible pure silver *probe* is often very useful as in cases of atresia where the uterine sound could not be inserted, or between a tumor and the uterine wall to determine its presence and extent.

The *tenaculum* or hook is used to draw down and steady the

cervix, to approximate the edges of a lacerated cervix, or to catch up sutures during operations in the vagina. A *vulsellum* is simply a double tenaculum.

The *dilator* is a steel instrument for opening the os uteri, and is infinitely preferable to sponge tents, which should now be discarded entirely for antiseptic reasons.

The *curette* is an instrument shaped somewhat like a spoon or scoop, and used for the purpose of removing by scraping off certain pathological tissues. It was invented by Recamier in 1846, and is now very much used, and to the successful gynæcologist is indispensable. It is used in uterine hemorrhage and erosions of the os, and as a means of diagnosis by examining the scrapings. In uterine hemorrhage which has resisted all medicinal treatment, a cure may often be effected by dilating the os and using the curette to remove fungus degeneration of the uterine mucous membrane, or small polypi, or adherent placental villi.

In any manipulations about the uterus you must bear in mind to always avoid them during pregnancy, and at any time do not use any unnecessary violence. During the puerperal state all operations are to be avoided, except of course immediate closure of a perineal rent, since there is such a great tendency at that time to septic infection, favored also by the dilated condition of the pelvic veins. Lactation does not interfere with operations except in so far as anæsthesia, excitement, and probable suppuration may affect the quality of the milk, and of course the woman is at that time in a somewhat enfeebled condition.

In advancing age women should be taught that while not in itself serious or dangerous, this period has been found by experience to be especially favorable to the development of malignant disease, and that therefore the slightest disorder of menstruation or leucorrhœal discharge may be the first indica-

tion of serious or fatal disease, and that therefore an examination should be firmly insisted upon. Age does not contra-indicate operation since ovariotomy has been successfully performed after the age of 70.

The peculiar situation of the uterus, the large networks of blood-vessels, the loose character of the surrounding connective tissue, and the proximity of the peritoneum render manipulation of the uterus difficult, and at times dangerous. While the uterus has the name and reputation of being the most patient and the toughest organ in the body, it or its surroundings will at times respond very unexpectedly and severely to the slightest manipulation. While one uterus will bear with impunity the application of fuming nitric acid to its internal surface, another will react severely to the introduction of the uterine sound, and a very simple operation may light up serious peritonitis. The pre-existence of chronic or subacute peritonitis is more apt to be followed by an acute attack if the uterus is irritated, and hence it would contra-indicate all operative measures.

SPECIAL DISEASES.

A.—Diseases of the Vulva.

I. MALFORMATIONS.

At first a depression takes place in the external skin, during the process of development, which gradually deepens until it communicates with the allantois which is not yet separated from the bowel. At the point where the allantois emerges from the bowel, the perineum protrudes forward separating the vaginal cloaca into two parts, the sinus urogenitalis in front, and the anus behind. Into the sinus urogenitalis opens the most dependent part of the allantois, which becomes narrowed down to form the urethra, and the vagina is formed by the

lower ends of the two Müller's ducts. Now should development be arrested at some stage of this process, the result will be the various forms of hypospadias, epispadias, hermaphroditism, or atresia of the anus.

II. VULVITIS.

Causes. Inflammation of the vulva may result from injury, irritating discharges as from want of cleanliness, or gonorrhœa, and may result in ulceration, abscess or phlegmon. It may occur in scrofulous children, and it is often the result of worms.

Symptoms. Itching, pain, redness, swelling, and increased secretion. Pruritis or itching is often described as a separate disease, and it is often a sign of diabetes.

Treatment. Cleanliness and lotions of plumbic acetate with opium, or if itching is marked, potassic cyanide solution and carbolized compresses are useful.

III. NEW GROWTHS.

Papillomata or warty growths are common, are usually syphilitic and are best treated by chromic acid locally, and hydrarg. bichlor. internally.

Lupus is found sometimes in strumous subjects.

Primary Cancer is rare.

Cysts of the vulva arise from the obstructed glands of Bartholini, and are treated the same as cysts elsewhere.

IV. RUPTURE OF THE PERINEUM.

Is not uncommon; it usually occurs in primipara and seldom in multipara, and its occurrence is not surprising when you consider the immense distension of the parts during labor.

Causes. **1. Owing to the Mother.** Very powerful

uterine contractions may too suddenly expel the child before the perineum has had time to expand, or there may be deficiency in the tone of the perineal structures, or a straight sacrum, or there may be preternatural narrowing of the pubic arch interfering with extension so that distension of the perineum is greater.

2. **Owing to the Child.** Unusual size of fœtal head, or great breadth of shoulders may cause it; or face presentations.

3. **Owing to the Physician.** Malpractice or meddlesome midwifery, faulty support of the perineum or the unskilful use of the forceps may cause it. In wise and practised hands the forceps are among the most valuable resources of the obstetric art, and are capable of preventing the very damage which they are frequently charged with producing.

Its Nature and Effect. Rupture of the perineum may be of varying extent, from simple tear of the fourchette, which occurs in every primipara, to the extent of tearing the sphincter and recto-vaginal septum.

Much difference of opinion exists in regard to the importance of the *perineal body*, which is a triangular wedge of fascia and areolar tissue, elastic and dense, situated between the lower part of the vagina and the rectum.

By some its functions are thought to be:—

(*a*). To sustain and prevent prolapse of the anterior wall of rectum which would drag down the cervix.

(*b*). To sustain and prevent prolapse of the posterior wall of vagina which would allow rectocele.

(*c*). Upon the posterior vaginal wall rests the anterior, and on this the bladder, and against the bladder the uterus all of which are dependant on it for support.

(*d*). It preserves a proper line of projection of the contents

of the bladder and rectum, and thus prevents the occurence of tenesmus, which is a frequent cause of pelvic displacements.

The effect of a ruptured perineum depends on its degree. When a rupture extends through the recto-vaginal septum the muscular attachments of the pelvic floor being torn, the uterus looses its support and descends.

Air is thus often admitted into the vagina and causes "flatus vaginalis," and cystocele and rectocele are frequent. These effects lead to difficulty in walking, irritability of the bladder, indigestion, nervous troubles and loss of control of the sphinter ani with its consequences.

Treatment. **1. The Immediate or Primary Operation.** The perineum should always be examined after delivery, and if a tear exists it should be at once bathed with bichloride solution (1-1,000) and from one to three or four silver wire sutures introduced.

Even if it is through the sphincter it should be stitched at once, and give it a chance, for if it fails no harm is done.

2. The Secondary Operation. (*a*). *Partial Rupture.* The patient is etherized, the mucus membrane freshened with curved scissors, and the parts brought together with silver wire sutures. The bowels should be kept open every day, and the sutures left for a week or ten days.

(*b*). *Complete Rupture.* The operation is similar, but great care is taken to freshen the edges of the wound through the sphincter and tear in recto-vaginal wall, and the first suture or two should begin by taking in this part, completely surrounding it and the tear in anus. The other sutures are applied as in a partial rupture.

B.—Diseases of the Vagina.

I. MALFORMATIONS.

You may have a double vagina, or it may open directly into the rectum, or it may be a cul-de-sac leading up to a rudimentary uterus, or an imperforate hymen may exist, or occlusion may occur from sloughing after delivery.

Imperforate Hymen sometimes gives rise to retained menses. You would suspect such a condition if puberty has arrived, and signs of being unwell are present without any sanguineous discharge, especially when there are pains of a forcing character. The abdomen soon becomes tender and there is a feeling of fulness in the pelvis and frequent desire to micturate. On making an examination there is felt to be a bulging fluctuating tumor at the vulval orifice of a deep red color.

Treatment. The hymen should be punctured antiseptically and washes used for some days, there being danger of admitting air and setting up septic peritonitis.

II. VAGINISMUS.

Is a painful cramp of the sphinter cunni which prevents the entrance of any body into the vagina. It gives rise to dispareunia, a speculum examination is impossible, and even a digital examination can hardly ever be borne.

It may be caused by inflammation, fissures, or a thickened hymen, or it may just be due to nervous spasm.

Treatment. If temporary, as often happens in the newly married, advise temporary discontinuance of the sexual act.

If due to inflammation or fissures, treat these, and if it is simply due to nervous spasm etherize the patient, incise the vaginal edges, dilate thoroughly with a bivalve speculum, introduce a

tampon of absorbent cotton well smeared with vaseline and leave it in for 24 hours.

III. COLPITIS.

Inflammation of the vagina is characterized by pain, heat, increased secretion, and frequent and painful micturition.

Causes. Foreign bodies, as a tampon or pessary, left in too long; but the most common cause is gonorrhœal infection.

Treatment. Remove the cause and use a wash of plumbic acetate and borax, or if gonorrhœal, introduce a speculum, apply a solution of silver nitrate (gr. xxx—oz. 1) and apply a tampon of cotton smeared with vaseline, which is left in for a few hours, and then a wash of borax should be employed frequently.

IV. NEW GROWTHS.

Myomata occur sometimes and may be submucous or polypoid.

Cancer is always secondary to that of cervix.

Encysted tumors are due to retention of cyst contents and are best treated by snipping out a piece of their wall.

V. FISTULÆ.

There are several forms of these, such as vesico-vaginal, recto-vaginal, utero-vesical, and utero-vagino-vesical. A consideration of one will suffice for the rest.

Vesico-vaginal fistula is an accident liable to occur as a result of child-birth, and until a recent period such a case was doomed to a life of seclusion and despondency, besides being compelled to live in an atmosphere reeking with the smell of decomposing urine. In 1852, J. Marion Sims invented an operation, the

elements of which consisted in the use of the duck-bill speculum, silver wire sutures, and a self-retaining catheter.

Causes. **1. Traumatic.** The cause of 90 per cent. of these cases is a tedious labor; the fœtal head pressing for a too long time upon the soft parts gives rise to a slough. So the maladroit use of forceps or perforator, a badly fitting or rough pessary, or a stone in the bladder may give rise to it.

2. Pathological. Cancer extending from the uterus, or a phagedenic chancre may cause it.

Symptoms. A history of retention of urine following a tedious or instrumental labor, needing the use of the catheter, and in a few days the urine is passed involuntarily, causing excoriation of the nates. An examination will reveal the fistula.

Operation. Lateral position and Sims' duck-bill speculum, under ether; pare the edges for $\frac{3}{8}$ to $\frac{1}{2}$ an inch around the opening, not including the mucous membrane of the bladder. Silver wire sutures are introduced $\frac{3}{16}$ of an inch apart, the first suture at the middle of the wound, and they must not include the vesical mucous membrane as it will give rise to tenesmus; perforated shot is applied over the wire and clamped —a self-retaining catheter should then be inserted, and the bladder washed out daily with boracic solution, and the sutures removed on the 8th day.

C.—Diseases of the Uterus.

I. DISORDERS OF MENSTRUATION.

Menstruation is the function popularly spoken of as the "monthly period," the "courses," "turns," or "the being unwell." It begins from the age of 14 to that of 17, depending on the climate, education, and mode of life. We have seen that it is accompanied by certain changes in the

individual, both bodily and mental. A knowledge of the healthy function is therefore necessary in order to understand its disorders. Its duration is 5 days, its amount $2\frac{1}{2}$ oz., it recurs every 28 days, it continues to recur periodically until about 45 years of age when the climacteric usually occurs, and during a period of about 30 years it only ceases *normally* during pregnancy and lactation.

For the proper performance of this function three elements must exist in a perfect state of integrity:

1. The ovaries, uterus, and vagina must be perfect in form and vigor.

2. The blood must be in a normal condition.

3. The nervous system, governing the relations between the uterus and ovaries, must be unimpaired in tone.

Any influence disordering one or more of these elements may check ovulation, the great moving cause of the function; will prevent the degree of sympathetic congestion necessary for rupture of the uterine vessels, or will oppose the flow of blood which has been effused.

1. Amenorrhœa. There are two distinct forms; first, where the menses have never appeared, and second, where having continued regularly for some time they have ceased.

(a). DELAYED MENSTRUATION.

(α). *From congenital malformation.*

(i). Absence of uterus or ovaries.

(ii). Stenosis of uterus or vagina.

(iii). Imperforate hymen.

(β). *Functional.* Here there is an absence of the above causes, and it is usually due to some constitutional disorder, as phthisis, chlorosis, Bright's disease, etc.

(*b*). SUPPRESSED MENSTRUATION. It may be simply irregular as to time, quantity or quality, or it may be completely arrested. Sometimes it is replaced by a uterine leucorrhœa.

Causes. Sudden cold, bodily or mental shock, fevers and severe disease, change from country to town, etc.

Symptoms. The amount of disturbance varies very much, but most frequently there is headache, fever, severe pain in abdomen and head, and frequently hysteria. Sometimes these symptoms are relieved by vicarious menstruation or uterine leucorrhœa, or it may last for months with abating disturbance of the system, but more or less ill-health.

Be careful to distinguish it from pregnancy.

Treatment. In delayed menstruation if the health is unaffected it is best to wait, being careful to find out in due time if there is any congenital defect present.

In suppressed menstruation the hot hip-bath and foot-bath, with hot drinks, and an aloetic purge just before the expected period are often all that is required. Then a mixture of iron and aloes, or Blaud's pills, with exercise and fresh air.

2. Dysmenorrhœa is menstruation accompanied by pain just before, during, or after the period. The character of the pain and the nature and severity of the accompanying symptoms vary according to the constitution of the individual; hence there are several varieties, viz. :—Neuralgic, congestive, mechanical, membranous, and ovarian.

(*a*). *Neuralgic.* Usually occurs in young girls or in sterile married women, and in those of a nervous, delicate constitution. The pain is usually severe and frequently in paroxysms, but unaccompanied by fever.

(*b*). *Congestive.* Usually occurs in those of a sanguine or plethoric temperament, and usually in married women. The

face is flushed, there is usually fever, and severe pain in the back, and aching in the limbs. The pain usually ceases after the flow is established, and the latter is often profuse. An examination shows enlargement and congestion of the cervix and frequently abrasion. The bladder frequently sympathizes and the breasts are tender.

(*c*). *Obstructive.* Is caused mostly by atresia of the os or retroflexion, and is readily detected by an examination. The pain precedes the flow, and there is usually sterility.

(*d*). *Membranous.* Where the superficial layer of the mucous membrane of the uterus is cast off as a coherent triangular sac, or else in shreds of a more or less firm consistence. It is accompanied by intense uterine pains like those of labor. Be careful not to mistake it for abortion, where you would find the villi of the chorion, large decidual cells, and epithelium undergoing fatty degeneration. Its true pathology is unknown, and its prognosis is unfavorable.

(*e*). *Ovarian.* These are cases where you can eliminate any uterine or periuterine cause, and where there is not merely a neuralgic condition, but the ovaries can usually be felt enlarged, congested, tender or prolapsed; they are often accompanied by epilepsy; and the pain precedes the flow by several days. The prognosis is usually bad.

Causes of Dysmenorrhœa. Cold during the menstrual period, sudden shock, mental emotion, constipation resulting in sluggish portal circulation, displacement of the uterus, endometritis, atresia, and peri or para-metritis.

Treatment of Dysmenorrhœa. 1. *During an attack.* Morphia, hot brandy, or even chloroform, and hot fomentations locally, and hot baths.

2. *To prevent a return.* This depends on the cause. If it is

neuralgic, strengthen the patient by tonics, exercise and fresh air, and lessen general and local irritability.

If due to congestion, treat locally by depletion and applications of iodine or the hot vaginal douche, and generally by saline aperients. If obstructive, dilate thoroughly, under chloroform if necessary, with a steel dilator; or if due to retroflexion treat that. If membranous, give Donovan's solution internally, and iodoform pencils to uterus. If any of these resist all treatment, especially the ovarian form, it may be necessary to remove the tubes and ovaries.

3. Menorrhagia is applied to excessive menstruation, while "metrorrhagia" is applied to uterine hemorrhage or a flow occurring during the interval of the menstrual periods.

The period may occur too frequently, or it may be too copious.

There are two forms met with in practice which are, strictly speaking, degrees of the same disorder, but the division is a convenient one.

(*a*). The flow is of natural quality, but the quantity or frequency of recurrence is increased.

It occurs in the unmarried sometimes, especially in young females who have to work hard, running up and down stairs, or using the sewing-machine.

Symptoms. Those of a continuous debilitating discharge, exhaustion, anæmia, languor, giddiness, pain in the side, and disorders of digestion.

(*b*). The flow is excessive, mixed with clots, and there is often subinvolution and displacements of the uterus. This form is confined usually to married life, and generally in those of a phlegmatic temperament and a constitution impaired by disease.

Symptoms. The symptoms are more intense, and on examination the cervix is large, open, and often eroded.

Pathology of Menorrhagia. (*a*). Any condition which induces a state of active or passive congestion of the uterus or its lining, such as subinvolution, displacements, fibroids, ovaritis, lacerated cervix and plethora.

(*b*). Anything which creates a solution of continuity of its lining, such as fungoid degeneration.

(*c*). Any growth having a vascular connection with the uterus, such as fibroids, polypi, products of conception, and cancer.

(*d*). Any dyscrasia of the blood, such as scurvy, chlorosis or uræmia. There are cases where there is an absence of all these causes, and they might at present be called functional.

Diagnosis. It should not be comfounded with abortion or the climacteric—a careful examination should always be made after medicinal treatment has been fairly tried, and it may even be necessary to dilate the os and thoroughly explore.

Treatment. In the simple variety, rest; a generous but unstimulating diet, and a mixture of sulphuric acid and zinc. sulphate, with alum injections may be all that is necessary. If this fails, seek the cause and treat it *secundum artem.* Never give iron in menorrhagia.

Leucorrhœa, commonly called "the whites," is a symptom and not a disease.

1. VAGINAL LEUCORRHŒA. (*a*). *Acute.* Is characterized by a white creamy discharge of acid reaction, accompanied by heat, soreness, fulness, smarting or pain, weight and bearing down in the vagina with a frequent desire to micturate. On examination the mucous membrane is red, swollen and tender. The principal causes are cold, violence, high living and excessive sexual indulgence.

Diagnosis. It is difficult to distinguish it from gonorrhœa, but in the latter there is more bladder trouble, the glands in the groin are usually enlarged, and the history of the case will assist.

Treatment. Injections of plumbi acet. or borax and tonics will often be sufficient. In gonorrhœa wash out the vagina with hot water, introduce a speculum and swab out thoroughly with a solution of silver nitrate (gr. 30—oz. i.) and introduce a tampon of absorbent cotton smeared with vaseline.

(*b*). *Chronic.* It is very common, as the vagina is exposed to so many sources of irritation. The causes are nearly all those of menorrhagia.

There is usually pain in the back and symptoms of a debilitating discharge.

Treatment. Injections, tonics, and the removal of the cause.

2. Uterine Leucorrhœa. Is characterized by a thick glairy alkaline discharge, which on examination with speculum is seen to ooze from the os uteri. It occurs often as vicarious of menstruation, or at the climacteric, and is frequent in chlorotic subjects and after abortions.

It is usually of a chronic character, gives rise to back-ache and general debility. Its causes are similar to those of menorrhagia.

Treatment. Seek the cause, which is most frequently endometritis, and treat the local affection, while at the same time give tonics and constitutional treatment.

Sterility. The desire for family, either to perpetuate the name, or for the descent of property, or the mere love of progeny, is so strong an instinct that with every other blessing many are miserable because they have no children. There can be no wonder then that you may often be consulted to remove the cause.

Causes. Bearing in mind the physiology of conception it will be easy to comprehend why barrenness or sterility should so often occur.

1. Anything which prevents the entrance of the semen into the uterus.

(*a*). Absence of uterus or vagina.

(*b*). Imperforate hymen.

(*c*). Vaginismus.

(*d*). Atresia of vagina or uterus.

(*e*). Cervical endometritis.

(*f*). Fibroids or polypi.

(*g*). Displacements.

2. Anything which prevents the production of a healthy ovum.

(*a*). Chronic ovaritis, or cystic degeneration of the ovary.

(*b*). Parametritis and perimetritis.

(*c*). Absence of the ovaries.

3. Anything which prevents the passage of the ovule into the uterus.

(*a*). Stricture of the fallopian tubes.

4. Anything which destroys the vitality of the semen or prevents fixation of the impregnated ovum.

(*a*). Endometritis.

(*b*). Leucorrhœa, and gonorrhœa and gleet in the male after marriage, infecting the woman.

(*c*). Membranous dysmenorrhœa.

(*d*). Menorrhagia.

(*e*). Abnormal growths, such as fibroids.

(*f*). Subinvolution.

If all these causes are found to be absent, then examine the husband and see if the organs of generation are healthy and sound, and examine the semen microscopically for spermatozoa, and enquire for a history of syphilis.

Married women, who are sterile, usually regard it as a reproach to their womanhood; sterility is therefore a cause of much unhappiness, so that it is well to inform the patient that a large proportion by appropriate treatment may become fruitful.

Treatment, consists in removing the cause if possible.

II. MALFORMATIONS.

These can only be understood in connection with the history of development. During the 4th and 5th week of intrauterine life, the Wolffian bodies are situated on each side of the vertebral column, and are the primordial or temporary kidneys. Their efferent channels communicate with the kidneys, but in the female are of no importance pathologically. From the lower angle of the Wolffian body a ligament extends to the inguinal region which developes into the round ligament of the uterus. At the median margin of the Wolffian body is the germinal gland, which becomes the ovary in the female, the testis in the male. From the anterior surface arises a cord, at first solid, called Müller's duct, which becomes of the greatest importance in the female. Both efferent channels of the Wolffian body, as well as the two mutually united Müller's ducts, insert themselves into the lower end of the urinary bladder at the point between the urethra above and the urogenital sinus below. While the Wolffian body is retarded in its growth into the parovarium, and the function of secreting urine is assumed by the kidneys, Müller's ducts continue to

develop, and then join together probably at the point where later the vagina is united to the cervix uteri. The septum between the two ducts then disappears so that a common canal arises, but the upper ends remain separate and begin to diverge. The upper extremity of the ducts becomes fimbriated, the next part becomes the fallopian tube itself, and the lower portions unite to form the uterus, which soon increases in size to form the fundus, and below, the vagina. The inguinal ligament approaches the upper edges of the uterus constituting the round ligament; the germinal glands, becoming the ovaries, sink down to the sides of the uterus, and at the point where the vagina and urogenital sinus join a fold arises which becomes the hymen.

Now if Müller's ducts fail to unite, we have *bicornuity;* if they unite externally but the septum fails to disappear, we have *bilocularity*; if one of Müller's ducts is absent or only partially developed, we have *unicornity;* or though joining and losing the septum in some portion there may be arrested development, we may have the uterus in an infantile state or rudimentary, or entirely absent.

III. STENOSIS OF OS UTERI.

Normally the os tincæ is transverse and about two lines in length. Stenosis or narrowing of the os may be congenital, constituting "pinhole os," which is usually a cause of sterility and frequently conjoined with a long conical cervix, or it may be acquired by the use of strong caustics. It usually gives rise to dysmenorrhœa or sterility, and is readily diagnosed by an examination.

Treatment. Dilatation with steel dilator, and in some cases the use of stem pessary afterwards.

IV. INFLAMMATION.

1. **Endometritis** is an inflammation of the lining membrane of the cervix uteri. It may be acute or chronic.

(*a*). *Acute.* Is a concomitant of acute metritis, indistinguishable from it, and treated in the same way.

(*b*). *Chronic.* Is a very common affection.

Pathology. The mucous lining of the cervix is disposed in folds and ridges known as the arbor vitæ, covered by columnar epithelium and studded with numerous villi. Between the folds are the glands or follicles of Naboth, about 10,000 in number. When inflamed this membrane is swollen, and hyperæmic; the glands, being especially involved, pour out a glairy viscid mucous which fills up the cervical canal in the form of a tenacious plug. This often creates abrasion or erosion of the os, and it was this appearance which used to be called "ulceration."

Causes. While there is usually some constitutional predisposition, as ill-health, scrofula, etc., it is commonly brought on by exposure to cold during menstruation; by excessive sexual indulgence; injury from sound, tent, or pessary; parturition, especially when the uterus has not been completely emptied; tumors in the uterine cavity; uterine displacements, especially retroflexion and prolapse; lacerated cervix; attempts at abortion; and extension of gonorrhœa.

Symptoms. (*a*). *Leucorrhœa.* The secretion is thick and glairy, of alkaline reaction, and is most characteristic of the complaint. Owing to the small amount of sensibility of the cervix, inflammation may be present without attracting the patient's attention until leucorrhœa becomes marked.

(*b*). *Menorrhagia.* This may frequently lead to anæmia.

(*c*). *Dysmenorrhœa* is frequent. Then there is weakness in

the back, and pain in the pelvis and loins, digestive and nervous derangements, sterility and often abortion. After the disease is established constitutional symptoms become more marked, nutrition is impaired, she becomes nervous, hysterical, fretful and despondent.

On examination with speculum the os is usually seen to be inflamed or abraded, with a thick glairy secretion oozing out of it.

Treatment. Regulate constipation if present, build up the general health and combat any diathesis that may be present. Then dilate, curette, dry and apply iodized phenol, and glycerine tampon. Then use a vaginal douche of plumbic acetate and borax every day. In very stubborn cases, zinc alum pessaries or fuming nitric acid are useful. Never use intrauterine injections.

2. Acute Metritis. Is an inflammation of the muscular and fibrous tissue of the uterus. Generally the lining is affected first, and Thomas thinks acute metritis is merely a complication of endometritis.

Pathology. The uterus is enlarged, thickened, doughy, infiltrated with serum, the veins engorged, but the cavity is not altered in size.

Causes. Mostly from an extension of inflammation from the mucous or serous lining of the uterus, and most commonly as part of the general inflammation produced by absorption of septic matter during the puerperal state. It may also arise from exposure to cold at the menstrual period; from gonorrhœal infection; or the careless use of the sound or curette.

Symptoms. It usually begins with a chill, and then fever with more or less general constitutional disturbance. There is a sense of heat, burning and fulness in the pelvis, and pain in

the hypogastric and sacral regions, aggravated by every movement of the body or in evacuating the bowels or bladder.

There is usually nausea, vomiting, diarrhœa, tenesmus of the bladder and rectum.

On examination there is tenderness on pressure in the hypogastric region; the vaginal walls are hot and dry; the cervix is swollen and any movement of it causes pain; there is tenderness in all the fornices. The bimanual is almost impossible for the pain. Avoid the use of the sound.

The acute symptoms usually terminate in a week, resolution gradually taking place, or else it runs into the chronic form.

Treatment. Remove the cause, especially if supposed to be due to septic poison. Thus if it occurs during the puerperal state the uterine cavity should be washed out with bichloride solution (1-5,000), and if any portions of placenta or secundines remain they should be removed by the finger or blunt curette. Perfect rest and morphia to ease pain with quinine in gr. v. doses every 4 hours, and locally hot fomentations and turpentine stupes, with hot vaginal injections.

3. Chronic Metritis. Is not correctly a chronic inflammation at all, but consists in an increase of connective tissue out of proportion to that of the muscular fibre which remains normal or but slightly increased in quantity, and is dependant upon long-continued hyperæmia. It resembles cirrhosis of the liver, and might in fact be called "cirrhosis of the uterus."

"Subinvolution of the uterus" one of its principal causes, cannot be diagnosed from it, and is treated in the same way.

Pathology. Like cirrhosis of the liver, at an early stage the uterus is enlarged, hyperæmic and soft, but later on it becomes indurated, anæmic and hard. There is an increased amount of connective tissue and a diminution of muscular fibre.

Causes. (*a*). *Of Chronic Metritis, the result of Subinvolution.* Retention of portions of placenta, membranes, or blood clots; lacerated cervix; pelvic inflammation after labor; rising too soon after delivery; non-lactation; and repeated miscarriages.

In the process of normal involution there are two factors, the fatty degeneration of the muscular fibre and the removal of the products of this degeneration. The enlargement of subinvolution is due to the substitution of connective tissue for the products of this degeneration.

(*b*). *Of Chronic Metritis, the result of repeated congestion.* Displacements of the uterus; pressure of distended bladder or tumors upon the uterus; endometritis; the too free use of caustics, and excessive sexual indulgence.

Symptoms. She usually dates her sufferings from a previous confinement or miscarriage. After such an occurrence she feels weak, has pains and weakness in the back, a feeling of weight and bearing down in the pelvis, and a want of power in the limbs. Then there is leucorrhœa and irregular menstruation, which may lead to frequent abortions, and shortly to sterility. After a time the constitutional disturbances become marked and urgent.

On examination the uterus is felt to be enlarged, especially the cervix and os. The uterus is freely movable and its cavity is enlarged so that the sound passes more than $2\frac{1}{2}$ inches, and there is usually endometritis.

Treatment. First seek the cause and remove that, such as endometritis, lacerated cervix, fungoid degeneration, displacements, etc. Then rest, local depletion by glycerine tampons, the application of tinct. iodine co., and hot vaginal douches. Internally ergot, quinine and nux vomica. If these means fail, trachelorrhaphy often acts well.

What is the influence of pregnancy and parturition on the local conditions of chronic metritis? In many cases it is injurious, but it may be so conducted as to accomplish a degree of good which can be obtained in no other way. Thus a natural delivery free from laceration, a prolonged decubitus free from sepsis, perfect cleanliness by means of vaginal injections, ergot and quinine to secure tonic contractions, suckling of the infant, and a careful return to ordinary exertion, are the means which may bring about a complete transformation.

V. DISLOCATIONS OR DISPLACEMENTS

Include alterations of *curvature* as well as of position, hence we have *flexions* and *versions*.

In the recumbent woman the vagina lies almost horizontally, the concavity being upwards. Between it and the uterus lies the plate-shaped empty bladder and immediately upon it the uterus, so that in the normal state there is no free space between the uterus and the bladder. The fundus of the uterus is directed towards the symphysis pubis, and its upper border is on a level with the plane of the superior strait. The cervix or vaginal portion of the uterus is on a level with the junction of the sacrum and coccyx. As there is usually a slight bend at the internal os, the cervix points somewhat downwards. Behind the uterus the rectum descends on the left, but often extends beyond the middle line, so that in frozen sections the part above the anus is situated entirely on the right side. Now it is of particular importance to remember that the uterus is freely movable and not absolutely fixed, and that

1. The uterus *in toto* is displaceable in all directions.

2. It may be moved in such a manner that the upper longer arm of the lever,—the body, imparts motion to the lower

smaller arm,—the cervix, in the opposite direction, and inversely the cervix to the body.

3. The uterus may be bent upon itself to a slight degree.

Thus the uterus, being held relatively in position somewhat loosely between the floor of the pelvis below and the intestines above, as well as by its ligaments, is pushed backwards by a distended bladder, forwards by a distended rectum, sinks on standing, is elevated in coition, and can be moved about by digital examination. As long as the pressure from above and the resistence from below are physiologically balanced, so long the uterus lies in normal position, the ligaments do not immediately enter into consideration,—but if the pelvic floor relaxes, or the pressure becomes excessive from above, the uterus will change its position and drag on its ligaments and on their attachments. You should not put too much importance upon slight variations, for unless marked or persistent they are not pathological, and you may sometimes be surprised to find on examining a patient, a well-marked flexion which had not made its presence felt by any symptoms.

This however is exceptional, and is due to the fact that flexions and versions in themselves give rise to no symptoms primarily, the symptoms arising secondarily, and being due to

1. Interference with the functions of menstruation, conception or pregnancy.

2. Chronic metritis or endometritis produced by the displacement.

3. Pelvic cellulitis and peritonitis accompanying the displacement and frequently causing it.

Causes of Displacements in general. 1. Influences which increase the bulk and weight of the uterus, such as congestion, pregnancy, fibroid tumors, subinvolution and hypertrophy.

2. Influences which weaken or displace its supports, such

as defective nutrition, local or general; enfeebled health, excessive intra-abdominal pressure, violent muscular effort, tight lacing, wearing heavy clothing, pressure of abdominal tumors, etc.

1. Anteversion. The uterus is straightened, the normal angle at the internal os becoming obliterated and the os pointing backwards. It occurs physiologically in early pregnancy, and pathologically when the uterus is enlarged through chronic metritis.

Symptoms. There are none *per se*, but there are usually the signs of chronic uterine or pelvic inflammation, such as pain in pelvis, difficulty in walking, micturition and defecation and derangements of the digestive and nervous systems.

Digital examination detects the os directed backwards, and the body of the uterus is felt through the anterior fornix. The position is felt by the bimanual method and verified by the sound, but be careful in the use of the latter if there is the least suspicion of pregnancy.

Treatment. Keep the patient in bed, regulate the bowels and bladder, elevate the hips and use an injection of some astringent, or a tampon of glycerine and tannin, and a carefully adjusted abdominal belt. Any complication such as hyperæmia, inflammation or abrasion should be attended to, and the general health built up by tonics. Do not be in any hurry to use a pessary, but if these means fail, you can insert a Graily Hewitt cradle pessary.

2. Anteflexion. Is an exaggeration of the normal flexion of the uterus, and is more frequent in nulliparæ for the reason that it is a frequent cause of sterility. It may be congenital; or acquired, which is usually due in delicate ill-nourished girls about the age of puberty to tight lacing, or heavy skirts, or to habitual constipation; or it may be the result of inflammatory changes behind the uterus.

Symptoms. (*a*). *Dysmenorrhœa.* This may be explained in two ways :—

(*a*). *The obstructive or mechanical theory*, held by Simpson and Sims, that the flexion causes a narrowing of the uterine canal obstructing the free exit of the menstrual blood which is retained, coagulates, and causes the uterus to painfully contract to expel the clots. While it is objected to this theory that the blood is not always clotted, that it is often in small quantity, and that the pains have not always the distinctive character of labor pains, yet if not the correct view it is difficult to explain the great benefit derived from various modes of treatment based upon it.

(*β*). *The congestive theory*, held by the Germans, that the pain is not due to the bend in the uterine canal but arises from the resistance which the muscular tissue of the uterus offers to the hyperæmia. In normal cases the tissue yields to the distending vessels, but when the uterus is bent upon itself there is an obstruction to the flow of blood, the mucous membrane cannot swell up as it normally does at the menstrual periods, there is thus undue vascular tension and compression of the nerve endings in the uterus, causing pain. There is always in this condition of anteflexion more or less density of tissue, the result of chronic inflammation which makes the tissue more dense and resisting, and the increased vascularity at these times causes pain just as in periostitis where pain in the affected limb is increased by its becoming warm in bed.

(*b*). *Sterility.* Is due to the same cause.

Then there are dysuria, dyspareunia, leucorrhœa, and often menorrhagia.

Diagnosis. By digital examination the cervix is felt to be high up, and the os looks downwards and forwards, while the body of uterus is felt in the anterior fornix forming a distinct

angle. This is verified by the bimanual, and the sound must be bent before it will pass up to the fundus.

It must be differentiated from myoma of the anterior wall of the uterus, in which case the sound passes normally, while the finger in the vagina detects the increased thickness of the anterior uterine wall, its hardness, irregularity and want of symmetry, and the increased bulk of the whole uterus.

Treatment. Pelvic inflammation if present should be first attended to, and cicatricial bands stretched by the daily use of well applied glycerine tampons. These cases require patience, perseverance and skill.

(*a*). The occasional introduction of the uterine sound. This should be done a few days after menstruation, and if its presence does not irritate you can make a wide sweep of the handle and place the uterus in a state of retroversion for a short time daily.

(*b*). The intrauterine stem pessary, with or without previous dilatation with steel dilator. Keep the patient in bed for a few days so as to watch its effect and withdraw it if there is any irritation.

(*c*) Should these means fail, divide the cervix and keep it open with an intrauterine glass plug.

3. Retroversion. The whole uterus is directed backwards.

It is caused by sudden strains or blows; by carelessness after labor, as at that time from its weight and laxity of attachment it is always more or less retroverted or retroposed for a few days; or by inflammation behind the uterus causing adhesions.

The *symptoms* are the same as those of retroflexion.

Diagnosis. The cervix is low down, and the os looks downwards and forwards. By the bimanual the fundus is found to

be absent from the anterior fornix, but can be felt through the rectum, and the sound passes in directly backwards.

Treatment Remove any existing inflammation first and then if there are no adhesions replace the uterus by the bimanual or by the sound, or combine with these the genu-pectoral position, and retain it in place by a Hodge, Albert Smith, Thomas, or Greenhalgh's pessary.

4. Retroflexion. Besides being turned back the normal angle is reversed.

This displacement is one of the most common and most important that you meet with. Besides being placed backwards upon itself so that the fundus lies in Douglas' pouch, its size is increased, the cervix is directed downwards and forwards.

Causes. The dorsal position and too tight bandaging after confinement, or the patient rising too soon while the uterus is large and heavy and its supports lax and weak, give rise to it. It may however be congenital.

Symptoms. There is usually much greater discomfort than in retroversion.

(*a*). *Weakness in the back,* which may in some cases amount to actual pain.

(*b*). *Symptoms of chronic perimetritis.*

(*c*). *Painful defecation.*

(*d*). *Leucorrhœa.* This is due to chronic endometritis, the displacement causing passive congestion.

(*e*). *Dysmenorrhœa* is not so frequent as in anteflexion.

(*f*). *Menorrhagia,* which is due to chronic endometritis and obstruction.

(*g*). *Sterility,* which is due to the altered position of the cer-

vix, to endometritis, obstruction of the Fallopian tubes or malposition of the ovaries.

(*h*). *Abortion* is apt to take place if pregnancy occurs.

Diagnosis. The cervix is low, the os directed downwards and the fundus is absent from the anterior fornix, but is felt in the posterior fornix or by the rectum, and the angle between the fundus and cervix can be felt behind. The sound has to be bent and passes backwards.

It must be distinguished from pelvic deposits in Douglas' pouch and myoma of the posterior wall of the uterus.

Treatment. (*a*). *Replacement.*

(*a*). By bimanual.

(*β*). By the sound.

(*γ*). By genu-pectoral posture combined with traction on the uterus, with vulsellum and pressure on the fundus, with the finger in the rectum. Before any of these manipulations the hot vaginal douche and glycerine tampons should be used to soften the parts and stretch any adhesions that may exist.

(*b*). *Retention* by Thomas' modified Hodge, or Albert Smith pessary.

5. Prolapsus or Procidentia Uteri. Owing to the amount of loose tissue surrounding the bladder and rectum, we get a weak point in the pelvic floor at which it separates, and the uterus becomes displaced under increased abdominal pressure. The pelvic floor is made up of two segments, the pubic and the sacral. The pubic segment is made up of loose tissue including the bladder, urethra, anterior vaginal wall and bladder peritoneum loosely attached to the symphysis pubis. The sacral segment is attached to the sacrum and coccyx, and consists of rectum, perineum, and strong tendinous and muscular tissue firmly dovetailed into the sacrum and coccyx. During

labor the former is drawn up and the latter pushed down, acting like folding doors, as the womb comes down between.

When prolapse occurs you have first the appearance of the anterior vaginal wall at the orifice, spoken of as "cystocele," then the uterus appears, then the posterior vaginal wall known as "rectocele." The uterus becomes more and more retroverted as it comes down.

Symptoms. The patient complains of dragging and bearing down, and afterwards of discomfort caused by the protrusion and excoriation of the womb. There is usually dysuria.

Pathology. There are three factors :—

(*a*). Deficient sacral support. Thus as a result of labor the sacral support has become straightened out or deficient at its lower margin—the perineum. It does not always follow in every case of ruptured perineum, but in those cases where as some hold the perineal body has been torn through, or as others hold where there has been a tearing of the perineal muscles, especially the levator ani, that prolapsus occurs.

(*b*). Deficient tone of the pubic segment of the pelvic floor.

(*c*). Intra-abdominal pressure. This is the most important factor. The uterus itself has very little to do with prolapse except by its weight, when it is hypertrophied or has a fibroid dragging upon it, and it may be likened to a hernia, the sac being the peritoneum, and the canal being the space between the bladder and the rectum.

Diagnosis. From inversion and polypus.

Treatment. (*a*). *Palliative*—the use of pessaries. In slight cases Hodge's, or the elastic ring pessary. Then rest, with alum injections and a good abdominal belt.

(*b*). *Radical.* (*a*). Repair of a ruptured perineum.

(*β*). Making a raw surface on anterior wall of vagina or on both sides, and stitching them together we lessen the calibre of the vagina and so keep up the uterus.

Pessaries. Perhaps there is no instrument so much wrongly used as the pessary, though much benefit may be derived from it judiciously applied. Some physicians think that if any displacement be found and often when symptoms are merely obscure, a pessary must be inserted. While therefore the pessary may do a great deal of harm when thus used, it is largely this ignorance in regard to its proper application which has brought it into so much discredit. First then be sure of the diagnosis and the amount and nature of the displacement; always replace the uterus before inserting one; be sure of the absence of peri-uterine inflammation; if adhesions exist loosen them by previous applications of glycerine tampons; select a special pessary for each particular case just as you would fit a splint for a fracture; if painful remove it and see for yourself at once or within a few hours that it suits the patient; she should be informed of its introduction, how long it is likely to be required, if painful to remove it and to use a daily vaginal douche for the sake of cleanliness. Pessaries should rarely, if ever, be used in young unmarried women.

6. Inversion. The uterus is turned inside out so as to form a polypoid projection into the vagina, its peritoneal surface is converted into a cup-shaped hollow, its mucous lining being everted and exposed in the vagina.

Pathology. A portion of the muscular wall of the uterus, usually the placental site, having lost its tone, becomes depressed towards the uterine cavity; muscular contractions of the non-depressed portion of the uterus, combined with intra-abdominal pressure or traction from below, as by pulling on the placenta,

or tension on the pedicle of a polypus, carry the depressed portion further into the uterine cavity, until the fundus reaches the os and by a continuation of the same process dilates the cervical canal and passes into the vagina.

It is caused most frequently by labor, occurring however only as 1 to 140,000 cases, and is much rarer now since the adoption of Crede's method of conducting the 3rd stage; the other less frequent cause being the traction of a pediculated fibroma attached to the fundus.

Symptoms. Hemorrhage, bearing down pains, anæmia and weakness.

Diagnosis. A digital examination reveals a rounded or flattened soft tumor, which bleeds easily, is free on all sides except at its upper extremity, around which is felt the cervix, the lips and fornices being recognized, or the cervix is thinned out to a ring and the fornices obliterated. With one finger in front and the other behind the tumor, liftit up towards the abdominal wall upon which is pressing the external hand; the latter feels in place of the fundus a truncated body with a depression in the centre. By drawing down the inverted uterus, the finger in the rectum feels the depression in the fundus, and a sound in the bladder can be felt by the finger in the rectum. It is to be distinguished from a polypus and prolapse.

Prognosis. The greater proportion of unrelieved cases end fatally from anæmia, hemorrhage, septicæmia or peritonitis.

Treatment. (*a*). *Reposition.* For a few days before the operation the patient should be prepared by perfect rest in bed, vaginal injections of hot water, a liberal diet and tonics. Place the patient in the lithotomy position and etherize. Pass the finger as far up as possible in the vagina and grasp the uterus, and press it upwards against the left hand on the abdomen. To

rest the hand a cup is set on a curved iron rod with a spring, known as Aveling's repositor, which is pressed against the chest and continuous pressure thus kept up for from ½ to 2 hours.

(*b*). *Amputation.* This is only justifiable after all other means have failed. The tumor is drawn down, an elastic ligature is tied around it as high as possible to control hemorrhage, the uterus is cut off, and any bleeding vessels tied or seared with the cautery.

VI. NEW-FORMATIONS.

1. Fibro-Myoma. The so called "fibroids" consist of connective tissue and involuntary muscular fibre. They are most frequently found in the posterior wall of the body of the uterus. They cut like cartilage and are surrounded by loose fibrous tissue constituting a capsule, the looseness of which is important in their removal by eneucleation.

They are all *interstitial* at first, but may grow outwards and become *subperitoneal*, these often developing a pedicle; or they may grow inwards and lie under the mucous membrane, projecting into the cavity of the uterus, and are called *submucous.*

The presence of these growths leads to hypertrophy of the uterus, to displacement, prolapse or inversion. They themselves may undergo *softening* from œdema, fatty or myxomatous degeneration; *induration* from fatty degeneration of the muscular tissue and contracting of the fibrous; *calcification*; or *suppuration*, which may lead to fatal peritonitis.

Symptoms. They often exist without causing any symptoms and may only be recognised after death, but they usually give rise to some disorder, especially the submucous variety :—

1. *Hemorrhage.* This is especially characteristic of the submucous variety, and it occurs from the hypertrophied mucous membrane and not from the tumor.

2. *Dysmenorrhœa.* Congestion of the mucous membrane especially at the seat of the tumor causes obstruction to the menstrual flow and produces uterine contractions.

3. *Dragging* and bearing down pain, owing to the increased weight of the uterus.

4. *Reflex phenomena*, such as dysuria or even eneuresis, constipation or mucous diarrhœa, piles and varicose veins.

5. Sterility or abortion, or obstruction to labor.

Diagnosis. 1. *Of small tumors.* If a submucous fibroid is suspected as the cause of uterine hemorrhage, dilate the os with steel dilator and explore with the finger. If interstitial, it may often be detected by vaginal, rectal or bimanual examination.

2. *Of large tumors.* These are of even more importance, requiring to be distinguished from advanced pregnancy, ovarian tumors, extra-uterine gestation, hæmatocele and inflammatory deposits. Proceed then in a systematic manner by :—

a. Palpation. They have a well-defined outline, hard and firm, and there is absence of fluctuation.

b. Percussion indicates dulness.

c. Auscultation gives the uterine souffle.

d. Vaginal digital examination shows cervix high up and uterus variously displaced according to situation of the growth.

e. Bimanual shows large mass continuous with cervix when interstitial, and if subserous the tumor is felt distinct from, but attached to, the uterus.

f. The *sound* shows increased size of uterine cavity, and if submucous fibroid the cavity is tortuous.

Ovarian tumors are soft and elastic and give no uterine souffle.

Treatment. 1. MEDICAL. Ergot, by causing contraction of involuntary muscular fibre diminishes the amount of blood supply and so checks their nutrition, and also favors their pedunculation and expulsion.

℞—Ergotinæ, ... dr. ii.
Chloral Hydratis, ... dr. ½
Aquæ ad ..... oz. i.

Dose, gtta. xii. (= gr. 3) injected deeply into the gluteal region twice a week for the first few weeks, afterwards once a week for several months.

2. SURGICAL. *a. Removal through vagina, eneucleation.* Dilate the os, incise the mucous membrane over the tumor with a bistoury or thermo-cautery, and the separation of the tumor should then be left to uterine efforts aided by ergot, unless sloughing occur, when the process of eneucleation must be hurried by the curette, using antiseptic douches.

b. Removal by Laparotomy. The pedicle is best treated by the extra-peritoneal method. Dr. Apostoli has lately successfully treated by electrolosis.

2. Fibro-Cystic Tumor. The majority of these are simply fibroids which have become softened, for the cavities are not cysts but loculi c ntaining serum.

Symptoms. Usually begin just as subperitoneal fibroids, and then acquire fluctuation.

Diagnosis. They are apt to be mistaken for ovarian tumors, but the cavity of uterus is larger, and on moving the tumor externally by manipulation the sound moves also. Then draw off some of the fluid with hypodermic syringe; it coagulates like serum, whereas that of an ovarian tumor does not.

Treatment.—Laparotomy, but be prepared for hysterectomy if necessary.

3. Uterine Polypi. Are pediculated tumors attached to the mucous membrane of the uterus.

(*a*) *Pediculated Submucous* fibroid.

(*b*) *Mucous Polypi* are usually developed from the mucous membrane of the cervix. They are soft, about the size of an almond, and usually multiple.

(*c*) *Pediculated cystic folliclcs* are merely retention cysts.

(*d*) *Placental polypus* is produced as the result of incomplete detachment of the placenta. It grows by coagulation of fibrin upon its surface until it becomes of the size of an egg.

Symptoms. Hemorrhage.—This may be at first a menorrhagia, and it may become very serious.

Leucorrhœa is a symptom due to the accompanying endometritis.

Dysmenorrhœa is a symptom due to uterine contraction.

Diagnosis. When the os is dilated you can easily detect the protruding polypus with the finger; when the os is undilated and a polypus is suspected, dilate and examine.

Treatment. If the tumor is small, dilate and remove with a curette; if larger, seize it with forceps and twist off the pedicle; using caustic or not.

4. Carcinoma or Cancer. CANCER OF CERVIX. May be scirrhus or epithelioma. It may begin inside the cervix or on its vaginal aspect. It spreads by forming nodules and ulcerating, and invading the surrounding organs.

Causes. The *predisposing* causes are heredity, age or debility.

The *exciting* causes are erosion of the os and protracted catarrh, lacerated cervix, etc.

Symptoms. The *local* symptoms are *hemorrhage*, which is usually the first symptom noticed ; an *offensive watery discharge ; pain*, which is not always present, but if it is, the pain is severe, sharp, lancinating, persistent.

The *general* symptoms are loss of flesh and debility, which together with anæmia gives rise to a cachectic appearance ; reflex symptoms as painful micturition, defecation and pruritus vulvæ.

Diagnosis. The patient usually does not come until the growth has begun to ulcerate, and then the diagnosis is easy. The vaginal digital feels the everted mushroom os. The speculum may be used, but is seldom necessary unless once to verify, but is painful, and should not be reinserted.

The differential diagnosis is from hypertrophy of cervix with erosion ; laceration of cervix with ectropion ; and syphilitic ulceration.

Prognosis. Is grave and usually fatal, death occuring usually from exhaustion or septicæmia.

Treatment. Palliative. Check the hemorrhage by styptics and ergot ; the offensive discharge by astringent and antiseptic injections, as :

℞

Acid Carbolic	1 oz.
Hydrarg. Bichlor. . .	1 dr.
Morphiæ	8 grs.
Glycerinæ ad	8 oz.

SIG. Tablespoonful to two quarts of hot water, and inject night and morning.

The pain is to be assuaged by morphia, and the general symptoms are to be attended to.

Chian turpentine is said to have a marked effect upon the disease.

Radical. Caustics, scraping out the diseased tissue, amputation of the cervix, and lastly, hysterectomy has lately been successfully performed in some cases.

Cancer of body of Uterus is rarer than that of cervix, occurs usually later in life and is more common in nulliparæ.

Symptoms are the same, the cervix usually at first normal, but uterus itself enlarged and hard. Dilate os under an anæsthetic, curette, and examine the scrapings for cancer cells.

VII. LACERATION OF THE CERVIX.

The recognition and surgical treatment of this condition is one of the many operative advances of the last 20 years, and is due to the genius of Dr. Emmet, of New York.

Dr. Thomas says, "the diagnosis and treatment of lacerated cervix is a pathological contribution which, even if this eminent author had done nothing else to lay his profession under obligation, would indelibly write his name upon the records of Gynæcology. No one contribution to this department which has been made in the period mentioned has exerted a more marked influence upon uterine pathology than this is now doing, and will do in the future. None will have more influence in abolishing useless and hurtful therapeutical resources."

Although laceration of the cervix was described by Dr. Bennett forty years ago, its importance as a pathological factor was only recognized by Emmet in 1862, when he at once set about a means of cure. He first published an account of his operation in 1869, but it was not until 1874 that general attention was drawn to the subject.

The existence of a laceration may sometimes be early recognized by the presence, after confinement, of an elevated temperature, indications of septicæmia, the absence of milk, and a general impression that the patient is not doing well. These symptoms are due to cellulitis, which sometimes occurs with a laceration of the cervix, without which it would otherwise have healed, but which causes local obstruction of the circulation, and so arrests involution and the repair of the injury. It would be well, therefore, when such a condition occurs after labor, to make an examination, not immediately when the parts are so soft that the tear could not be felt, but six or eight weeks afterwards, and then by appropriate means prevent a life of suffering.

Now, while on the one hand I believe some have laid more stress upon this condition than they should, and have even operated when it was not necessary, Emmet going so far as to say that "at least one-half of the ailments among those who have borne children are to be attributed to lacerations of the cervix"; on the other hand there is little doubt that this condition is often overlooked by the general practitioner, or it is mistaken for erosion of the os (so called ulceration), or cancer, and either improperly treated or neglected. A middle course is the safest one, and the truth probably lies in the following propositions:—1. A certain degree of laceration of the cervix is the rule in all first labors.

2. A certain number of these are entirely recovered from, or else they exist without producing any symptoms.

3. A certain proportion form important factors of disease.

It is this last class of cases that alone require Emmet's operation, and in which relief of the symptoms may be expected. The tendency then of laceration of the cervix is to heal unless either septic poisoning takes place, or the tear extends beyond the crown of the cervix into the connective tissue, the accom-

panying cellulitis obstructs the circulation, interferes with involution, and thus prevents repair of the injury. It is most commonly met with on the left side, probably because the vertex usually occupies the right oblique diameter; and the next in frequency is the bilateral.

Symptoms. When a laceration of the cervix exists, there is a tendency, especially on standing, for the uterine tissue to roll out, while the obstructed circulation, the irritation of the vagina, and the resulting sub-involution increase the laceration; and as the vaginal outlet is usually patulous—owing perhaps to the us of forceps, or traction, or the accompaniment of a ruptured perineum—there is usually prolapse or retroversion. The reticulated mucous membrane, containing numerous Nabothian glands, undergoes cystic hyperplasia and granular degeneration, resulting in a condition closely resembling erosion (so-called ulceration), or even cancer.

Then we have inability to walk or stand comfortably, backache, pains in the abdomen, irritability of the bladder, profuse menstruation, leucorrhœa, headache, insomnia and other nervous derangements, and lastly sterility; or if pregnancy should occur, it usually results in abortion.

If neglected it may result in chronic parametritis, cancer, subinvolution, sterility; if pregnancy occurs, a tendency to abort; menstrual disorders, endometritis, dispareunia, and displacements.

Diagnosis. Readily felt by finger, and then put the patient in the Sims position and use Sims' speculum and a tenaculum or vulsellum, and by bringing the two lips in apposition you can tell at once the amount of laceration. It is to be distinguished from erosion, syphilitic ulceration and cancer.

Treatment. Trachelorrhaphy. The method which I have employed for some time past is to mark out the intended incision with a scalpel, remove the angle or cicatricial plug

(as it has been called) with Skene's Hawkbill Scissors, then trim the edges with knife and long handled scissors, and stitch up with chromic catgut. This has the power of resisting the tissues for two weeks, and can be removed with the finger nail on making an examination after that time, up to which period there is no need of disturbing the patient, nor any danger of re-opening the wound, as there is with either silk or silver wire

D.—Diseases of the Pelvic Connective Tissue.

I.—PARAMETRITIS, OR PELVIC CELLULITIS.

Is an acute or chronic inflammation, usually septic, of the cellular tissue of the pelvis.

The peritoneum is so closely applied to the body of the uterus that there is no separating the layer of connective tissue between them. In the same way there is little connective tissue between the peritoneum and the posterior wall of the vagina, between it and the bladder or between it and the rectum. There is more found between the uterus and the bladder, but the greatest accumulation of connective tissue is found laterally at the uterus, the parametrium proper or Virchow's parametric tissue. This is important from a diagnostic point of view, as inflammation and exudation of the parametrium would be looked for at each side of the uterus, although it may extend to that tissue between the uterus and the bladder.

Causes. In parous women the great cause is septic matter absorbed by the lymphatics from the torn perineum, vagina or cervix. This passes along the lymphatics in the cellular tissue beneath and in the brood ligaments, causing inflammation of the glands and proliferation of the connective tissue in which they are embedded.

The same may follow premature labor, abortion, gynæcological operations, and even a very prolonged and tedious labor.

Symptoms. It usually sets in with a rigor, then fever, and pain over the lower part of abdomen, which is increased by pressure and is more severe laterally. After the exudation occurs, one leg is usually drawn up, and a fulness is felt usually at one side of the uterus which is itself pushed over to the opposite side. The lameness and stiffness of the thigh often remain for months.

Prognosis. The inflammation may be arrested and the effusion absorbed, or it may go on to form an abscess which may open into the bowel, or bladder, or pass below Poupart's ligament, or up towards the kidney. It usually takes months to ripen and recovery is tedious.

Treatment. Same as that of perimetritis.

II.—PERIMETRITIS, OR PELVIC PERITONITIS.

Is an acute or chronic inflammation of the pelvic peritoneum, and is not always of septic origin.

Causes. Extension of pelvic cellulitis; rupture of ovarian cysts, fibroids, tubercle or cancer; child-birth and abortion; gonorrhœa spreading up the tubes; cold during menstruation, venereal excess, or instrumental manipulation.

Symptoms. There may or may not be a rigor; then fever sets in and severe pain in abdomen increased by palpation; the patient lies on her back with legs drawn up; the vagina feels hot and tender. After exudation occurs, a flat hard unbulging condition of the fornices around the cervix is felt, and the uterus becomes immovable, feeling as if plaster of paris had been poured into the pelvis and had set all round the uterus. The bulging is specially marked in Douglas' pouch.

Prognosis. It may resolve or suppurate, and is not usually fatal, unless it becomes general.

Treatment.—1. **Prophylactic.** Always scrupulously carry

out antisepsis in labor, abortion or gynæcological operations. Young women should be warned to avoid all undue fatigue during their menstrual periods, as well as late hours, violent exercise and alternate exposure to heat and cold. Gonorrhœa should be thoroughly treated, especially during pregnancy.

2. **Curative.**—(*a*) *General.* Morphia to ease pain; aconite for fever, and quinine to combat the septic condition. The diet should consist of iced milk, beef tea, soup, and champagne.

(*b*) *Local.* Leeches over iliac region, hot fomentations, hot vaginal douche, and later on glycerine tampons.

III. PELVIC HÆMATOCELE.

Is an effusion of blood, usually into the pelvic peritoneum, sometimes beneath it; hence there are two varieties, the intraperitoneal and the subperitoneal.

1. *Intraperitoneal hæmatocele* is the more serious, and if the effusion is rapid, death may take place before it has time to coagulate, or if it is slower, violent inflammatory action is sure to be set up.

2. The *subperitoneal or encysted* variety is when the blood is effused into the cellular tissue surrounding the uterus, ovaries and pelvic viscera.

Hæmatocele is no more a disease than hæmoptysis, but is a symptom of some previously existing pathological condition of the pelvic organs. It is only since 1850 that gynæcologists have really had their attention drawn to this condition, so liable to occur owing to the abundant venous supply of the pelvic organs, the congestion induced by menstruation, and the hemorrhage accompanying the monthly rupture of the Graafian follicle.

Causes. The *predisposing* cause is the period of ovarian

activity, especially that of greatest sexual vigor, viz.: between 20 and 30, and at the menstrual period.

The *exciting* causes are sudden suppression of menstruation from cold, mental shock, undue exertion, over fatigue, violent straining at stool, external violence, premature exertion after abortion, etc.

The source of the blood may be from the veins of the pelvic peritoneum, connective tissue, uterus, or excessive hemorrhage from rupture of Graafian follicle.

Symptoms. The sudden onset of anæmia, and signs of internal hemorrhage, accompanied by pain, difficulty in urination and defecation, a feeling of fulness and bearing down and the presence of a tumor behind the uterus. The uterus is pushed forward, and when coagulation takes place the tumor can be displaced by the finger through the posterior vaginal wall, often with a creaking sound, and feels not unlike scybala in the rectum.

The condition often simulates acute poisoning.

Diagnosis. It is to be differentiated from pelvic peritonitis, pelvic cellulitis, fibroid in posterior wall of uterus, extrauterine pregnancy and retroversion of uterus.

Prognosis. It may undergo absorption, an indurated mass remaining for months and being finally absorbed, or it may undergo suppuration, or death may occur very early from hemorrhage or exhaustion. Icterus often occurs from absorption of hæmatin.

Treatment.—1. *Preventive.* Obstructive dysmenorrhœa should never be neglected. Fatigue, dancing, exposure, etc., should be avoided during the menstrual period. Cases of menorhagia and abortion should also be watched.

2. *Curative.*—(*a*) Of the *subperitoneal* variety, the expect-

ant plan is the best : rest, ice bags, ergot. If collapse, use stimulants ; and if pain, give morphia. Firm bandaging is good. If suppuration occurs, open and drain antiseptically. Never incise a recent hæmatocele.

(*b*) Of the *intraperitoneal* variety, early performance of laparotomy and securing the vessels is best

E.—Diseases of the Tubes and Ovaries.

I. OF THE TUBES.

Strictures of the fallopian tube may occur from perimetritis, the tube being bound by bands of lymph, or the fimbriated extremity matted together by lymph so as to effectually close the tube. This results in sterility or hæmatocele, and if only partial may give rise to extra-uterine gestation.

Salpingitis, or inflammation of the tubes, is usually the result of the extension of endometritis and is very frequently caused by gonorrhœa. As a consequence of this, serum may accumulate and distend the tube, when it is called *Hydrops tubæ ;* or if suppuration results, *Pyosalpinx ;* or if it fills with blood, *Hæmatosalpinx.*

Diagnosis. This is difficult and often impossible, but hydrosalpinx may sometimes be distinguished from an ovarian cyst by the swelling being more tortuous and elongated, more anterior and often felt behind Poupart's ligament, and often symmetrical ; or if one tube is affected it usually pushes the uterus to the other side. Draw off some of the fluid with an aspirating needle and examine it.

Treatment. Laparotomy.

II. OF THE OVARIES.

1. Prolapse of the ovary into Douglas' pouch sometimes occurs. Here it may become inflamed and fixed, giving rise

to a sickening feeling in defecation or walking, and to dispareunia, and is a very frequent cause of ovarian dysmenorrhœa. It can readily be felt on examination, and is usually the left, to one side of the uterus and low down. It is very sensitive to touch, giving rise to the same sickening sensation as pressure on an inflamed testicle. It can readily be distinguished from retroflexion by a careful bimanual and rectal examination, and by the uterine sound.

Treatment. The genu-pectoral position and use of a padded Hodge pessary to distend the posterior cul-de-sac. Hot vaginal douche, pessaries of morphia, avoidance of prolonged exertion, regulation of the bowels and the use of potass. brom.

2. Oöphoritis. May be acute or chronic, the latter being more common.

Causes. Gonorrhœa; childbirth and abortion; obstructed menstruation; acute febrile diseases, such as cholera, the exanthemata, septicæmia, phosphorus and arsenic poisoning and perimetritis.

Symptoms. Pain in the iliac fossa radiating to the back and increased by pressure; the ovary can be felt enlarged and tender.

It may result in resolution, adhesion or suppuration and abscess.

Treatment. Hot vaginal douche, hot fomentations and morphia suppositories. In the chronic variety, glycerine tampons, and potass. iodid. Should it resist all treatment, an operation has been devised for its cure.

Oöphorectomy, or removal of the tubes and ovaries, is indicated in several conditions and known by the name of the operator. Thus *Battey* first did it for the cure of those cases where hystero-epilepsy, convulsions and insanity depend on ovarian disease; *Hegar* did it for uncontrollable bleeding from fibroids;

and *Tait* for intolerable dysmenorrhœa due to pyosalpinx, hæmatosalpinx, prolapsed or otherwise diseased ovaries.

Operation. May be vaginal or abdominal, the latter being preferable in most cases. Every antiseptic precaution must be thoroughly carried out. An incision is made 4 inches long from the mons veneris upwards. All bleeding to be carefully stopped as the tissues are each cut to the peritoneum, which is then incised. Then pass the index finger down to the fundus and carry it along the fallopian tube to the ovary, which is lifted out, caught with snap forceps, ligated, and the silk cut short. The peritoneal toilet is made carefully, and the abdominal incision is closed by one continuous cat gut suture, taking up the edges of peritoneum first, then the sheath of recti, and then the skin. An antiseptic dressing and binder completes the operation.

3. Ovarian Tumors. They may arise from a Graafian follicle that has not ruptured but become distended, and when small they have a similar structure, viz: a fibrous coat derived from the stroma of the ovary and an inner coat lined with epithelium corresponding to the tunica propria of the follicle, and enclosing a clear fluid. They may arise from a corpus luteum; from colloid degeneration of the ovarian stroma; from pathological development of enclosed germinal epithelium (the so-called Pfluger's ducts). Dermoid cysts are skin-like in structure and contain bones, teeth, hair, etc., and are formed by a displacement of the external layer of the blastoderm, a portion of which becomes included in the part of the middle layer from which the ovary is formed. Lastly they arise from malignant development of the connective tissue of the ovary.

The cyst of an ovarian tumor may be single or multiple, and the pedicle is usually made up of ovarian ligament, fallopian tube and broad ligament with vessels, all being covered with peritoneum. The fluid contained in the cysts varies in consistence

and color from a clear, thin, watery fluid to a viscid or semi-solid gelatinous mass. It does not give a flocculent precipitate as ascitic fluid does. It may also contain oil globules, cholesterine crystals, blood and large granular cells, and a corpuscle has been described as characteristic of ovarian fluids, a round delicate, transparent cell containing a number of granules, but no nucleus, and varying in size from the $\frac{1}{500}$ to $\frac{1}{200}$ of an inch.

Ovarian tumors occur most frequently between 20 and 40 years of age, most commonly in those who are sterile or unmarried. Anything which intensifies ovarian congestion is apt to give rise to them; thus women who have suffered long from congestive or obstructive dysmenorrhœa are apt to have ovarian growths.

Symptoms. (*a*). *When small* (pelvic). Pain is often felt in the region of the ovary; there is ovarian dysmenorrhœa, irritability of the bladder and a desire to micturate, discomfort in the bowels often amounting to tenesmus, and usually displacement of the uterus.

(*b*). *When large* (abdominal). As the tumor enlarges it fills the abdominal cavity, and the symptoms now are mainly those of pressure, such as dyspnœa, aching in the loins, œdema of the legs and varicose veins.

In these cases there is generally a history of gradual enlargement of the abdomen commencing usually on one side; not tender on pressure; easily displaced; causing little or no inconvenience until it becomes bulky and reaches above the umbilicus; the general health, at first good, becomes gradually impaired; the abdominal veins enlarge; the facial expression becomes altered, œdema of legs sets in; and then a physical examination reveals a tense elastic tumor, dull on percussion, fluctuating and distinct from the uterus.

Diagnosis. It is seldom that you may be called upon before the cyst has become abdominal, but if small it can be made out by the bimanual and is to be distinguished from parametritis, perimetritis and fibroid of the uterus.

It is often exceedingly difficult and the best surgeons have made glaring mistakes, and very often an exploratory incision will alone reveal the true nature of the case. It is well then in every case to examine thoroughly and systematically, endeavoring to make a reliable and trustworthy rather than a brilliant and showy diagnosis, often arrived at too hastily and regretted at leisure. First get a history of the case, and then after evacuating the bowels and bladder, examine by inspection, palpation, percussion, auscultation, the bimanual and rectal, and by the use of the sound, and draw off some of the fluid with a hypodermic syringe to examine it. It is to be differentiated from typanites, ascites, hydatids, pregnancy, fibroids, and fibro-cystic.

Treatment. (*a*). *Tapping* should only be resorted to as a palliative, if there is great distension, but is contra-indicated if an operation is possible.

(*b*). *Ovariotomy.* This may be done at any time, but is somewhat easier when the tumor has attained the size of 6th month of pregnancy as it has then displaced the intestines and stretched and thinned the abdominal wall. A time ten days after the menses should be chosen. The operation is similar to that of Oöphorectomy until you come to the cyst, when the patient is turned on her right side, the fluid evacuated with a large trocar until the cyst walls become flabby, when the opening may be enlarged with a scalpel to allow the fluid to escape more rapidly. The cyst walls are then freed carefully from any adhesions, which are first made out by passing a sound between cyst wall and peritoneal lining of abdominal cavity, and the cyst is drawn out; the pedicle is secured in two or more

sections with a strong silk ligature which is cut short and dropped into the pelvic cavity. The remainder of the operation is similar to that already described for removal of the ovaries. In some cases it is necessary to use a drainage tube.

F.—Diseases of the Bladder.

I—MALFORMATIONS.

The bladder is formed from the stem of the allantois, and the deformities met with are due to some arrest in development giving rise to atresia, fissures, diverticuli, patent urachus, and ectopia.

II.—CYSTITIS.

Inflammation of the bladder is frequent in the female, often resulting from the proximity of neighboring inflammations, such as parametritis, perimetritis, and metritis. The shortness of the urethra permits a vaginitis to readily extend upwards.

Causes.—Gonorrhœa, exposure to cold, prolonged labor, introduction of septic matter by catheter or bougie, and prolonged retention of urine.

Symptoms.—Pain and tenesmus of the bladder; burning pain on micturition, and the urine is often high-colored and bloody, of an acid reaction in the acute, and alkaline in the chronic variety.

Treatment.—In the acute form, alkaline mixtures with belladonna; morphia hypodermically, and locally hot fomentations, but never use turpentine. In the chronic variety, nitric acid, hyoscyamus and buchu, or ammonium benzoate, and in bad cases irrigation of the bladder with warm bichloride solution (1-20,000) is often useful. The diet should be principally milk and lime water, and linseed tea.

The reason why these cases are often so persistent may be explained by reference to the process of urination. The urine

trickling from the ureters partly by blood pressure, and partly by muscular contraction of the ureters, passes into the bladder, an empty flaccid sac. The urethral muscles are kept contracted by the activity of the motor centre, and as the bladder gradually distends, the former is reflexly inhibited, and the urine is expelled by muscular contraction of the bladder, aided by the contraction of abdominal muscles and diaphragm. This condition of the bladder of contraction and flaccidity may be likened to the systole and diastole of the heart, and explains the intractability of inflammatory conditions of the bladder.

III.—CALCULI AND FOREIGN BODIES.

Stone is less frequent in the female than in the male, since they are apt to pass at an early stage owing to the shortness and dilatability of the urethra. The uric acid, phosphatic, oxalate of lime, and cystic calculi are met with.

Symptoms.—Severe pain on micturition, especially at the close; alterations in the character of the urine, and hæmaturia; the stone can be felt by the bimanual, and verified by the sound in the bladder.

Treatment.—If less than an inch in size, it may be removed by dilating the urethra with the finger or speculum and extracting with forceps; if larger crush and remove it; and if very large and hard it may be removed by an incision through the anterior wall of the vagina.

Foreign bodies introduced wilfully by patients of depraved tastes may be removed by polypus forceps, or if large may be extracted by vaginal incision.

IV—FUNCTIONAL DISEASES.

1. Irritability.—May be due to acidity, nervousness or worms.

Treatment. Remove the cause.

2. Incontinence.—*Treatment.*—Remove any source of irritation, and give iron and belladonna.

3. Retention.—May be due to:

(a). Hysteria.

(b). Reflex action, such as piles, gonorrhœa, tears of perineum, etc

(c). Mechanical obstruction, such as the presence of fibroids, ovarian tumors, or retroversion.

4. Dysuria, or painful and difficult micturition, is often due to digestive derangements where the urine becomes very acid; or if the patient perspires too freely; or to the presence of anteflexion; to paralysis of the bladder from prolonged retention; or to exhaustion of nerve power.

V. NEW GROWTHS.

The bladder may be examined by the catheter and sound; by finger; and by the speculum. The most common growth which occurs in the bladder is a villous tumor, which is usually situated in the trigone and lower part of the bladder. It is very vascular and bleeds readily.

Symptoms.—Are similar to those of stone, but the hemorrhage is often severe, giving rise to anæmia, and the sound finds the absence of a calculus.

Treatment.—Dilate the urethra, scrape out the growth with a spoon, and wash out with a disinfectant, giving opium for the pain.

VI. DISEASES OF THE URETHRA.

It is of great importance to make a correct diagnosis of these diseases, and not to mistake cause for effect. Thus a fissure of the anus, inflammation about the utero-sacral ligaments, or pro-

lapse of the uterus may give rise to symptoms resembling disease of the urethra, and it is only by a careful endoscopic examination that these conditions are to be correctly found out.

1. *Urethritis* is most commonly caused by gonorrhœa. Nitrate of silver solution should be applied locally and copaiba internally.

2. *Fissure* is apt to occur after the frequent use of the catheter. It should be carefully sought for and nitrate of silver applied, and afterwards bougies of iodoform, tannin and cacao butter.

3. *Prolapse of Urethral Mucous Membrane.* It appears as a pouting completely surrounding the urethra, and the catheter can be passed through the centre of it. It should be incised close to urethra, and a catheter left in for a few days until healed.

4. *Caruncle* is a small vascular tumor like a raspberry, consisting of dilated capillaries in connective tissue, the whole being covered with squamous epithelium. It often gives rise to much pain and distress, causing reflex bladder symptoms.

Treatment.—Ablation and the thermo-cautery.

Emmet's button-hole operation is useful in some of these affections.

G.—Neuroses.

Although the cerebro-spinal and sympathetic nervous systems are independent, they are yet in a certain way mutually dependent upon one another. So long as functional life is performed regularly the ganglionic system is, as it were, a silent partner in the nervous arc, yet a busy one in maintaining nutrition. Like the wheels of a watch they work together harmoniously as long as each performs its proper function, and is

undisturbed by extraneous agencies, and it is only when some disorder occurs that the sympathetic system asserts its potency for evil by transmitting the morbid impression through the spinal nerves to the brain. So in women, the brain participates more or less in every disturbance of the ovario-uterine circle. Still more so is this the case when the brain has been rendered morbidly sensitive by faulty education or overstraining, by defective moral balance or some previous shock, the whole force of any uterine disturbance is thrown directly on the cerebro-spinal system. We have then headache, wakefulness, change in disposition, irritable temper, and every grade of hysteria, up to actual insanity. Let us then consider some of these nervous aberrations.

I—HYSTERIA.

The term hysteria is somewhat misleading as it has of late years been shown to exist in men as well as women, but when so found it is to be observed that such persons are either mentally and morally of feminine constitution, mentally overworked, exposed to emotional disturbance, or reduced in physical power. Hysteria manifests itself in various ways besides convulsions, such as derangements of sensibility, and alterations of motion.

Symptoms—**1. Alterations in Mental Condition.** These cases are characterized by inability or rather indisposition to exert the will, and the existence of illusions, hallucinations or delusions. At one time she cries, then laughs, or both at the same time without any sufficient cause.

2. Alterations in Sensibility.—(*a*). *Hyperæsthesia*, or excessive cutaneous sensibility, when of a hysterical origin, is characterized by never being permanently fixed in one place; is excessively acute, and is unaccompanied by serious disturbance of the nerve centres.

(*b*) *Anæsthesia*, or loss of cutaneous sensibility, is frequent. In these cases the reflex excitability of the larynx is abolished, so that the finger can be passed down the throat to the epiglo tis, which can be rubbed or scraped with the nail without causing any irritation, and this may be used as a diagnostic test.

3. **Alterations in Motility.**—Various forms of paralysis, such as hemiplegia, aphonia, and derangements of the stomach, bowels and kidneys are due to this cause.

Causes.—It is most frequent in females of a delicate organiz ation, and where the emotional system is highly developed; it is most common between the ages of 16 and 25; more common in the single than married; and all those influences are most apt to give rise to it which are connected with refinement and education, such as music, the reading of novels and poetry, the study of art, etc., which develop the emotional at the expense of the physical and intellectual.

Treatment.—No cases will s' test your patience and tact as these, and there is no doubt the greater success which one physician has over another in the treatment of these cases depends upon a bett r knowledge of human nature and a greater force of character. The first thing is to gain the patient's confidence and respect, make her believe that you thoroughly understand her case, that she is not suspected of shamming, that with her assistance the trouble will be removed, and the effect which you desire will probably be produced. Sympathy is often injudicious, but firmness is always necessary. If there is hyperæsthesia the bromides are indicated; if anæsthesia the faradic-electric current by means of the brush is a specific; for paralysis, strychnia, phosphorus and electricity; for vomiting, the valerianate of caffeine; for spasms, chloroform inhalations followed by monobromide of camphor; and during these attacks copious

enemata of hot water, in which is mixed 1 ounce of tincture of assafœtida often acts specifically.

II.—HYSTERO-EPILEPSY

Is one of the most frightful of the nervous affections. We cannot yet say positively if it is a special disease or a combination of epilepsy and hysteria.

Symptoms.—The attack begins like epilepsy, she recovers consciousness, and then begin contortions of the face, neck, trunk and extremities, tearing with the hands and teeth anything within reach, the hysterical element now predominating, the patient alternately weeping and laughing, gradually becomes sensible again. Sometimes it seems to prevail epidemically.

Treatment.—The bromides, and galvanization of the sympathetic.

III.—NEURASTHENIA.

Nerve exhaustion, or nervous prostration, is applied by Erb and modern authorities to a class of grave and intractable nervous disorders, familiar to those who see much of the diseases of women. It represents a class of women who have been from one doctor to another, subjected to all sorts of medication, tried all kinds of pessaries, until they have become confirmed invalids, more or less bedridden. Sleepless, the victims of chloral or morphia, worn out in body and mind; in short, miserable wrecks, burdens to themselves and their families. There is no doubt these cases have been the result of uterine mischief, but they have now got beyond the point at which local treatment can be of any service or ever effect a cure. The pain, backache, leucorrhœa, difficulty in walking, and disordered menstruation have ended in producing a state of general disturbance in which all the bodily functions have become implicated. The nervous

system is profoundly affected, the blood is impoverished, and the general nutrition at its lowest ebb. There is emaciation, anorexia, dyspepsia, probably made worse by morphia. As a result of all this, and partly from pain, she has abandoned exercise and keeps in the house or even in bed. Moral aberrations also arise, both emotional and hysterical. She craves sympathy which she often obtains to her own hurt, until at last the whole household become victimized by the morbid selfishness thus developed.

It is in such cases as these that Dr. Weir Mitchell has proposed a plan of cure consisting in the removal of the patient from the unwholesome moral surroundings in which she has been living, away from sympathetic friends to the care of a trained nurse; in the renewal of her vitality by excessive feeding, which under ordinary circumstances could not be assimilated, but which is rendered possible by passive muscular exercise obtained through the systematic use of shampooing and electricity. The elements of this treatment, which has resulted in many cases of marvellous cure, consist of *seclusion and rest; massage; electricity*, the faradic current with slow interruptions; and *forced feeding*.

PEDIATRICS.

While the infant may be regarded physically as the abstract of the man, possessing the same organs, the same processes of waste and repair, of growth and decay, still there are some important structural and functional differences between childhood and adult life which modify and alter the diseases to which the young child is liable. Thus in childhood the tissues are softer, more vascular, and more succulent; the glandular, lymphatic and capillary systems are extremely active; the skin and mucous membranes are softer, more delicate and more sensitive; the brain is large, vascular, and almost fluid in consistency; there is excessive nervous excitability due to want of controlling power; and reflex sensibility is excessively acute. Thus some slight functional derangement such as the presence of indigestible food will cause fever, extreme agitation or even convulsions, and the onset of any acute affection is apt to be ushered in by a convulsion instead of the chill which is often the first indication in the adult.

Again, the rapidity with which infants part with their heat, and so become easily chilled, makes them more prone to catarrhal affections which may rapidly prove fatal, and so the cause of death may be overlooked on making a post mortem examination.

Then the diathetic tendencies, such as syphilis, scrofula or tuberculosis, are especially active in the young, and exert a remarkable influence upon the growing body, shaping the figure, moulding the features, and so altering the structure that if insanitary surroundings interfere with the nutritive processes the mischief may be widespread.

While diagnosis is often a difficult task in the adult, it is still much more so in the infant where our only guide is an objective examination. The best means to overcome the difficulties of such an examination is to form a plan or method to study them. So great are these difficulties in the clinical examination of children that unless you have been prepared by some preliminary study you will find it a most uncertain and disheartening task to unravel the history and nature of any case that may come to you. The task is one which requires patience, good nature, and tact, for the helpless silence of the infant, the incorrect answers of the older child, the fright, agitation, or anger produced by your examination, or even mere presence, render it difficult to detect the real aberration of function. And lastly, the difficulty of obtaining reliable information from the mother or nurse all concur to make your examination of children, with a view to find the seat of disease, a most difficult and perplexing one.

If possible, you should try to see the child first when asleep, or during or immediately after the act of nursing, as it is then usually more or less drowsy, and more easily managed. While this is going on, or even before you have seen the child at all, you should enquire of the mother or nurse all about the history of the case. Most women are good observers, and especially is this the case in a mother whose watchfulness is increased by affection and anxiety. You should listen attentively to her statements, and although they may be foolish, false, or exaggerated, she will often be able to detect variations from health which might escape the most acute and observant medical examiner. The history should bear upon the causes of the illness, its precise moment and mode of attack, and its course and symptoms up to the present time; the health of its parents and their previous diseases; or if they are dead, the cause of death. The hygienic surroundings should be taken in; the

house, the room, the clothing, the food, whether the child was nursed or bottle-fed. If one of the eruptive fevers is suspected, enquire whether it has had measles, or scarlet fever, and if it has been vaccinated. The exact onset of the disease should be got at by going back day by day, or by enquiring if it were well on some particular day ; then enquire into the course of the disease and its treatment up to the date of your visit, being careful not to ask leading questions. Having in this way succeeded in obtaining all the information you can from the mother, you next proceed to examine the child yourself, and as this is purely objective you must observe the cry, the expression, the various spontaneous movements indicative of uneasiness, of pleasure or pain ; the manner of sucking or drinking, whether eagerly and with relish, or languidly, carelessly or not at all ; the enjoyment it receives from pleasant sounds, or the evident pleasure it takes in regarding the light. You should cultivate a habit of minute, systematic and patient investigation, and you will thus in a little while acquire a tact and sagacity that will not often be at fault. While you were questioning the mother you could have been taking in at the same time the infant's size and development, its amount of emaciation, decubitus, gestures, color, temperature, dryness or humidity of the skin, the presence of eruptions or swellings. If it is below the average size try to discover the cause of its arrested growth. You should notice carefully the countenance as to its expression, color, presence or absence of wrinkles from pain. emaciation or disordered muscular action ; the appearance of the alæ nasi, and the character of the mouth. The nature of its sleep, cry, pulse, respiration ; and lastly examine its mouth and throat, its abdomen and the excretions.

Let us look at these points particularly :—

1. The Countenance. The complexion of a healthy baby or young child is fresh and clear ; a loss, therefore, of its purity

and clearness is one of the first indications of digestive derangement; the face then becomes muddy-looking, and the upper lip whitish or bluish. In lardaceous disease it is pallid and bloodless; in cyanosis bluish. In health the face of an infant during sleep has an appearance of comfort and content, perhaps now and then disturbed by a gentle smile. In sickness the features become contracted, the forehead wrinkled and furrowed, the nostrils dilated, or pinched and thin, while the mouth is drawn and rigid. In a general way it may be stated when the upper part of the face is affected some brain trouble is the cause; the middle of the face indicates trouble in the thorax; and wrinkles about the chin point to abdominal affections. Insomnia is often one of the first indications of illness. The child may only be uneasy in its sleep, or you may notice contractions of the brow, working of the features, tossing and turning in bed, crying out, grinding of the teeth, or it may wake up in a violent fright.

2. The Cry. In a healthy infant a cry is excited by anything which causes it discomfort or inconvenience, therefore the absence of a cry should lead you to suspect serious disease. The cry is often accompanied by contractions of the features, body, or limbs, which may throw light upon its cause. Violent, obstinate prolonged crying indicates one of two things,—*ear-ache*, or *hunger*. In ear-ache the child puts its hand to its head or presses it against its mother's chest. Pain in the head is indicated by a short sharp cry; in pneumonia the pain is slight and usually only during the cough, and is usually accompanied by distortion of the features; in pleurisy the pain is increased by moving the child or by pressing the affected side; the cry of intestinal pain is usually just at stool, and is accompanied by wriggling of the trunk, flatulence, tympanitic belly and drawing up of the legs.

3. Attitude and Decubitus. Healthy children, when

awake, are always in motion, but their movements can easily be distinguished from the constant tossing, impatient fretting and complaining of a child that is ill You would readily recognize the languid hesitancy of prostration and weakness, or the stillness and immobility of stupor and coma.

During sleep a healthy infant or young child usually lies on one side, and turns its head so as to bring the cheek in contact with the pillow. If a child be found lying motionless on its back with closed eyes and face directed to the ceiling, it is probably the subject of serious disease, such as tubercular meningitis, or inflammatory diarrhœa. If he lies on one side with his head greatly retracted upon his shoulder, it points to intra-cranial disease.

4. The Pulse. In the infant it can scarcely be counted except during sleep, and even if its rapidity can be ascertained, the information is of little value because it is so varying, being influenced by every movement or mental emotion. The pulsation of the anterior fontanelle is of far more value as a test of vigor than the pulse. In infants under a year old a sinking of the fontanelle is a sure sign of reduction of strength; tenseness and bulging is a sign of excess of fluid or hyperæmia of the brain.

5. Respiration. In new-born infants the respirations number 40 per minute, gradually becoming less, but even after the 2nd year they are over 20. Of more importance is the ratio of the respirations to the pulse. Normally in the young child they are as 1 : 3, and if they become as 1 : 2 you should suspect pneumonia or pulmonary collapse. Frequent heavy sighs and long pauses, during which the chest is motionless, should lead you to suspect tubercular meningitis.

6. Temperature. In very young children is best taken in the rectum, and is normally 99° F. You should never trust to

your hand, for in inflammatory diarrhœa the extremities are often cold while the temperature rises to 104° or 105°; while in a baby exhausted with vomiting and diarrhœa the temperature often sinks to 97°.

7. General Inspection. Having obtained all the information possible without unnecessarily disturbing the infant, you should strip it completely, and thoroughly examine its body for anything abnormal. Notice if there is any eruption, if the abdominal veins are enlarged; and if there is any rupture, or if the testicles are undescended. Feel for the edges of the liver and spleen, and the degree of tension of the abdominal walls. Examine the chest with the stethoscope; then the mouth and throat, and lastly the stools and vomica should be personally examined.

TREATMENT OF THE NEW-BORN INFANT.

As soon as the child is born, the cold air upon its chest by reflex irritation causes the first inspiration, the thorax expands, the alveoli of the lungs fill with air, the blood passes from the right side of the heart to the capillaries of the lungs, and is returned arterialized to the left side of the heart. As a consequence of this the ductus arteriosus contracts, the foramen ovale closes, and the left ventricle hypertrophies. Then from diminished arterial pressure in the aorta the circulation in the umbilical arteries ceases, while thoracic aspiration empties the umbilical vein, the cord dries up from the cut surface toward the navel, and drops off about the 5th day leaving a raw surface which soon heals, but sometimes a button-like granulation is left which should be cut off with scissors and touched with silver nitrate.

You should personally see that the infant's eyes have been thoroughly washed by the nurse, and attend to the navel yourself, for neglect of the former may lead to troublesome

ophthalmia neonatorum, and carelessness in regard to the latter has resulted in fatal hemorrhage.

The first washing should always be thorough, and if there is much vernix caseosa it should be first well smeared with lard or oil, and some even prefer to use this alone and wipe off with a soft rag rather than use water at all.

Asphyxia. If the second stage has been unduly long; the head subjected to prolonged pressure; if ergot has been injudiciously used, producing tonic contraction of the uterus, closure of the uterine sinuses, and pressure upon the umbilical cord; or if there has been premature separation of the placenta, the child may be in a more or less asphyxiated condition, the face being swollen and livid, and the heart beating very feebly.

Treatment. If the face is very livid, allow the cord to bleed a little; stimulate the surface of the body by rubbing with whiskey, sprinkle cold water on its chest, use Sylvester's method of artificial respiration and put the child in a hot bath, where it may be allowed to remain for a time.

Application to the breast should be early, just as soon as the mother is thoroughly rested. For the first few days, until the secretion of milk is thoroughly established, the child should be put at long intervals only, otherwise it is apt to irritate and cause sore nipples. Colostrum is aperient and so obviates the use of castor oil. After the flow of milk is fully established the child should be put to the breast every two hours, and in a month or six weeks, every three hours. The mother should try to nurse at night before retiring, so that if possible she may not be disturbed during her sleep. Her diet should be simple but nutritious, and she should drink plenty of milk and gruel, and should avoid all excitement, or passion, or severe physical exertion. Weaning of the child depends upon the onset of teething and the condition of the mother, but should be

begun about the 8th or 10th month, and usually it ought to be removed from the breast entirely at the end of a year.

Selection of a Wet-nurse. Some mothers cannot, others will not, owing to the calls of society or business, nurse their infants, and if they can afford to get a wet-nurse it is best to do so, rather than bring them up on the bottle. If there is strumous cachexia, hereditary phthisis, or great debility, it would be better for the mother not to attempt nursing herself, but if possible it should be insisted upon, as it promotes uterine involution.

In selecting a wet-nurse she should be strong and healthy, not over 35 nor under 18 years of age, and there should be an absence of any cachexia or diathesis. The mammary glands should be pear-shaped, firm, large veins superficially, nipples prominent, but not too large; the milk should spirt out in jets when squeezed and be of a bluish white color and alkaline reaction. You should also inspect the nurse's child to see if it is healthy, or if it is thin and wizzened and has "snuffles," indicating syphilis.

Hand-feeding. In some cases the inability of the mother to nurse, her repugnance to a wet-nurse, or her inability to bear the expense, renders hand-feeding a necessity.

A young infant should be fed with good new cow's milk, equal parts diluted with water, or lime water, or sometimes barley water, and sweetened with sugar, six tablespoonfuls to be given at a meal. In hot weather it may with advantage be boiled, and often a teaspoonful of cream should be added.

Sometimes when this food disagrees, a little gelatine may be added, or some infants' food, in which the farinaceous matter has been converted into dextrine and glucose, may be substituted, or condensed milk will often be found to agree better. For the first week or two it has been estimated that a nursing mother supplies a pint of milk to her baby in 24 hours, and that in

the later months of lactation about three pints is reached. Therefore although infants vary in the amount of food required, this will furnish a guide in bottle-fed babies. Goats' and asses' milk are better than cows' milk if they can be obtained, and often peptonized milk will be found to agree where all other foods are not assimilated. After six weeks the milk should be less diluted, and after seven months the milk should be thickened with biscuit, arrowroot or ground rice, and after 9 months it ought to get beef tea, broths, and when a year old a little meat every day very finely cut or pounded.

Directions for Peptonizing Milk with Extractum Pancreatis.

"Into a clean quart bottle put a powder of 5 grains of Extractum Pancreatis and 15 grains of bicarbonate of soda, and a gill of water. Shake; then add a pint of *fresh milk*.

"Place the bottle in a pitcher of *hot water*, or set the bottle aside in a warm place for an hour or hour and a half to keep the milk *warm*, about 110° F.

"By this time the milk will become well peptonized.

"When the contents of the bottle acquire a *grayish-yellow color* and a *slightly bitter* taste, *then* the milk is *thoroughly peptonized*, that is to say, the *caseine* (or curd) of the milk has been *digested* into *peptone*, as it is naturally in the body.

"*Partially* peptonized milk *has no bitter taste*—has, indeed, little *apparent* evidence of any change.

"Yet, in most instances, and especially for *infants*, it is sufficient to partially peptonize the milk.

"*After the contents of the bottle get warm, then every moment lessens the amount of the indigestible ingredient of the milk.*

"The *degree* of peptonizing *necessary* in each case is best determined by the readiness with which it is assimilated by the patient.

"Great heat destroys, or cold *checks*, the digestive action.

"So, after either *complete* or *partial* digestion, it is simply necessary, in order to *prevent all further action*, to at once place the bottle of peptonized milk *on ice*, or put the bottle into a vessel of *boiling* water, long enough to *scald* its contents. It may then be kept like ordinary milk.

"It must be borne in mind that this is not a cooking or chemical process; the object is to subject the milk to the action of the digestive principle (the extract pancreatis) at a *temperature similar* to that *of the body*.

"Peptonized milk may be sweetened to taste, or used for punch, with rum, etc., or made into jelly; also in the preparation of such foods as ordinarily require the use of milk; according to the instructions of the physician."

I. DISEASES OF THE INTESTINAL TRACT.

1. Dentition. Perfectly healthy infants may cut their teeth without any trouble, but in the majority there is usually more or less local irritation and general disturbance. Teething is not a disease, but is a delicate indicator of the child's constitutional condition, and when any hereditary predisposition to disease exists, dentition may prove the immediate exciting cause of some grave disorder.

Usual Course. The gums are hot and swollen; there is increased flow of saliva; the cheeks are flushed; the child is restless and fretful; its sleep is disturbed; its appetite fails; and intestinal disturbances are common, such as vomiting and diarrhœa. These symptoms may become exaggerated so that restlessness may become extreme; the skin become hot and

dry; the tongue foul; it refuses to take the breast; and inflammatory diseases of the brain and nervous system are apt to be induced; or there may be convulsions or diarrhœa. Skin eruptions are very apt to occur, and should be treated cautiously at first, the more common varieties being eczema, lichen, herpes, and erythema. Besides these complications you may have thrush, pyrexia, stomatitis, diarrhœa, pulmonary catarrh and otitis.

The evolution of the teeth corresponds to a similar activity elsewhere; thus towards the end of the first year the follicular apparatus of the intestines is undergoing considerable development; the cerebro-spinal system is passing through a stage of rapid growth and high functional activity, and as most of the organs and tissues of the body are in a state of active change, it is not to be wondered at that the system at large should often be profoundly affected by the process of dentition.

Treatment. The child should be kept in the open air; the body sponged; the gums may be rubbed; the diet should be simple; the bowels regulated; any local irritation should be relieved, and if the gums are swollen and congested, they may be lanced; and lastly, constitutional disturbance should be subdued.

2. Thrush. Popularly called "the sprue." Is a disease of the mucous membrane of the mouth and gullet, consisting of white spots looking like portions of milk curd and due to a vegetable parasite called *oïdium albicans.*

Symptoms. Before the appearance of the white spots the mouth is red and sore, the child sucks with difficulty; is fretful and peevish; is more or less feverish; the bowels are loose and the motions greenish and acrid, so that the anus becomes excoriated, giving rise to the expression that the disease has "gone through" the child.

Causes. There is usually some cachectic condition or constitutional disease. It may be due to hot weather, to want of cleanliness or indigestible food, and it is especially common among hand-fed infants due to carelessness in the cleansing of feeding bottles. It is rarely seen in infants suckled at the breast.

Treatment. Correct any gastric derangement by a dose of gray powder and rhubarb; check diarrhœa; and if there is debility give an iron tonic. Locally use a wash of borax and glycerine, or sodium sulphite.

3 **Stomatitis.** Is an inflammation of the mucous membrane lining the mouth, and is partly due to the irritable condition of the gums from teething, and partly to sympathy with the digestive organs. There are three varieties: aphthous, ulcerative, and gangrenous.

a. Aphthous. Is characterized by a vesicular eruption of the mucous membrane of the mouth. The vesicles are of a pearly-gray or yellowish color, varying in size from that of a pin's head to a millet seed, surrounded by a red areola. The vesicles rupture in a couple of days and give rise to little ulcers, from 2 to 20 often appearing on the lips, gum, cheek or palate. There is usually pyrexia; the child is peevish and refuses to nurse; it often vomits, and the bowels are relaxed.

Treatment. Begin with a dose of gray powder, rhubarb and soda, and if there is any cachexia, a tonic of nitro-muriatic acid and quinine.

Locally, a wash of borax and glycerine, and if the ulcers are slow to heal, apply silver nitrate.

b. Ulcerative. Is most frequent after two years of age, and is found in those who are exposed to insanitary surroundings, poor diet, and the subjects of weakly or cachectic constitu

tion. The ulceration usually begins on the gums, which become red, swollen, spongy, and painful. The saliva flows freely, and the teeth often become loose.

Treatment. Attend to the sanitary surroundings and the diet. Chlorate of potash is almost a specific and should be given early and freely, and may be combined with iron and glycerine.

c. Gangrenous. "Cancrum oris," or noma, is a disease of the very poor, and of strumous subjects. The face swells, a hard spot appears on the inside of the cheek or gum, while the tissues around become soft and œdematous. A brown slough soon appears which rapidly spreads; the saliva is dark; the breath stinks; the pulse is small; and the child becomes rapidly weak, with hardly any fever.

Treatment. Give a gentle aperient, and try to sustain the strength by strong nourishment, stimulants, and fresh air.

Locally, the diseased surface should be destroyed with strong caustics, and a wash of chlorinated soda or permanganate of potash used freely.

4. Marasmus. Infantile atrophy, or the slow wasting of infants, is a common cause of death in hand-fed babies.

Causes. It is the consequence of insufficient nourishment, or too much farinaceous food from which its feeble digestive organs cannot derive even a minimum amount of nourishment. and so it suffers from starvation. Many a child's life is sacrificed through the inability of those about it to understand that feeding and nourishing are not the same thing. For efficient nourishment four classes of food substances are essential, viz:—albuminates, carbo-hydrates, fats, and salts; and furthermore, they must be administered in such a form that they can be easily assimilated. The only food which contains all these

elements in an assimilable form is *milk*. Now cow's milk, besides its difference in constitution from human milk, presents a more important difference in the size and denseness of its clot when curdled. Human milk forms a light, loose flocculent clot which is readily disintegrated and digested in the stomach.

Again, the new-born infant has scanty salivary secretion, and its pancreatic secretion has little effect on starch until after the 3rd month, so that it has feeble capacity for digesting starch. Hence, the danger of giving biscuits or other farinaceous food to a being quite unprepared by nature to digest it,—the result is indigestion, indicated by flatulence, vomiting, diarrhœa; and, if persisted in,—wasting from starvation.

Marasmus is seldom seen to any serious extent in infants at the breast, unless a new-born child is put to a wet-nurse whose child is much older, for then the milk is proportionately richer in curd and cream, and so the young child cannot digest it. Human milk is also very subject to diatetic and emotional influences on the part of the mother, and so may disagree with the child.

Symptoms. There is persistent wasting; the child is peevish from hunger; at times it cries violently; it is troublesome and sleepless at night; the fontanelle is depressed; it is pale; its skin flabby; bowels irregular; and eruptions are common.

Treatment. If possible you should secure a wet-nurse, and this will often at once arrest all the unfavorable symptoms. The change should be preceded by a dose of castor oil, followed by an antacid stomachic. If a wet-nurse cannot be secured, the feeding should be carried out as directed before at page 199.

5. Gastric Catarrh. This is one of the most common causes of infantile atrophy, but we now speak of it as affecting children who have passed the period of infancy.

Causes. Exposure to cold; and the ingestion of unsuitable food. It is especially liable to occur in scrofulous and rickety children.

Symptoms. It may or may not be accompanied by fever. The child is chilly, languid, sallow, dark under the eyes, loses its appetite, vomits, bowels are costive, and it is often drowsy or delirious.

Treatment. Begin with an emetic of vin. ipecac., and then give a mixture of soda, bismuth, and columbo. The diet should be restricted to milk and lime water, and in a few days the child should have a tonic of the ammonio-citrate of iron.

6. Diarrhœa. Is especially common in childhood, and may be of three varieties:—simple, inflammatory, and choleraic.

a. Simple Diarrhœa. Is a temporary derangement of the bowels resulting from a mild form of catarrh.

Causes. The most common cause is improper feeding, either because it is excessive in amount, or unsuitable; chilling of the surface; insufficient clothing, or dentition.

Symptoms. It is often sudden; at first the stools are fecal, and lumps of indigestible food are passed, and then they become watery or greenish. Lienteric diarrhœa is when a motion is at once caused by taking food.

Treatment. If any irritant is the cause, begin with a dose of castor oil or rhubarb and soda. Then give a chalk mixture with opium, catechu and sp's. of chloroform. In lienteric diarrhœa, give liq. arsenicalis in drop doses. Green diarrhœa is thought by Hayem to be due to a microbe, and he recommends a teaspoonful of a two per cent. solution of lactic acid after every stool.

b. Inflammatory Diarrhœa. May begin like the simple variety but soon becomes more violent and rapidly saps the strength of the little patient. It is a severe intestinal catarrh or entero-colitis.

Symptoms. At first like an ordinary looseness, the stools become greenish, offensive and acid; the child rapidly wastes and becomes weak; the eyes become hollow; the pulse rapid and feeble; there is often fever; and in a few days, if not relieved, it may result in profound depression.

Treatment. First attend to the diet, and if the child is not suckled at the breast you should stop the use of milk, which in these cases acts as poison. Give cream and whey, or barley water, or weak veal and chicken broth instead. The food should be given cold and in small quantities. Raw meat is often beneficial. Begin with a dose of castor oil, and then gray powder and Dover's powder. When the diarrhœa is checked, and if there is much prostration of vital power try drop doses of liq. arsenicalis or triturations of arsenic $\frac{1}{100}$ to $\frac{1}{200}$ gr.

Locally, a spiced pad is often very efficacious and agreeable.

c. Choleraic Diarrhœa, or Cholera Infantum. Is the most dangerous variety and only occurs during the summer months. It runs a rapid course, inducing in a few hours a startling change in the child, and often ends fatally.

Causes. Hot weather, injudicious feeding, bad drainage, etc.

Symptoms. It often begins suddenly with vomiting and purging. It first vomits the food, then yellow mucus, and then pure bile. The stools are watery and abundant, squirting out like water from a syringe, and are not especially offensive like the inflammatory variety. The child wastes rapidly; its eyes are hollow; its nose sharp; thirst is extreme; and it goes on to collapse.

Treatment. Give the child a hot mustard bath, and try to check the diarrhœa with starch and laudanum injections. It should be allowed ice water freely ; three teaspoonfuls of iced wine-whey, or whey and cream. The most valuable remedy is sulphate of morphia injected hypodermically in $\frac{1}{60}$ gr. to a child one year old, with five drops of ether.

The child should be kept warm by hot blankets, and hot water bottles to its feet.

7. Dysentery. Is a disease of the large intestine characterised by mucous and bloody stools, accompanied by pain and tenesmus. It is frequently epidemic and is due to ulcerative inflammation of the colon and rectum.

Treatment. Mild cases are best treated by rest, with light and unirritating diet, and small doses of opium. If unwholesome food is suspected as the cause, give a dose of castor oil with a few drops of laudanum. In the chronic form, hydrarg. bichlor. in minute doses is good.

8. Constipation. *Causes.* Unsuitable diet; excess of farinaceous food ; atony of the bowels in ill-nourished children ; the use of soothing syrups ; or simply neglecting the calls of nature.

Symptoms. The bowels are not moved for several days ; the complexion becomes dull and pasty ; there is restlessness, flatulence, tympanitis, and furred tongue.

Treatment. Cultivate a habit in the child of regular evacuation, and attend to its diet. An excess of starch should be avoided ; oatmeal may be mixed with the milk, and the food sweetened with brown sugar. If the child is very young, soap suppositories, and if older, enemata may be used. Cascara co[illegible]l, or minute doses of podophyllin are useful, and massage may be employed to the abdomen daily with good effect.

9. Intestinal Obstruction. Is rarely due to any other cause than intussusception. Babies are especially prone to it during their first year.

Causes. Drastic purgatives; indigestible food; violent coughing; or falls and accidents. One part of the bowel is forced or invaginated from above downwards into the part immediately continuous with it, the consequence of which is obstruction of the canal and of the circulation of the intestine; effusion of blood and lymph takes place, giving rise to adhesions, and if complete, gangrene may result. A swelling can usually be seen or felt in the abdomen over it. It may occur in the small intestine or in the colon.

Symptoms. The child suddenly screams, turns pale, cries violently, writhing and drawing up its legs as if in great abdominal pain which comes on in paroxysms. The bowels are obstinately confined, and a little blood is usually passed with straining, and it vomits all food. After a time a distinct swelling can usually be felt deep in the iliac fossa.

Treatment. Its early recognition is of great importance. Opium should be given at once to ease the pain and arrest peristaltic action. An enema may be tried, but it is best to distend the bowel with air as completely as possible, and this often relieves the pain and unfolds the intussusception if done early. All means failing, it may be advisable in some cases to perform laparotomy.

10. Intestinal Worms. (*a*). *The Small Thread Worm.* (Oxyuris Vermicularis) is found in the cœcum and rectum.

(*b*). *The Long Round Worm.* (Ascaris Lumbricoides). Inhabits the small intestine, but migrates to all parts of the intestinal tract.

(*c*). *The Tape-Worm.* *Tænia solium*, derived from pork, and *Tænia medio-cannellata* from beef.

When the ripe joints are swallowed by some animal such as a pig or cow, the eggs and embryos, called pro-scolices, escape, and penetrating the tissues enter the muscles, liver, or brain, becoming a cystocercus or bladder-worm. This swallowed in partially cooked pork or beef develops in the human system into the perfect tape-worm.

Symptoms of Worms. Itching of the nose, pruritus ani, abdominal pains, variable appetite, fever, vomiting and diarrhœa, or convulsions, are a group of symptoms often pointing to worms, but the only sure indication is to find either the worms or their ova in the evacuations.

Treatment. The small thread worm is best treated by rectal injections of salt and infusion of quassia; the long round worm by santonin; and the tape-worm by ext. male fern, turpentine, or Tanret's pelleterine.

II. DISEASES OF THE NERVOUS SYSTEM.

1. General Symptoms. In the young child there is excessive excitability, so that a slight irritant may give rise to symptoms out of all proportion to the cause. In every acute illness the nervous system shows signs of distress; thus, in acute indigestion the skin is hot, the child is restless, cries, is often delirious, twitches in its sleep, or may have convulsions. There are certain symptoms, however, which point directly to disorder of the nervous system.

Squinting, although not always a sign of brain disease, should always excite alarm.

Nystagmus, or rolling of the eyeballs, often indicates brain disease, especially tubercular meningitis, hydrocephalus, or brain tumor.

The condition of the pupils is of importance. They are usually contracted during sleep, and dilated when the child is

awake. They are contracted from opium and in the early stages of meningitis; in the later stages of meningitis, and in other cerebral diseases, they are dilated.

Impairment or loss of sight points to brain tumor, meningitis, or thrombosis.

Delirium often occurs in digestive derangements; in alterations of the blood, as in acute specific fevers; in the early stage of croupous pneumonia; and in serious brain affections.

Drowsiness, while it occurs in brain affections, may occur in pneumonia, fevers, etc.

Changes of temper; tremors; spasms; paralysis; vomiting, independent of food; and *constipation*, often point to cerebral disease.

2. Convulsions. Are common in children, especially during the first two years, and depend upon exalted excitability of the reflex centres in the pons and medulla.

Causes. They may occur in utero, and many of those cases of death and paralysis of new-born infants are due to convulsions. The liability to this condition often runs in families, or in individual members of families, and in rickety children.

They may be due to reflex causes, such as injuries to the skin, as burns; to irritation of the alimentary canal, as from indigestible food, or worms; to irritation of the gums from teething; to inflammation of the ear; retention of urine; sudden chilling of the surface of the body; violent emotions, as terror; to the onset of some acute illness; to anæmia of the brain from loss of blood; or to uræmia.

Symptoms. They may come on suddenly, or be preceded by symptoms of nervous excitability spoken of as "inward

fits." When the fit sets in the child gets stiff; its head is retracted; its arms and legs become rigid; the eyes turn up; and the breathing is labored. Then clonic spasms come on; the muscles of the face work; the tongue is bitten; there is twitching of the legs and whole body; and often frothing at the mouth. It is more serious if limited to one side, as it indicates a cerebral origin. A persistent squint; convulsions without loss of consciousness; and persistent stupor after the convulsions all point to organic disease. The congestion of the brain from convulsions due to some reflex cause, if persistent or long continued, may lead to organic cerebral disease.

Prognosis. If due to organic disease the upshot is unfavorable; but if owing to some reflex cause, the older the child and the shorter the attack, the less danger, although in any case it is always dangerous and alarming.

Treatment. Waste no time in seeking for the cause, but at once put the child in a hot bath and apply sponges soaked in cold water to the head. If this does not arrest it, give a whiff or two of chloroform, which will usually quiet the fits, and then seek for the cause and if possible remove it. If due to an overloaded stomach, give an emetic of vin. ipecac.; if the bowels are loaded, use an enema; if teething, lance the gums; if inflammation of the ear, syringe with warm water, or apply a poultice; if due to uræmia, give pilocarpine. To prevent a recurrence, give chloral in gr. 2 doses repeated frequently to a child under one year, or else pot. brom., and then improve the general condition, attending to the diet and giving tonics or cod-liver oil if indicated.

3. Hydrocephalus. This is serous effusion into the cavity of the skull and may be congenital or acquired.

Causes. It is often due to drunkenness or syphilis on the

part of the parents; or it may be the result of rickets or anæmia.

Morbid Anatomy. When congenital, the walls are pressed out, and the head becomes distended; the frontal bones are prominent, the sutures are widened, and the fontanelles distended.

Symptoms. The children so affected often die during delivery, and usually within the first two years. The eyes protrude; the head is heavy; the muscular system is not developed; as a rule intelligence is backward, while sight and hearing are often impaired; and nervous symptoms are common, such as headache and convulsions.

Treatment. Little can be done except to regulate the bowels and diet. Hydrarg. bichlor. may do good, and strapping the head with ung. hydrarg., or ung. potass. iodid. may be tried.

4. Tubercular Meningitis. Is an inflammation of the meninges at the base of the brain, and may occur at all ages.

Causes. The tubercular diathesis, the exciting causes being injury to the head, exposure, or overstudy.

Pathology. Engorgement of the meninges and vessels of the pia mater is found, together with ventricular effusion, and a deposit of gray miliary tubercle at the base of the brain.

Symptoms. The child is thought for some time not to look well. It is thinner, paler, and listless. A change of character is often noticed, and there is headache and vertigo. The temperature is often slightly elevated. Then severe headache sets in, with vomiting independent of taking food, and obstinate constipation. The headache is severe, frontal, in paroxysms, and is increased by any movement, or by light. The tongue is

not usually coated, and the child takes early to its bed. The abdomen is soft, compressible and doughy; the pulse is usually slow; the breathing is irregular, and sighing; the pupils are first contracted, and then dilated; and light is painful to the eye. These symptoms steadily go on and become intensified, until coma, convulsions, and paralysis result. The average duration is 12 days.

Treatment. Should be one of prevention, although potass. iodid., or iodoform in $\frac{1}{4}$ to $\frac{1}{2}$ gr. doses, may be tried. An ice bag may be applied to its head, and a purgative should be given, but these cases are usually hopeless.

5. Acute Infantile Spinal Paralysis. (Anterior Poliomyelitis).—*Pathology.* Is an inflammation of the anterior cornua of the spinal cord, producing changes in the gray matter itself, in the roots of the nerves springing from that situation, and in the muscles, tendons, bones, and joints to which they are distributed.

Symptoms. The attack is sudden, the paralysis reaching its height at once. The child goes to bed and wakens up with its limbs motionless. It may affect one muscle, or a group of muscles, one limb, or all. After some weeks or months a partial recovery is the rule, but the muscles atrophy, and paralytic contractions occur, giving rise to club-foot, etc.

Prognosis. It is not fatal, and some cases recover completely, others partially. Electricity is of great importance in determining the result. Thus, every muscle which does not react to the faradic current after the lapse of a fortnight is likely to be permanently disabled. Again, the muscles which have lost all physical connection with the spinal cord, no longer respond to the faradic current, while they react to slow interruptions of the constant current. This is called the reaction of degeneration.

Treatment. Quiet, and rest in bed; a brisk purgative; counter-irritation to the spine; a diet of milk and broths; and as soon as any recovery of power is noticed, but not before, the faradic current should be used daily. If no response takes place you should try the constant current with slow interruptions. The paralyzed limb should be wrapped in cotton batting and kept warm; friction and massage should be employed; and tonics of iron and strychnia.

6. Pseudo-hypertrophic Paralysis. This singular affection, in which extreme feebleness of the muscles is combined with an appearance of extraordinary development and vigor, is sometimes spoken of as Duchenne's disease, as he first described it.

Symptoms. The spring, so marked in healthy children, is wanting, and it feels heavy to lift. It can easily be pushed over, and has difficulty in rising. It soon has to stand with a characteristic attitude, the legs widely spread out, and its shoulders thrown backward, exaggerating the antero-posterior spinal curvature, and the belly protrudes. This is the consequence of weakness of the extensors and flexors of the hip, and the extensors of the knee, muscles which maintain the upright position in walking. In about a year the calves of the legs become enlarged, and a similar change takes place in all the other muscles. As the paralysis extends the patient gets more helpless, and seldom lives long after puberty.

Treatment. Very little can be done. Faradization may be used, with arsenic and phosphorus internally, while it may be necessary to employ mechanical supports.

III. DISEASES OF THE RESPIRATORY SYSTEM.

1. Examination of the Chest.

A.—PHYSICAL SIGNS OF DISEASES OF THE LUNGS.

Physical Signs are elicited by the following means:

I. *Inspection*, by which we learn the form, size and movements of the chest.

II. *Mensuration* is the measurement of the chest by the tape line or by the spirometer, to ascertain the amount of air the lungs are capable of receiving.

III. *Palpation* or the application of the hand is used for the same purposes as in other parts of the body and to ascertain the presence of "vocal fremitus;" or "fluctuation," and to confirm the results obtained by Inspection and Mensuration.

IV. *Succussion* is employed to detect thoracic fluctuation by gently but abruptly pushing the patient's trunk backwards and forwards and listening.

V. *Percussion* may be mediate or immediate:

(1) *Diminution of Clearness* to any degree of dulness is caused by effusion, congestion, condensation and œdema.

(2) *Increase of Clearness* is caused by pneumothorax, atrophy, hypertrophy and emphysema of the lung.

(3) *Tympanitic Sound* indicates the presence of quantities of air contained in cavities whose walls are yielding but neither very tense nor very thick. It may be of various kinds.

(*a*). *Simple.*

(*b*). *Amphoric Resonance* and "metallic tinkling" is similar to that obtained on striking a wine cask when partially or entirely empty.

(*c*). *Tubular Sound* is heard when any condition exists which brings the larger bronchial tubes unnaturally near the surface, or when any sound-conducting substance is present between the bronchi and surface.

(*d*). *The bruit de pot felé* or "cracked pot sound" is heard when a cavity exists in the lungs having thin elastic walls and a free communication with the bronchial tubes.

VI. *Auscultation* may also be mediate or immediate. In health two sounds are heard, viz.: the Tubular or Bronchial sound and the Pulmonary or Vesicular murmur.

These are altered by disease or new sounds are heard.

1. Changes in the Vesicular Murmur:

(*a*) *As to Intensity.*

(*α*) Increased, or puerile breathing, depends on an increased action of the air cells, usually to make up for deficient action of other parts.

(*β*) Diminished—more noticeable in inspiration—may be caused by anything which obstructs the passage of air; by deficient respiratory action, owing to debility or local pain; by effusion; or deposit of tubercle.

(*γ*) Absent, caused by continued furtherance of above causes.

(*b*) *As to Rhythm.*

(*α*) Jerking respiration is only corroborative if heard at the apex in tubercular deposit, as it is so often heard in hysterical persons.

(*β*) Prolonged expiration denotes that the air has difficulty in getting out of the lungs, and is owing to loss of elasticity of the cells from over-distention (clearness); or deposits (dullness); or from an obstruction in the bronchi.

(*c*) *As to Character.*—In health the vesicular murmur is characterized by its softness. Any affection which causes the sound in the bronchi to be produced with greater intensity, or to be better transmitted, will occasion harsh breathing, as when the bronchial membrane is swollen, as in Bronchitis, or when there is compression of the lung tissue with partial condensation, as in Phthisis and Pneumonia.

2. Changes in the Bronchial Sound.

Here the character is of more importance than rhythm or intensity.

To hear well defined bronchial respiration is mostly to meet with complete consolidation of the lung tissue, as in tubercular infiltrations and hepatization of the lung.

Varieties of Bronchial respiration are :

(*a*) Cavernous Respiration, where a cavity exists.

(*b*) Amphoric Respiration is indicative of a large cavity with firm walls.

3. New or Adventitious Sounds.

(*a*) Rales are sounds generated in the air tubes by the passage of air through them when contracted or containing fluid.

They may be :

(*a*) *Dry.*

(i) Sibilant Rhonchus (in small tubes) is a hissing, whistling or wheezing sound heard in certain stages of Catarrh and Bronchitis.

(ii) Sonorous Rhonchus (in large tubes) is a snoring or droning hum. Less dangerous than sibilus.

(iii) Dry Crackle. Like sound of blowing into a dry bladder. Heard in emphysema.

(β) *Moist*, caused by air bursting through a liquid in tubes.

(i) Small Crepitation or subcrepitant rales.

(ii) Large Crepitation or Mucous rales.

(iii) Gurgling is merely rale of cavities.

(*b*) Friction Sound attends both movements of respiration, but is loudest and most prolonged during inspiration. Best heard in Pleuritis.

4. The Voice and Cough, "Vocal Resonance."

(*a*) *Bronchophony* denotes increased density of Pulmonary tissue caused by pressure or by deposit, especially in Pneumonia and Phthisis.

(*b*) *Pectoriloquy* caused by condensation of the lung around a cavity communicating with a bronchus. Hollow cavernous sound.

(*c*) *Œgophony* is a bleating variety of Bronchophony. It is due to the presence of pleuritic effusion, or a thin layer of fluid between compressed lung and ear.

B.—Rational Signs.

1. *Pain* is a symptom of very little value by itself. In Pleuritis you have a severe sharp pain; in Pneumonia the sensation is a burning one.

2. *Dyspnœa* may be caused by exertion in weak persons; by bodily or mental excitement; by pressure upon the lungs as by tumors, ascites, and pregnancy. The most aggravated form is "Orthopnœa."

3. *Cough* may be present when no disease exists in the lungs but there is very seldom any affection of the lungs without a cough. May be,

(*a*) Dry Cough, which is indicative of irritation caused by very many causes and usually precedes

(*b*) Moist Cough which is usually accompanied by free expectoration.

In Bronchitis you have a loud ringing cough; in Pleuritis a small suppressed cough; in tubercle a small dry hacking cough usually most troublesome in the morning; in Pneumonia a slight small cough.

4. *Expectoration* is mucous and free in Catarrh and Bronchitis; purulent in severe Bronchitis and Phthisis; rusty in Pneumonia; lumpy and muco-purulent in advanced Phthisis; suddenly and largely purulent in bursting of an abscess; in Pulmonary Gangrene a stinking sputa, etc.

(*c*) *Constitutional Signs.*

Constitutional signs are those which affect the system at large. They are fever, night sweats, accelleration of pulse, emaciation, loss of strength, loss of appetite, etc.

The examination of a child's chest requires gentleness and tact. It should be stripped to the waist.

Inspection. In the child respiration is chiefly diaphragmatic, so that forcible movement of the thoracic walls is a sign of labored breathing, and one of the indications of broncho-pneumonia. Great recession of the lower part of the chest or epigastrium is an indication of some obstruction in the larynx. If the chest is laterally grooved it indicates softening of the

ribs from rickets. There may be more mobility on one side than the other.

Palpation. The movement of the chest can be made out, but vocal fremitus is not so marked as in the adult, for the high pitched notes of the child's larynx succeed one another too rapidly to be readily perceptible by the hand. Fluctuation can often be detected when there is effusion. You should always ascertain the exact site of the heart beat, as it is greatly influenced by effusion in the chest. In young children it is always nearer to the nipple than in adults, and as the latter is always lower, and the heart itself relatively smaller, the apex beat is higher than in adults, being usually found in the fourth interspace.

The exact position of the liver and spleen should be noticed, as they may be pushed down by effusion.

Percussion. If your hands are warm, and gentleness is exercised there is seldom much opposition. There is greater resonance than in the adult, and this often obscures dulness. The degree of resistance is also important, thus in pneumonia it is dull, and in pleuritic effusion there is still greater resistance. It is always best to use two or three fingers in percussing the child's chest as the sound is collected from a larger area of lung than if one finger only were employed. The "cracked pot" sound is always heard in a child if the chest is percussed during expiration, or with the mouth open.

Auscultation. Always use a stethoscope because the chest being smaller it is more important to limit as narrowly as possible the area under investigation. The vesicular murmur is coarser and harsher (puerile), and so is apt to be mistaken by the inexperienced for disease, especially at the apices, and expiration is often prolonged without any disease being present.

Conduction of sounds from the pharynx and trachea to the apices is common, so that the breathing there is often loud, hollow, or blowing, and still does not indicate disease. Weakness of vesicular murmur is very important.

Bronchial, cavernous, and amphoric sounds are the same as in the adult, but the morbid process is usually a step in advance; thus cavernous respiration is often a sign of mere consolidation.

Be sure to thoroughly and particularly examine the back of the lungs in children.

2. Laryngismus Stridulus, or false croup, is a catarrh of the larynx with superadded spasm.

Causes. It is rare before two years of age, and is most common between 2 and 7. It is more frequent in boys than girls, and is apt to recur.

Symptoms. The child may go to bed well, and wakens up about 12 o'clock with a hoarse, barking, sonorous cough, and a loud whistling stridor in his breathing, this being confined to inspiration, while the expiration is short and comparatively noiseless. The movements of the chest are labored and violent; the nares dilate; the eyes are staring; and the child has a terrified expression. The seizure lasts from a few minutes to half an hour, gradually subsiding, and the child falls asleep.

Diagnosis. The sudden invasion; the voice is not suppressed; the cough is loud and not muffled; the stridor is marked in inspiration; there are no enlarged cervical glands; and there is an absence of albumen in the urine.

Prognosis. Is favorable, death very seldom occurring.

Treatment. Put the child in a warm bath and give an emetic of vin. ipecac. A cold wet cloth to the larynx often acts magically. Then give chloral to prevent a relapse.

Diphtheria is a specific, infectious and contagious disease, characterized by inflammation of various mucous surfaces and the formation on them of a more or less tough and leathery false membrane. It often follows some zymotic fever such as measles or scarlatina; it probably has a pythogenic origin; it has no proper eruption, although sometimes it has one like scarletina, to which disease it seems to be closely allied; and lastly, one attack does not protect against another.

(*a*) *Pharyngeal Diphtheria.*

Symptoms. There is usually a stage of incubation of a day or two; then there is languor; slight elevation of temperature; some difficulty in swallowing; the breath is fetid and the tongue thickly coated, and there is albuminuria. On examining the throat one or more patches of a tough, dirty grayish-white material are seen, which are usually not confined to the tonsil but extend to the soft palate or uvula, and cannot be removed by mere swabbing as can be done with the exudation in follicular quinsy. The cervical glands become enlarged and tender early in the disease, and very soon there is more or less prostration according to the severity of the attack.

Pathology. It is due to a germ, probably a variety of micrococcus, which is introduced from without by direct contact, generally fixes itself on the fauces or larynx and becomes generalized from that point.

(*b*) *Laryngeal Diphtheria.*

When the inflammatory process attacks the larynx it is spoken of as membranous croup. There is still a difference of opinion as to the identity of croup and diphtheria. Those who hold that they are different affections say that croup is a sthenic disease, while diphtheria is asthenic; in croup the urine is not albuminous, but it is in diphtheria; croup is not followed by paralysis, while diphtheria usually is; croup is neither epi-

demic nor contagious, while diphtheria is both. Now these distinctions do not always hold good, indeed they are convertible, and while there may be reasons for believing in the possible existence of a non-specific membranous croup, still as it is impossible to distinguish between them with any certainty, and the question of contagion is involved, it is always best to treat every case on the assumption that it is diphtheritic. The very fact that many surgeons have contracted diphtheria by sucking a tube where tracheotomy had been done in a case of supposed simple membranous croup, ought to convince anyone of their identity.—

Symptoms. There may or may not have been previous exudation in the fauces, and the preceding symptoms may have been slight, when suddenly the breathing is noticed to be stridulous, respiration becomes harsh, the cough, voice and cry are hoarse. This lasts from a few hours to a few days becoming more marked until dyspnœa and cyanosis set in unless relieved.

Sequelæ of Diphtheria. These are albuminuria and paralysis.

Albuminuria is a constant symptom and is present early in the attack. It is not like that of scarletina in which albuminuria is a late symptom, the urine contains blood and casts, is accompanied by dropsy, and the kidney is in a condition of inflammation.

Paralysis occurs usually two or three weeks after an attack of diphtheria, and shows itself first by a peculiar alteration of the voice and difficulty in swallowing due to paralysis of the palate muscles. It is a symptom which often leads to the detection of a hitherto unsuspected disease. The paralysis may extend to the ciliary muscle and affect accommodation; or to the muscles of the eyeball causing squint; or it may affect the muscles of the body and extremities giving rise to a peculiar attitude and gait.

Modes of Death. Diphtheria may destroy life by blood poisoning; inhibition of the heart's action; asthenia; or laryngeal extension with its consequences,—asphyxia, etc.

Treatment. Every means should be taken at once to prevent contagion. The strength should be sustained by a stimulating diet. Iron, quinine, and potass. chlor. should be given internally. Locally a spray of hydrarg. bichlor. and sulphurous acid should be used every hour or two, and the patches may be gently removed, and a saturated solution of boracic acid in glycerine applied several times a day by means of a camel's hair brush. Some prefer chloral solution, iodized phenol, or iron and glycerine.

In the laryngeal variety the steam spray is beneficial, and tracheotomy or intubation of the larynx may be indicated in some cases.

4. **Bronchitis** is a disease which is common in children, and not only dangerous in itself but in its tendency to run into broncho-pneumonia or pulmonary collapse.

Causes. It is brought on by damp and cold. It may occur during teething; from irregularities in diet; from worms; or it may complicate measles, whooping-cough, typhoid fever, scarlet fever, diphtheria, and diseases of the heart and kidneys.

Symptoms. It usually begins with coryza, sneezing and cough. The cough is at first hard and soon becomes soft. There is no dulness on percussion, and auscultation determines bubbling and squeaking with sonoro-sibilant rhonchus all over the chest. If the inflammation extends to the smaller tubes (capillary bronchitis), or alveoli of the lung (broncho-pneumonia), the symptoms become very alarming; the child becomes restless; great dyspnœa; face livid and expression of distress;

pulse quick and feeble. Dulness, and subcrepitant rales are heard especially at the back of the lungs.

Chronic Bronchitis is common in children five or six years of age, especially those of a scrofulous tendency, and is very apt to lead to emphysema.

Treatment of Bronchitis. Never neglect a cough in a child, but if feverish at once put it to bed, a poultice with a little mustard should be applied to the chest, and a febrifuge expectorant given. If capillary bronchitis or broncho-pneumonia sets in give stimulating expectorants and an emetic of ipecac. Opium should be very cautiously used as it is apt to dry up the secretions.

In the chronic form liquid tar, counter-irritants, and change of air are indicated.

4. **Pneumonia** may be croupous or catarrhal.

(*a*) *Croupous.* Is rare in infancy up to the end of the second year, after that catarrhal and croupous are equally common, and with each succeeding year it is more and more likely to be of the croupous variety.

Of late years there has been a growing tendency to look upon croupous pneumonia as an acute general disease of which the pulmonary consolidation is the anatomical expression, and no longer to regard it as a mere local inflammation. Some have compared it to acute rheumatism and tonsillitis, while others look upon it as a specific fever and class it with typhoid. That it is a general disease with marked local manifestations is shown by the fact that the general symptoms are not proportionate to the extent of lung involved; they precede several days any evidence of local mischief, and the highest temperature is often reached before the point of most complete consolidation; while the head symptoms, the sweating, the herpetic eruption, and the exudation are peculiar.

Symptoms. Are like those of the adult but are often ushered in with convulsions.

(*b*) *Catarrhal.* Broncho-pneumonia is nearly always a secondary affection resulting from the spread of inflammation from the bronchial mucous membrane to the alveoli, and so it invariably attacks both lungs.

Symptoms. It is always preceded by pulmonary catarrh; more or less fever; cough, which is short and hacking; the face is more or less livid; the labial line is marked; the pulse respiration-ratio is perverted; respiration is labored, and dyspnœa or even orthopnœa are common. The paroxysmal cough of bronchitis changes to the short hard hacking cough of pneumonia, which usually causes great distress and exhaustion.

Physical Signs. At first are heard only the signs of bronchitis, for the consolidation being limited to small scattered nodules surrounded by emphysematous air cells can rarely be detected by percussion. Auscultation determines crepitant rales and rhonchus, and unlike croupous pneumonia the rales are not lost when consolidation occurs. As the nodules of consolidation grow larger and coalesce, respiration becomes more labored, cyanotic symptoms appear, and if the child is not relieved it becomes exhausted, sinks and dies. Before this, there is more or less dulness at the back of both lungs, and tubular breathing is heard. There is seldom any dulness in front. Lastly, should a favorable termination occur, there is not the critical fall of temperature seen in croupous pneumonia, but the symptoms gradually abate as well as the physical signs.

Diagnosis. One of the greatest difficulties is to exclude phthisis.

Prognosis is always doubtful, and the mortality is very large in infancy.

Treatment. It may often be prevented by the judicious management of the preliminary bronchitis. Begin with an emetic of ipecac, linseed and mustard to the back of chest, stimulants early, and sustain the strength by nourishing diet.

6. **Pleurisy** is comparatively rare during the first year, more common during the second year, and after that is one of the most common diseases met with in childhood. It is seldom fatal. The effused fluid is apt to become purulent at an early period.

Symptoms. It usually sets in with a chill, then fever and a slight cough; a pain in the side, causing the child to cry violently when pressed in the side; but it usually subsides as the effusion sets in, and this soon turns to pus, constituting *empyema.*

Physical Signs. It is difficult to distinguish it from croupous pneumonia. Palpation detects fluctuation. On percussion there is increased dulness with resistance like that on percussing a thick block of wood, and the alteration of note is got by change of position. By auscultation a friction sound is heard which is peculiar, being crackling or crepitating but very superficial. The heart may be pushed over to the right nipple by the effusion.

Treatment. Put the patient in bed and at absolute rest; a light diet; febrifuge; and opium for pain. Apply cotton batting to chest with a bandage. Potass. iodid. three or four times a day may be given later, and if pus is detected, and verified by hypodermic syringe, it is best to make a free incision with antiseptic precautions, and after carefully evacuating a portion of the pus, an antiseptic dressing should be applied and changed daily, allowing more pus to escape gradually.

IV. DIATHETIC DISEASES.

1. Scrofula. Is the most common of the morbid types of constitution; affects all ranks; is found in all part of the world; is often hereditary; and is very persistent. Its evidences are widespread throughout the body, attacking the skin, the mucous membranes, bones, joints, organs of special sense, lungs, and the lymphatic glands. All these parts are exceedingly sensitive, and may be attacked with some obstinate or even incurable form of the disease. They occur early, so that scrofula is especially a disease of childhood, being found more especially from the 3rd to the 14th year, after which its ravages usually abate.

Besides actual scrofulous disease, other circumstances determine it in the child, such as cancerous, tubercular, and syphilitic cachexiæ; age in the father; imperfect nutrition in the mother during gestation; marriage of cousins; insanitary surroundings in the child; neglect and bad food; or lastly, it may be the result of measles, whooping cough, variola or scarletina.

Symptoms. In a well marked case it is expressed in the build and general appearance of the child. It is stout, heavy, and looks older than its years; the face is broad and flat; the upper lip thick; the nose wide and its bridge sunken; the ends of the bones are thick; and the limbs are soft and flabby. Some scrofulous children are delicate; and the skin thin and transparent.

In a scrofulous constitution there is a tendency to rapid proliferation of all the epithelial and cellular elements of the body. The lesions are inflammatory in their nature, and characterized by rapid cell growth, and rapid decay of the new formed elements. Diseases, therefore, of this nature, show their constitutional origin by their tedious course; their sluggish

response to treatment; their origin from some trifling cause; and their proneness to relapse. Wherever the lesion is, the glands are liable to suffer, and this is so generally recognized that in a popular sense scrofula means simply a chronic enlargement of glands with a tendency to suppuration.

(*a*). *Mucous Membranes* are especially sensitive in strumous children, and they are very liable to catarrhs. Gastric catarrh is common and differs from that in healthy children by being always accompanied by fever. Intestinal catarrh is apt to lead to ulceration, and so become chronic. Catarrh of the nasal passages is usually accompanied by excoriation of the upper lip, and is apt to lead to ozœna and destruction of the bone, especially if it occurs in a child over two years of age. It is apt to be syphilis in a younger child. If it attacks the eyelids it results in tinea tarsi; or the eyes, it gives rise to pustular ophthalmia and keratitis, indicated by lachrymation and photophobia. If it is a girl you may find vulvitis.

Pharyngeal catarrh is very common, leading to enlargement of the tonsils and deafness. Otorrhœa and otitis are common. Pulmonary catarrh is apt to become chronic and give rise to what is commonly called "winter cough."

(*b*). *Skin.* Scratches are apt to fester, and acute eczema is common in scrofulous children. Small lumps often appear on the legs, arms, or abdomen, at first hard and movable, soon become fixed, inflamed, and suppurate, containing a cheesy-like pus.

(*c*). *Bones and Joints.* Caries of the vertebræ is very frequent, and disease of the tibia.

(*d*). *Lymphatic Glands.* Enlargement of cervical glands is most common, but the bronchial and mesenteric are often also affected. They do not always suppurate.

Treatment. Much may be done in the way of prevention by attending to the diet, clothing, pure air, and daily exercise. Iodide of iron and cod liver oil internally. Suppuration may be prevented by minute doses of calcium sulphite, and locally ung. cadmii or cleate of mercury.

2. Infantile Syphilis. Is due to hereditary taint, either on the father's or mother's side; or to vaccination with impure lymph.

It may affect:

(*a*) *Mucous membranes*, giving rise to catarrh, or mucous patches and ulcers on the cheek, glottis or epiglottis.

(*b*) *Solid organs*, giving rise to fibroid growths or gummata which may be found in the lungs, liver, spleen, or pancreas.

(*c*) *Bones*, especially the long bones, either affecting the periosteum, or the ossifying line of the shaft leading to separation of the epiphysis.

Symptoms. These depend upon the degree to which the system is affected. If it occurs while the child is in utero it may cause the death of the fœtus, and syphilis is a common cause of abortion. If less active the child may be born living, but it is thin and shrivelled, looking like a little old man; its body is often covered with pemphygus; it has "snuffles" and a hoarse cry, and as the internal organs are usually diseased the child sooner or later dies. When a child is born with hereditary syphilis, but apparently healthy you first notice "snuffles," then a discharge from the nose which often leads to ulceration of the septum. Then a rash consisting of copper-colored flat spots appears on the perineum, genitals, and anus, extending over the body, and there are frequently ecthymatous and tubercular spots; the hair and eyelids often fall out, and the nails become diseased, while the teeth are peculiar, being

screw-driver shaped. The fontanelles are slow in closing; the long bones become thickened and the epiphyses loosened, while dactylitis is common.

Treatment. When a child is born with syphilis you should treat both parents specifically for some months. In the child begin the treatment as early as possible with mercury, and it is indispensable to use it both internally and externally. Hydrarg. cum creta two or three times a day, or if it disagrees hydrarg. bichlor. ^{1} to $\frac{1}{40}$ gr. three times a day. Ung. hydrarg. should be smeared on a flannel band and applied to the belly, wrapping freshly every day. Mercurial baths, $\frac{1}{2}$ drm. to $1\frac{1}{2}$ drm. hydrarg. bichlor. to two gallons of water.

At the same time improve the general health, and counteract the tendency to anæmia by giving iron and cod liver oil.

V.—Diseases of the Liver.

1. **Jaundice** is a symptom and not a disease, being due to various causes.

(*a*) *Icterus neonatorum.* Usually begins on the second day, and lasts a week or ten days. The skin and eyes are yellow; the stools are clay-colored; and the urine is dark. It may be simple or malignant.

(*a*) *Benign.* Is often the result of some trifling derangement, and may be caused by severe labor, premature birth, or exposure to cold, damp, or bad air. In many cases it is due to the sudden transference of the chief blood supply from the umbilical to the portal vein, giving rise to engorgement of the hepatic circulation. The liver can usually be felt enlarged, but the jaundice is seldom of any consequence.

(β) *Grave.* May be an indication of very serious disease, and may be due to:

(i) *Atresia of the bile ducts from malformation.* If this is conjoined with umbilical hemorrhage it is rapidly fatal.

(ii) *Syphilitic inflammation.*

(iii) *Umbilical Phlebitis* and *Pyæmia.* This depends on infection like puerperal fever.

(*b*) *Icterus of Childhood.* This is due to the same causes as in the adult, duodenal catarrh being the most common.

Diagnosis is usually easy. When it persists and becomes deeper you would suspect the malignant form, especially if a child of the same parents has died from a similar condition. The pyæmic form is characterized by fever, dry tongue, discharge of blood and pus, and swelling and tenderness of the abdomen.

Treatment. In the simple form castor oil, followed by small doses of sodæ bicarb. is all that is necessary. In the variety due to malformation, if hemorrhage occur it may be necessary to ligate in mass.

2, Amyloid Liver. Known as waxy or lardaceous disease.

Cause. There is usually some cachexia such as syphilis, tubercle, or scrofula, and it is most commonly brought on by the existence of chronic suppurations and purulent discharges such as necrosis or empyema. The kidneys, spleen, and lymphatic glands are usually affected at the same time.

Pathology. The liver is uniformly enlarged, heavy, dense, its edges thin, of a gray and glistening color on section and stained reddish-brown by iodine, while the addition of sulphuric acid gives a violet and blue color.

Symptoms. There is no pain, but a feeling of weight and distension of the belly. Palpation feels the liver enlarged, smooth, and hard, with sharp and prominent edges; the digestion is disturbed; the spleen enlarged; the child is easily tired; there is anæmia; and hyaline casts and albumen are found in the urine.

Prognosis. It is less serious in the child than in the adult, provided the source of irritation and suppuration can be removed.

Treatment. Remove the cause, and thus obviate the symptoms such as diarrhœa, vomiting and anæmia. Then give a liberal diet, and potassic iodide, and ferric citrate internally.

3. Fatty Liver. Is due to excess of farinaceous food, or to tubercular disease.

Pathology. The liver is enlarged, soft, and doughy, its edges blunt and receding. When cut it is yellowish-red, and shows fat under the microscope.

Symptoms. There is slight tenderness over the liver, but never jaundice or acites.

Treatment. If due to excess of farinaceous food stop that, but if it accompanies scrofula or tubercular disease you must treat the primary trouble.

VI. ACUTE INFECTIOUS DISEASES.

1. Mumps. Usually occurs before the 5th year, and seldom after 14. It rarely occurs twice; is usually epidemic; is especially common in the spring; is extremely infectious, the virus being carried by the breath; and it has a period of incubation of from one to three weeks.

Pathology. It is an inflammation of the salivary glands and ducts, never going on to suppuration, but resolves in a few days.

Symptoms. There is fever which often runs up to 103°, accompanied by headache and vomiting. Then the parotid gland swells, becoming tense, elastic, tender, and aching. This lasts from 3 to 6 days, and then subsides, so that by the 10th day it is all away.

Metastasis is common; affecting the testicle in boys, the mammæ in girls. A common sequence is deafness.

Treatment. Allay fever, and apply hot flannel or poultices to the cheek, but avoid rubbing for fear of metastasis. Ung. belladonnæ with glycerine is often beneficial, and the bowels should be regulated.

2. Measles. Is the most common of the eruptive fevers, and is rarely fatal of itself, although some of its complications may prove serious. The contagion is conveyed by the breath, and it has a period of incubation of 10 days.

Symptoms. It begins with signs of catarrh; the child sneezes, coughs, and its eyes are red and watery; there is headache; fever; furred tongue; and often vomiting and diarrhœa. Then on the 4th day the eruption appears on the chin, temples, and forehead, at first yellowish-red slightly raised spots, which become of a deeper red. The fever and catarrh seem to be increased as the rash appears. The eruption soon fades, and it is often followed by a slight branny desquamation, especially when the rash has been profuse.

Complications. The most frequent and dangerous are broncho-pneumonia and membranous croup.

Etiology. As a rule it occurs only once in the same individual but there are frequent exceptions, and cases have been recorded where it has occurred twice in one month. It is

especially contagious from the beginning till the end of the eruptive stage when the infection becomes less and less active. It is impossible to isolate a child in the same house with others suffering from the disease, and it takes three weeks from the onset of the eruption before the sick child should be allowed to mix with healthy children.

Treatment. The sick room should be kept at a temperature of 65° F.; the diet should be milk and lime water, or barley water, with any farinaceous food; a mixture of tinct. aconite, and tinct. camph. co. may be given for the cough and fever, and if the latter is high quinine or antipyrine may be given; and complications should be watched for and anticipated.

3. Rötheln. German measles or roseola is an exanthem which resembles measles and scarlet fever combined, but is commonly looked upon as a distinct species since an attack does not protect against measles.

Symptoms. After a period of incubation of two weeks, there is headache, fever, and often backache, and after twenty-four hours an eruption of dusky-red, slightly elevated papules, appears on the cheeks, and quickly spreads to the body and limbs. The catarrhal symptoms are seldom well marked but the throat is sore, inflamed, and swollen.

Treatment. Similar to that of measles.

4. Scarlet Fever. Is a common infectious disease in children, rarely occurring twice in the same person, but sometimes appearing in an abortive form in one who is already protected by a previous attack. It is most highly contagious at the time of desquamation.

Symptoms. The period of incubation is from a few hours to a few days, never more than a week. Then there is usually

a chill, vomiting, or a convulsion; the tongue is furred, and red at the edges, but soon becomes very red and rough,—the "strawberry tongue;" the throat is sore; the temperature rises, and often soon reaches 105°; the pulse is very rapid; and on the 2nd day a scarlet pointed rash over a uniform pink surface appears on the chest and neck, and body.

On the 5th day the rash fades, and desquamation sets in, often fine branny scales or the skin may peel off. Three varieties of scarletina are described: simplex, anginosa, and maligna. In the malignant form the severity of the disease is shown by the violence of the nervous phenomena, the child being overpowered by the disease in some cases in 36 hours; or it may be owing to the severity of the throat affection.

Sequelæ. Diphtheria and rheumatism are apt to complicate early in the disease, while later on albuminuria due to nephritis is apt to occur; and otorrhœa is common.

Treatment. The first thing to do in a case of scarletina is to take every precaution to prevent its spread to the other members of the family, and this can be done by early isolation and disinfection. The child should be put in a well-ventilated, moderately warm room; all carpets, curtains, and woollen materials should be removed. The symptoms should be combated as they occur.

Nephritis, indicated by albuminuria, dropsy, and anæmia should be treated by pulv. jalap. co. and pilocarpine. The diet throughout scarletina should be light, and free from albumen and meat.

5. Varicella.—Chickenpox has a period of incubation of one week, and then slight fever, and an eruption appears, after 24 hours, of papules, which soon become vesicles, and pustules,

forming upon the back first and extending over the body and limbs.

Treatment. Most cases only require isolation and protection from cold, regulation of the bowels, and the prevention of irritation from picking the eruption.

6. Whooping Cough.—Pertussis is an infectious disease consisting of catarrh of the air passages combined with peculiar nervous symptoms. It occurs in epidemics, is contagious by breath and expectoration, and can be conveyed by the atmosphere or clothes; a second attack is rare.

Symptoms. After a short period of incubation the disease begins by catarrh of the air passages, and a troublesome cough which is worse at night, and soon becomes spasmodic, consisting of a series of short hacks rapidly following one another so as to prevent inspiration, the child's face becoming livid, and at last it takes a long deep inspiration accompanied by the characteristic "whoop" which gives the disease its name. This soon begins again until the child brings up a large quantity of tough, ropy mucus.

Complications. Convulsions and broncho-pneumonia are the most important.

Treatment. At first any simple expectorant may be used, and then when the spasm becomes established give belladonna and pot. bromide, or zinc. sulphate and atropia. Quinine also has a good effect, and locally the throat may be swabbed with solution of silver nitrate, or resorcin.

VII.—Diseases of the Skin.

In childhood the skin is very susceptible to disease; it is delicate and easily irritated by irregularities in diet, or disordered secretion; by neglect and want of cleanliness; the

frequency of gastro-intestinal disorders are apt to be accompanied by eruptions of the skin; and the parasitic diseases are common. The division of skin diseases which considers them according to the local lesion seems the simplest.

1. Erythemata. (*a*) *Erythema* is a superficial inflammation of the skin, occurring in slightly raised patches, diffused or circumscribed; the redness disappears on pressure but instantly returns; and it usually ends in slight furfuraceous disquamation; the general symptoms being slight. You may have *Fugax* when of a fleeting character; *Intertrigo* when produced by friction between folds of skin and want of cleanliness; *Pernio*, an unbroken chilblain; *Læve*, occurs on anasarcous limbs due to renal or cardiac disease; *Nodosum*, when confined to the fore part of the leg in the form of large, oval, somewhat raised patches resembling nodes.

Treatment. Remove all irritants; attend to cleanliness; apply soothing agents such as ung. zinci; lin. aq. calcis; or fine starch; attend to the diathesis; give an aperient, and tonics may be indicated.

(*b*) *Roseola* consists of transient red patches or slightly raised rose-colored spots, and is apt to be mistaken for measles.

(*c*) *Urticaria* is a febrile and non-contagious disease in which hyperæmic elevations similar to those that follow the sting of a nettle are produced upon the skin, and consist of wheals accompanied by tingling and burning, suddenly coming and then going without leaving any stain, and unaccompanied by desquamation. It is often produced by the ingestion of shell fish.

Treatment. Remove any irritation such as flannels, avoid draughts, use emollient and alkaline baths, and anoint the body with vaseline; relieve the work of the skin by aperients and

diuretics; prevent the circulation of effete products such as urea, or uric acid; tone up and lull by anodynes the nerve paresis.

2. Vesiculæ. (*a*) *Herpes* consists of clusters of vesicles situated on irregular-shaped inflamed patches.

There is *circinatus* occurring in a crescentic form and apt to be mistaken for "ringworm."

Zoster or shingles because the groups of vesicles tend to encircle one half of the body like a girdle; it follows the course of the cutaneous nerves; is more frequent on the right than on the left side; lasts from 14 to 20 days; occurs only once; and is accompanied by severe neuralgic pain. *Preputialis* and *labialis* are other varieties.

Treatment. Allay irritation, apply ung. zinci, and give iron and quinine tonics.

(*b*) *Eczema* is an acute inflammatory disease characterized by a vesicular eruption closely packed upon a more or less inflamed base, which quickly runs together, bursts, and is replaced by a slightly excoriated surface that pours out a serous fluid, which dries into crusts of a light yellow color. The discharge stiffens linen. The principal varieties are *simplex*, *rubrum* and *impitiginodes*.

Treatment. A typical case of eczema in its progress towards cure passes through certain stages, viz.: erythema, vesication, ichoration, pustulation and scabbing. It is a curable disease, and its passage through these definite stages should be promoted. It is aggravated by anything which irritates the skin from within or without; occasionally relieved or even aborted in its slighter forms or earlier stages by soothing remedies; liable to be complicated by accidental occurrences consequent upon the persistence of congestion, such as œdema, induration, atrophy,

etc. ; modified by constitutional conditions, such as gout, struma and syphilis ; influenced by organic diseases of the liver, kidneys, heart or stomach ; and always associated with a lowering of the general vitality of the system. Ask yourself the questions : What variety is it ? What stage is it in ? And are there any complications ? Lotions are best suited to the acute and discharging, while ointments are best for the scaly, stages. When the discharging stage lessens, and that of desquamation approaches the disease may be regarded as chronic. When the scaliness is distinct but no crusting, use astringents and absorbents ; when scaliness is well marked and a tendency to crusting tarry compounds are best ; and when there is considerable thickening and infiltration of plastic matter use oil of cade and soft soap. In the acute form alkalies and arsenic are good ; and in the chronic variety iron and arsenic are better.

3. Bullæ. (*a*) *Pemphigus* is characterized by the appearance of large round or oval blebs about one inch in diameter, distended with a fluid which is at first clear, but soon becomes milky, and often bloody ; the bullæ generally occur in successive crops.

Treatment. It should be treated as an asthenic disease ; begin with an aperient and then tonics with iron and mineral acids, and good food.

(*b*). *Rupia* begins like pemphigus, but the blebs speedily fill with a mixture of blood and pus, giving place to thick scales, beneath which is more or less unhealthy ulceration, yielding a nasty, dirty, fetid discharge augmenting the crusts with successive layers of dried secretion, until they assume a conical form. Rupia is pemphigus occurring in a syphilitic subject, and is to be treated accordingly.

4. Pustulæ. (*a*). *Ecthyma* is characterized by solitary pustules on an inflamed base and most frequently affects the

shoulders, buttocks and limbs. It is caused by all that tends to debility and impoverishment of the blood.

Treatment. Remove the exciting cause, and combat the cachexia, giving tonics and proper food.

(*b*). *Impetigo* is characterized by an eruption of small flattened pustules, usually arranged in clusters, and having a tendency to run together and form thick and moist yellowish incrustations. It usually begins on the face and head.

Treatment. The natural course of the disease is short and definite. As the discharge is contagious, cleanliness is important; so destroy the activity of the pus, and change the character of the surface that secretes it. Remove the scabs by poulticing, and apply ung. hydrag. ammon. chlor. (gr. v. to oz. i.), and give tonics.

5. Papulæ. (*a*). *Lichen* is characterized by minute hard, dry elevations of the skin, accompanied by tingling and itching, and slight desquamation. The varities are *simplex*, *planus*, and *urticatus* or "red gum."

(*b*). *Prurigo* is a chronic inflammation of the skin accompanied by the development of papules, general thickening of the skin and intense itching.

Treatment. Allay itching and give good diet and tonics.

6. Squamæ. (*a*). *Psoriasis* is characterized by the development of dry closely packed shining scales seated on a hyperæmic cutis. The elbows and knees are the most common sites; it is chronic; relapses are frequent; and it is often hereditary.

Treatment. Locally ung. ac. crysophanic, and internally arsenic is a specific.

(*b*). *Pityriasis* is a superficial and chronic inflammation of the skin, attended with redness and itching, and the production of minute white scales like bran. "Dandruff" is a mild form.

Treatment. Locally a wash of hydrarg. bichlor. and arsenic internally.

(*c*). *Ichthyosis* is characterized by thick, hard, dry, and imbricated scales of a dirty gray color, resting upon an inflamed surface. It is often congenital and hereditary.

Treatment. Can only be relieved by emollient applications, and tonics with arsenic.

7. Tuberculæ. (*a*). *Elephantiasis.*

(*b*). *Molluscum.*

(*c*). *Acne* is characterized by small isolated pustules with deep red bases, which after suppurating and bursting, leave behind them minute hard, red tumors, the seat of which is the sebaceous follicles.

(*d*). *Keloid.* Is like a cicatrix of a burn.

8. Parasitici. (*a*). *Tinea Tonsurans* is recognized by the thickened and brittle or broken condition of the affected hairs by the brawny eruption, and the roundness of the diseased patches. When not on the scalp it is called *tinea circinata*, and popularly known as "ring-worm."

(*b*). *Tinea Favosa* is known by the small cup-shaped yellow crusts, each containing a hair in its centre, and somewhat resembling a honey-comb; there is itching; the hairs are brittle and fall out; and it has an offensive odour.

(*c*). *Tinea Decalvans*, or alopecia areata, is where the hair falls out in one or more circular or oval spots, leaving perfectly smooth bald patches, which may be small in size or extend over the entire scalp.

(*d*). *Tinea Sycosis* is known by spots of erythematous inflammation which involve the hair follicles causing successive eruptions of small accuminated pustules. It is properly known as the barber's itch.

Treatment. Tinea is best cured by the thorough application of some parasiticide, such as tinct. of iodine, crysophanic acid in ether, etc.

(*e*) *Tinea Versicolor* usually appears in the front of the chest or abdomen in the form of small patches of a dull reddish color, which gradually increase in size, and assume a yellowish tint.

Treatment. Solution of hydrarg. bichlor., or sulphurous acid ; or hyposulphite of soda.

(*f*) *Scabies* commences as a papular, vesicular, or even pustular eruption, which ruptures and produces excoriations ; is intensely itchy ; is most frequent in the flexures of the joints, especially the fingers, toes, elbows and thighs ; and the itching is mostly at night when the child is warm in bed. The history and the microscope confirm the diagnosis. It is due to an animal parasite.

Treatment. The parts should be well washed with soap and water and an ointment of sulphur vivum rubbed in thoroughly, which is a specific.

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GENERAL INDEX.