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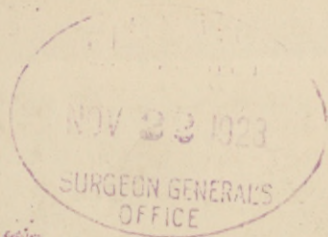
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OBSTETRICS FOR NURSES







Fig.1

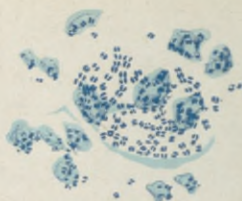


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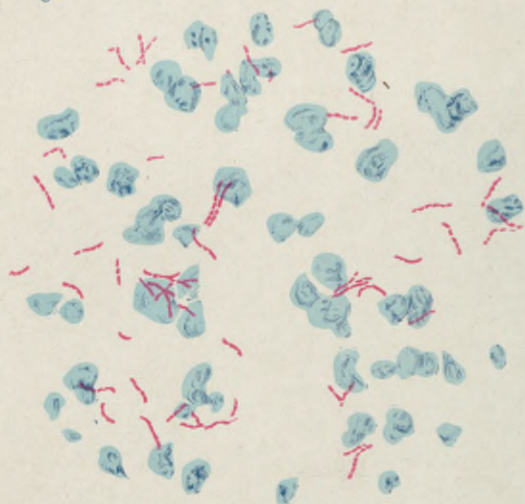


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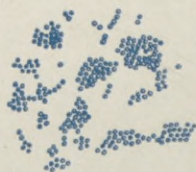


Fig.5



Fig.6

Germes most frequently found in cases of puerperal fever. (Kelly's Gynecology.) 1, streptococci (in chains); 2, gonococci; 3, tubercle bacilli (not a source of puerperal infection); 4, bacillus coli communis; 5, staphylococcus pyogenes aureus; 6, bacillus aerogenes capsulatus.



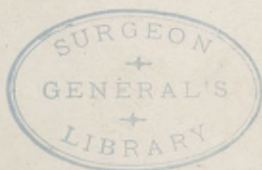
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**OBSTETRICS**  
**FOR NURSES**

BY

✓  
CHARLES B. REED, M.D.,

Obstetrician to Wesley Memorial Hospital, Chicago.

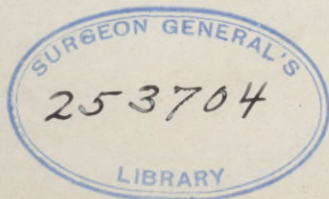
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TO HIS LOYAL FRIEND

EUGENE S. GILMORE

THIS BOOK IS AFFECTIONATELY DEDICATED  
BY THE AUTHOR

## PREFACE TO SECOND EDITION

It is no small gratification to the author that the large first edition of his "Obstetrics for Nurses" should be so quickly exhausted, for it not only shows a real need and appreciation for the book, but it also affords an opportunity for revision.

The text has been abbreviated in many places and enlarged and emphasized in others to conform to our constantly changing thought. Besides the new text material, a number of illustrations have been added which class use has suggested.

Various inaccuracies and obscurities in the text have been detected and removed through the careful supervision of Dr. C. D. Hauch, whose assistance it is pleasant to mention.

C. B. R.

Chicago, 1923.

## PREFACE TO FIRST EDITION

It might seem that an apology was necessary for presenting a new textbook on obstetrics for nurses when so many are to be had for the asking. But when a teacher is rarely or never satisfied with his own work it is too much to expect that he will ever fully endorse the product of another. It may be therefore largely a personal matter that none of the existent books seem to exhibit the fullness of information, the conciseness of expression, and the emphasis due to certain subjects that the present writer would hope to find.

The necessities apparently demand such an arrangement of our obstetrical doctrine that the book may serve for class instruction and at the same time be complete enough for post-graduate reference.

To secure this much discrimination is necessary. The confusion attendant upon overabundance must be avoided as well as the discouragement that is not infrequently produced by a large book or a periphrastic style.

Hitherto there has been a tendency to teach the nurse too little rather than too much but conditions have changed. Vocational instruction is not only more methodical and far reaching but it is developmental. The present day nurse expects not merely to assist the physician and earn a stipulated reward, but she is constantly alert to attain her own maturity as a professional woman.

To be a capable and intelligent assistant it is not sufficient to have a clear comprehension of her particu-

lar duties, but she must have a defined and critical conception of what the doctor is aiming to accomplish.

This is especially true in obstetrics where the nurse has the additional responsibility of giving support and counsel to her patient in the various emergencies that arise. Moreover, to attain her intellectual maturity the nurse must strive unremittingly to understand the complicated processes that take place under her observation.

She must cooperate with her doctor whose associate she is and secure the confidence of her patient who relies upon her for guidance in the perils she is facing. For childbirth is a peril. It is no longer the normal process it once was. Civilization has changed the shape of the pelvic bones, altered the muscles of parturition and weakened the nerve centers that control the event.

The birth of a child is equal in severity and seriousness to many of the major operations. It is not an affair to be entered upon lightly nor managed without the utmost foresight and care.

The dangers that are recognized and prepared for in this book by what may seem to some to be an extravagant technic, are very real dangers, extremely subtle, and against them at times every precaution and every defense proves unavailing.

Nevertheless, skill, thoughtfulness, and above all, cleanliness, will avert the worst, as well as probably the most common of these disasters. If our nurses could be convinced of this, the difficulties and apprehensions of childbirth would be greatly diminished.

The nurse should see to it that her patient is surrounded by all the precautions and safeguards against infection that she would demand for a member of her own family. This means of course that her work will

be far more exacting and onerous but also it will save many nights of anxiety and not infrequently a life.

This book represents the obstetric ideas and technic which the writer has endeavored for years to impress upon his students and nurses with such emendations and changes as experience and scientific progress have suggested. It is a selective essence distilled from the recurrent harvests that workers in this field have brought forth during centuries of consecrated effort. To all these forerunners the writer acknowledges a deep personal indebtedness.

In the preparation of the book thanks are due particularly to Charlotte Gregory, Head Nurse of the Wesley Maternity, whose rare ability as teacher, technician and executive and whose untiring vigilance has been a leading factor in securing and maintaining the high state of efficiency in this department. She has kindly contributed Chapters XXIII and XXIV, together with valuable suggestions and criticisms in other portions of the text.

The author also takes pleasure in acknowledging his obligations to Florence Olmstead, Head Nurse of the Dispensary of the Northwestern University Medical School, whose long experience in feeding babies gives to her words an unquestioned authority. Chapter XXII is almost entirely her work.

To the various publishers who have courteously allowed the reproduction of valuable illustrations from the books of other writers thanks are also extended, and to his own publishers especially for their cordial and sympathetic cooperation the author wishes to express his warmest gratitude.

C. B. R.

Chicago, 1917.

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# OBSTETRICS FOR NURSES

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## CHAPTER I

### ANATOMY

The study of obstetrics is an investigation of the passage, the passenger, and the driving powers of labor, as well as of the various complications and anomalies that may attend the process of reproduction.

The passage is composed of a bony canal, called the pelvis, and the soft tissues which line and almost close its outlet.

**The pelvis** is made up of four bones; the sacrum, the coccyx, and two other large structures of irregular shape, called the hip, or innominate bones. Joined by cartilage and held in place by ligaments, they form a cavity or basin which, in the male is deep, narrow, small and funnel-shaped, while in the female, slighter bones, expanded openings and wider arches make a broad, shallow channel, through which the child is born.

The bony pelvis is divided for description into two parts, the upper or false pelvis, and the lower or true pelvis. The upper pelvis is formed by the wings of the innominate bones and has but two functions of importance to child-bearing. It acts as a guide to direct the child into the true passage, and when measured by the pelvimeter, it gives information as to the shape and size of the inlet to the true pelvis. The true pelvis is of most concern to the obstetrician, because anomalies in its size or shape may impede the progress of labor or

render it impossible. The pelvis is divided conveniently into three parts: the brim, the outlet, and the cavity.

The *brim, inlet, or upper pelvic strait*, is the boundary line between the false and true pelvis. It is traced from the upper border of the symphysis along the iliopectineal line on both sides to the promontory of the sacrum. The shape and size of this opening varies much in different races and individuals, both normally and through

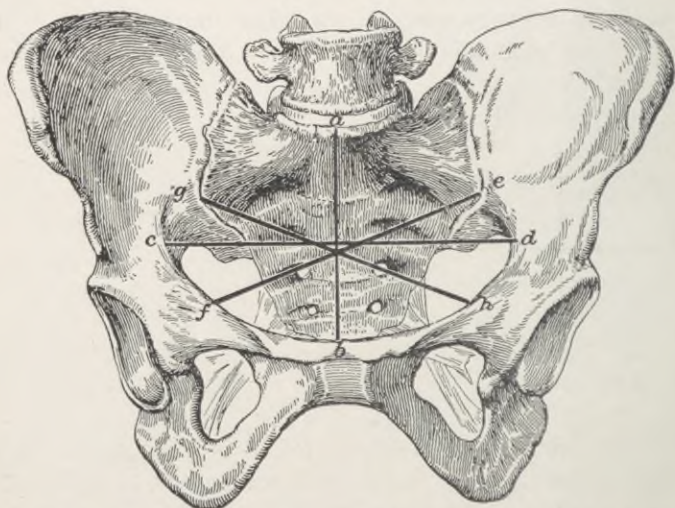


Fig. 1.—The normal female pelvis. (Eden.) The lines *ab* and *cd* divide the pelvis into the right and left anterior and the right and left posterior quadrants. *ab* indicates the anteroposterior diameter of the brim, *cd* shows the transverse diameter while *gh* and *ef* represent, respectively, the right and left oblique diameters.

disease; and when pathologically altered, both shape and size may exercise a marked influence on the course of labor. In American women, the outline of the brim is roughly heart-shaped, like an ovoid with an indentation where the promontory of the sacrum impinges upon the opening.



The brim or inlet has four important diameters to be remembered; important because the hard, round head of the child must pass through them by accommodating its diameters as favorably as possible to those of this opening. These diameters are named respectively the anteroposterior or conjugate diameter, the transverse, and the right and left oblique diameters. The two oblique diameters attain their greatest importance when the pelvis is irregularly distorted, but the others are essential in every case where labor impends. It is to secure an estimate of these latter diameters that the

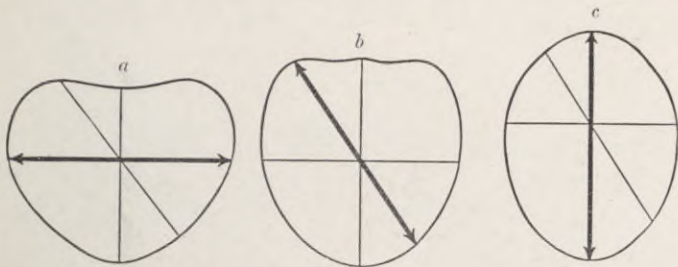


Fig. 2.—The planes of (a) the brim, (b) the cavity and (c) the outlet. (Eden.)

bony prominences are measured. This upper opening lies not horizontally, but in oblique relation to the body in standing position, and the weight of the abdominal viscera rests largely upon the bones and in consequence does not crowd into the inlet unless forced in by corsets or faulty habits.

Passing through the brim, a cavity is found below it, midway between the inlet and outlet, which is nearly round in shape. This is the "excavation," or the *true pelvis*. Then comes the *outlet*, bounded in front by the pubic arch and soft parts, and behind by the coccyx pushed back as far as it can go. It is ovoid in shape, but the long axis of this ovoid lies at right angles with the axis of the ovoid inlet.

We find, therefore, a succession of three geometric figures or planes through which the head must pass by means of a spiral motion called rotation. These figures are inclined to one another so markedly in front that a line drawn through the center of each will curve forward at both ends, one end passing out near the um-

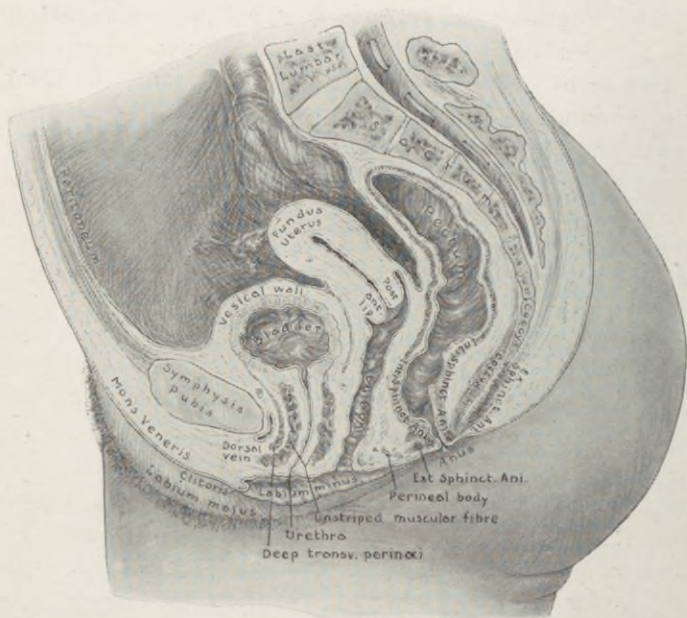


Fig. 3.—Visceral relations. (Redrawn from Gray.)

bilicus, the other through the vulva. This is known as the axis of the pelvis or the curve of Carus.

### THE SOFT PARTS

Inside the pelvis are the organs of generation with their accessory structures and supporting tissues.

Of first importance are the ovaries, tubes and uterus, together with the vagina. These special structures are the true genital organs. They are bounded in front by the bladder, behind by the rectum, above by the abdominal viscera, and surrounded everywhere by muscular, mucous and fatty tissues, which support them and aid their function.

**The Vagina.**—The vagina is a hollow organ, about four inches long, attached to the cervix above and the vulva below. It is an elastic sheath bounded in front by the bladder and behind by the rectum. Under normal conditions, this tube easily admits one or two fingers, but during labor it dilates enormously to allow the head to pass. The vagina is lined with a thick mucous membrane, ridged and roughened by folds, which are called rugæ. Thus a continuous channel connects the ovary with the outside and through it pass, at appropriate times, the ovule, the menstrual blood, the uterine secretions, the child, the placenta, and the lochia.

**The Uterus.**—The uterus (womb) is a pear-shaped organ, flattened from before backward, and composed of unstriped or involuntary muscle cells and connective tissue. Normally the virgin uterus measures from two and one-half to three inches in length, and weighs about two ounces. It is suspended in the middle of the pelvis by strong ligaments, so that the fundus inclines gently forward against the bladder. When the bladder fills, the uterus is pushed backward. Most of the organ is internal, but a small part of the lower pole is grasped by the vagina, in which the lower end with its invaluable aperture, the os, dips and swings. The part above the vagina is called the body or fundus, and is covered with the serous membrane (peritoneum) that lines the abdominal cavity. Below the fundus is the cervix or neck, which lies partly above and partly within the

vagina. The cavity of the uterus is usually closed by the apposition of the walls. The inner surface is covered with a peculiar kind of membrane called the endometrium, which is highly vascular. The uterine cavity opens into the vagina through the os, which is small and round in the nulliparous woman, and slit-shaped or gaping in the woman who has borne a child.

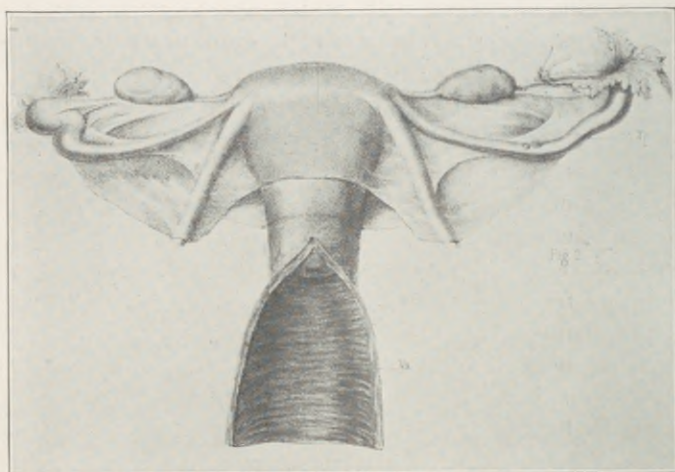


Fig. 4.—Uterus and appendages. On either side of the uterus will be seen the ovary, the fimbriated extremity of the tube, the tube, and the round ligament. The vagina lies open below. (Lenoir and Tarnier.)

**Fallopian Tubes.**—On either side of the upper end of the uterus are the orifices of the Fallopian tubes, through which the egg, escaping from the ovary, finds access to the uterine cavity. These tubes extend outward from the uterus about four inches, and terminate in a bell-shaped opening with long, ragged fingers which hang loosely down toward the ovary. The tubes are lined by epithelial cells having hair-like projections, (ciliæ) which wave automatically toward the uterus. Thus im-

pelled by a gentle current, the egg moves definitely along the tube toward the uterus and against this current the spermatozoa force their way to meet and fertilize the egg.

**The Ovaries.**—On each side of the pelvis, close to the fringed end of the Fallopian tube and attached to it, lies a small, hard, almond-shaped organ, called the ovary. This is the intrinsic sexual gland of the female. It contains the small cells which are to ripen and become eggs. Each ovary is said to contain about thirty-six thousand eggs, or ovules.

**The Bladder.**—The bladder lies between the pubic bone and the uterus. It is a reservoir for urine, filled by means of two little tubes called ureters, that run down from the kidneys. It drains through the urethra which opens just below the pubic bone in front of, and just above, the vaginal opening. The bladder should be emptied frequently during labor.

**The Anus.**—The large bowel (colon) terminates in an opening near the middle of the genital crease. This opening is called the anus. It is closed by a contracting muscle, the sphincter, which acts like a puckering string. Just inside of the opening is a group of large veins which may become enlarged, inflamed, and bleed during pregnancy. They are then called hæmorrhoids.

**The Rectum.**—Upward from the anus and to the left of the uterus extends the rectum. This is the end of the intestinal canal and is supplied with an abundance of nerves. When the head presses upon it, it gives the sensation of a bowel movement, and warns the observer of the low position of the head. The anus pouts as the head comes down and the anterior walls become visible. In severe cases of labor, the sphincter is sometimes torn. The bowels should be emptied by an enema as early as possible in the first stage of labor.

**The Peritoneum.**—The peritoneum is a thin, glistening, serous membrane, which lines the abdominal cavity and drops down from above over the uprising tops of the bladder and uterus. Folding together at the sides and extending to the walls of the pelvis, it encloses the tubes and round ligaments in deep, flat masses, called the broad ligaments. This is the structure that becomes so perilously inflamed (peritonitis) when infected by germs that find entrance through the genital passage.

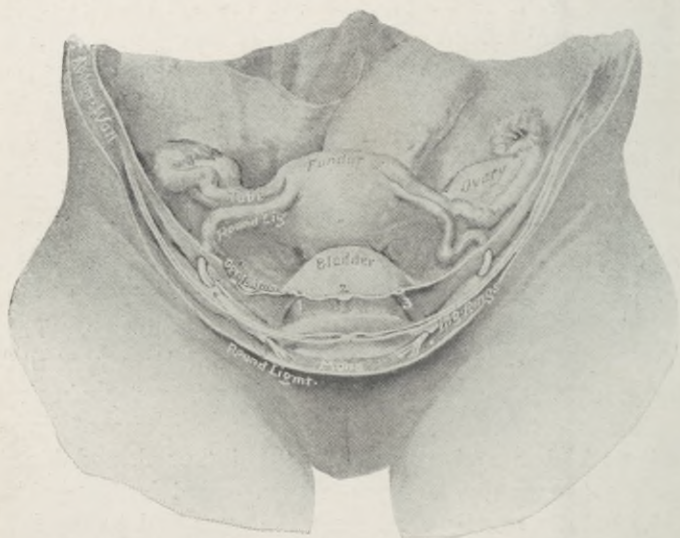


Fig. 5.—Normal position of pelvic organs, seen from above and in front. They are enveloped in peritoneum. (Bougery and Jacob, in American Text Book.)

## THE EXTERNAL GENITALS

The external genitals form the vulva. Under this name are included the mons veneris, the labia majora, the labia minora, the clitoris, the vestibule, the hymen and the glands of Bartholin.

The entire groove from the mons veneris to a point well up on the sacrum forms a deep fold or crevice, which is known as the *genital crease*. That part of the genital crease lying between the anus and vulva is technically known as the *perineum* (q.v.).

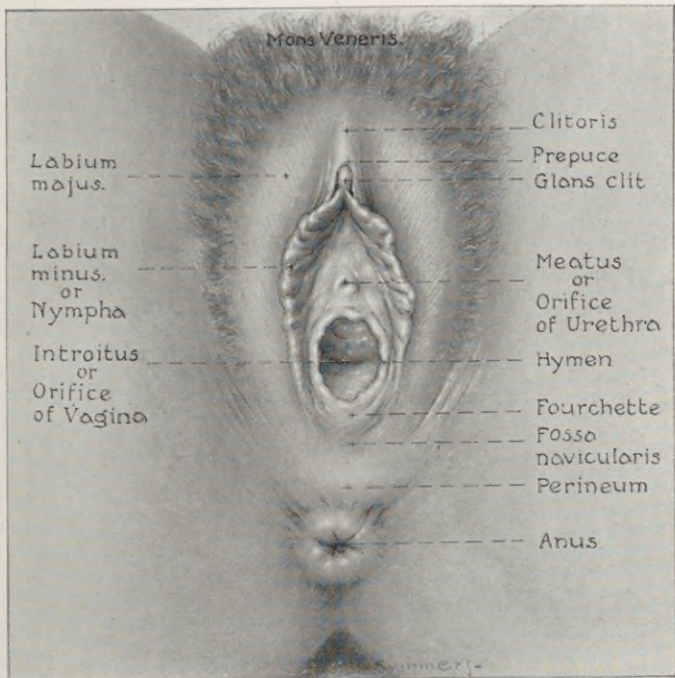


Fig. 6.—The external genitals. (Redrawn from Gray.)

**The Mons Veneris.**—The mons veneris is a gently rounded pad of fat lying just above the junction of the pubic bones (the symphysis). The overlying integument is filled with sebaceous glands and covered with hair at puberty.

**The Labia Majora.**—The labia majora are the large

lips of the vulva. They are loose, double folds of skin extending downward from the mons veneris to the anterior boundary of the perineum and covered externally with hair. Normally they lie in apposition and conceal the vaginal opening. They correspond to the male scrotum.

**The Labia Minora.**—The labia minora, or nymphæ, are two small folds of skin and mucous membrane, that extend from the clitoris obliquely downward and outward for an inch and a half on each side of the entrance to the vagina. On the upper side, where they meet and invest the clitoris, the fold is called the prepuce, but on the under side they constitute the frænum.

The labia minora are sometimes enormously enlarged in the black races and are then called the Hottentot apron.

**The Clitoris.**—The clitoris is an erectile structure analogous to the erectile tissue of the penis. The free extremity is a small, rounded, extremely sensitive tubercle, called the glans of the clitoris. About the clitoris there forms a whitish substance called smegma. This is a good culture medium for germs and must be carefully sponged away when the vulva is prepared for delivery.

**The Vestibule.**—The vestibule is bounded by the clitoris above, the labia minora on the sides, and the vaginal orifice below. It contains the opening of the urethra, which is called the meatus urinarius.

**The Hymen.**—The hymen is a thin fold of membrane which closes the vaginal opening to a greater or less extent in virgins. It varies much in shape and consistency. It is sometimes absent, or it may persist after copulation, hence its presence or absence can not be considered a test of virginity. When torn, the edges



shrink up and form little irregularities called *carunculæ myrtiformes*.

**Bartholin Glands (or Vulvo-Vaginal Glands).**—Bar-

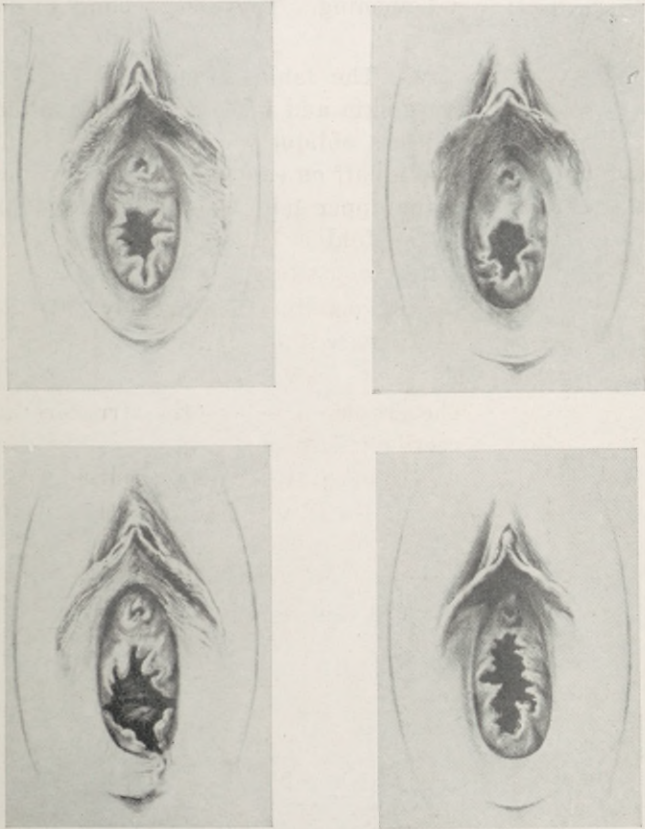


Fig. 7 A.—Varieties of hymen. (American Text Book.)

tholin glands are located on each side of the commencement of the vagina. Each gland discharges a yellowish tenacious mucus through a small duct just external to

the hymen. They are often the seat of a chronic gonorrhœal inflammation and must be watched carefully, lest

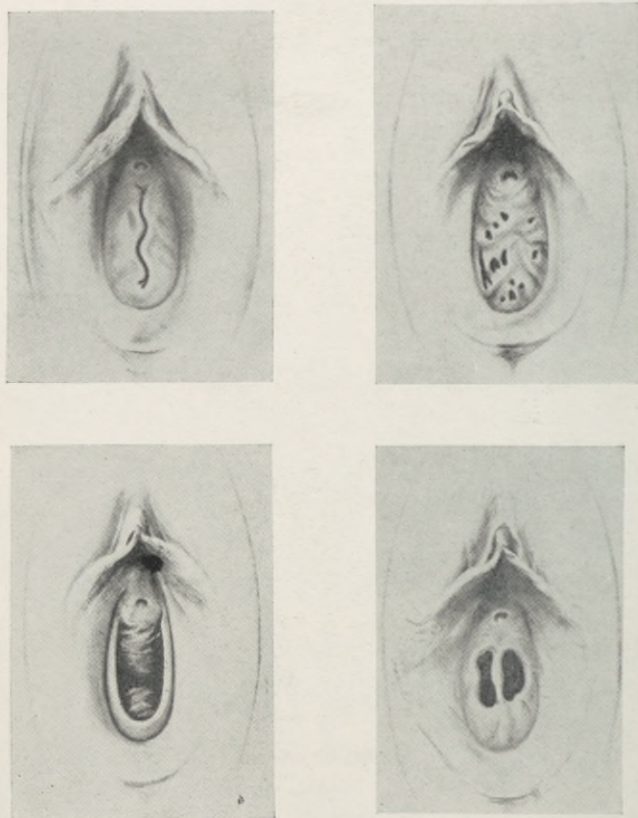


Fig. 7 B.—Varieties of hymen. (American Text Book.)

infection extend to the mother after labor, or to the eyes of the child in passing.

**The Perineum.**—The perineum is a body of muscle, fascia, connective tissue, and skin, situated between the vagina and the rectum. The vagina bends forward

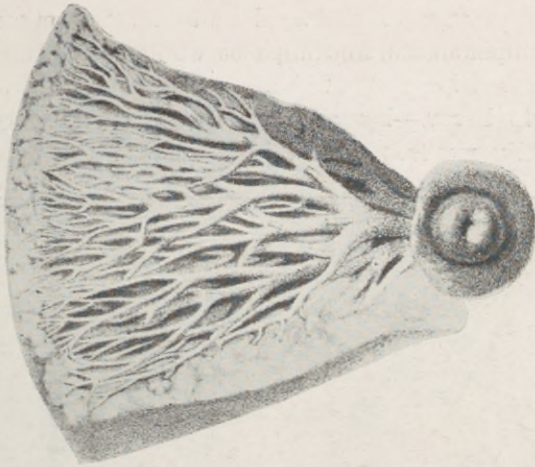


Fig. 8 A.—The excreting ducts of the mammary gland. (Lenoir and Tarnier.)

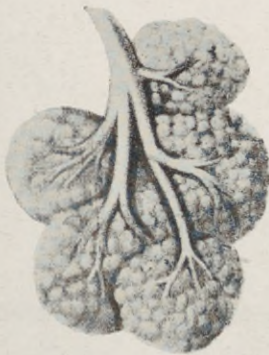


Fig. 8 B.—Lobules and duct of the mammary gland. (Lenoir and Tarnier.)

and the rectum backward, so a triangular area is left between them which is filled by the perineal body. It is about two inches long from before backward, and becomes progressively thinner the deeper it extends.

The perineal body is flattened out and compressed

by the passage of the head and in many cases torn. (Thirty per cent of primiparas and ten to fifteen per cent of multiparas.) It should be repaired immediately.

**Pelvic Floor.**—By a fortunate arrangement of the bones, ligaments, muscles, and fascia of the pelvis the

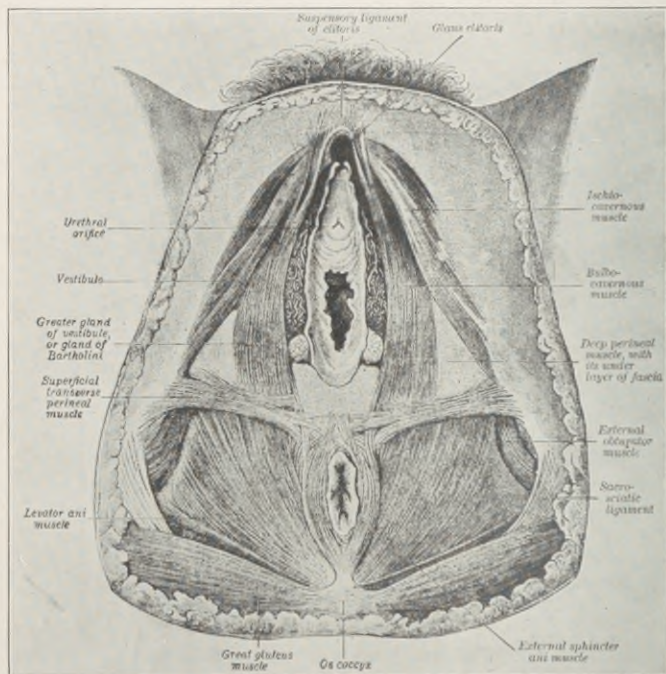


Fig. 9.—Female perineum after removal of skin and superficial fascia. Shows the various structures on the pelvic floor and the muscles to be overcome or lacerated in the passage of the child. (From Gray's Anatomy.)

contents of the abdomen and pelvis are prevented from escaping from the body when crowded down from above. Just under the skin and superficial fascia lies a variety of interlaced muscles and tissues which cover in the outlet and are commonly called the pelvic floor although

the true pelvic floor extends from the skin outside to the peritoneum inside. This structure is pierced by the openings of the rectum, vagina, and urethra.

The most important tissue in the pelvic floor is the levator ani muscle and the strong fascia which overlies its upper and lower surfaces. This muscle hangs like a hammock from its attachments and surrounds and sup-

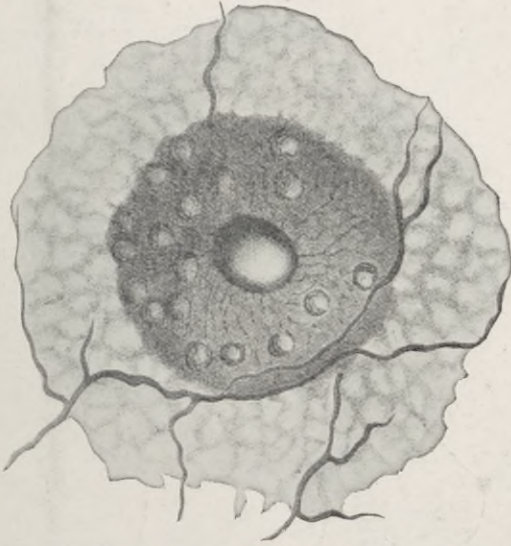


Fig. 10.—Nipple, areola, and the glands of Montgomery. (Eden.)

ports the pelvic organs. It closes the outlet so effectually that it is sometimes called the pelvic diaphragm. It is from 3 to 5 millimeters in thickness, but increases greatly during pregnancy. The contraction of the levator ani draws the vagina and rectum upward and forward toward the symphysis. It is the chief constrictor of the vagina. In lacerations of the perineum the injury frequently extends through the transverse perineal mus-

cles and a variable distance into the levator ani. When this happens the resulting weakness permits the pelvic contents to sag down or prolapse. One author states

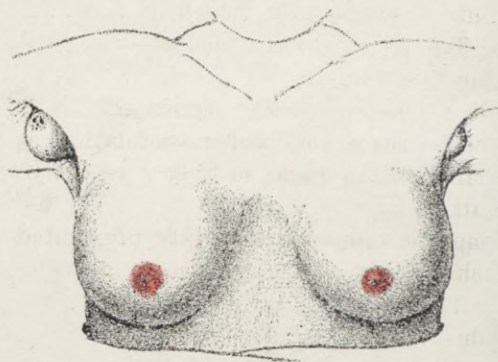


Fig. 11.—Supernumerary milk glands in the axilla. They may be found also below the breasts. (Witkowski.)

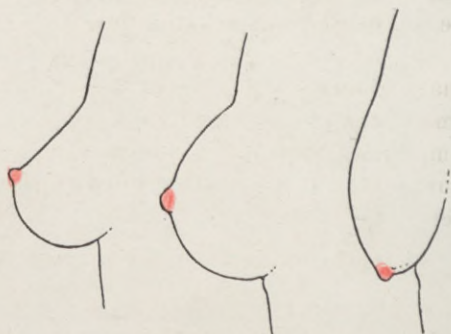


Fig. 12.—The three ages of the breast—virginity, maturity, and senescence. (Witkowski.)

that entire absence of lacerations occurs only in 15 per cent of primiparas. (Munro-Kerr.)

**The Mammary Glands.**—The mammary glands are secondary but highly important parts of the genital sys-

tem. They are formed by a dipping down of skin glands and they perform the special function of secreting milk.

The breast is made up of fifteen or twenty lobes, each of which, like a bunch of grapes, clusters about and discharges into a single tube which, in turn, leads to the nipple. The area between the lobes is filled with fat and connective tissue.

The *nipple* is pink or darkly pigmented. It is composed of erectile tissue and under stimulation, it rises from the surface of the gland so that it is easily taken into the mouth.

Surrounding the nipple is a darkly pigmented area from one inch to four inches in diameter that is called the *areola*. It contains hard, shot-like nodules, the glands, or tubercles, of Montgomery. These often secrete milk and sometimes become infected. It occasionally happens that more than two breasts may be found on the human female, and not infrequently pieces of mammary tissue may be discovered in the axilla or on the chest or back.

The mammary gland is undeveloped at birth, but, nevertheless it may fill with milk (witches' milk). At puberty, after marriage, and during pregnancy, the gland reaches maturity. It is only after delivery, however, that the functional climax is attained.

## CHAPTER II

### PHYSIOLOGY

**Ovulation.**—Ovulation is the process whereby the eggs are discharged from the Graafian follicle which matures and protects them in the ovary. The egg is a true cell with one, and sometimes more than one, nucleus.

The ripening of the eggs, as well as their discharge, is attended with much general disturbance and great physical changes. This phenomenon begins from the twelfth to the fifteenth year, depending on race, climate, occupation and temperament, and marks the transition of the individual from childhood into maturity.

This period is called *puberty*. At this time the breasts enlarge, the hips round out, the vagina, uterus and external genitals increase in size. Hair appears upon the vulva, the emotions become more evident, and modesty develops through a consciousness of sexual difference and attraction.

The process of ovulation is not simple. In the ovary the *Graafian follicle* gradually increases in size and acquires a layer of cells known as the *membrana granulosa*. The ovum at the same time acquires a thick outer coat, called the *zona radiata* on account of the numerous fine lines which appear in it. Fluid accumulates in the cells of the *membrana granulosa* and finally collects in a large cavity and is known as the *liquor folliculi*. Other changes appear and the Graafian follicle seems to sink down into the ovarian substance. As ripening approaches, however, the follicle swells until it looks al-



most as large as the ovary. The follicle now ruptures and the ovum which is about 200 microns in diameter, is set free. The ovum is now in the peritoneal cavity and is swept along toward the Fallopian tubes by various currents which are produced in the peritoneal fluids by the waving cilia of the fimbriated extremities of the tubes.

**Corpus Luteum.**—After the rupture of the Graafian follicle a series of changes take place which convert it

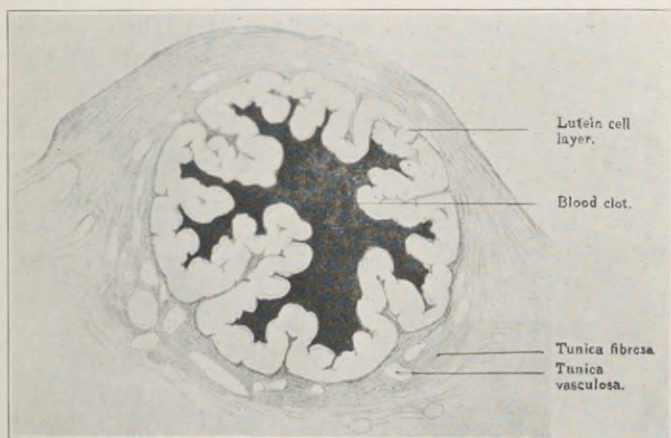


Fig. 13.—Section of corpus luteum from an adult ovary. X 3.

into the corpus luteum. First there is a hemorrhage into the follicular cavity which may be either slight or profuse and is accompanied not infrequently by pain. Coagulation occurs and the clot is organized. A thick layer of cells called lutein cells forms on the outside of the clot. They enlarge and become crinkled. Capillary blood vessels appear and to the eye the follicle has a red center and a yellow husk. Gradually the clot is

absorbed. The cavity shrinks and the surface of the ovary contracts into a small hard mass.

The theory is now established that the corpus luteum in some way controls or influences the implantation of the fertilized ovum upon the uterine wall. With the occurrence of ovulation another function becomes manifest. This is called menstruation.



Fig. 14.—Development of the ovary (after Wiedersheim). *A*, an in-growth of the germinal epithelium, forming a cell-cord, which breaks up into primitive Graafian follicles; *B*, a primitive Graafian follicle, with its contained primitive ovum; *C*, *D*, *E*, later stages in the development of the Graafian follicle. (Crossen.)

**Menstruation.**—Menstruation may be defined as a process wherein a bloody fluid is discharged from the uterus at regularly recurring periods between puberty and the menopause, *except* during pregnancy and lactation. It is a hæmorrhage which in some way is

closely associated with ovulation, but it is not known positively which is the precedent of the other, or whether one causes the other.

Menstruation is not essential to pregnancy, for pregnancy may occur when the flow is normally absent, as before puberty, after the menopause, or during lactation. Nevertheless, regularity of menstruation is the rule in fertile women and clinicians agree that while conception *may* occur at any part of the menstrual cycle, it is *most likely* to happen just before or just after the menstrual flow.

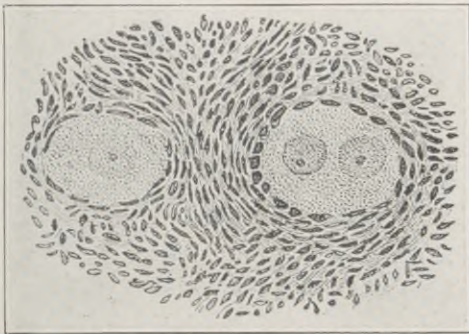


Fig. 15.—Graafian follicles. One contains two ovules which, if fertilized, will produce twins. If all three are fertilized, triplets will result. (Bumm.)

The best authorities at present support the theory that ovulation usually occurs soon after the close of the menstrual period. This is confirmed by the similarity of the physical changes that take place in the endometrium during menstruation and after conception.

As the period of the flow approaches, the lining membrane of the uterus becomes hyperæmic and swollen with blood, serum, and glandular secretions. The blood vessels are engorged, the glands become longer and more tortuous, little hæmorrhages appear, and the su-

perificial epithelium is thrown off. A large amount of mucus is produced by the increased activity of the glands, and all is discharged into the vagina as a bloody, incoagulable flow with an odor of marigolds. The process continues usually from three to seven days, when the discharge ceases and the endometrium slowly resumes its uncongested state.

Meanwhile, the psychic and bodily conditions have not remained unaffected. The nervous system is disturbed, the disposition is irritable and capricious and the head may ache. The woman takes cold easily. She is indisposed to exertion from a sense of languor and malaise. Pain may develop in the back, or cramps in the pelvis, so severe as to keep the woman in bed. Frequently the approach of the period is signalized by skin changes, such as a marked odor or an eruption of acne pustules.

The flow usually returns every twenty-eight days, but it may vary within normal limits from twenty-one to thirty days. The flow continues at such intervals regularly from puberty to the menopause (change of life), which occurs between the ages of forty-five and fifty.

**Conception, or Fertilization.**—This is the process wherein the male element (spermatozoon) meets and unites with the female egg. From what is known through investigations of lower animals, this meeting usually takes place in the Fallopian tube.

The egg expelled from the ovary is carried into the open end of the tube by peritoneal currents and passed on toward the uterus by the waving action of the hair-like outgrowths of the cells (ciliæ) that line the tube, aided, possibly, by the tubal muscle.

The spermatozoon makes its way upward from the vagina by means of its tail. This activity, like the tail

of a fish, or snake, or as a boat is sculled, drives the cell forward through the thin layer of fluid that covers the mucous membranes.

The arrow-shaped spermatozoon travels at a rate that completes the passage to the ovary in twenty-four hours, but spermatozoa may lie in wait for the egg a considerable time, as is shown by the fact that they have been found alive in Fallopian tubes removed three and a half weeks after copulation. As soon as the male and female elements approach each other, they exercise a



Fig. 16.—Human Spermatozoa. *h*, head; *c*, intermediate portion; *t*, tail. (Williams.)

powerful magnetic attraction, which draws them together, and as soon as they touch, the two cells unite and the spermatozoon almost immediately disappears.

Only one spermatozoon is required for the fertilization of an egg, and hence enormous numbers must perish without achieving their destiny.

The fertilized egg has become the *ovum*, and originally  $1/125$  of an inch in diameter, it now begins to grow, and filled with a new energy, it passes down the tube

and enters the uterus. Here it comes into contact with the soft mucosa and digs a hole for itself—a nest, very much as a warm bullet might sink into ice or snow—and is soon completely surrounded by a proliferating tissue called the decidua. The woman is now pregnant. The menstrual flow does not appear, and local and systematic changes are inaugurated.

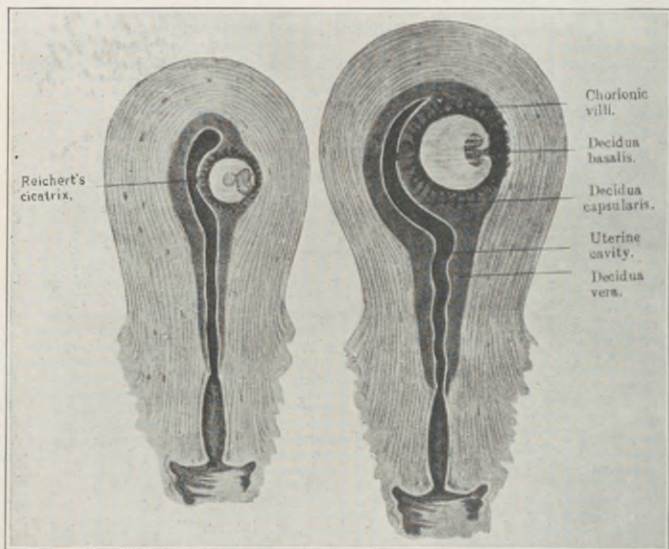


Fig. 17.—Diagrams to show the embedding of the ovum, and the formation of the decidua, and the differentiation of the decidua basalis and the decidua capsularis from the decidua vera. (From Berkeley's Midwifery.)

Proliferative changes now occur in the uterine mucous membrane. The whole endometrium is transformed into a highly vascular and spongy substance which is known as the decidua.

Special portions of this structure receive special names. The part on which the egg rests is called the

decidua basalis (formerly the serotina), the part covering the pole of the egg opposite to the basalis is called the decidua capsularis, while all the rest of the uterus is covered by the decidua vera.

The egg enlarges rapidly. Little glove-finger-like projections (the villi) appear on its surface and dip



Fig. 18.—The chorionic villi about the third week of pregnancy. (Edgar.)

down into the maternal tissues. Through these villi the egg gets nourishment until about the twelfth week, when the placenta forms. Externally the ovum resembles a chestnut burr. As the egg grows, the villi on the surface find it more and more difficult to secure nutriment, and *except at one place*, all gradually shrink and disappear. At this significant point, they increase

greatly in size, number, and complexity to form the thick, cake-like placenta.

The egg or ovum is simply a growing cyst, filled with a fluid, normally sterile, in which the developing embryo lives and swims. This fluid is the liquor amnii and

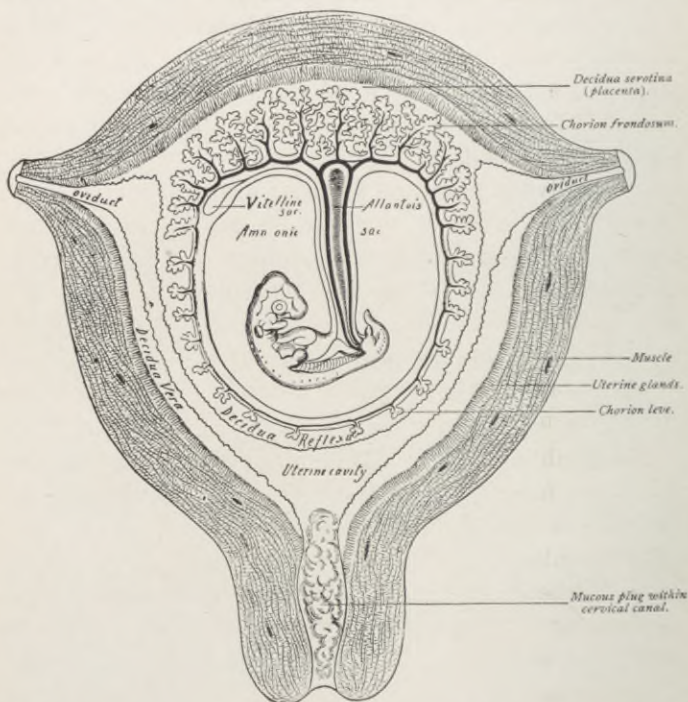


Fig. 19.—Diagram illustrating relations of structures of the human uterus at the end of the seventh week of pregnancy. (American Text Book.)

it is retained by a cystic wall made up of two layers—the chorion, which represents the original cell membrane, and the amnion, which develops out of the fœtus. At maturity, the ovum will contain from one to two pints of liquor amnii.



**The Liquor Amnii.**—The liquor amnii is of vast importance to the child. It allows free movement for the growing limbs and body, protects the child from sudden changes of temperature, prevents injury both from without and within, saves the child from birthmarks and deformities by keeping it from contact with the surrounding walls, and in labor lubricates the passages for the advancing part. In a measure, too, it probably serves as a food and as a source of fluid for the fetal tissues. In labor it forms a pouch called the *bag of waters*, which aids in dilating the os.

Gradually, as nutrition becomes more abundant at the site of the growing placenta, a stalk-like structure thrusts out from the fetal abdomen and forms an attachment with the formative placenta. This is called the ventral stalk and as soon as the communication with the placenta is established, it is combined with other parallel structures and becomes vascularized, to form the umbilical cord.

**The Umbilical Cord.**—The umbilical cord at maturity measures from five to fifty inches in length and from one-half to one inch in thickness. The cord is composed of a gelatinous connective tissue, called Wharton's jelly, in the midst of which lie the twisted vessels (two arteries and a vein) that supply the embryo with air and food and carry off the waste.

**The Placenta.**—The placenta or “after-birth” is an oval or circular somewhat flattened disc, six to ten inches in diameter, and three-quarters to one and one-half inches thick. It weighs about a pound and a half. It is the organ of respiration and nutrition for the fetus.

It is formed about the third month *outside* the membranes covering the child and is more or less loosely attached to the uterine wall. The umbilical cord is at-

tached to its foetal surface, inside the ovum. Like a flat sponge it takes oxygen, blood, and the nourishing fluids from the blood vessels in the uterine wall, carries them to the child by means of the umbilical vein, and carries back the carbonized blood and waste products by the umbil-



Fig. 20.—Maternal surface of the placenta and membranes. The cord protrudes from the cavity which held the foetus. (Edgar.)

ical arteries to the placenta, and there returns them to the maternal blood for disposal. The blood of the veins is bright red, and of the arteries, dark and turbid.

There is no direct communication between the maternal tissues and the placenta, hence all the changes

occur by osmosis, and by the activity of the cells which form the walls of the villi.

**The liver** of the child is large and active. The stom-

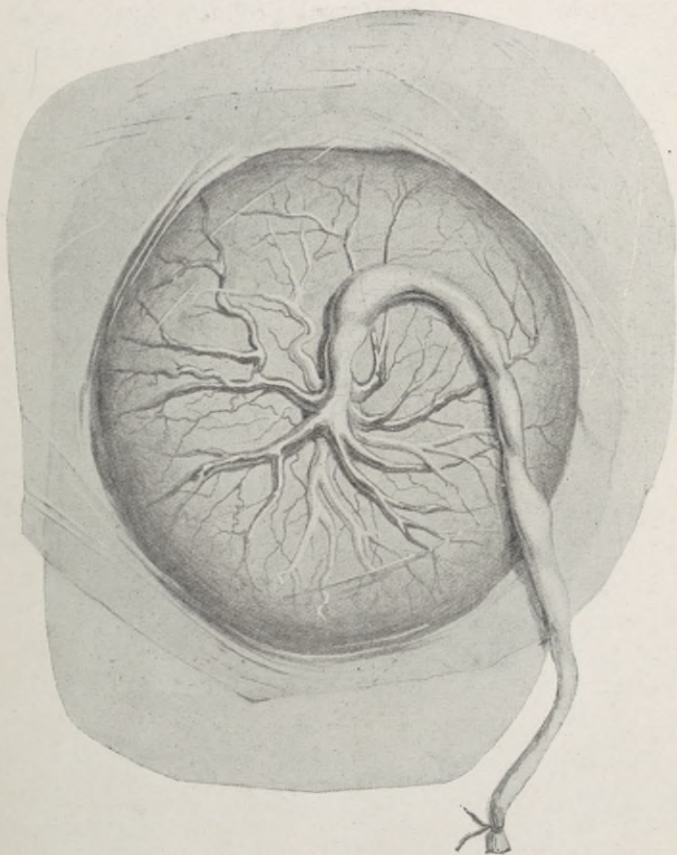


Fig. 21.—Fœtal surface of human placenta. (Eden.)

ach and intestines functionate mildly. The kidneys act, and urine is discharged into the liquor amnii, which the child occasionally swallows.

During development, the movements of the child become more and more pronounced. Arms, legs, and entire body participate in turn. Periods of rest are also



Fig. 22.—The egg at term with uterus removed and child showing through the membranes. (Edgar.)

observed. Gradually the child assumes a definite attitude in the uterus. It becomes more and more folded and flexed to accommodate its size to the limitations of space. The head bends on the chest, the arms are

folded, the thighs flex against the abdomen, the legs on the thighs, and even the back ultimately becomes convex. It attains a complete flexion, the normal atti-



Fig. 23.—Normal attitude of fœtus (complete flexion). (Barbour.)

tude of the child. As maturity approaches, the head becomes more and more palpable and seeks its usual location in the lower pole of the uterus, resting on the pelvic brim.

The foetal skull at maturity (at term) is still incompletely ossified. The bones are thin and pliable and separated at their edges by intervals of unossified membrane which form the sutures and fontanelles. Thus the skull is compressible to a slight degree and capable of much change in shape. It can be measurably moulded by the uterine contractions to suit the pelvis.

In front, the two coronary sutures meet the frontal and sagittal sutures to produce a kite-shaped figure, called the large or anterior fontanelle, or the bregma.

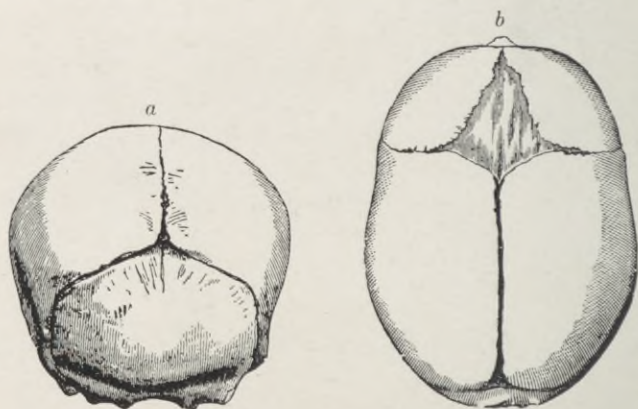


Fig. 24.—Fœtal skulls showing sutures. Note the differences between the anterior and posterior fontanelles. (Eden.)

Behind, the lambdoidal suture meets the sagittal suture to form the small or posterior fontanelle.

The large fontanelle is made up of four bones and four angles; the small, of three bones and three angles, and are usually easy to differentiate. Furthermore, the difference between these fontanelles is of great importance in labor, since by it the observer is enabled to determine the position of the head. In America, the shape of the head is that of an ovoid with the long

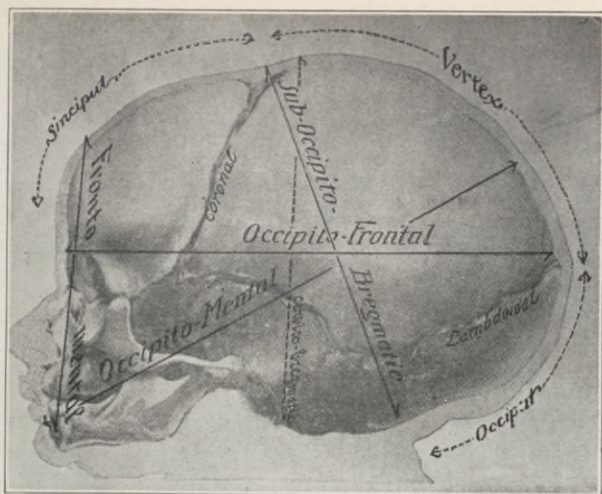


Fig. 25-A.—Child's head at term (from side), showing diameters. (American Text Book.)

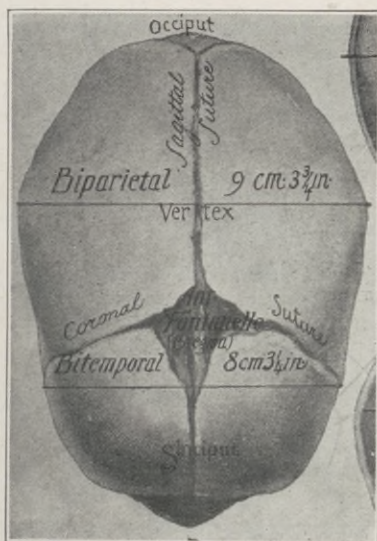


Fig. 25 B.—The child's head at term (from above), showing diameters and fontanelles. (American Text Book.)

diameter anteroposterior (Dolico-cephalic). Thus it happens that when the head is completely flexed, the smallest diameters are presented for delivery.

The important diameters of the head, with their measurements and names, are as follows:

Nape of neck to center of bregma, 9.5 cm.—Suboccipito-bregmatic diameter. Occipital protuberance to root of nose, 11.25 cm.—Occipito-frontal diameter. Between the eminences of parietal bones, 9.25 cm.—Biparietal diameter. Between anterior ends of coronal sutures, 8 cm.—Bitemporal diameter.

The smallest circumference is that of the suboccipito-bregmatic plane, which comes into relation with the brim of the pelvis when the flexion of the head is complete. It measures 27.5 centimeters.

The fœtus grows at a definite rate throughout gestation and so regularly that the increase is rarely simulated by any other condition.

To find the probable length of the fœtus at any given time, square the month of the pregnancy (up to five) and the result is the fœtal length in centimeters. After the fifth month, multiply the number of the month by five. Thus:

7th month  $\times 5 = 35$  cm., the approximate length of the fœtus at the lunar month.—Haase's rule.)

**The Mature Fœtus.**—Although subject to considerable variation, the fœtus at term will weigh about seven and one-fourth pounds, and measure 50 cm. in length. The weight is far more uncertain than the length, and therefore not so reliable as a sign of maturity.

To obtain an estimate of the weight of the child at any given month of the pregnancy, the number of *lunar* months minus 2, is squared and divided by 2, and the



result is the average weight of the child at that time in hundreds of grams. Thus:

8th month  $-2=6$ .  $6 \times 6=36$ .  $36 \div 2=18$ , or in hundreds of grams, 1800, the weight of the child.—(Tuttle's rule.)

Differences between the mature and immature fœtus:

<i>Mature</i>	<i>Immature</i>
1. Skin smooth, plump, pink covered with vernix caseosa.	1. Skin lax, wrinkled, dull red in color; little vernix caseosa.
2. Generous amount of subcutaneous fat.	2. Subcutaneous fat scanty.
3. Hair abundant and from 1 to 2 inches long.	3. Hair on scalp short.
4. Lanugo mostly absent.	4. Lanugo present all over body.
5. Nails project from finger tips.	5. Short nails on fingers and toes.
6. Skull bones in contact except at fontanelles.	6. Skull sutures open.
7. Length 48 to 52 cm.	7. Moves and cries feebly when born.
8. Weight five to eight pounds.	8. Weight less than five pounds.
9. Cartilage in ear well developed.	
10. Navel in middle of body.	
11. Testes have descended in the male, and the labia majora in the female usually cover the labia minora.	
12. Moves and cries vigorously when born.	

**The Fœtal Circulation.**—The placenta is an organ of nutrition as well as respiration, and through the umbilical vessels the food materials are brought to the fœtus and the waste products removed.

Surrounded by the jelly of Wharton that fills out the cord, and running in and out between the two arteries,

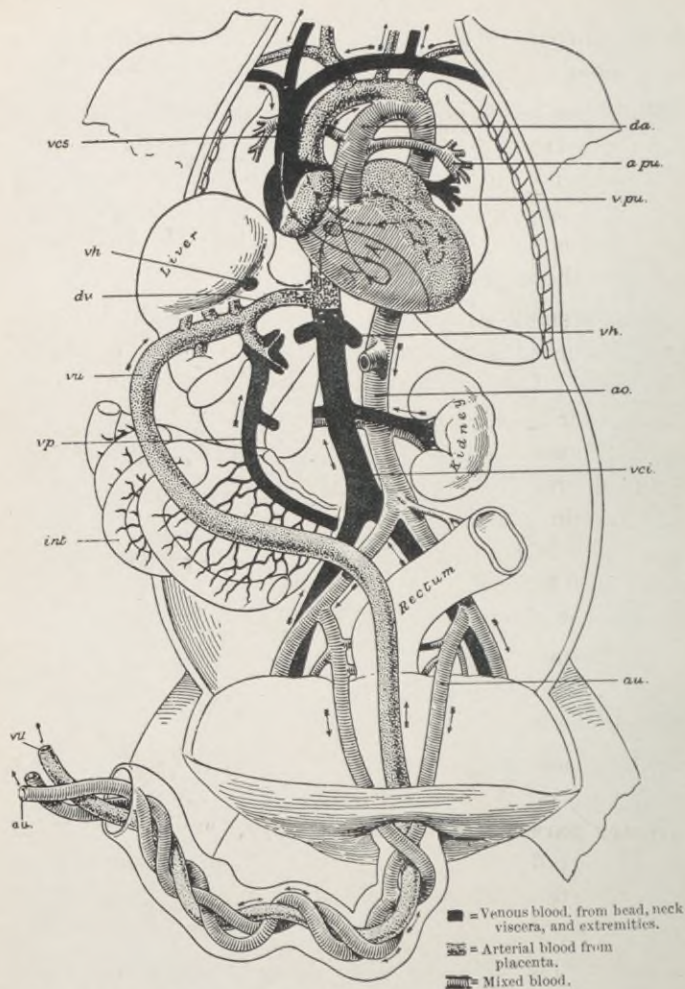


Fig. 26.—The fetal circulation. (Edgar.)

the umbilical vein passes into the foetal abdomen and divides into two branches, one, the larger, short-circuits directly into the inferior vena cava. This branch is called the ductus venosus. The other joins the portal vein and

passes through the liver, after which it also enters the vena cava.

Thus the heart is fed with a mixed blood, part coming fresh from the placenta and part coming up from the lower half of the fœtus. This blood is poured into the right auricle, where it becomes mixed again with the blood coming down from the upper pole of the fœtus through the superior vena cava.

Now a small part goes down into the right ventricle and is forced into the pulmonary arteries to supply the lungs. But the lungs are not functioning, hence the greater part is again short-circuited through the ductus arteriosus into the arch of the aorta, where it meets with the great volume of blood which passed over into the left auricle through the hole in the septum between the right and left auricles, called the *foramen ovale*, thence down into the left ventricle and out through the aorta to supply the rest of the fœtal body.

With the exception of the ductus venosus and the ductus arteriosus and the foramen ovale, the circulation is the same as in the adult.

The blood in the descending aorta again divides and part goes on to supply the lower extremities while the greater part leaves the internal iliac arteries by means of the hypogastric vessels and returns through the umbilical arteries to the placenta for oxygenation.

As soon as the child is born, the fœtal structures are altered. The child breathes, the pulmonary circulation is established and the ductus arteriosus is closed. The placental circulation is abolished, and the ductus venosus and the hypogastric arteries are converted into solid fibrous cords. Owing to the immediate change of pressure in the auricles, the foramen ovale closes and the circulation assumes the adult type.

## CHAPTER III

### NORMAL PREGNANCY

The entire body participates in the changes brought about by pregnancy. The hips and breasts become fuller, the back broadens, and the woman puts on fat. She becomes mature in appearance, but, of course, the phenomena connected with alterations in the breasts and genitals are most important, and late in pregnancy, most conspicuous.

The uterus exhibits the most marked alteration. From an organ that weighs two ounces, it becomes the largest in the body, and increases in size from two and one-half or three inches to fifteen inches. The typical pear-shape becomes spheroidal near the end of the third month, becomes pyriform again at the fifth month, and continues thus until term.

Up to the fourth month the walls become thicker, heavier and more muscular, but as pregnancy advances, more and more tissue is demanded, until at the end, a muscle wall of only moderate thickness protects the ovum. Meanwhile the muscular functions of contractibility and irritability are greatly increased.

At the fourth month the womb, which has occupied a position of anteversion against the bladder, rises out of the pelvis. It is now an abdominal organ and as it gets heavier and heavier, it rests a certain amount of its bulk on the brim of the pelvis. About the sixth month, the uppermost part of the uterus (fundus) is at the level of the umbilicus. At the eighth month, the fundus is found a little more than midway between the

umbilicus and the ensiform cartilage. About two weeks before term, it reaches its highest point, the ensiform cartilage, and then sometimes sinks a little lower in the abdomen.

The ovum, or egg, does not completely fill the uterine cavity at first, but grows from its side like a fungus until

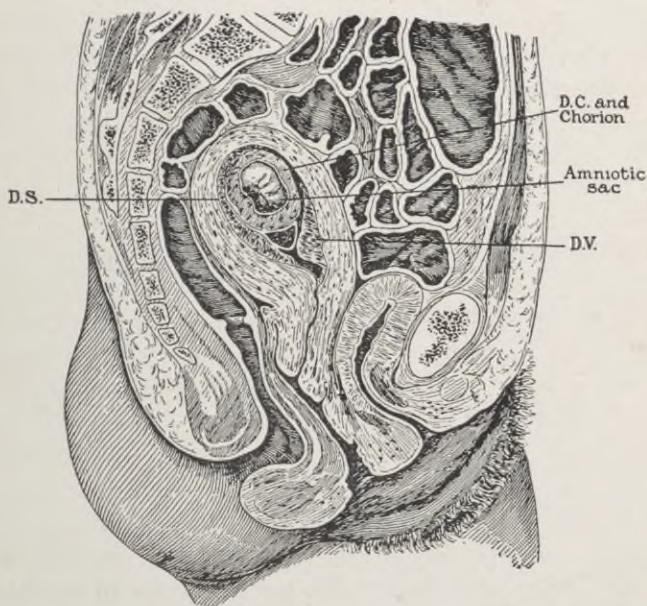


Fig. 27.—Gravid uterus at the end of the eighth week. (Braune.)

the third month. Then the uterine cavity is entirely occupied and thereafter the egg and the uterus develop at an equal rate. As the uterus rises in the abdomen, it rotates to one side, usually the right, forward on its vertical axis.

The blood vessels and lymphatics also increase in size, number, and tortuosity. Many of the veins become

sinuses as large as the little finger. This increased amount of fluid both within and without the uterus has a marked effect upon its consistency. The walls of the uterus, vagina, and cervix become softened, infiltrated and more distensible. There is also an increase in size and in number of the muscle cells.

During pregnancy the uterine muscle exhibits a definite functional activity. Intermittent contractions occur, feeble at first, but growing markedly stronger as pregnancy advances. These are the contractions of Braxton Hicks. They are irregular and painless, but can be felt by the examining hand. At term they merge into, and are lost in, the regular, painful contractions of labor.

The breasts can not be said to be fully developed until lactation has occurred, nevertheless, the glands show pronounced changes as a result of marriage and pregnancy.

The size of the gland, as well as the size and appearance of the nipple and areola, varies greatly in different women; but under the stimulation of pregnancy the whole gland enlarges, including the connective tissue stroma.

About the fourth month a pale yellow secretion can be squeezed from the nipple. This is called *colostrum*. The pigmentation extends over a wider area and deepens in color, while the increased vascularity is shown by the appearance of the blue veins under the thin tender skin. Light pinkish lines sometimes radiate from the nipple. These are *striæ* and are more evident in blondes.

The milk comes into the breasts about the third day after labor, and normally continues to flow for six, to ten or twelve months.

Why the pregnancy and labor induce such marked mammary activity is not known, but the fact is patent.

**The skin** reacts both mechanically and biologically to the stimulus of pregnancy.

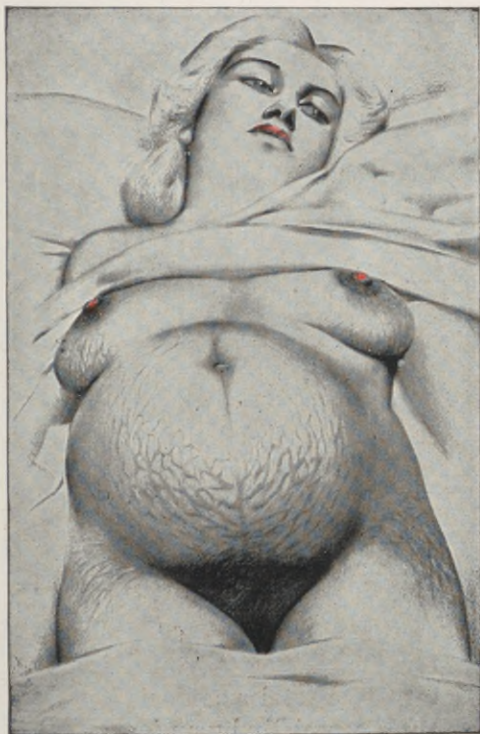


Fig. 28.—*Striæ Gravidarum*. (Edgar.)

*Striæ Gravidarum*.—*Striæ gravidarum* appear on the abdomen similar to those observed on the breasts and are due to the same cause—mechanical stretching. When fresh, they are pinkish in color and variable in length and breadth, but attain the greatest size below

the umbilicus. Occasionally they extend to the thighs and buttocks.

After labor, they become pale, silvery, and scar-like and are called *linea albicantes*. They are sometimes found in other conditions than pregnancy, such as tumors or ascites.

*Increased Pigmentation.*—Pigmentation is not limited to the breasts. On the abdomen, a dark line will appear between the umbilicus and the pubes. This is the *linea nigra*, and it becomes most conspicuous in the latter half of pregnancy. In the groins, the axillæ, and over the genitals, the deposit is common, and sometimes patches appear on the face, either discrete or in coalescence, to form a continuous discoloration, called *chloasma*; or when extensive, the “mask of pregnancy.” The pigmentation is absorbed, or at least greatly diminished, after labor. The sebaceous and sweat glands are more active.

*The hair* may fall out and the teeth decay. “With every child a tooth,” is the cry of tradition. These changes are due to imperfect nutrition, or to the presence of toxins in the circulation. (Vid. also p. 76.)

*Eruptions* of an erythematous, eczematous, papular or pustular type are not uncommon; and itching, either local or general, may make life miserable.

**The blood** undergoes certain modifications that are fairly constant. The total amount is increased, but the quality is poorer, especially by an increase in water and white cells and a diminution of red cells. The amount of calcium is slightly increased and the fibrin is diminished up to the sixth month, when it rises to normal again at term.

**The heart** is slightly hypertrophied on the left side and blood pressure somewhat raised. A marked increase in blood pressure is suggestive of eclampsia.



**The thyroid gland** enlarges frequently, both as a consequence of menstrual irritation and of pregnancy. Goiters may show an increase of development, which may remain after labor.

**The urine** is diminished in amount, but increased in frequency of evacuation. The bladder is more irritable during the first and last months, and micturition may be painful and unsatisfactory. The kidneys must be watched carefully during gestation.

**The nervous system** is disordered in most women, but especially in those of neurotic tendencies.

Irritability, insomnia, neuralgia of face or teeth, or perversion of appetite in the so-called "longings" are the more common manifestations.

Cramps occur in the muscles of the legs, owing to varicose veins, pressure upon the lumbar and sacral plexuses of nerves, or toxemia.

**The lungs** are crowded by the growing uterus and the respiration interfered with.

**The liver** is enlarged, but functionally it is less competent, and constipation is common.

It is probable that most of the changes enumerated above are due to the circulation through the body of some definite product of foetal activity, which is more or less toxic in character. The more pronounced effects of this toxin will be studied under the abnormal conditions of pregnancy.

Generally, if the pregnancy is normal, the whole body responds to the stimulating influence. After the nausea and vomiting of the early months subside, the woman feels energetic and ambitious. She is eager to do something at all times and feels fatigue but slightly. Music, literature or housework engages her attention and is zealously and joyfully practiced. The world

seems bright and the thought of her labor does not bring solicitude, but pleasant anticipations. The body fills out in all directions and the woman takes on the appearance of maturity.

### DIAGNOSIS OF PREGNANCY

The presence of pregnancy is naturally determined by the recognition of those changes in the maternal system which the growing ovum produces.

During the *second half* of the period the foetus can be made out distinctly by palpation, or by its movements, and the heart tones observed by auscultation.

During the *first half* this is impossible and the diagnosis must be made from subjective symptoms elicited from the patient and upon physical signs observed by the physician.

It is of extreme practical importance to be able to recognize a pregnancy at all periods. The *subjective symptoms* of the first half are—amenorrhœa, morning sickness, irritability of the bladder, discomfort and swelling of the breasts, enlargement of the abdomen and quickening; but the appearance of any or all of these phenomena is not to be regarded as conclusive, but merely as a presumption that pregnancy exists. Either through ignorance, intent to deceive, or from pathological conditions, any or all of these symptoms may be present, but not until the tenth week are the changes in the uterus sufficiently definite to confirm a diagnosis unless the circumstances are especially favorable.

**Amenorrhœa.**—Cessation of the menses is practically invariable in pregnancy. One or two periods may occur after conception, but care must be used to exclude other causes of hæmorrhage. Sudden cessation of the peri-

ods in a healthy woman of regular habits who is not near the menopause, is strongly suggestive of pregnancy. Why a developing ovum causes an immediate arrest of menstruation is not understood.

Amenorrhœa may occur in consequence of chlorosis, heart disease, hysteria, tuberculosis, fright, grief, and some forms of insanity. A change from a low to a high altitude, or an ocean voyage not infrequently causes the flow to remain absent for one or more months. A woman may have her babies in such rapid successions that the menses do not appear but once or twice during her sexual life. In addition to its value as a presumptive symptom, the amenorrhœa affords a common and convenient method of estimating the date of confinement. The method is fallacious but practical, and will be discussed later.

**Morning Sickness.**—This symptom is not invariable. It is most frequent in primiparas, but not so likely to occur in subsequent pregnancies. It usually appears about the second month, shortly after the first period missed. It varies in intensity. Some women have a little nausea on arising and no further trouble during the day, others are nauseated and vomit either on rising or after the first meal, and yet others after each meal; but the general health is not ordinarily affected and the tongue remains clean. Some cases are of extreme severity (hyperemesis) and will be discussed elsewhere.

The morning sickness is probably toxic in origin. It must be remembered that chronic alcoholism is accompanied by morning sickness, but with it the tongue is furred.

**Irritability of bladder** is shown by a frequency of urination. It is caused by the congestion and stretch-

ing of the tissues that lie between the uterus and bladder and hold them in relation to one another. After the third month an accommodation is established and the symptom does not reappear until late in pregnancy, when the pressure of the heavy uterus tends to keep the bladder empty. If especially annoying, this irritability may be much relieved by putting the patient in the knee-chest position night and morning.

**Enlargement of the breasts** is common in primiparas, but this, with changes in the areola, may occur at menstrual periods in nervous women. Tingling, pricking and shooting sensations may also be noted.

**Enlargement of the abdomen** is only noticeable toward the latter part of the first half, when the uterus rises out of the pelvis.

**Quickening** means "coming to life," and refers to the first movements of the fœtus that are felt by the mother. It is described as similar to the flutter of a bird in the closed hand or the twitching of a muscle. It is sometimes accompanied by nausea and faintness. Quickening usually occurs about the seventeenth week of pregnancy, and continues to the end. Gas in the intestines will sometimes simulate quickening.

The movements are important in the second half as indicating that the child is alive.

**Physical Signs.**—During the first weeks no conclusive changes occur that can be detected by examination, and unless conditions are especially favorable, the earliest time for the definite diagnosis of pregnancy is the eighth week. Previous to this it is presumptive only.

At the eighth week, the breasts may show enlargement and tenderness, with some secretion. In the multipara, this sign has no significance. Secretion is present sometimes in the breast of nonpregnant women with uterine disease (fibroids).

Examination of the abdomen at this time is of little value, but changes in the uterus can be detected by careful bimanual examination. It is needless to say that all internal examinations should be made with the utmost care and gentleness.

Softening of the lips of the os (Goodell's sign) may

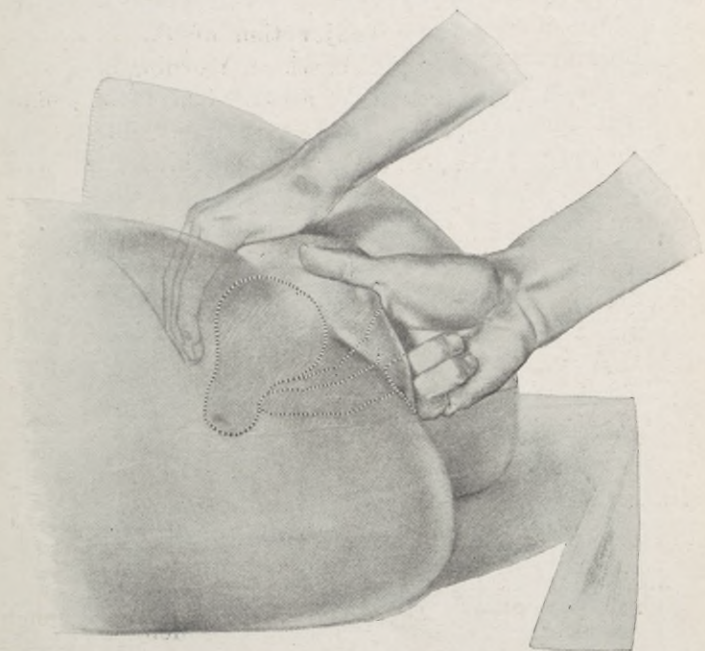


Fig. 29.—Bimanual examination. (Edgar.)

be found, but it must not be confused with erosions of the os. The os of a nonpregnant woman feels like the tip of the nose, and that of the pregnant woman like the lips.

The increased size and globular shape must also be considered as confirmatory.

**Hegar's Sign.**—The upper part of the uterus is soft and distended by the ovum, the lower part is soft and not filled out by the ovum. Between the two is an isthmus that is compressible between the fingers of one hand in the vagina, and of the other upon the abdomen. When found, this sign is of great value.

At the eighth week, pregnancy can be regarded as highly probable by the conjunction of the following symptoms and signs: Amenorrhœa, morning sickness, irritability of bladder, slight breast changes in primiparas, lips of os externum softened, uterine body enlarged, softened, and nearly globular in shape, and Hegar's sign.

**Abderhalden's test** is a serum reaction based on the well established principle that the introduction into the blood of an organic foreign substance leads to the formation of a ferment to destroy it. Abderhalden's plan was to discover whether the blood of a pregnant woman contained a ferment capable of destroying placental protein. It is a very complicated test, and subject to many inaccuracies and numerous sources of error.

**Sixteenth Week.**—Morning sickness and urinary symptoms have disappeared but amenorrhœa remains. Enlargement of the breasts is noticeable, as well as the increased pigmentation. The uterus begins to rise above the symphysis as an elastic, somewhat ill-defined, boggy mass. The cervix is softer. The characteristic dull lavender coloration of the vulvar mucous membrane is now evident. It is due to the congestion and is called Jacquemier's sign.

**Two New Signs.**—Irregular, painless contractions of the uterus (Braxton Hicks' sign), and ballottement.

The contractions of Braxton Hicks now become more easily palpable.

Ballottement consists in the detection in the uterus of a movable solid body surrounded by fluid. In a standing position, the fœtus rests in the lower part of the uterus, just above the cervix. The woman stands with one foot on a low stool, and two fingers of one hand are pushed into the vagina until they touch the cervix, the other hand is placed on the fundus. A smart upward blow by the internal hand is transmitted to the fœtus, and it can be felt to leave the cervix, strike lightly the tissues underneath the external hand, and return to the cervix. It is simulated by so few things, and so rarely, that in practice it must be regarded as a positive sign.

During the second half, the subjective symptoms are of minor importance since unmistakable evidence is furnished by the physical signs. The symptoms of this period are mostly discomforts. Increased intraabdominal pressure brings on edema of the feet, cramps in the legs, varicose veins of the legs and vulva, dyspnœa, and palpitations.

**Twenty-sixth Week.**—About the twenty-sixth week, or, at the end of the sixth calendar month, the hypertrophy of the breasts, the presence of secretion, and the marked pigmentation are unmistakable. The abdominal protrusion is now clearly visible, and the fundus will be found at the level of the upper border of the umbilicus.

Spontaneous fœtal movements appear and may be felt by the palpating hand.

Auscultation reveals the uterine souffle and the fœtal heart sounds. The heart sounds and the fœtal movements, when obtained by the observer, are positive signs.

Uterine souffle is a soft, blowing murmur, synchronous with the mother's pulse. It is best heard at the lower parts of the lateral borders of the uterus. It is

due to the passage of blood through the greatly dilated uterine arteries. It may be heard also in cases of fibroid tumors of the uterus.

The fetal heart sounds are the most anxiously sought for of all the signs of pregnancy. They are conclusive. They not only determine the diagnosis, but afford valu-

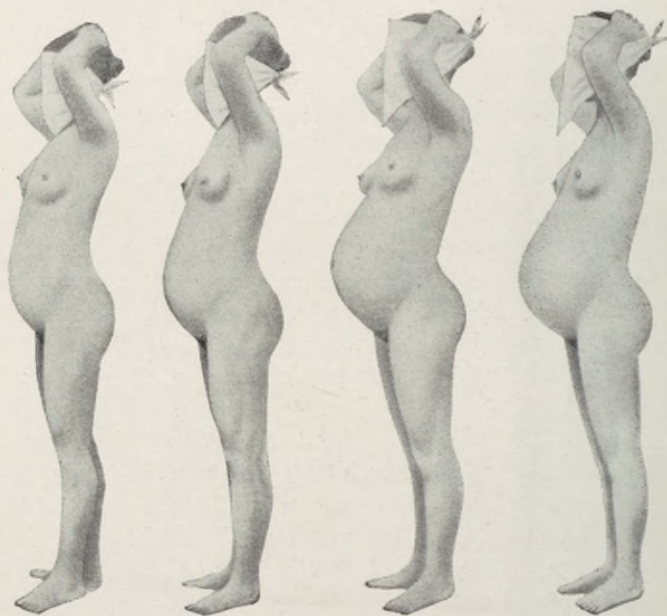


Fig. 30.—Abdominal enlargement at third, sixth, ninth, and tenth months of pregnancy. (Williams.)

able information during labor, and nurse and student should lose no opportunity of becoming familiar with them. The heart tones can be heard as early as the twenty-sixth week, but they become more and more distinct as pregnancy advances. They vary from 140 to 160 beats to the minute at the twenty-sixth week, and at



term, from 120 to 140. When they rise above 160 or sink below 120, some danger threatens the child. The foetal heart tones have *no significance* as an indication of sex.

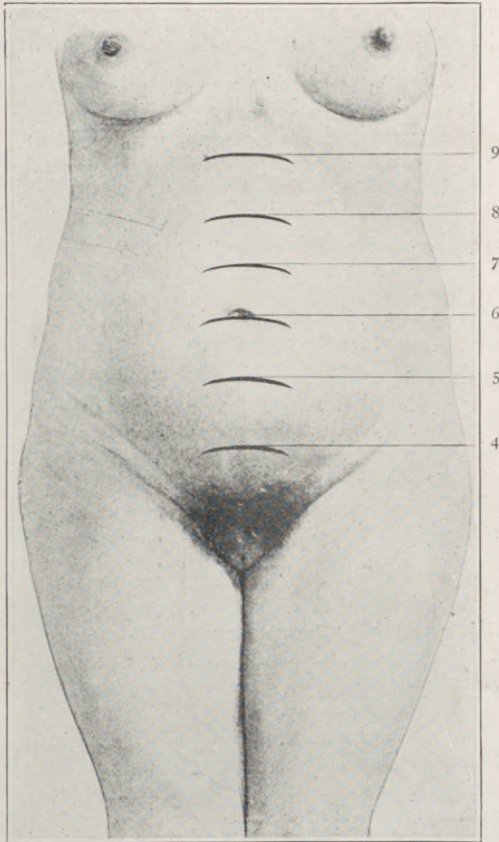


Fig. 31.—Height of the uterus at various months of pregnancy. (Bumm).

Funic souffle is the sound made by the passage of blood through the umbilical cord when a loop accidentally lies under the tip of the stethoscope. It is syn-

chronous with the fetal heart tones, but of no great practical importance when the heart tones can be obtained.

Determination of the period to which pregnancy has advanced is sometimes important. This can be approximated by a calculation of the time that has elapsed since the last period, or from the date on which quickening has occurred. Measurement of the height of the fundus and comparison with such scales as Spiegelberg's, may be carried out, but in the last eight weeks the most accurate results are obtained from the McDonald, the Ahlfeld and Perret measurements which are described later.

A method of estimation in gross, that is approximately correct in many cases, depends on the observation of the steady growth of the womb.

Thus, the uterus rises out of the pelvis at the fourth month, and may be found well above the symphysis pubis. At the fifth month the fundus is midway between the symphysis and the umbilicus. At the sixth month it reaches the umbilical level. At the eighth month it is a little more than midway between the umbilicus and the ensiform cartilage, which it attains in another month, the ninth. Then it usually sinks a little, especially in primiparas during the last two or three weeks. This is called *lightening*.

HEIGHT OF FUNDUS ABOVE SYMPHYSIS AT VARIOUS  
WEEKS OF PREGNANCY (SPIEGELBERG)

28th Week	.....	26.7	cm.
30th	“	.....	28.4 “
32nd	“	.....	29.5 “
34th	“	.....	31 “
36th	“	.....	32 “
38th	“	.....	33.1 “
40th	“	.....	33.7 “

## CHAPTER IV

### HYGIENE OF NORMAL PREGNANCY

The day of delivery can never be accurately determined, because the onset of labor is purely an accident, dependent on many factors. Furthermore, conception does not take place necessarily at the time of intercourse, and we have no means of knowing whether conception occurred *just after* the last period present or *just before* the first period missed. So there is always a possible error of three weeks.

Pregnancy in the human family normally lasts from 273 to 280 days, and the approximate date of confinement can be obtained by the following convenient rules:

1. Take the first day of the last menstruation, count back three months and add seven days.

2. Or, assuming that quickening occurs at the seventeenth week, count ahead twenty-two weeks from the day on which quickening was observed.

3. Or, count two weeks from the day of lightening.

4. Or, with a pelvimeter, get the length of the fœtus by Ahlfeld's rule (measure from symphysis to breech of child, subtract two cm. for thickness of abdominal wall and multiply by two. The result is the length of the child in centimeters) and compare with fifty centimeters, which is the average length of a mature child. After the seventh month, the child in utero grows at the rate of about 1 cm. a week (0.9 cm.).

5. Or, by the tape, according to Spiegelberg's standard of growth, as previously mentioned.

The hygienic rules to be observed during pregnancy

are founded on three basic principles: (1) To watch attentively the different organs and see that they functionate normally; (2) To eliminate all those conditions that favor the premature expulsion of the egg; and (3) To provide, so far as possible, for the normal gestation and the physiological delivery of the child. These factors will be taken up in detail.

The best results in obstetrics are obtained in those cases which have prenatal care. There should be both mental and physical preparation of the mother for labor and lactation. The mother should know that in breast-fed babies diseases and complications are less frequent and that proper food plays an important part in the future health of the child.

**The Diet.**—The appetite is usually somewhat increased, but it is unnecessary to indulge the stomach on the ground that the mother “must eat for two.” Longings, however, should be gratified so far as the demand is not for unwholesome things. Food should be simple and plainly cooked. Meat is permitted in moderation unless some organic change exists to contraindicate it. Rich pastries and gravies should be avoided, but cereals, fruits and vegetables should be used in abundance. It may be better to eat four times a day instead of three. Fluids should be taken freely, from one to two quarts daily. Milk is especially valuable, and alkaline, natural and charged waters, such as Vichy and seltzer, are useful. Wine, beer and other alcohols should not be taken, or if the patient is habituated to their use, the amount should be restricted on account of danger to the pregnancy and danger to the child.

In contracted pelves it is sometimes desired to furnish a special diet, with the idea of controlling the size of the child (see Prochownick’s Diet, p. 357) but this

is an emergency. Certain books on maternity, designed for popular reading, advocate diets that are supposed, by depriving the child of lime salts, to keep its bones soft and make the labor easy. If it succeeds, the child will be injuriously affected. If it does not succeed, the claim is false.

**Exercise.**—Exercise should be taken, but it should not be violent, nor attended by risk. Golf, swimming, tennis, dancing, horseback or bicycle riding and fast driving in automobiles should be forbidden, lest abortion follow. General exhaustion must be avoided and all conditions that even approximate traumatism. Walking and slow driving are best, and housework is excellent up to a mild degree of fatigue. Walking in moderation develops the abdominal muscles, causes deep breathing, and assists the elimination. Travel should be restricted. If exercise is not feasible, massage will furnish the required stimulation to the circulation. The menstrual epochs are peculiarly favorable to abortive influences.

**The Bowels.**—Most women have a tendency to constipation during pregnancy. Many times this can be corrected by increasing the “roughening” in the food; more vegetables and fruits, bran bread and muffins, whole wheat bread, spinach, beans, carrots, turnips, peas and especially potatoes, baked and eaten, skin and all. Prunes, figs, and dates are valuable aids. Agar may be eaten three or four times daily. Russian oil (liquid petrolatum), taken in tablespoon doses three times daily, is an adjuvant, and finally, some form of cascara or aperient pill may be taken, if necessary.

Violent cathartics should not be used at all, and enemas as little as possible; only when *quick* results are necessary.

**Heartburn.**—Heartburn is a frequent complication, especially in the later months. It is due to an inordinate secretion of acid in the stomach. Soda mint tablets, bicarbonate of soda, and magnesia, in cake or as milk of magnesia, will relieve. The magnesia is also a laxative.

**The kidneys** require particular care during pregnancy, and in every case the urine should be examined monthly, up to the fifth month, and every two weeks thereafter, until the last six weeks, when a weekly test should be made.

The amount passed in twenty-four hours should be measured. Three pints is an average quantity. Albumin, sugar, and casts must be looked for and reported. Albumin may or may not be a serious symptom. Casts are significant of nephritis and indicate danger. Sugar may be lactose and be derived from the milk secreted in the breast. Edema of feet, hands and eyelids must always be investigated, with the possibility in mind, of heart and kidney lesions. Blindness, dizzy spells, headaches and spots before the eyes are always alarming symptoms until their innocence is established.

Through constant watchfulness of the urine, many cases of eclampsia may be averted.

**Bathing** is more important in pregnancy than at other times. The more the skin secretes, the less the burden on the kidneys. The skin must be kept warm, clean, and active. Then again, during pregnancy the skin is often unusually sensitive and only the mildest soaps and blandest applications can be used. The water must be neither hot nor cold, but just a comfortable temperature. Cold bathing, whether shower, plunge, or sitz, must be denied. Sea bathing is also unwise. The warm tub bath of plain water or with bran answers all conditions until the ex-

pected labor is near, then the warm shower or sponge bath should be substituted, lest germs from the bath water enter the vagina.

If the kidneys need aid, a hot pack may be used; but in all cases, frequent rubbing of the skin with a coarse towel should follow the bath.

**The dress** must be warm, loose, simple and suspended from the shoulders. To prevent chilling, wool or silk, or a mixture of both, should be worn next to the skin,—light in summer and heavy in winter.

The patient must be sensibly clad in broad, loose, low-heeled shoes. There should be no constriction about chest or abdomen. Circular garters must not be worn. If a corset is insisted upon, it must support the abdomen from below and *lift it up*. No corset is admissible that pushes down on the abdomen. This is especially true if the woman has borne one or more children and has a pendulous abdomen. The breasts may get heavy and require the rest and ease supplied by a properly fitting bust supporter.

**Fainting** is an annoying symptom in some women. It may come when quickening is first perceived, or from the excitement of crowds, or from hysteria. It usually passes quickly. The pallor is not deep, the pulse is not affected, and consciousness is not lost. It does not affect the ovum. Heart trouble should be excluded, and the daily habits of dress, diet, and bowels investigated. Smelling salts will usually suffice for the attack.

**The abdominal walls** may be strengthened by appropriate exercise before and after gestation, so that the muscles will preserve their tone. After delivery nursing the child will help greatly in the preservation of the waist line and figure, by aiding involution.

About the seventh month in primiparas, the abdomen gets very tense and in places the skin is stretched

until it gives way and forms striæ. This tightness can be relieved to a considerable degree by inunctions of cocoanut oil or albolene.

Pain in the abdomen at this time may be due to mechanical distention, to strain on the muscles, to stretching of operative adhesions, to gas, constipation, or appendicitis. The physician should be informed of it. In every case, constipation, swelling of feet, hands or eyelids, blurring of vision, ringing in the ears, vomiting, persistent backache, or the passage of blood, no matter how slight, should be reported to the doctor.

**The Breasts.**—There should be no pressure on the glands and they should be warmly covered. The nipples must be kept clean and soft by soap and water, and about a month before the labor is expected, the nipple should be anointed with albolene or cocoanut oil and rubbed and pulled for a few minutes every night. This removes the crusts and dried secretions that collect on the nipple and prepares it for the macerating action of the baby's mouth. No alcohol or strongly astringent washes should be used. Injuries must be avoided. If the nipples become tender they may be protected from external irritation by the lead nipple shield or by a wooden shield with a hollow center, such as Williams recommends.

**Leucorrhœa.**—This is one of the commonest discomforts of pregnancy, and the sense of uncleanness, if the discharge is excessive, as well as the resulting irritation, may demand attention. It must be kept in mind, however, that the normal vaginal discharge of a healthy pregnant woman is strongly germicidal and should not be douched away without definite indications.

Vaginal douches of warm boric acid solution will do for cleanliness, but the douche bag must not be higher than the waist. Stronger and more antiseptic solutions



are potassium permanganate 1:5000, or lysol 1:100. A suppository may be used, consisting of extract belladonna, gr. ss; tannic acid, gr. v, and boroglyceride dr. ss.

**Sexual intercourse** is distasteful to most pregnant women, but sometimes the inclination is intensified.

Coitus often causes much pelvic discomfort and may be an influential factor in producing abortion. It should be forbidden during the early months, at all menstrual epochs, and for at least two weeks before labor. The uterus may be infected from germs beneath the foreskin and hæmorrhage may follow the act if the placenta is low. In healthy persons, at the instance of the female, intercourse in moderation is permissible.

**The mental condition** should be placid without either excitement or fatigue. Anxiety should be dissipated by cheerful company and surroundings. Judicious amusement is desirable and a congenial occupation, but neighbors who tell frightful tales of disaster in labor, or nurses who relate the details of their critical cases, are equally to be avoided.

Many women of neurotic temperament dread the labor desperately. They are sure that death impends and they dwell with tragic interest on the stories of complicated cases related by thoughtless or malicious neighbors. The nurse can do much to allay these apprehensions by cheerfulness, optimism, and gentleness. Her buoyant temperament will drive away the patient's fears just as effectively as the assurances of the physician.

Great allowances must be made for attacks of irritability, for the changes going on in the woman's pelvis keep her in a capricious and whimsical condition. A good book to read at this time is, the "Prospective Mother," by Slemons.

**The subject of maternal impressions** is the cause of much anxiety during pregnancy. It is safe to assure the mother that it is nearly impossible to mark her child by emotional stress. There is no demonstrable nervous communication between mother and child, and most of the deformities that occur and are attributable to shock, etc., can be explained by our knowledge of intrauterine changes. Furthermore, the same deformities occur in lower animals, to which it is difficult to ascribe such high nervous organization.

Many of the birthmarks, supposedly due to shock, occur too late in the pregnancy to affect the child, even if it were possible, for the child is completely formed before the fourteenth week.

**The Determination of Sex.**—It is not possible to know in advance of delivery whether the child will be a male or a female. It is equally impossible to determine or even to influence the sex of the coming child. Many theories have been advanced, and much talent has been wasted in trying to solve this problem.

Reasoning by analogy from the facts obtained from lower animals, the sex of the child is unalterably decided the moment conception occurs. The responsibility for the decisions seems to lie with the male cell. All we really know is that the sexes appear in the ratio of 100 girls to 106 boys.

**Teeth.**—In pregnancy the teeth are especially liable to decay on account of the unusual acidity of mouth and stomach. They should be kept rigorously clean and occasionally inspected by the dentist. Fillings ordinarily can be put in and even emergency extractions done without great danger.

## CHAPTER V

### ABNORMAL PREGNANCY

After the diagnosis of pregnancy has been satisfactorily established, no further internal examinations are necessary in the absence of special indications, until about the thirtieth week.

At this time a series of complete physical examinations may be required to determine the presentation and position of the child, the presence and rate of foetal heart tones, the diameters of the head, the length and approximate maturity of the child, as well as the condition of the bony and soft passages of the mother.

It is thus that an appreciation of the obstetrical problem is secured and a course laid out for its successful solution.

Pregnancy is a normal function; but the woman is exposed, nevertheless, to many grave risks that are peculiar to her condition and to many complications accidental or otherwise which are more serious on account of her pregnancy.

**The Toxæmias.**—The growing ovum brings about changes in the maternal metabolism that are manifested by characteristic symptoms which in other better known conditions are recognized as due to toxæmia. Therefore, while there is no positive proof as yet that these symptoms, arising during pregnancy, are toxæmic in origin, the evidence goes to show that they are; and, therefore, should be classified as toxic.

Postmortem findings in eclampsia and pernicious vomiting such as extensive thromboses, cell necrosis, and interstitial hæmorrhages are very suggestive.

Clinical findings in regard to the excretion of nitrogen (urea, ammonia, uric acid, etc.), the occurrence of acidosis, elevation of blood pressure, fever, diminished excretion, coma and convulsions, all point to toxæmia.

It is the minor disturbances, however, that the nurse will come in contact with most. They are nearly all toxæmic in origin, and a brief description of them must be given, together with suggestions for their management.

**Salivation or Ptyalism.**—In the majority of cases, saliva is not especially noticeable; but at times the secretion shows an enormous increase, and may even threaten life. Patients will have saliva running constantly from the mouth. The amount may reach a pint or a quart a day, and the skin of the lower lip becomes greatly inflamed. Abortion sometimes occurs.

The only satisfactory *treatment* is a rigorous milk diet on the theory that the disturbance is an intoxication. The annoyance can be greatly benefited by giving thyroid extract, Belladonna āā grs.  $\frac{1}{4}$ , twice daily.

**Gingivitis.**—The gums may become inflamed, spongy and hæmorrhagic during pregnancy, usually in patients of low vitality. If a generous diet and astringent mouth washes do not relieve the condition, the milk diet should be instituted.

**Toothache and Dental Decay.**—The patient may be given hypophosphites, and the teeth should be put in good condition by a dentist.

**Constipation** has already been referred to. Strong cathartics should be avoided lest abortion follow.

**Condylomata of pregnancy** occur most frequently around the labia, perineum, and anus. They are wart-like growths that develop slowly or quickly and may remain discrete or cover the entire area with masses as

small as beans or as large as cauliflowers, which in appearance they much resemble. The etiology is obscure, but they are generally associated with irritating vaginal discharges, such as an old gonorrhœa.

*Treatment* consists in stopping the discharge or neutralizing it, and in keeping the growths dry with a salicylic acid dusting powder. (See Therapeutic Index.)

**Pruritus** is often distressing. The itching may be limited to the genitals or appear on other parts of the body. It may be due to the irritation of local discharges or to a condition of the nervous system, arising from toxæmia. The urine must be examined for glucose. The presence of lactose is not so important.

Astringent douches and protective ointments will relieve some cases. Bromides and milk diet, bran or alkaline baths give good results, and local applications of sedative lotions and ointments containing menthol, carbolic acid or cocaine (cautiously) will aid. The woman in some instances becomes almost frantic and tears at the vulva with her nails until it bleeds.

The iodine treatment of Hensler is simple and often effective. If no skin changes are visible and but little leucorrhœa, the vulva is thoroughly prepared as for a vaginal operation, dried and painted with a 10 per cent solution of tincture of iodine. Generally one application suffices, but when the leucorrhœa is bad, it may be necessary to repeat the treatment on the third and fifth days thereafter. Between treatments, the vulvar surfaces and even the vaginal walls (by insufflation) are kept dry with zinc oxide powder. If all other measures fail and exhaustion is imminent the patient should be removed to a hospital with laboratory advantages for isolation and special study.

**Herpes** is an inflammatory, superficial eruption, characterized by red patches, blisters, or pustules. It is accompanied by burning, itching, and nervous depression. The origin is probably toxic and the termination may be fatal. Milk diet, soothing lotions, and, if necessary, narcotics, constitute the routine methods of treatment.

**Areas of pigmentation** (the chloasmata) are not amenable to treatment. They usually disappear after labor.

**Toxemias.**—We now come to a class of cases which is more definitely toxic in origin although the clinical manifestations may vary greatly in nature and severity. In this category we find: The Pregnancy Kidney; Eclampsia; Hyperemesis Gravidarum, and Icterus Gravis Gravidarum, or in English, Acute Yellow Atrophy of the liver.

These conditions are not always distinctly separated from each other in life and the pathological changes after death are similar. The whole *Toxemic Theory* is based on the work of Bouchard who suggested in 1887 that certain diseases of pregnancy might be an auto-intoxication. This theory assumes that in health the body contains a variety of toxic substances which are taken in with the food or produced by digestion or by tissue metabolism. These waste products are usually excreted through intestines, kidneys, or skin or rendered harmless by the liver.

If the woman becomes pregnant, the waste products increase greatly, for she must then eliminate, in addition to her own, the poisons of the enlarging uterus and of the fetal metabolism. To meet this emergency the maternal organs must exceed their normal functional activity or the waste accumulates. That these poisons circulate in the blood and may cause disease

is evidenced first by analogy. Thus certain known poisons, when absorbed, will produce lesions similar to those recognized and grouped under the head of "toxemias of pregnancy."

The lesions in the liver from acute yellow atrophy are very similar to those produced by phosphorus, chloroform or snakebite poisoning.

The kidneys in eclampsia show the same changes as in cantharides, phosphorus or snakebite poisoning.

Stillborn infants of eclamptic mothers show the same changes that are found in the liver and kidneys of the mother. These changes are not the ones that usually follow inflammation, but are usually accompanied by a degeneration and necrosis as from chemical toxins. It has also been found that the blood and urine of eclamptic women is highly poisonous to animals.

These toxins must arise either from the mother or the child. On the mother's side it is possible for them to form either from over-production or under-excretion or both. Do they form in the intestines from sluggishness of function or, is there a relation between their appearance and a lack of thyroid function? Enlargement of the thyroid is normal in pregnancy and the absence of this increased activity may predispose to toxemia.

On the other hand there is limited support for the theory that the ovum is responsible; but if so, it would seem to come from the point of attachment of the egg to the uterus rather than from foetal metabolism. The basis for this lies in the fact that cases of eclampsia and pregnancy kidney occur after the delivery of the babe, after its death, and in cases of vesicular mole where no foetus is present.

**Pregnancy Kidney** (albuminuria of pregnancy, pre-eclamptic toxemia) occurs most frequently in primip-

aras. The average is about twenty to one. It is more common also in cases of hydramnion, twins and hydatidiform mole. The presence in the maternal circulation of toxins which have been derived from the foetal elements of the placenta may be mentioned as a cause.

The condition develops usually during the second half of gestation so that there is a slight support for the theory that it is the result of compression of the ureter between the pelvic bones and the heavy uterus. Restriction of kidney function by heightened intraabdominal pressure may also be a factor.

The symptoms differ much in severity. Headache is frequent, usually frontal and often persistent. Dimness of vision, flashes of light before the eyes or sudden blindness may occur. Edema of feet, hands and eyelids is common. Nausea and vomiting may be present or epigastric pain. The urine may not be greatly diminished and there may be only a trace of albumin, or the urine may be scant and contain as much as 5 per cent of albumin.

The condition must not be confused with old standing kidney troubles which the pregnancy has intensified.

*Prognosis.*—Patients rarely die from this disorder although the degree of toxemia is important. With early diagnosis and treatment a rapid improvement usually takes place in a week or ten days though in exceptional cases the kidney may be permanently impaired.

If the toxemia is profound and the response to treatment slow, eclampsia is likely to come on. An attack during one pregnancy does not predispose to a recurrence in the next. The labor is often premature and many babes are stillborn.

*Treatment.*—The urine must be examined regularly in normal cases as often as once in two weeks. The patient



should be warned to report any ill feeling and especially any of the symptoms enumerated above. As soon as the condition is suspected or recognized by physical findings or urinalysis the woman is put to bed on a diet of milk and milk products. All the eliminating organs are put to work. Magnesia sulphate is given as a purge, with drinks and hot baths to stimulate the skin and activate the kidneys. Meat and nitrogenous foods should be forbidden although in mild cases such foods as fish, eggs, bread and butter, tea, cocoa, milk pudding, junket, custard, etc., may be allowed. The urine must be measured and examined every twenty-four hours. If the condition does not clear up within a week eclampsia must be looked for.

**Eclampsia** is an acute toxemic disease of pregnancy, labor and puerperium which is characterized outwardly by convulsions and inwardly by certain changes in the liver and kidneys.

The attack occurs about once in 500 labors and in the ratio approximately of 3 to 2 to 1 in the antepartum, intrapartum and postpartum epochs. Seventy-five per cent of the victims are primiparas.

The disease appears in one of two ways. There may be a brief warning or none at all of the onset or it may follow the pregnancy as described above.

*Warning Signs.*—

1. Severe and persistent headaches, mostly frontal.
2. Swelling of feet, hands, eyelids or vulva.
3. Epigastric pain and persistent vomiting.
4. Puffiness of eyelids, flashes of light before the eyes, dimness of vision, double vision or sudden total blindness.
5. The urine is diminished or suppressed and loaded

with albumin. As much as six or eight drams to the ounce may be found.

Many hyalin and granular casts are seen and a few epithelial casts. Blood, acetone, and diacetic acid are generally present. The ratio between the nitrogen excreted as ammonia and that excreted as urea is high, i.e., the ammonia coefficient is high.

*Clinical course.*—The disease frequently begins with a convulsion. The attack may appear at any time even during sleep. The number of convulsions may vary from one to a hundred or more.

The stage premonitory to the convulsion lasts only from fifteen to twenty seconds and may not be observed. The patient rolls her eyes while the muscles of the face and hands twitch slightly. Next the woman becomes rigid from a general muscular contraction. The face is cyanosed from fixation of the diaphragm and chest muscles and the tongue may be caught and injured between the clenched teeth. This stage lasts ordinarily half a minute.

The stage of convulsions is unmistakable. The muscles relax and contract spasmodically. The jaw muscles share in the movement and the tongue may be bitten. Blood-stained saliva appears as a froth. The face is congested, the breathing stertorous and the patient deeply unconscious. This stage lasts from half a minute to two minutes. It is followed by coma.

*Coma.*—The woman sinks into a deep stupor which may last for hours. At other times the coma may be quickly broken by another fit. The attacks may follow in such rapid succession that the coma does not intervene. The temperature may rise to 104° or 105° F. The blood pressure rises, possibly to 250 mm. or more of mercury. The pulse is full and bounding.

*Complications.*—Injury to tongue, septic bronchopneumonia from insufflation of saliva, or improper efforts to put food or medicine into the stomach. Memory is lost during the attack. Mental derangement follows in from five to seven per cent of the cases. Jaundice sometimes occurs and has a serious significance. Antepartum eclampsia is usually followed by the rapid onset of labor.

*Results.*—The patient may die undelivered, recover without delivery and later expel a living, but more often a dead, child. In intrapartum eclampsia the uterine contractions tend to become stronger and more frequent and thus brings about delivery. Postpartum eclampsia ordinarily comes on within forty-eight hours but may be postponed for a week.

*Prognosis.*—One out of four mothers die. The outlook is bad if any of the following conditions prevail:

1. If convulsions recur at short intervals.
2. If the coma is deep and prolonged so that the patient has no conscious intervals.
3. Urine markedly diminished in quantity or suppressed.
4. Pulse frequent and blood pressure high.
5. Temperature remaining at 103° or more.
6. Delivery cannot be easily and quickly accomplished.

The outlook is worst in the antepartum and postpartum varieties. It is worse when it occurs in a patient with kidneys previously diseased.

The prognosis is favorably affected in antepartum cases by the death of the child.

The cause of the maternal death may be asphyxia, edema of the lungs, cerebral hemorrhage, a gradually deepening coma or later from infection or bronchopneumonia.

The babe's prognosis is worse than the mother's.

Fifty per cent of the babes are stillborn or die soon after delivery.

*Treatment* should be prophylactic if possible. The preliminary stages should be managed like the pregnancy kidney (see above). On the principle of thyroid insufficiency as a causative factor one could give thyroid extract in 10 gr. doses thrice daily. It acts as a diuretic and as a vasodilator. During the attack the patient must be kept from hurting herself. The head should be kept on one side to aid drainage from the mouth.

If the morphine and chloral method of controlling convulsions is not employed (see p. 258) veratrum viride may be given in the form of veratrone. One cubic centimeter may be given hypodermically at half-hour intervals until the physiologic effect is produced. This physiologic effect is a reduction in pulse rate to 60 or 80 per minute, a profuse perspiration and a copious "bilious vomiting." (Gillette.)

If anything is given by mouth it should be done through an esophageal tube. Subcutaneous continuous saline injection will add to the bodily fluids and stimulate the kidneys. To each pint of the saline solution may be added one dram of sodium bicarbonate to increase the alkalinity; while to combat the condition of acidosis, one can add 5 per cent of sterile glucose to the same solution.

**Hyperemesis Gravidarum.**—The nausea and vomiting of pregnancy is so usual as to be regarded as normal. It usually ceases from the fourth to the fifth month spontaneously; has no ill effect upon the ovum, and may respond readily to treatment.

Hyperemesis comes on quite as early and exhibits all stages of violence, from the mild form above described, to cases that end fatally.

Three classes of this serious disorder may be distinguished as associated (Eden), neurotic, and toxæmic vomiting.

Associated vomiting is the vomiting that comes with gastric ulcer or cancer, chronic gastritis, cirrhosis of the liver, and cerebral disease. These conditions must be excluded in diagnosis.

Neurotic vomiting—severe and persistent nausea and retching—is common in pregnant women of the nervous type. It does not lead to loss of flesh ordinarily; the urine is somewhat diminished in quantity from the lack of fluids, but the amount of nitrogen excreted remains normal. This is important.

Toxæmic vomiting includes a small but very important class of cases, for all are severe and intractable and some end in death.

*Hyperemesis Gravidarum*, therefore, is the term applied to those cases of vomiting in which the stomach is emptied so frequently and so completely that the woman gets no nourishment. It occurs in all degrees of seriousness. Fortunately the severe conditions are not often met with, possibly not oftener than once in a thousand pregnancies.

In the toxic cases no cause for the vomiting can be found aside from the pregnancy. No food is retained. The vomiting occurs at short intervals even at night; the patient wastes rapidly and becomes exhausted. Headache is often present as well as edema of the extremities. The vomit is at first mere stomach contents, then it becomes stained with bile and later becomes brownish in color. The woman complains of epigastric pain. The pulse becomes rapid (140 or more). The temperature goes up to 103° or 104° F. There is albumin in the urine. The quantity varies, but the percentage of

nitrogen which is excreted as ammonia is raised. This condition may also be present in starvation which clouds somewhat the value of this factor in the diagnosis.

If no change occurs in ten days or two weeks and the emaciation and exhaustion become more marked the patient's condition will become extremely grave. She will begin to vomit coffee-ground-like material, jaundice may appear, and the consciousness will gradually fail. A low leucocyte count is always ominous. The prognosis in the group of toxic cases is much more unfavorable than in the neurotic group. These latter nearly always recover under appropriate treatment.

*Treatment.*—Organic disease must be excluded and a diagnosis of pregnancy strongly evident.

For the neurotic type, the patient must be segregated from her friends, and a competent, cheerful nurse put in charge. A cool, darkened room is best. If the patient can be transferred to a hospital, the results are more satisfactory. Here the isolation from external interests and irritations can be made complete. The patient does not talk. Even the nurse comes with food, attends to the obvious necessities, and departs in silence. Once a day a sedative bath is given (see Baths, p. 350) and medication in kind and frequency as the conditions demand.

In any case, the patient should be put to bed and fed carefully every two or three hours on milk, peptonized food or barley water. If this is not retained, albumin water may be given for twenty-four hours at regular intervals, or rectal alimentation may be tried after stopping all foods by mouth. Iced champagne, seltzer or vichy, either alone or with milk, may be tried. A dry diet is sometimes effective, rusk, toast, toasted shredded wheat biscuit, crackers, etc., taken early in the morn-

ing, as one eats cheese. No exercise is permitted except such muscular and nervous excitation as may be derived from massage or the sedative bath.

Drugs are sometimes of great value—the bromides, in full doses, or 1 m. doses of tincture of iodine, well diluted, every hour; or thyroid extract, grs. v; or cocaine or oxalate of cerium. Occasionally good results are reported from a capsule of pepsin, 2 gr. and  $\frac{1}{4}$  gr. silver nitrate given just before meals; and adrenalin (1 in 1000) in 2 drop doses may be considered. Extract of corpus lutea has been tried by Hirst with favorable results.

Sinapisms to the epigastrium and ice bags to the spine have been found useful, and washing out the stomach is efficient at times. In washing out the stomach, be sure the stomach tube is *iced* before it is introduced.

When the case gets worse in spite of treatment and acidosis supervenes, bicarbonate of soda may be given in sixty grain doses every four hours, by rectum, if necessary, until the urine gives an alkaline reaction.

Glucose as a readily assimilable carbohydrate may be given in doses up to 10 oz. of a 6 per cent solution (Eden) or sugar infusions by rectum, 1000 c.c. in twenty-four hours by drop method.

Normal saline may be given by rectum. By these methods the toxin is diluted and its injurious effects diminished. Starvation must be combated by rectal feeding, but to prevent the decomposition of retained food the bowel should be cleaned daily by a soap suds enema.

Before resorting to obstetric methods of treatment, the patient should be given from 15 c.c. to 20 c.c. of serum subcutaneously. This serum may be normal horse serum or blood serum taken from a woman in the sixth

to the eighth month of pregnancy whose Wassermann is negative. The injection may be repeated in forty-eight hours, but anaphylaxis must be kept in mind.

*The obstetric treatment* is the emptying of the uterus, but this is rarely necessary in well observed cases. To be effective the operation must be done before the condition of the patient is desperate. It is most favorable before the febrile stage. If the vomiting persists in spite of treatment and is accompanied by emaciation, a pulse of over 100, albumin in the urine, with an increase of the ammonia output, the termination of the pregnancy will probably be useless. If the interference is attempted and the patient cannot go to a hospital, the nurse should prepare the room as described for operations.

After emptying the uterus, the vomiting sometimes ceases but much labor is thrown upon the nurse in supplying nourishment and caring for an exhausted whimsical or moribund patient.

The back must be inspected daily for decubitus (bed sores) and her position changed frequently. A daily rub with alcohol and water (50 per cent) followed by an oil inunction will be valuable. The teeth and gums should be cleaned with gauze, wrapped around the finger and dipped in solution of boric acid. No brush should be used.

The treatment of the eclamptic convulsion will be considered more fully under the complications of labor, with which the attack is often associated. Headache, scanty urine, disorders of vision and swelling of feet, hands or eyelids should be reported to the doctor.

**Pyelitis of pregnancy** is an acute, and rarely, a chronic infection of the pelvis of the kidney, commonly due to the *Bacillus coli*. It usually appears after the fourth



month (fifth to eighth) and attacks by preference the right side. Extension to the kidney substance, ureters, and bladder is occasionally observed.

*Symptoms.*—Sudden, acute abdominal pain, at first diffuse, but after a few hours, becoming localized in the right side, and on this account is often confused with appendicitis, especially as vomiting is not infrequent. A chill may mark the onset and the temperature rise to 103° F. or 104° F. The bowels are constipated, the tongue coated, and there is tenderness over the kidney. The urine is scanty, turbid, slightly albuminous and contains pus and often epithelial cells. A culture reveals the bacillus which has obtained access to the kidney, either by extension through the ureter from the bladder, by direct invasion of the tissues from the adjacent colon, or through the circulation.

*Treatment.*—The diet should be fluid and mostly milk, the bowels should be moved freely and frequently. The urine is alkalinized with sodium citrate, since the *Bacillus coli* lives only in an acid medium. As the symptoms subside, urotropin may be administered. If the patient does not improve within two weeks, the pelvis of the kidney should be washed out by means of the cystoscope and the ureteral catheter. With appropriate treatment the cases usually recover and go to term. Autogenous vaccines are occasionally successful. Untreated cases sometimes abort. Nephrotomy is not to be thought of.

**Multiple Pregnancy.**—Twins occur about once in ninety labors, triplets, once in six thousand.

Heredity and multiparity seem to be the only recognized predisposing factors. The more pregnancies a woman has, the more liable she is to have twins.

Twins may occur by superfecundation through the fertilization of two ova from the same or different ovaries, or by fertilization of a single ovum having two nuclei. (See Fig. 15.) The former are called binovular twins, and may or may not be of the same sex. The latter are called uniovular twins and are always of the same sex. Twins are usually somewhat smaller than a single child, and frequently asso-



Fig. 32.—Twins. (Lenoir and Tarnier.)

ciated with hydramnios. Binovular twins have separate placenta and uniovular twins have one placenta, with separate cords. Binovular twins are the healthier.

Twin pregnancies usually go into labor earlier than the single child, possibly on account of the over-distention of the uterus.

*The diagnosis* is occasionally difficult and at other times easy. Two sets of heart tones must be distinguished and differentiated by their variation in fre-

quency, heard at the same time by different observers. The presence of twins may be strongly suspected also when the external measurements of child and uterus greatly exceed the average. In such cases a systematic and persistent search must be made for the two fetal heart tones. The x-ray is sometimes an aid.

*The delivery* is generally uncomplicated, unless the chins become locked.

**Superfecundation** is the fertilization of two ova from the same ovulation. The fertilization does not occur at the same coitus, but the interval cannot be long.

**Superfetation** is the fertilization of separate ova of different ovulations. Its occurrence is very doubtful.

**Displacements of the Uterus.**—In most cases displacements of the uterus are a consequence of conception in organs that are previously retroflected or retroverted. They rarely produce symptoms until the end of the third month, when the attention is directed to the bladder. There may be absolute retention or a constant dribbling from a full bladder (ischuria paradoxa), possibly associated with pain. If recognized early, an attempt should be made to replace the uterus by posture (knee chest) and when replaced, to hold it by pessary or tampon. The prone position in bed will aid.

After retention has occurred, the patient should be put to bed and the bladder catheterized regularly every eight or ten hours for three or four days. As a rule, the organ will rise spontaneously into the abdomen. If it does not, it is probably incarcerated under the promontory, and the physician must try to release the uterus by manipulation or by continuous pressure from below before abortion occurs or the condition of the patient becomes too serious. The release is sometimes done by laparotomy.

In multiparas with weak abdominal walls, or women with spinal curvature or contracted pelves, the uterus may fall forward and, passing between the recti muscles, continue to drop until the fundus lies lower than the symphysis pubis.

*Management*, until labor occurs, consists in the use of a strong, well-fitting abdominal bandage.

**Malformation of the uterus** may possess an obstetric interest at times. The double uterus (uterus didelphys) and the uterus with a rudimentary horn (uterus bicornis) are examples. These are congenital conditions, due to imperfect development, and pregnancy may take place in one or both sides. If in one side only, the other half will also exhibit the softening and other changes as in normal cases. Binovular twins may be the result of a pregnancy in each side.

**Pressure Symptoms.**—*Edema* of legs and sometimes of the vulva occurs during the last trimester. It is due to increased intraabdominal pressure and to direct interference with the return circulation by the pressure of the heavy uterus on the iliac veins at the brim of the pelvis. The urine should be examined for albumin and the patient put in the horizontal position if the edema is troublesome.

*Varicose veins* of legs and vulva may cause much distress. The limbs should be bound with flannel spirals or with rubber bandages in the recumbent position, or elastic stockings may be obtained. Operation during pregnancy is not to be considered. The vulva can only be relieved by a double bandage, which is sewed at the point where it crosses the vulva, and buckled or tied to a waistband above the hips, both before and behind. This brings support to the vulva. If the veins rupture,

the part should be elevated and compressed with an aseptic pad.

*Hæmorrhoids* may either appear or grow worse late in pregnancy. If they protrude, they should be replaced. Ointments and iced applications may be used and the bowels kept loose.

*Cramps* may occur in the muscles of the legs, due sometimes to the varicose veins and sometimes to pressure on the lumbosacral plexus. They may also be a sign of toxemia.

**Moles.**—Mole is the name given to an ovum which is destroyed by disease of its coverings during the early months of gestation. Two kinds are known, the blood mole (carneous mole, fleshy mole, or hæmatoma mole) and the hydatidiform mole (vesicular mole).

The blood mole results from progressive or recurrent slight hæmorrhages into the ovum during the first three months of pregnancy, but hæmorrhages insufficient in quantity to produce an abortion. The blood forms a clot, which may be retained for several months and become solidified.

Hydatidiform mole is a disease of the young chorionic villi, characterized by the growth of an immense number of irregular clusters and chains of grape-like cysts from the very minute to bodies four-fifths of an inch in diameter. The causation is unknown. Age (35 or more) and nephritis seem to be frequently associated factors.

Both forms occur in the first half of the pregnancy and are characterized by undue enlargement of the uterus and hæmorrhagic discharge. The ovum is already destroyed and the uterus should be emptied.

**Diseases of the Membranes.**—*Hydramnios*, or polyhydramnios, is the name applied to the condition wherein an

excess of liquor amnii is formed. The amount normally present varies, but anything in excess of four pints could be called hydramnios. Six gallons have been reported. Since the source of the liquor amnii is not positively known, the etiology of hydramnios must be equally obscure.

It is occasionally associated with morbid conditions of the mother, such as hepatic or cardiac dropsy, but more frequently with developmental anomalies of the fœtus.

Since the mother is usually healthy and the fœtus frequently deformed, the theory is advanced that the disease is fœtal in origin. It frequently occurs with twin pregnancies, and in the first months it is most plausible that the liquor amnii is in some way derived from the fœtus. The fœtus is a male in 75 per cent of the cases.

The disease is more common in multiparas. It is generally slow in onset, but it may be acute, and an immense amount of fluid may be formed in a few weeks.

*The symptoms* are those due to pressure from the extremely large uterus.

*The treatment*, if interference with heart or lungs becomes pronounced, is puncture of the membranes. The child need not be considered for it is usually dead, horribly deformed or incapable of living.

*Oligohydramnios* is the condition wherein the liquor amnii is deficient in amount. It gives no maternal symptoms, but it is the cause of many birthmarks and fœtal deformities (club-foot, spinal curvature, wry-neck, ankylosis of joints).

Amniotic adhesions are usually associated with oligohydramnios and cause deformities by amputation of limbs, strangulation of cord, and production of six fingers. It is claimed that harelip, cleft palate and spina bifida may result from this condition.

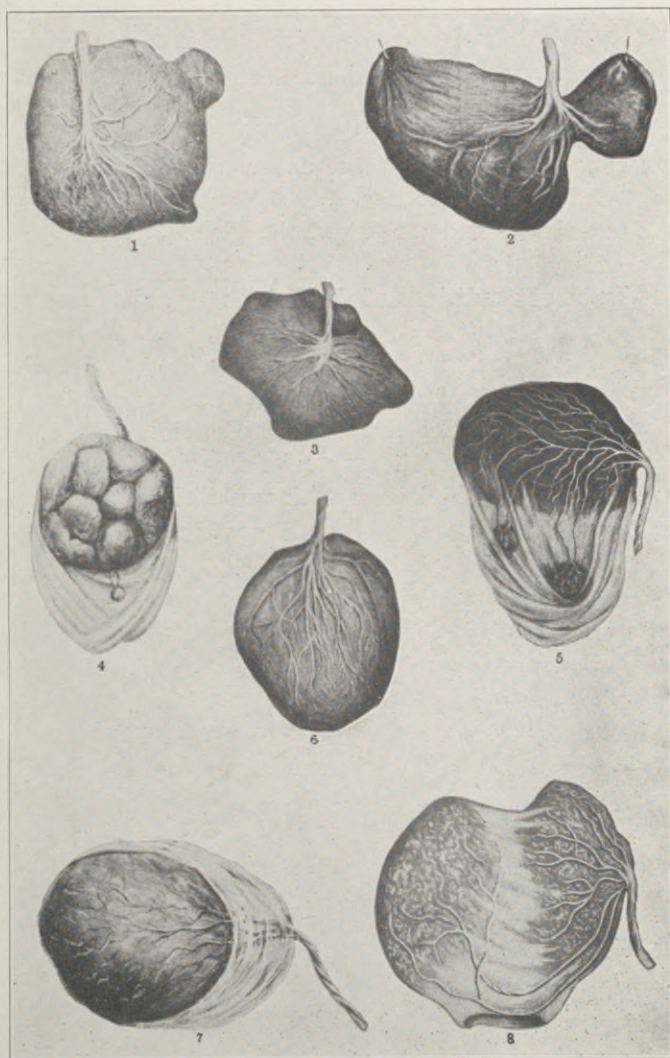


Fig. 33.—Anomalies of the placenta. (From Dorland's Dictionary.)

**The placenta** may show anomalies of size and shape. Thus, there may be two lobes, or three. There may be the main placenta and a small out-lying mass connected by membrane and vessels with the larger segment. The cord may be inserted in the middle or at the edge and yellowish-white masses called infarcts may be found in its substance.

Unusual size and weight of the placenta are suggestive of syphilis.

**Abnormal conditions of the fœtus** may arise from primary or transmitted disease or from errors of development. The developmental errors may be monsters, hydrocephalus spina bifida, etc., which may not influence the pregnancy. The most commonly transmitted disease is syphilis, which may produce abortion, premature labor, or a child born with syphilitic skin changes on palms and soles, as well as internally.



## CHAPTER VI

### ABNORMAL PREGNANCY (Cont'd)

**Extrauterine Pregnancy.**—This is a pregnancy which occurs outside the uterus, and while the event usually happens in the tube, cases have been reported where the egg developed in the ovary or abdomen.

The ovum, owing to some delay in passage to the uterus, is fertilized either in the ovary or in the tube, and by reason of a chronic inflammation of the tube or pelvis, or of an over-growth it does not succeed in reaching the uterus at all.

As the ovum develops, the tube expands, but it does not possess the capability of growing into a large organ like the uterus, hence a sudden jar, a strain, or a blow may cause it to rupture and discharge the egg into the abdomen (ruptured tubal pregnancy) or force it out through the end of the tube (tubal abortion).

This phenomenon may be accompanied by a severe or even fatal hæmorrhage; or the prostration may pass off in a few days or weeks, and leave the patient well.

In the early stages the ovum is absorbed, but after the pregnancy becomes more advanced, it may remain as a tumor, or require an operation for its removal.

Infection may occur and the mass ulcerate its way into neighboring organs (rectum, vagina, or bladder) and discharge itself in a long, suppurative process.

Most cases of ectopic (extrauterine) gestation present definite and even dangerous symptoms between the second and fourth month. The *symptoms* are those of pregnancy, together with irregular hæmorrhages from the uterus,

which may result in the expulsion of pieces of tissue or of membrane. Besides this, there is a vomiting and acute irregular pain on one side, associated with a sense of fullness. Such symptoms should be brought to the attention of the physician, who will learn the true condition of the pelvis by internal examination, conducted as gently as possible so as not to produce rupture.

If rupture occurs, it will be ushered in by a sharp lancinating pain on one side, followed by faintness, nausea, vomiting, prostration, rapid pulse, sighing

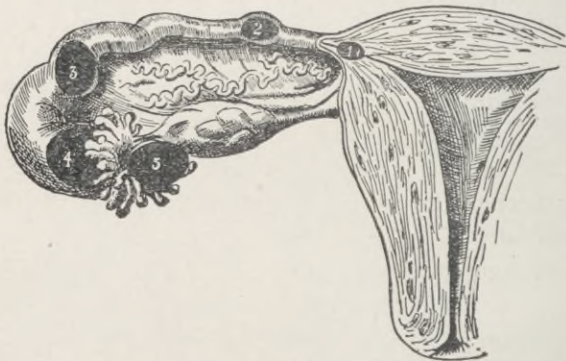


Fig. 34.—Diagram representing the sites for the various forms of tubal pregnancy. 1, interstitial pregnancy; 2, isthmial pregnancy; 3, ampullar pregnancy; 4, infundibular pregnancy; 5, tubo-ovarian pregnancy. (Gilliam.)

respiration, and collapse. The temperature is sub-normal and death may occur in a few hours, unless an operation is done.

In cases of tubal abortion (where the ovum escapes through the end of the tube) the symptoms are very similar, but the patient soon rallies and gradual recovery takes place.

If the diagnosis is made before rupture or abortion the *treatment* is laparotomy. If rupture occurs, the

laparotomy must be done immediately to check the hæmorrhage, which threatens the life of the patient. In tubal abortion, if the diagnosis is certain, some delay may be permitted under extreme watchfulness of the nurse and physician. In such case, the nurse will keep the patient absolutely quiet and forbid exertion of any kind.

If operation is necessary, the utmost gentleness must be used in preparing the abdomen. The tincture of iodine application to the site of the incision is sufficient preparation, and, of course, an abundance of sterile gauze, cotton, and towels should be supplied, as in every case where laparotomy is done.

If the rupture occurs while the nurse is present, the doctor should be notified at once, and if not at home, another doctor should be summoned. Meanwhile, the nurse prepares the room, solutions and utensils for an abdominal operation. Immediate incision to check the hæmorrhage and remove the mass offers the greatest safety.

The after-care is the same as for any laparotomy, with the additional duty of making up the lost blood as soon as possible by nourishing foods, normal saline solution by rectum, and, if necessary, by hypodermoclysis.

**Acute fevers** are a serious complication of pregnancy on account of the danger of abortion or premature labor, which may come on either from the associated high temperature or from the transmission of the disease to the ovum.

The following diseases are known to affect the fœtus *in utero*: cholera, yellow fever, small pox, scarlet fever typhoid, measles, erysipelas, meningitis and syphilis.

## CHRONIC INFECTIONS

**Tuberculosis** does not affect fertility or the course of the pregnancy, but the progress of the disease is hastened, and the maternal death accelerated.

If the case goes on to term, the child must not be nursed or cared for by the mother.

**Syphilis** is the most frequent systemic cause of the interruption of pregnancy. It is a blood disease, due to

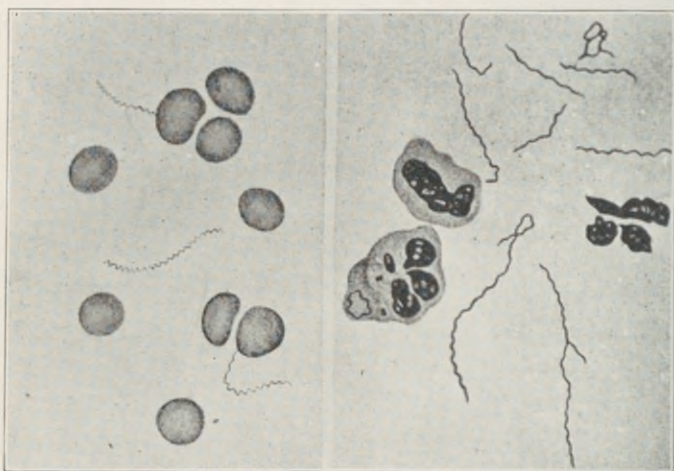


Fig. 35.—On the left *Treponema pallida* (*Spirochete pallidum*). A smear from a chancre. On the right *Spirochete refrigens*. A smear from a chancre. (From Emerson's Clinical Diagnosis.)

an organism called *spirochæta pallida*, and it appears in three distinct stages. The first is the primary stage, wherein a hard, nodular ulcer appears on some part of the body, as the vulva, lips, gums, tonsils, or hand. It is *not always* venereal in origin. The second stage begins six or eight weeks after the sore, and is marked by a general eruption of red spots, chronic sore throat, falling hair, and rheumatic pains in the joints. The third

stage is the name given to the later conditions of the disease which affect the bones, blood vessels, and nervous system.

Infection of the ovum may usually be traced to the father, who may transmit syphilis at any stage of the disease. In the third stage, the child alone will be infected; the mother escapes.

The mother may or may not transmit the disease, depending on the period of pregnancy wherein her infection occurs. If she gets the disease at, before, or just about, the time of conception, she will abort three times out of four, and the ovum will show definite lesions. If infected later, abortion occurs less frequently; and if the disease is contracted late in pregnancy, the child may be born apparently free from infection.

*Symptoms.*—A child with congenital syphilis will show the eruption of coppery spots, blisters on palms and soles, deep cracks on the feet, snuffles, cracks and ulcers around the mouth and rectum, an enlarged spleen, and a weakly, marasmic condition of the body.

The diagnosis in suspected cases can be rendered more certain by the Wassermann reaction. This is a laboratory test of the blood which should always be made before a wet nurse is allowed to nurse a child, or before a suspected child is nursed by a clean woman. In all cases of transfusion of blood, it is an imperative preliminary.

*Treatment.*—Antisyphilitic treatment of an infected mother or child by salvarsan, mercury, and potassium iodide must be carried out vigorously in all cases.

The syphilitic patient must be prevented from spreading the infection by having dishes and utensils of her own, which are kept sterile. Discharges are collected and burned, and the nurse in charge of these cases must

carefully cover her hands with rubber gloves, and see that all cracks and fissures are properly protected from contact with sources of infection.

**Gonorrhœa** is an acute or chronic disease of the mucous membranes due to a germ called the gonococcus.

Beginning with a sharp inflammatory disturbance of the urethra or vagina, it may pass slowly up through the genital passage and produce chronic and permanent disabilities, such as sterility, pus tubes, and pelvic peritonitis.

*The symptoms* are painful urination, painful inflammation of the vagina, with a purulent discharge. During pregnancy all these symptoms are intensified, and warty growths (condylomata) may appear on the vulva.

If infection occurs after pregnancy has begun, the course of the gestation is rarely affected, as the uterus is closed to germ invasion. During delivery, however, there is a serious danger of infection of mouth or eyes of the child if they come in contact with the discharge.

*Prophylaxis.*—The eyes at birth must be immediately instilled with a drop or two of 1 per cent solution of silver nitrate in water. This is *not neutralized* by normal saline. Great care must be used that the pus does not come in contact with the eyes of the mother or attendants, lest infection follow.

*Treatment.*—Scrupulous cleanliness must be observed. Douches of potassium permanganate, 1:5000, or painting the vagina with iodine or solution of silver nitrate, or suppositories of argyrol or protargol furnish the best means of treatment before labor.

Neither syphilis nor gonorrhœa is *necessarily* caused by venereal infection. They may be spread by barbers, dentists, physicians, and nurses,—by anyone who is unclean; and may be acquired innocently everywhere.

These diseases should not be discussed by the nurse or physician except with the patient. Certainly nothing from the sick room should be repeated elsewhere.

**The valves of the heart** are not uncommonly found to be diseased in pregnancy, the mitral being the most often affected, either as an insufficiency or as a stenosis (a narrowing of the mitral opening). Mitral stenosis is the most serious of all heart complications of pregnancy, and where this is present, a woman should be advised to avoid conception.

In other mitral lesions, many pregnancies may be successfully passed, if compensation is maintained; but every one brings further damage to the already weakened heart, and reduces its reserve of force. If the heart breaks down early in pregnancy, and does not respond to medication, abortion may result. In the second half of pregnancy, the mother should be given the prior chance, but the child should be saved, if possible.

**Renal diseases**, such as nephritis, may not only induce abortion by destroying the fœtus, but the kidney lesion may be greatly aggravated by the pregnancy. The most careful observation of the patient's condition, the regular examination of the urine, and the scientific management of the diet is necessary to relieve the work on the kidneys and keep the patient in a moderate degree of health.

It is the duty of the nurse to protect her patient against fatigue and chill, and to see that the proper diet is followed; but other symptoms, such as headache and disturbance of vision and developing edema, must be noted and reported to the physician at once.

**Diseases of Liver.**—Acute yellow atrophy is a rare condition, which, for reasons unknown, is promoted by pregnancy. It is due to toxemia. (See p. 80.)

*The symptoms* are intense headache and pain in the abdomen, possibly accompanied by vomiting and purging, which are soon followed by coma. There is generally a certain amount of jaundice. The urine is diminished in amount and contains albumin, casts, and sometimes blood. There is no known treatment, and the end is death.

**Diabetes** is seldom found associated with pregnancy. Its presence is unfavorable to conception and to gestation. Mother and child are both less secure. Abortion or premature labor is the rule.

**The hæmorrhages** of pregnancy in the first half generally mean abortion, and in the last half, either placenta prævia or premature detachment of the normally implanted placenta (see p. 248).

**Abortion** is the expulsion of the ovum before the fœtus is viable, that is, before it is capable of maintaining life after birth. This means the twenty-eighth week, or the seventh month. Subsequent to the seventh month, the interruption is called premature labor. Abortion is a miniature labor, consisting of a stage of dilatation, a stage of expulsion, and a stage of involution.

The interruption of the pregnancy may occur spontaneously or be induced. In spontaneous cases the causes may be sought in diseases of the ovum, or in the mother, in injuries to the uterus or its contents, and such systemic affections as syphilis, Bright's disease, alcoholism, lead poisoning, etc.

Abortions happen about once in every five or six pregnancies, and more frequently at the third month than at any other time.

*The symptoms* are hæmorrhage and pain. *The dangers* are hæmorrhage and infection.

Infection is most common and most serious in abortions that are brought about mechanically.



Hæmorrhage, in some degree, is an invariable symptom, which has its origin in the separation of the ovum from the uterine wall. Hæmorrhage from the uterus is serious at whatever stage of pregnancy it appears.

The duty of the nurse is to put the patient in a cool, dark room, on her back, elevate the foot of the bed, put ice bags on the lower abdomen, and summon the attending physician, with the hope that an abortion can be averted. Bromides and opium are the drugs most to be relied upon. Opium may be given in suppository, 1 grain night and morning.

If the hæmorrhage is alarmingly profuse and the nurse is skillful and clean, under exceptional circumstances she may pack the vagina with sterile cotton while waiting for the doctor. Then the room should be set for operation.

**Dead Ovum.**—The ovum may be discharged in pieces or in a single complete mass.

The egg may die at any period of the pregnancy, and be discharged in a few hours, or it may not be expelled for weeks, if at all. Fœtal death in the uterus may have its cause on the paternal side in a father too old or too young, or affected with such diseases as diabetes, nephritis, tuberculosis, syphilis, or chronic lead poisoning; on the maternal side, the same diseases, plus cancer, anæmia, insufficient food, and inflammation of the uterus; on the part of the embryo, syphilis or any transmitted or primary disease of the ovum.

The results of retention of the dead ovum vary with the case. Infection of the ovum is rare, except where the membranes have ruptured and an open channel exists. No harm follows the death of the fœtus, except in the presence of infections, all other changes are benign. The embryo in the first and second months may

be absorbed, but at later periods, it becomes macerated petrified, or otherwise altered.

Among the *signs* of fœtal death are prolonged cessation of fœtal movements after being definitely observed, chilliness, languor and malaise of the mother, sense of weight in abdomen, and possibly a bad taste in the mouth. Furthermore, the uterus does not correspond to the period of pregnancy, and may have become smaller. Retrogressive changes take place in the breasts.

The diagnosis is only certain when the heart tones are persistently absent, or the macerated head of the fœtus is felt through the partly dilated os as a flabby bag of bones.

*Treatment* in noninfective cases is expectant. Spontaneous expulsion will occur sooner or later and there is no necessitous indication for interference. Hæmorrhage from retained pieces may indicate a curettement. Infected cases should not be interfered with surgically until they have been free from fever for five days.

**The Postmature Child.**—All large babies, 9 lbs. or more, must be suspected of postmaturity. Seventy-four and eight-tenths per cent of these babies have passed the estimated date of their delivery. Parvin declared that as many as 6 to 8 per cent of all babies went over-time. Some, of course, grow faster than others and may be as large at eight months as others at ten. At all events the pregnancy is prolonged beyond the proper time either from a primary uterine inertia or on account of the absence of the normally exciting causes of activity.

These large babies are a source of danger both to the mother and child. The labor is greatly protracted, the mother exhausted, the overdistended uterus gives but weak and shallow contractions, the membranes are lia-

ble to premature rupture with a resultant dry birth, the hard, well ossified head moulds slowly or not at all and when it is finally forced through in the ultimate delivery, it overcomes the soft parts by means of extensive



Fig. 36.—The McDonald measurement. From upper border of symphysis to highest point of fundus. Note method of holding upper end of tape. It does not follow down into the depression above fundus. Normal fundus is 35 cm. above the symphysis at term.

lacerations. Usually the normal powers fail and an operative delivery is imperative. Fistulae from the prolonged pressure are frequent and maternal mortalities

must be expected either from the exhausting labor, from hæmorrhage, infection or the necessary but brutal instrumentation.

The child is endangered by the shrinkage of the blood supply, by strangulation of the cord and by the long cerebral compression. Asphyxia, intracranial hæmorrhage, skull fractures and paralyses are a constant menace and the death of the child forever impends.

The large size of the child on the other hand is no advantage, for the extra weight is merely an accumulation of fat and water which melts off and disappears within three days after birth.

All babies are mature which measure from 48 to 53 cm. in length, which weigh from five to nine pounds, and exhibit skulls with occipito-frontal diameters of 10 to 12 cm. and 8.5 to 10 cm. in the biparietal. Babies of smaller dimensions are usually premature and larger ones are postmature.

The size of the babe in utero is readily determined by the Ahlfeld, McDonald and Perret measurements. The Ahlfeld gives the length of the child on the well founded theory that the child extended is twice the length of the child folded up in the uterus.

The McDonald measurement assumes that a uterus holding a mature babe will extend 35 cm. above the symphysis. Spiegelberg says 34 cm. The McDonald method is shown in the illustration. Also the height of the fundus in centimeters when divided by 3.5 gives approximately the stage of the pregnancy in months and days. Since the child grows at the rate of .75 cm. per week during the last few weeks anything less than 35 cm. is easily calculated.

By the Perret maneuver the occipito-frontal diameter

of the head is measured directly and the biparietal deduced therefrom by a sliding scale. These measurements are all easily learned and very reliable. They should be employed in every case. Errors are possible

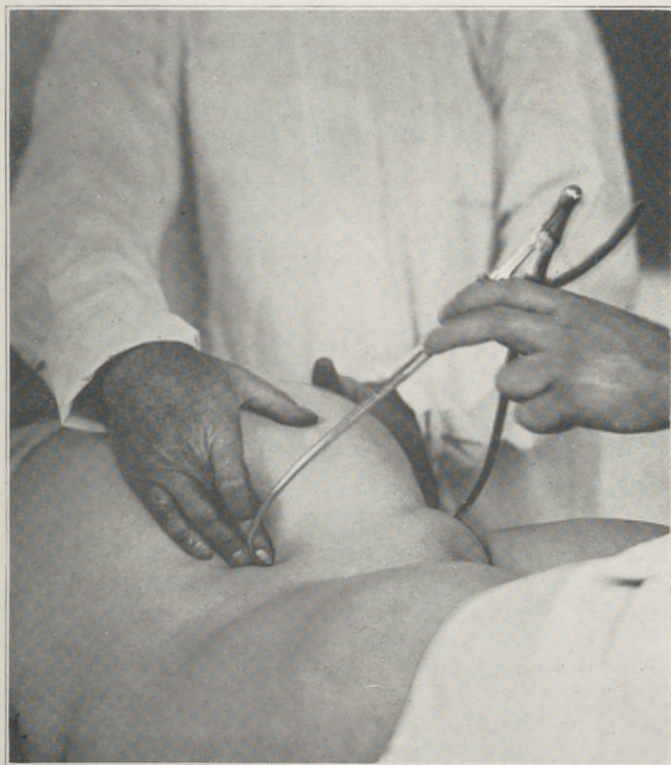


Fig. 37.—The Perret measurement of the occipitofrontal diameter of the head. The poles of the head are found by the fingers and the assistant applies the pelvimeter. From this result the biparietal is deducted.

where the head is deeply engaged or obesity or hydramnion is present.

No pregnancy should be allowed to pass very much

beyond the proper date of confinement. An overtime child commonly means a dead child and a long-ailing mother. In general more babies are lost from post-maturity than from prematurity.

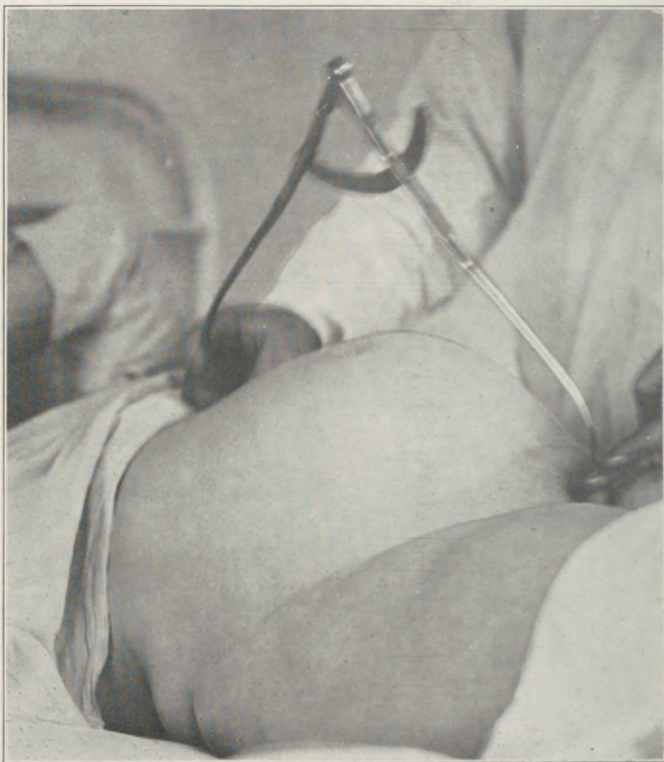


Fig. 38.—The Ahlfeld measurement. One tip of pelvimeter on upper pole of child. The other inside the labia majora above the clitoris is pushed up until it impinges on upper border of symphysis. Subtract 2 cm. and multiply by 2 to get length of child.

As soon as the pregnancy oversteps its time it must be carefully watched. The babe in utero must be measured at frequent intervals and as soon as maturity is

assured and before the babe becomes too large, the labor must be induced.

Any safe and convenient method may be employed. It is immaterial whether castor oil and quinine be used or the Voorhees bag or a catheter or rectal tube be passed into the uterus between the membranes and the endometrium. The pituitrin method is also excellent. The writer usually prefers the castor oil and quinine or the Voorhees bag or both. The important thing is to save the child.

## CHAPTER VII

### PREPARATIONS FOR LABOR AND THE NORMAL COURSE OF LABOR

**The Nurse.**—Scientific obstetric nursing is a specialty that enlists the interest of exceptional women only.

It demands a high sense of duty, a strong physique, broad training, unusual judgment, and rare tact. The nurse must be professionally aseptic and personally clean. She should keep herself free from odors, and bathe at least three times a week. The presence of pus anywhere on her body disqualifies her *at once*, and she should report off duty.

The compensation should always be somewhat higher than for other work, because there are two patients to be cared for.

An obstetric nurse should specialize in her work, and not take infectious cases. Unhappily the haphazard character of the onset of labor presents a difficulty. The patient frequently can not afford to have the nurse for a long time in advance of labor, and the nurse whose income is limited by the number of her cases can not afford to be idle. Hence, it is better for two nurses to work in alternation with one another, so that one is always available in an emergency.

Both doctor and nurse should visit the lying-in room before labor begins, and plan its rearrangement. At least a week before the expected confinement, the chamber selected should be thoroughly cleaned and the wood-work wiped off. Curtains, draperies and bric-a-brac and all useless furniture should be removed. Carpets must



be taken up, or at time of confinement, well protected. Rugs can be easily managed. A chair, a bed, and the various tables for instruments and solutions are all that are required.

The nurse usually is called to the case first, and upon her falls the responsibility of the diagnosis and the burden of the preparation. As soon as she arrives and satisfies herself that the patient is really in labor, she puts the final touches to the room. In her own mind she goes over all possible emergencies and prepares to meet them.

The following supplies should be in the house for the labor:

- 3 hand basins, 10 inches in diameter.
- 3 hand brushes.
- 1 two-quart douche bag.
- 15 yards nonsterile gauze.
- 2 lb. each of cotton batting and absorbent cotton for making bed pads.
- 2 pieces of rubber sheeting 1 by 2 yards.
- 5-yd. jar of borated gauze.
- 4 oz. lysol (or ziratol).
- 100 c.c. of Squibb's chloroform.
- 2 oz. green soap.
- 2 oz. solid albolene.
- 8 oz. alcohol.
- $\frac{1}{2}$  oz. ergotol.
- $\frac{1}{2}$  oz. bismuth subnitrate and  $\frac{1}{2}$  oz. boric acid powder mixed (or Dermatol).
- 1 nail file.

**Nurse's outfit consists of the following:** Nail file, surgical scissors, catheter (silver is best), hypodermic syringe with tablets of morphine, strychnine, and digitalis; two fever thermometers, one for mouth and one for rectum; a pair of tissue forceps and a razor.

Some time before the labor, the nurse should call on the patient and establish a working acquaintance. It adds greatly to her authority and to the patient's con-

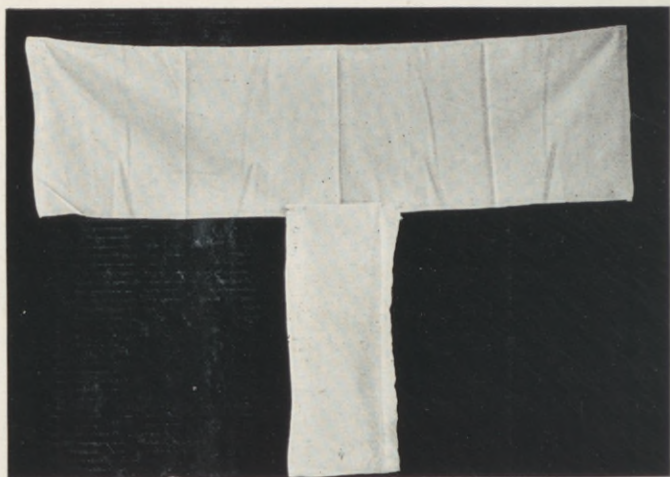


Fig. 39.—Abdominal binder with crosspiece to hold vulvar pads.



Fig. 40.—T-binder, used in all cases after the fifth day post partum.

fidence in her. Her advice will be sought on a multitude of subjects, partly real and partly to try her out.

**Sterilizing** may be done in a hospital, or, if this is not feasible, the nurse should go to the house two or three weeks before the expected labor and sterilize in an Arnold or Rochester sterilizer the following articles:

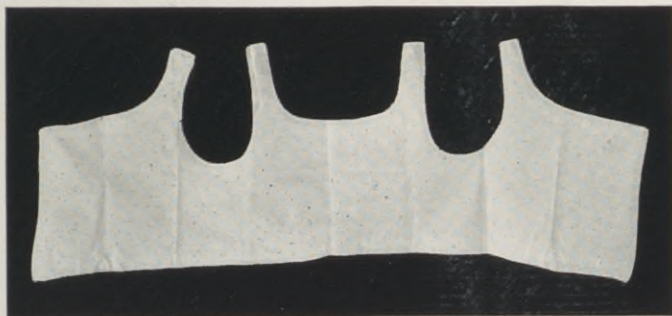


Fig. 41.—Breast binder.

- ½ doz. sheets.
  - 3 doz. towels.
  - 2 pillow slips.
  - 3 abdominal binders of unbleached cotton, 16 in. wide and 36 in. long, folded and hemmed.
  - 4 T-bandages.
  - 3 breast binders.
  - 2 jacket parts of pajama suits.
  - 3 pairs of long white stockings.
  - 3 packages of vulvar dressings (see Preparation of Supplies, p. 326).
  - 2 obstetric pads 1 by 36 by 36 inches.
  - 1 pillow slip full of cotton pledgets for sponges.
  - 1 jar applicators (cotton twisted about toothpicks).
  - 1 jar of gauze pledgets for perineorrhaphy and cord dressings.
- Everything must be neatly wrapped and labeled.

#### Infant's Outfit.—

- 12 plain slips 27 inches long of dimity or nainsook (with winged sleeves).

- 3 long sleeve shirts, silk and wool (size No. 2).
- 6 pinning blankets, made of outing flannel, if it is a winter baby.
- 3 bands, 6 by 18 inches, clip or notch edges, do not hem.
- 3 petticoats, flannel bottoms and muslin waists, without sleeves and with small button on shoulders.
- 3 outing flannel wrappers.
- 6 plain, soft muslin dresses.
- 3 (Arnold) knitted night gowns, light weight.



Fig. 42.—Baby's dress with winged sleeves.

- 4 doz. light weight cotton diapers, 20x40 inches. Bird's-eye linen is the best. Wash and dry these in the air before using.
- 4 soft towels (linen preferred).
- 2 quilted pads.
- 4 soft wash cloths.
- 4 wool wrapping blankets.
- 1 pair scales that weigh ounces and fractions thereof.
- 4 oz. of olive oil or benzoated lard.
- 4 oz. of alcohol (95 per cent).
- $\frac{1}{4}$  lb. boric acid crystals.

- ½ lb. absorbent cotton.
- 1 cake of castile soap.
- 2 oz. solid albolene.
- ½ oz. subnitrate of bismuth powder and ½ oz. of powdered borie acid mixed (or Dermatol 1 oz.).
- 1 bed pan.
- 2 basins, holding 2 quarts each.
- 1 papier mache, rubber, or enamel ware bathtub.

**Anæsthetics.**—Excessive pain is destructive and disintegrating to the vital forces. Many a woman who has passed through a particularly severe labor remembers her experience with a horror that forever precludes its repetition.

This is the day of relative painlessness in labor, and all the world is striving to make childbirth easier and less lethal. No woman, unless she herself requests it, should be permitted to go through the agony of labor without an anæsthetic, judiciously selected and carefully administered.

Pain-deadening agents are numerous and inexpensive, and it is only a matter of experience and judgment to choose a method that will reduce the suffering of childbirth to a minimum. The second and first stages of labor, in the order named, demand the most in the way of relief.

A prolonged first stage with nagging, violent and apparently useless pains may devitalize the patient more than short, but acute pains of the second stage. In the first stage, under proper selection of cases and experienced supervision, "Twilight Sleep" will be successful in seventy to eighty per cent of the cases.

By success, is meant that the patient is relatively free from pain. When the drugs do not relieve pain, the case is a failure (fifteen per cent), although in no case, when properly given, is the mother or child endangered. Morphine solution 1/6 gr. and scopolamine hydrobromid

1/200 gr. to 1/150 gr. is the customary dosage for the first injection. Another injection of 1/200 gr. is given in a half or three-quarters of an hour. The room is darkened, talking is forbidden, and the family exiled. The patient gets red in the face and very thirsty, the pulse is rapid but full. She answers questions very slowly and drowsily, awakes for her contraction but goes right off to sleep again. In this condition she is kept through bi-hourly repetitions of the scopolamine until the delivery. It is this half waking and half sleeping condition that suggested the name of "Twilight Sleep."

Morphine and scopolamine will relieve the pains of the first stage without greatly protracting the labor. The same drugs may and probably will prolong the duration of the second stage. The first dose should be given as soon as the patient is well started in labor.

"Twilight Sleep" is at present a hospital procedure, and the technic so exacting as to weary the attendants greatly. It can not be employed until the woman has definitely gone into labor and is at least three hours away from delivery. It is not serviceable where the pains are weak and shallow; and it must be used with wise circumspection, if at all, in the presence of complications.

For the second stage, there is a choice of three drugs: gas, chloroform, and ether. Like twilight sleep each is open to some objection, but each may be of the greatest assistance if used under appropriate indications and conditions.

Gas has one advantage, in that it in no way interferes with the pain activities; and Lynch and Davis have shown that with a proper admixture of oxygen, it may be given with comparative safety for the two or three hours

which may mark a normal second stage. To administer it a competent machine for mixing the gas is necessary. It should not be given to patients who have bad hearts, high blood pressure, or toxæmia. Neither is it a satisfactory anæsthetic when the head delivers, for the mother being less relaxed and more rigid, the legs and muscle action are harder to control and unnecessary perineal lacerations are liable to occur. The patient is instructed to take several deep breaths just as the uterine contraction comes on and the gas bags supply about 75 per cent nitrous oxide and 25 per cent oxygen. As the pain passes off the oxygen is increased and the nitrous oxide diminished until the mind is again clear.

To save the perineum and better to control the patient, when the head is about to pass the vulva, it is wiser to abandon the gas for chloroform or ether.

Obstetrical operations, such as forceps and version, require ether or chloroform, and not gas. The dangers vary with the anæsthetic chosen, as well as the amount and the method of administration. Ether affects the respiration, chloroform attacks the heart. Ether must not be given near an open flame. Chloroform is not explosive but is decomposed by fire into an irritating gas. Chloroform must be diluted with 90 per cent of air, hence the mask must be open, or the napkin held free from the face, so that plenty of air can enter. Ether and chloroform, when given "*a la reine*;" i. e., a few drops on the mask at the beginning of each pain and increased up to the acme, is relatively free from danger. They have the additional advantage that the sleep may be instantly deepened if operation is required. Chloroform, it is now believed, predisposes mildly to post partum hæmorrhage. Davis has shown that neither ether, gas, nor chloroform affects the child injuriously if

the administration is intermittent and not too greatly prolonged.

To summarize: Morphine and scopolamine combined is a first stage analgesic, which has too much value to be neglected.

Gas, if an apparatus is to be had, may work well for the greater part of the second stage, while for operations, or for the period of expulsion, during which the head passes the perineum, chloroform and ether give best results. Moreover, chloroform "*a la reine*" may be given safely and efficiently by a competent nurse and in many instances *must* be given by the nurse, if at all.

When the perineum bulges, or the head becomes visible at the vulva, the nurse should anoint the lips, cheeks and tip of the nose with cold cream or olive oil, to avoid burning the skin, and lay two or three thicknesses of handkerchief or gauze over the nose (an inhaler is best). An abundance of room must be left underneath and at the sides of the mask for air to enter.

At the beginning of the pain a few drops of chloroform are poured on the cloth and the patient instructed to breathe vigorously. The cloth is removed as soon as the pain ceases and when the next contraction comes on, the process is repeated. As the head passes the perineum, the chloroform should be pushed to complete anæsthesia, both to save suffering and to give the doctor full control of the perineum. When the nurse gives the anæsthetic, she should watch the doctor for his signal to increase the vapor or remove the mask.

*Summary.*—Cover the eyes with a wet towel and anoint the face with cream or oil before using chloroform. Remove false teeth, if present.

Obstetric degree—a few drops on mask at beginning of each pain.



Surgical degree—complete anæsthesia.

Watch pulse and respiration.

A nurse should never leave a patient who has had an anæsthetic until she is conscious. Vomiting is especially dangerous.

**Normal Labor.**—Labor is the process by which a fœtus of viable age is expelled from the uterus.

By normal labor is meant a case where the fœtus presents by the vertex and terminates naturally without artificial aid, or complications. It varies greatly in severity, duration and danger to mother and child. A first labor is more prolonged and difficult than later confinements. A woman in her first delivery is called a primipara, in subsequent cases, a multipara.

The *date* at which labor comes on is difficult to determine accurately. The average duration of pregnancy is from 275 to 280 days, forty weeks, or ten lunar months, but conception does not occur necessarily at the time of coitus, nor is it possible to know with any certainty when it does occur.

Labor may occur two weeks earlier than calculated, with benefit to the mother, and no harm to the child; but if the woman goes over time, the child becomes much larger and the labor harder and more dangerous to both.

**Causes of Labor.**—Why labor should occur at all is not known. Many theories have been advanced, none of which is entirely satisfactory. Some of the best known are the growing irritability of the uterus accompanied by an increase in the frequency and strength of the intermittent uterine contractions or increasing distention of the uterus. Thus it is believed that when the uterus is distended up to a certain point, it will try to relieve itself like the bladder, or a baby's stomach. It may be

that any one of the following factors, or all of them acting together, are influential.

Dilatation of the cervix by the presenting part.

Increasing distention of the lower half of the uterus with pressure on neighboring nerve structures.

The circulation of fetal products of metabolism (toxins) acting on the nerve centers.

The menstrual periodicity.

Heredity and habit.

Physical and emotional causes.

The onset of labor probably is not purely accidental, and yet it is so inconstant in appearance and so indifferently early or late, that it has every appearance of being an affair of chance. The time when labor will come on is highly speculative in general, but the phenomenon is preceded by certain definite symptoms:

The lightening.

False pains.

Show.

Rupture of membranes.

The pains.

*Lightening.*—About two weeks before labor, especially in a primipara, the uterus and the head sometimes descend into the pelvis. The body of the child falls forward and the abdomen protrudes, the stomach is flatter, the patient breathes easier and feels, as she says, "lighter." But walking is more difficult, the bladder is stimulated to frequent evacuations and the rectum is compressed.

This occurrence is a premonitory sign of labor, and also favorable inasmuch as it demonstrates that this particular head is not too large to pass this particular pelvis.

*False pains* may appear, especially in multiparas, from two to four weeks before labor. In some of these cases

the pains may be due to gas or indigestion and respond to hot applications and enemas, or there may be definite uterine contractions, as shown by the hardness of that organ during a pain, but the phenomena are irregular and therefore not typical of labor pains.

Usually they pass off in a few hours, but if the patient is nervous, the doctor or nurse may be called needlessly. The patient, therefore, should be instructed to have the pains timed by the watch for half an hour or an hour. If they are regular during this period, the physician should be notified. Upon his arrival, an internal examination will reveal the true character of the disturbance by the condition of the cervix and os.

*The show* is a discharge of thick, white mucus, slightly stained with blood. This is the mucus plug which occludes the cervix during pregnancy and when the os begins to dilate, the mass is released and passes out. Labor usually comes on vigorously within twelve hours.

*The membranes* may rupture before labor begins and much fluid escape. The advantage of the dilating bag of water and lubricating qualities of the liquor amnii are thus lost. Such a labor is called a "dry-birth" and is frequently slow, exhausting, and extremely painful.

*The pains* are the subjective manifestations of the powers of labor. The forces concerned are uterine and abdominal muscles, principally assisted by those of the back, legs, and arms. Their constricting action on the nerve fibers in the walls of the uterus is the cause of the pains in the first stage. The onset may be violent and go on to a quick delivery, but generally the inception is more insidious.

*The irregular, painless* contractions, (of Braxton Hicks) that were mentioned on an earlier page, gradually at term change their character and become *regular* and *painful*.

At first they may be slight and vague, lasting only half a minute and separated by intervals of ten or fifteen minutes and scarcely attract the patient's attention. They are felt chiefly in the abdomen.

More or less rapidly they increase in frequency, severity and duration. They last from a minute to a minute and a half and come every three minutes. The whole uterus hardens and its outline is clearly defined during the contraction; it relaxes and becomes soft in the interval. The woman is now in labor. The pains become grinding and the patient feels that she is not accomplishing anything, yet under the influence of these contractions the cervix is effaced and the os is dilated.

**The Course of Labor.**—Labor is divided for convenience into three stages as follows:

The *first stage*, from the beginning of pains until the complete dilatation of the os.

The *second stage*, from the complete dilatation of the os to the delivery of the child.

The *third stage*, from the delivery of the child to the expulsion of the placenta.

The *first stage* is the stage of dilatation.

Usually at term, the cervix is columnar and unshortened, the canal intact, and closed at both ends, as shown in Fig. 44.

In multiparas the outer opening will usually admit the tip of the finger.

As labor proceeds, the cervix is *effaced*, the os slowly dilates, and the bag of waters forms.

*The Bag of Waters.*—When the cervix is effaced and only the os remains, the lower end of the egg with its fluid restrained by the membranes, bulges forward into the canal. The fetal head, or breech presses into the pelvis, and the fluid in the membranes, compressed be-

tween the presenting part above and the cervix below, is called the bag of waters.

When the contraction comes on the longitudinal muscular fibers of the uterus are drawn upward and the bag of waters becomes tense and pushes farther and farther down into the opening; and by its even and universal pressure, mechanically and slowly increases the size of the opening which the muscular traction is enlarging. At the same time, the fluid around the child prevents, for

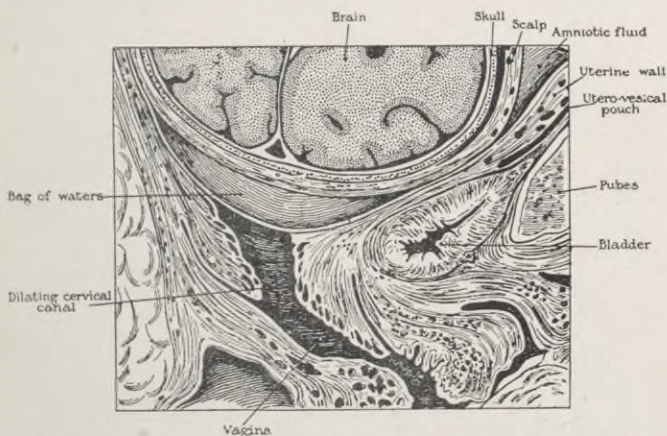


Fig. 43.—The bag of waters begins to act on the cervix. (Eden.)

a time, direct and injurious compression on the body. When no definite cervical projection can be felt, and when the teat-like protrusion of the cervix has disappeared, the cervix is said to be effaced.

The os now begins to stretch and widen, the bag of waters becomes more and more evident, vomiting occurs, and at last, when the os has expanded to a diameter of four inches (ten centimeters), the membrane can withstand the pressure no longer. It ruptures, a certain amount of fluid escapes, the presenting part comes down

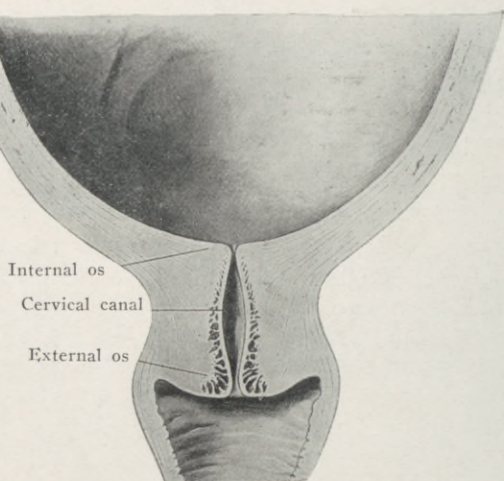


Fig. 44.—The effect of the pains. The cervix before labor begins. (Bumm.)

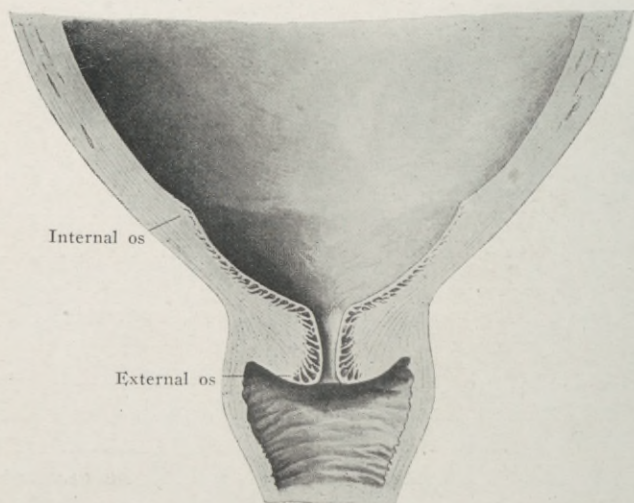


Fig. 45.—The effect of the pains. The cervix begins to be "effaced." (Bumm.)

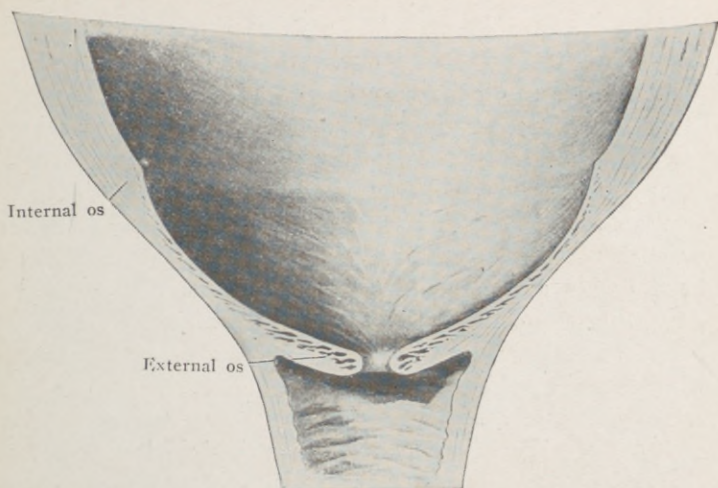


fig. 46.—The effect of the pains. The cervix is effaced, and the dilatation of the os begins. (Bumm.)

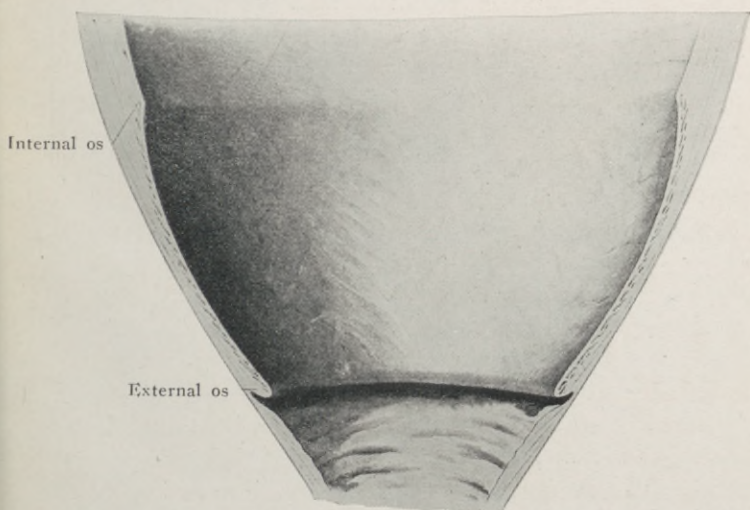


Fig. 47.—The effect of the pains. The cervix is effaced and the os continues to dilate. (Bumm.)

against the opening, and like a valve, prevents the outflow of the waters from above.

Sometimes the labor may be preceded by some hours (two or three), or days (two or three), even weeks (two or three), by the rupture of the membrane, and sometimes when the structure is thick and tough, the rupture may be delayed until well into the second stage, or even until the child is born. In the latter case, the head comes out, covered with membrane. In the old days, this was called being "born with a caul." It was supposed to be a lucky omen, but it was lucky only that the babe escaped suffocation. The membrane should be torn open quickly.

The duration of this stage is variable. It is much longer in primiparas than multiparas. It averages sixteen hours in the former, and eight hours in the latter. Vomiting during this stage is quite common, but the pulse and temperature remain normal. The first stage of labor is usually under the entire control of the nurse. It is her responsibility.

With complete dilatation of the os, the *second stage*, or stage of expulsion, begins, whether the membranes rupture or not. The presenting part, usually the head, passes from the cervix into the vagina. The vagina in turn gradually dilates from above downward until uterus, cervix and vagina form a single, wide channel of the same diameter. The child is driven forward by the uterine contractions, strongly reinforced by the abdominal muscles, which the patient uses vigorously. The onset of each pain is accompanied by a deep inspiration, followed by straining or bearing down with the abdominal muscles as in a highly exaggerated bowel movement. The patient holds her breath, braces her feet, fastens her hands on bed or attendant, and uses all the trunk muscles in the effort. The face becomes con-



gested, the pulse quickened, she perspires some, and groans deeply during the contraction. The pain is extreme and is due partly to the stretching of the vagina and vulva and partly to the distention of deeper sensitive structures.

When the head reaches the pelvic floor, the first

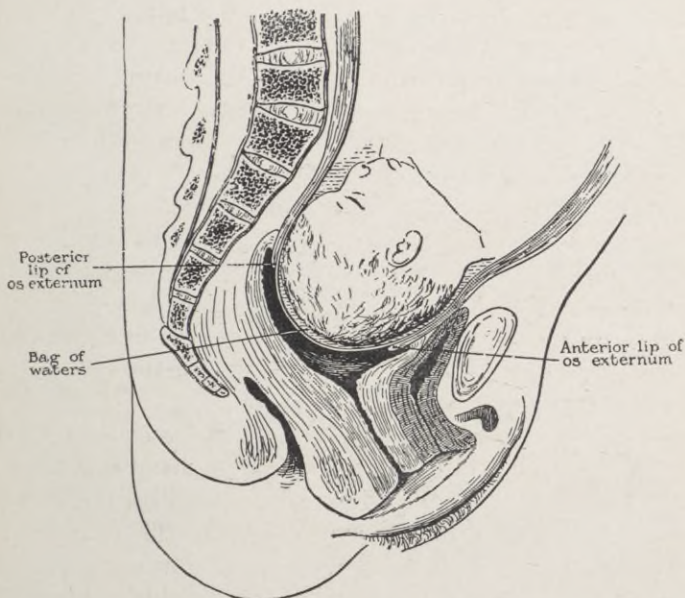


Fig. 48.—The cervix is effaced, and the os dilated. The second stage begins. (Eden.)

change observed in the external genitals is the stretching (bulging) of the perineal body. Next, the anus becomes turgid, dilates slightly, the anterior wall becomes visible, and the hairy scalp of the child appears at the vulva. The actual expulsion of the head in a primipara is accomplished by a series of prolonged and severe contractions, accompanied by violent straining.

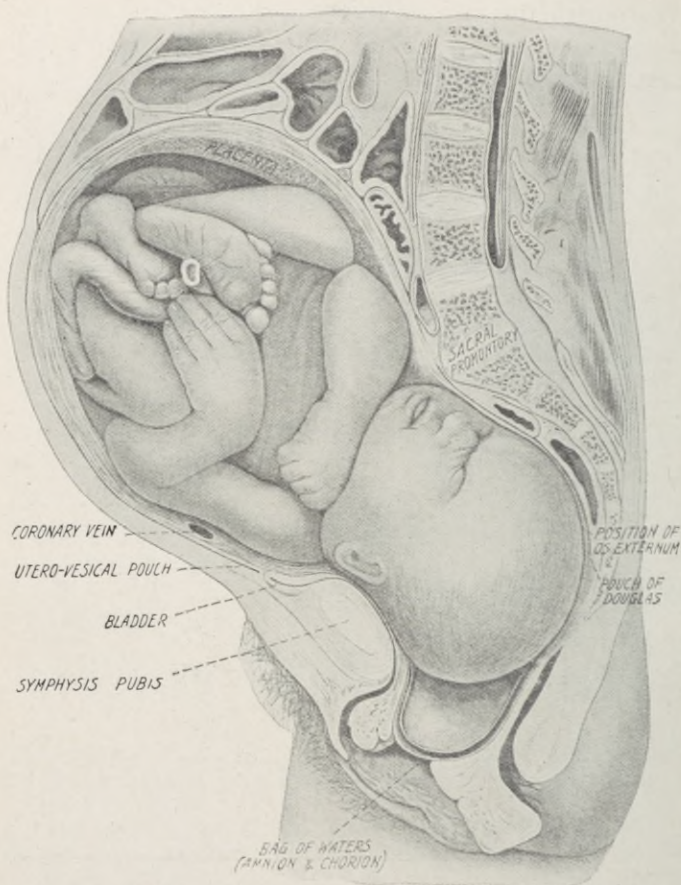


Fig. 49.—Child in second stage of labor with bag of waters unruptured and presenting at the vulva. (Braune, from Barbour.)

A short pause ensues, followed in two or three minutes by a return of the pains, which expel first the shoulders and then the trunk. As the body escapes it is followed by a rush of blood-stained liquor amnii. This is the fluid that has been pent up in the uterus by

the obstructing body of the child. The second stage lasts about two hours in a primipara and from fifteen minutes to one hour in a multipara.

*The third stage* is the delivery of the after-birth. The after-birth sometimes called the secundines, consists of placenta, umbilical cord, and membranes.

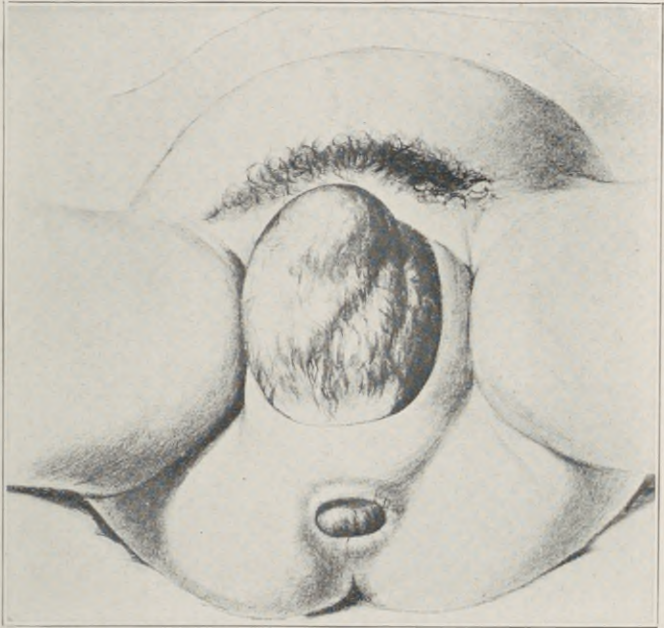


Fig. 50.—The head passing over the perineum. (Bumm.)

After the expulsion of the fœtus, the uterus undergoes a sudden diminution in size. It is about as large as the child's head, and the fundus lies near the level of the umbilicus. The contractions still persist feebly, but they are practically painless, and the patient is greatly relieved, possibly sleeping.

In from ten to thirty minutes, the uterus becomes smaller, harder, more globular in shape and more movable. The patient brings the voluntary muscles of the abdomen strongly into action again. The nurse presents a sterile basin and the physician sustains and slowly twists the membranes free from their final attachment and out of the uterus. When the placenta passes the vulva, a moderate sized blood clot follows it.

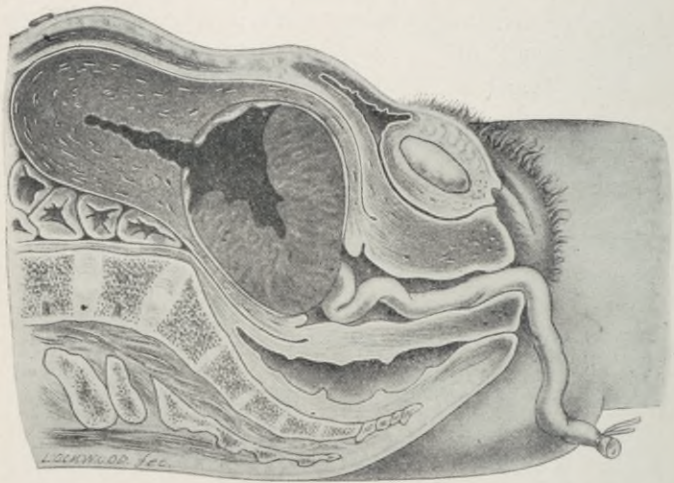


Fig. 51.—Normal expulsion of the placenta like an inverted umbrella according to Schultze. (Williams.)

The uterus is now much smaller, and hard and firm in consistency, but for some hours the contractions are intermittent, and while this continues, there is risk of hæmorrhage.

*General Effects.*—The mother's pulse is quickened during the contraction. The foetal heart beats more slowly and feebly during a contraction, but quickly recovers in the interval.

The amount of blood lost during labor averages from ten to sixteen ounces. The temperature may be elevated one or two degrees in a woman of moderate physique, while one with a fragile body may present the signs and symptoms of surgical shock. The chill, pallor, cold limbs and body, rapid and feeble pulse with subnormal temperature, suggest to the nurse at once the proper *treatment*. Heat, to all parts of the body, warm covers and hot milk or coffee. If hæmorrhage is present and the uterus relaxed, the nurse should immediately inject pituitrin (15  $\mu$ ) into the deltoid muscle and notify her attending physician.

## CHAPTER VIII

### THE MECHANISM OF NORMAL LABOR

The powers of labor are primarily the uterine contractions strongly aided by the muscles of the abdomen and diaphragm. Some assistance is given by the fixation of the legs and arms and sometimes by gravity, when a sitting or standing position is maintained.

The resistances are the bony pelvis and its relatively soft coverings of muscle and fascia.

The problem is to get the awkwardly shaped passenger through the curiously shaped passage.

In the first, and a part of the second stage, the uterine contractions do not act directly upon the body of the child, for the latter is surrounded by a wall of liquor amnii.

Pressure is transmitted by a fluid medium equally in all directions, hence, the weak part of the wall, which is the cervix, must give way. While the membranes remain intact, or when sufficient fluid is retained, no amount of pressure can injure the fœtus. When the membranes rupture, the force of the pains is exerted directly upon the child to drive it forward, and prolonged pressure may produce injurious effects through compression of fœtus, placenta, or cord.

The progress of labor is registered usually by watching the advance of the fœtal head.

The relation of the head to the pelvic brim is of great importance, as it travels much faster and easier in certain positions than in others. The term "presenta-

tion" is used to designate that part of the child which enters or tends to enter the pelvic inlet.

The presentation is named from the part of the child which comes into apposition with the brim. Thus, one speaks of a vertex presentation, or a breech presentation, or a shoulder presentation. The presentation is determined externally by palpation.

The vertex presents in 96 per cent of all labors. With the vertex presenting, the head may occupy any one of four positions. The term "position" is used to explain the relation which the most distinctive feature of the presenting part bears to the quadrants of the pelvic inlet. Thus, the most distinctive feature or landmark of the vertex is the occiput, which is the point of direction, and so again, the position is the relation of the point of direction to the brim of the pelvis. The *point of direction* is the part that takes precedence in the process of delivery. Thus, in all cases where the occiput is in advance, the occiput is the point of direction and the position is called occipital. Where the chin is in advance, the position is mental (*mentum* is Latin for chin). In breech cases, the sacrum is the point of direction.

The pelvis is divided by the transverse and anteroposterior diameters into four quadrants named respectively the left anterior, the right anterior, and the right and left posterior. (See Fig. 1.) Thus, in a vertex presentation the back of the child may be (and in 53 per cent is) to the front and to the left.

The occiput is the point of direction, and lies in relation to the left anterior quadrant of the pelvis, and is spoken of as a left-occipito-anterior position. Similarly a right-occipito-anterior position is named, and right and left occipito-posterior positions. These three occur respectively in about 21 per cent, 14 per cent and 11 per cent of the cases. (Eden.)

In passing the pelvis, the fœtus not only follows the curved line of the pelvic axis, but it describes a certain series of movements which alter its relations to the pelvis.

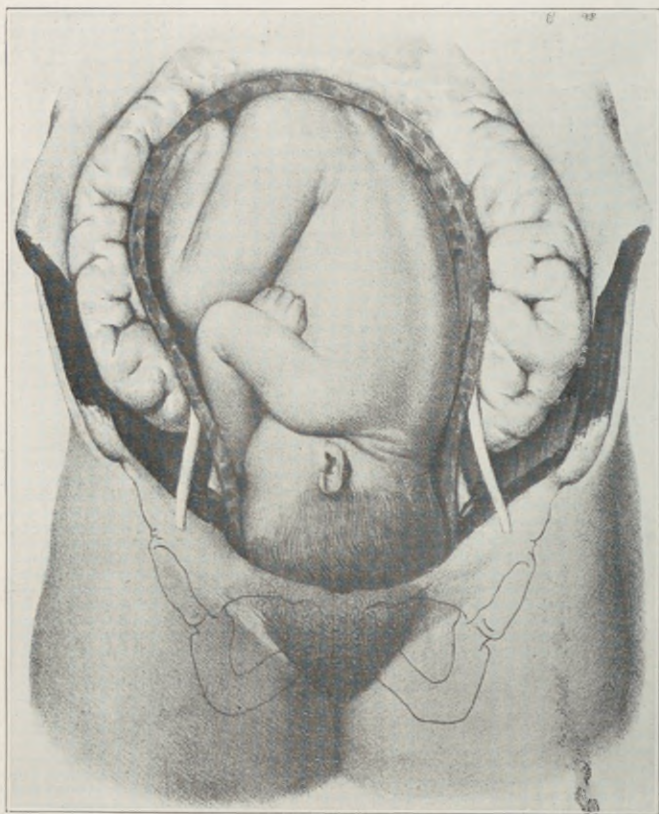


Fig. 52.—The child in left-occipito-anterior position. (Lenoir and Tarnier.)

There are five of these movements: *flexion*, *descent*, *internal anterior rotation*, *extension*, and *external restitution*.



**Flexion.**—Flexion is usually present before labor begins. That is, the head is bent down until the chin touches the breast. This may be modified by various conditions, but so far as it becomes extended, the mechanism is disturbed and the labor complicated, since large and less favorable diameters are brought to delivery.



Fig. 53.—The child in right-occipito-anterior position. Shows the flexion of the head intensified at the beginning of labor. (Eden.)

Flexion is increased by pressure against the pelvic brim as labor begins.

**Descent.**—As the driving force of the contractions becomes effective, the head passes the inlet and descends to the pelvic floor. When the large diameters of the head (biparietal) have passed the inlet, the head is said to be engaged.

**Internal Rotation.**—The head most frequently enters the brim with the occiput to the left and anterior (obliquely) because it finds more room and an easier



Fig. 54-A.—The descent of the head in right-occipito-anterior position. Seen from below. (Edgar.) Fig. 54-B.—Side view.

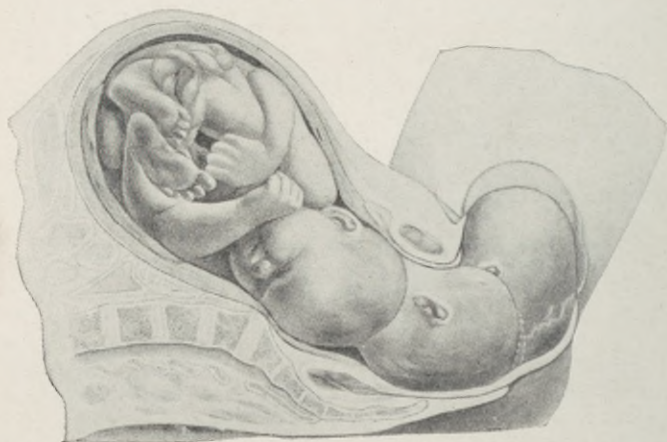


Fig. 55.—Internal anterior rotation and extension of the head in a left-occipito-anterior position. (American Text Book.)

passage; but upon passing this strait and entering the roomy, true pelvis, the head must rotate so that the long diameter of the head will conform to the long di-

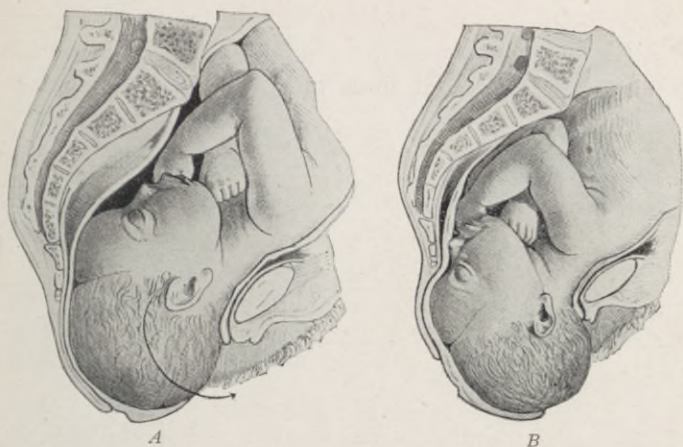


Fig. 56.—Extension. *A*, the chin leaves the chest; *B*, extension in progress. (Eden.)

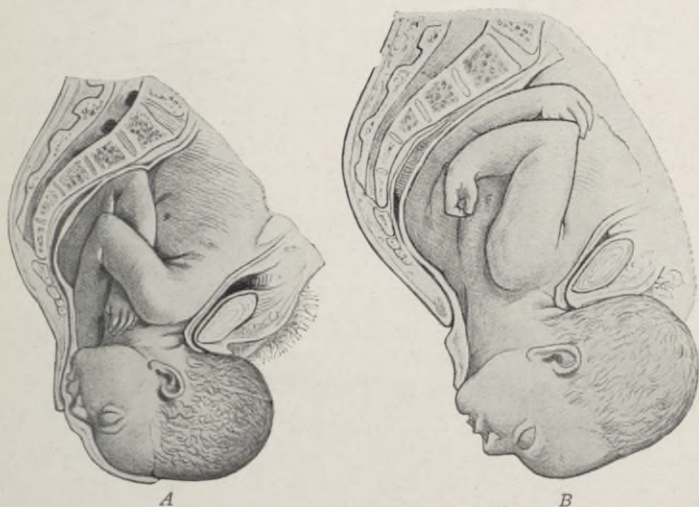


Fig. 57.—*A*, extension complete; *B*, expulsion. (Eden.)

iameter of the pelvic outlet, which lies in a direction just opposite to the long diameter of the inlet or brim;

hence, the occiput turns forward under the pubic arch. This movement is due largely to the sloping pelvic floor and the necessity of accommodation between the head and pelvis as the child is driven forward.

Rotation is much retarded or entirely stopped when the head is extended instead of flexed or when it enters the inlet with the occiput posterior instead of anterior.

**Extension.**—After internal, anterior rotation, the head emerges at the vulva, the occiput coming out first, then in succession the vertex, forehead and face and chin. As the chin rolls out over the perineum, it moves away from the chest wall—it becomes extended.

**External Restitution.**—While the head is passing through the outlet, the shoulders are entering the pelvic inlet, and so soon as the head is released from the restraint of the vagina, it naturally falls into its normal relation to the foetal back; hence in the position now discussed, it turns toward the left.

Therefore, we may summarize the mechanism in a normal left-occipito-anterior position of the head by saying: The head is flexed and forced into the pelvis. It descends to the pelvic floor. The occiput rotates to the front of the pelvis and impinges against the symphysis. Extension ensues in consequence of the necessity for an accommodation between the pelvis and the advancing head, and during this extension, the head delivers over the perineum. External restitution follows.

**The Effect of Labor on the Foetal Head.**—As the head passes through the canal, it is *moulded* by contact with the resistances. The degree of moulding is proportionate to the pressure required to drive it through. Thus, in a large head, or a relatively small pelvis, the moulding may be extreme, and changes in the scalp are common.

*Caput Succedaneum*.—All parts of the scalp are in contact with a resistant wall, except in the center of the birth canal. An effusion of serum takes place here



Fig. 58.—A cephalhæmatoma. Do not confuse with caput succedaneum. (Bumm.)

which is due to the obstruction of the venous circulation.

Swelling occurs in the subcutaneous cellular tissue, and a tumor forms—the caput succedaneum—which spontaneously disappears in twenty-four or forty-eight

hours. It is useful in confirming the diagnosis of the position.

*Cephalhæmatoma*.—Following labor a tumor is sometimes found upon the head, which is often confused with a caput succedaneum.

This tumor is caused by an effusion of blood beneath the periosteum or the covering of the bone—usually a parietal bone. It is sometimes single and sometimes double, and it varies in size from a filbert to a peach. The swelling never extends across a suture. The effusion takes place gradually, and may not appear for a day or so after birth. The cause is unknown, for it occurs after normal and easy, as well as after difficult, deliveries, and after breech, as well as vertex, cases.

At first it fluctuates, then becomes hard, and in a few weeks or months is gradually absorbed. If symptoms of cerebral pressure develop, it must be remembered that hæmatoma may occur inside as well as outside the cranium.

No treatment is necessary. Puncture is inadvisable. In extremely rare instances the tumor may suppurate and require incision. Rarely the tumor may ossify.

## CHAPTER IX

### THE CARE OF THE PATIENT DURING NORMAL LABOR

Every case of labor must be conducted with the most scrupulous attention to surgical cleanliness on the part of the patient, doctor and nurse. Puerperal infection in most cases is due to the introduction of disease-producing microbes into the wounded genital canal. To be sure, the successful enforcement of surgical cleanliness is attained only in good hospitals, but it can be approximated in a private house if the patient insists upon delivery at home.

A nurse or doctor who is clean of person, is most apt to have an "aseptic conscience." The possession of such a conscience may entail financial sacrifices, but it has many compensations. Neither the nurse nor the doctor is doing justice to the patient, nor to the profession, who indiscriminately takes pus cases, contagious diseases, and confinements. The public will soon learn that such a nurse and such a doctor are unsafe attendants.

How may the nurse know that the patient is in labor? This is the final assumption that must be confirmed or refuted when the nurse is called to her case. It is ascertained partly by the history and partly by the conditions found.

Thus, the patient may report the passage of a piece of blood-stained mucus, and the nurse will observe that the contractions of the uterus are regular, rhythmical and painful. She will observe that when the patient complains of pain, the uterus gets hard. She will

also observe the definite regularity of the contractions by timing them.

Under such conditions, the doctor should be called at once if the symptoms develop between 7 A. M. and 11 P. M. If the pains begin in the night, say from 11 P.M. to 7 A.M., the doctor need not be called unless he

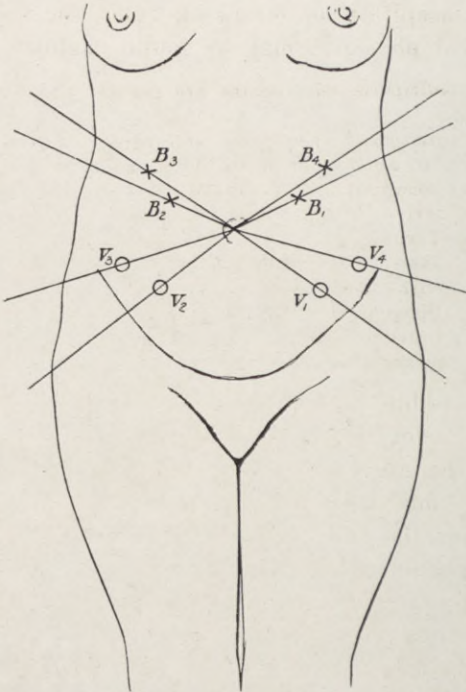


Fig. 59.—Points of greatest intensity of fetal heart tones. *V*, vertex presentations; *B*, breech presentations. (Eden.)

has requested it, or, unless in the judgment of the nurse or the anxiety of the patient, it is desirable for him to see her.

When the doctor is notified he will want to know, and the well-trained nurse will be able to inform him, when the pains began, their strength, duration and frequency.



He will want to know whether or not the membranes have ruptured. Many doctors also require, and a well trained nurse who specializes in obstetrics should be able to say by external examination, whether the head seems high or low, as well as the position and frequency of the fetal heart tones.

In the hospital the following rules for summoning the resident physician may be found useful:

1. For multipara, when pains are regular and five minutes apart.
2. For primipara, when pains are regular and two minutes apart, or when head is visible if pains are less frequent.
3. If a precipitate is imminent, delivery must be delayed until arrival of attending man by—
  - (a) Turning patient on side with legs straight;
  - (b) Instructing patient to breathe deeply or to cry out with mouth wide open; then
  - (c) Place sterile towel over vulva, and at time of pain prevent expulsion by compressing the head by means of locking the hands over a towel on the vulva.

It is possible thus to delay delivery two hours, or until the doctor arrives. *Do not permit a precipitate.*

After the nurse has completed her preliminary observation, she starts the history, notes the character of the pains, the pulse, temperature and respiration. All unusual phenomena should be recorded; and after the visit of the attending man, his examination, if any, and the conditions found, are put down. Then she prepares the patient and sets up the room for the delivery.

**Preparation.**—As soon as the patient is known to be in labor, the bowels are thoroughly cleansed with a soap-suds enema. A toilet jar should be used and not the water closet. The bladder must be emptied at the time of preparation and at frequent intervals throughout the labor. As soon as the bowels and bladder are emptied, the patient is given a bath and thoroughly soaped. The shower is preferred lest the water, contaminated by

bacteria from the skin and external genitals, should enter and pollute the vagina.

The hair should be braided in two braids. The vulva and perineum are shaved. No patient will object to this when its importance as a feature of protection against blood poisoning is explained to her.

Scrub thighs, hips, and abdomen as far as the navel



Fig. 60.—Handling forceps, kept sterile in a jar of alcohol.

with soap and warm water, then sterile water, followed by a 2 per cent solution of lysol. Care must be taken to remove the smegma and dried secretions from the folds of the vulva. Put on a fresh pad, a clean gown, and long stockings. A loose wrapper over all permits the patient to move about. (See Chapter XXIII.)

Guests are forbidden, and the immediate family is kept at a distance—if possible.

An air of buoyancy, composure, and competence should prevail in the sick room, and the patient should be cheered and encouraged in every possible way.

During the first stage, the patient may be up and about, as this diverts the mind. She may assist in the arrangement of the room which should always be the best room in the house. It should be well warmed and close to the bathroom. All unnecessary furniture and hangings should be removed, as previously described. After the room has been put in order, the bed is made.

**Making the Bed.**—Put mattress pad over mattress and cover with rubber sheet or oil cloth, and spread a sheet over all. Then a smaller rubber sheet is put on, extending from the pillows nearly to the foot of the bed. A plain muslin sheet goes over the rubber, then the delivery pad.

When the bed is ready, a small table or stand should be placed near the head, on which is put the anæsthetic, the mask and the oil or cold cream. The patient may be lightly covered with a sheet or a sheet and blanket.

During the first stage, light and easily digested food and drinks may be served, either cold or hot, as the patient prefers.

When the doctor arrives he may want to examine the patient either externally or internally, or both. So a sheet is thrown across the lower part of the body and the night-dress pulled up as far as the breasts.

**For the external examination** the doctor washes his hands in warm water and green soap and scrubs with the nail brush for five minutes. This period should be prolonged to fifteen minutes, if, by any mischance, the hands have been in contact with pus or infectious material. It is extremely difficult to get them even approximately clean after such an experience.

He now palpates the abdomen, notes the location of

the head and back, finds and counts the heart tones, measures the pelvis and child, estimates the descent of the head and the character of the pains.

If he thinks an internal examination is necessary, he will now return to the bathroom, pare and clean his nails, scrub hands and arms to elbows for ten minutes in running water with green soap and a sterile brush,



Fig. 61.—Palpation. What is in the pelvis? (Eden.)

soak the hands in lysol solution 0.5 per cent for five minutes. Bichloride of mercury solutions have no place in obstetrics. They ruin instruments and hands, and are valueless for asepsis since the mercury unites with the albumin of the mucoid discharges and forms an albuminate of mercury, which is inert. The bichloride solutions also are nonlubricating, harsh and astringent, as well as poisonous, as soon as the mucoid protection

has been removed. When the doctor takes his hands from the lysol solution, they should be wiped on a sterile towel. A sterile gown is put on, if possible. If it is not available, he should be careful not to touch anything that may destroy or contaminate his preparation. The hands are powdered and sterile rubber gloves put on (one will do).



Fig. 62.—Palpation. What is in the fundus? (Eden.)

The nurse, meanwhile, has wrapped the legs of the patient in the ends of a sterile sheet, the bulk of which covers the abdomen. The knees are spread apart. The vulva cleansed with pledgets of cotton soaked in lysol solution. One or two pledgets are used on each side of the vulva and the same number for cleansing the introitus.

The fingers are now introduced.

The internal examination may be conveniently postponed until the waters break, or it may be omitted altogether if the heart tones of the child remain good, the labor progressive, and the head continually advances into the pelvis, as determined by the external examination. The great advantage of an internal examination at this time is the diagnosis of the degree of dilatation

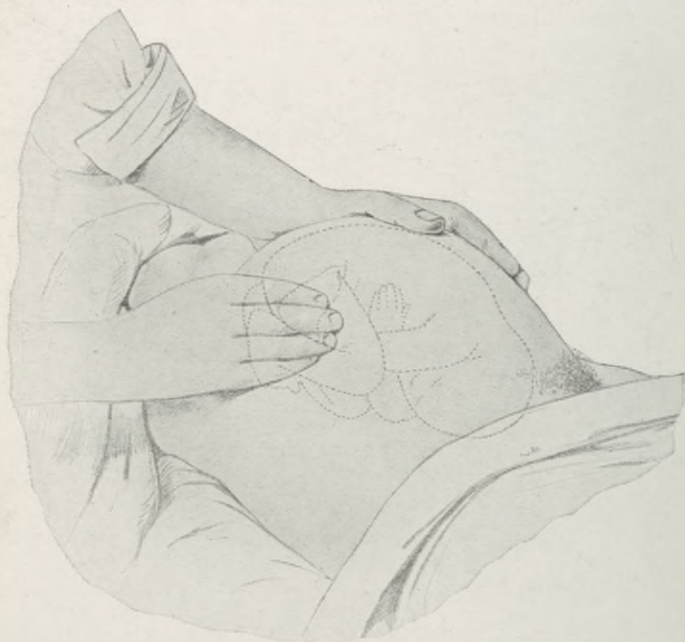


Fig. 63.—Palpation. Where is the back? Where are the small parts? (Eden.)

and the assurance that the cord has not been washed down into the vagina by the rush of fluid.

If the first stage is prolonged, the nurse should try to get the patient to rest, and she should herself snatch a few moments of repose if possible.

The condition of the os and the character of the pains may make the doctor feel safe in leaving the house,

but his whereabouts and telephone number should be ascertained and the exact time of his return.

**Second Stage.**—During this stage, the patient should go to bed and the doctor should remain nearby. The nurse may observe the vulva at intervals and note bulging, if present, or she may press a finger against the soft parts outside the labia and see if the hard resistant head has come into the outlet.



Fig. 64.—Patient draped for internal examination. (Williams.) (Patient should be shaved.)

The pains are severe and all accessory muscles are called into action. Partial anæsthesia should be maintained in most cases, which should merge into complete narcosis as the head passes the vulva. The nurse may have to administer this.

When this stage begins, or is well under way, the patient should be prepared. A *sterile pad* should be placed under her, then a *sterile bed pan*. The nurse having prepared her hands and arms as previously di-

rected for the doctor, scrubs abdomen, legs, and vulva with green soap and warm water, followed by lysol solution 0.5 per cent and a rinsing with sterile water. The cleansing of the patient should take about ten minutes. Cover with a sterile towel and put on the sterile linen.

If in the hospital, the drums have been packed for sterilization so that when they are opened each article will appear in the order of its need:

*No. 1.* (Beginning at the bottom.) A receiving blanket, which has a ticket, marked with the weight of the blanket, attached to it.

1 abdominal binder with pad holder attached.

1 pillow slip folded half way back.

1 gown for patient.

2 surgeon's gowns.

3 sheets.

1 pair surgical stockings folded half way.

1 surgeon's gown for nurse.

*No. 2* contains cotton pledgets.

*No. 3* contains strips of gauze and combination pads.

**Application of Sterile Linen—Normal Case.**—Sterile linen is to be applied as follows, by a clean nurse:

1. Lay sheet across foot of bed and half way up.
2. Put surgical stocking on one foot and draw sheet up for foot to rest upon.
3. Second foot as above.
4. Lay sterile sheet across bed under patient, letting ends hang.
5. Lay sterile sheet over abdomen of patient.

In many hospitals the sterile stockings and protective sheet are all made in one piece, which greatly simplifies the application of the linen.

As soon as the second stage begins, the packet containing the perineorrhaphy and cord set, carefully sterilized, is brought out and placed in convenient reach of the doctor.



This set contains—

- 8 in. forceps.
- 2 scissors, one curved on the flat and one straight.
- 1 dissecting forceps.
- 1 duck bill speculum.
- 1 needle holder.
- 1 metal catheter.
- 8 gauze sponges.
- 1 medicine dropper.
- 1 cord clamp, or
- 2 cord tapes.
- 2 case numbers, attached.
- 12 needles, 4 round, 4 half curved cervix needles, and 4 skin needles.



Fig. 65.—Patient draped for normal delivery. Dorsal position.

This is the stage of expulsion and the patient may want to pull or push on something to aid the straining effort. Unless the nurse needs time to set up the room or to get the doctor, this tendency may be encouraged.

A sterile sheet may be attached to the foot of the bed and the ends (corners) given into the patient's hands as a knot or loop to pull on, or she may push upward against the head of the bed. Under no circumstances must she be permitted to touch or contaminate the clean linen in her movements, either consciously or unconsciously. The hands should be restrained, if necessary, to avoid this.



Fig. 66.—Patient prepared for delivery on the side.

The face may be sponged and a cold towel laid across the eyes. Rubbing of the back and legs will bring great comfort, and cramps of the limbs may be removed by straightening the legs and rubbing the muscles underneath. Everything is now ready for the delivery. If the husband insists upon being in the room, he should take off his coat and vest and wear a gown, or if the labor is in the home, drop a clean night robe over his clothes.

The prepared room will show at close hand-reach, the

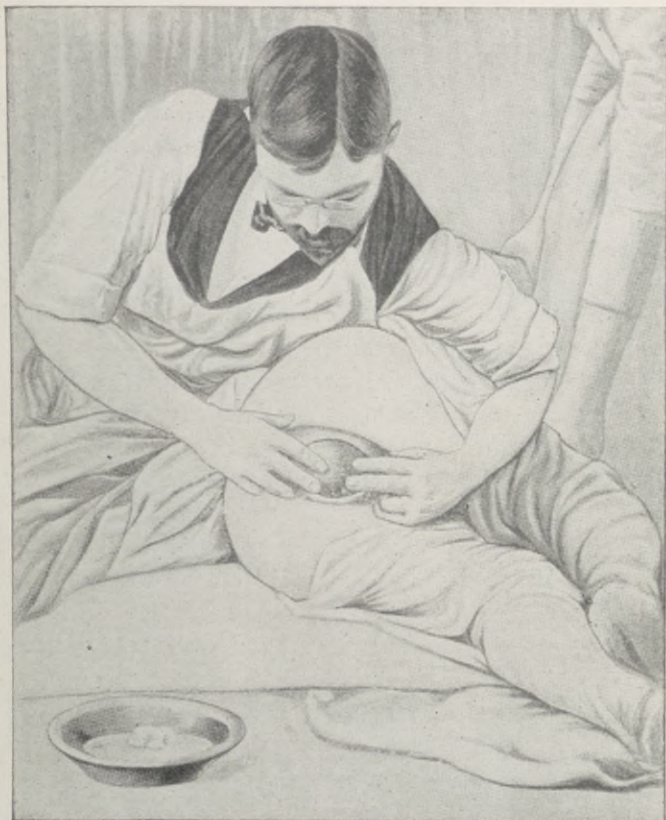


Fig. 67.—Delivery in side position. The doctor should be gowned, his hands gloved and his head covered, and the patient's upper leg should be raised on a hard cushion or pillow. (American Text Book.) (See Fig. 66.)

basins of solutions, the pledgets of cotton, tape or clamp for cord, scissors, nitrate of silver solution (1 per cent) for the eyes, with dropper, the sterile douche can in readiness for hæmorrhage and a large reserve of supplies. Whatever anæsthetic has been chosen for the second stage, is now administered. Throughout this

stage, the heart tones of the child must be watched, as well as those of the mother, for intra-partum death may occur at any moment.

A second examination may be desirable now to confirm the diagnosis and to secure an estimate of the advance. As a rule, the examinations should be as few as possible on account of the danger of infection.

This is the period of greatest responsibility for the doctor whose duty it is to watch and, if necessary, to restrain the advance of the head in order to protect the perineum from rupture.

This may be done at times most successfully, or in the case of too few assistants, most desirably, by *delivery on the side*. To secure this, as the head becomes more and more visible, the woman is turned upon her left side; a pillow rolled tightly and pinned in a sterile covering is placed between the knees, and a sheet flung across the body.

The hips must be brought to the edge of the bed while the chest and head are pulled over to the other edge of the bed, leaving the legs just enough space to double up along the side of the bed parallel with its long axis.

The doctor may now sit on the edge of the bed, or on a high stool at the back of the patient and facing the buttocks. This is a most convenient and easily managed position.

As the head is born, the faecal matter, blood and discharges must be sponged away, and the field kept clean, with the whole perineum visible. Always sponge from vagina toward rectum and throw away the sponge. Should the hand touch nonsterile things or septic material, like faeces, the glove must be changed. *The hands must be kept surgically clean.*

It is a part of the nurse's duty tactfully to warn the doctor when such a thing occurs, as it may happen accidentally while his attention is concentrated elsewhere, and a conscientious man will be grateful for the information. As the head passes the perineum the anaesthesia should be deepened.

As soon as the head is born and the first respiration established (see *Asphyxia*, p. 298), the cord is cut and clamped. There is rarely any necessity for haste in this maneuver. The eyes are treated, and if in a hospital, a numbered tape is tied about the wrist and a tape with a corresponding number about the mother's wrist.

The baby is now placed in the receiving blanket on its right side, with artificial warmth at its back and feet. The head must be lower than the body so any retained mucus can drain out of nose and mouth. Meanwhile, the doctor (or nurse) keeps a hand on the fundus of the uterus to watch its contraction, see that it does not balloon up, and massage it occasionally if necessary while he awaits the onset of the third stage.

**Third Stage.**—The patient is turned upon her back as soon as the child is delivered. The pulse and face must be watched for signs of hæmorrhage. While waiting for the placenta, the perineum is examined to note the degree of laceration, if any. To do this, the vulva must be spread apart with clean fingers so as to bring the posterior wall into view, and the discharge is sponged away with cotton pledgets taken from the lysol solution and squeezed dry.

The patient may now have the saturated dressings removed and clean, dry ones substituted. The new pads catch the oozing blood and give an estimate of its amount.

At this time, if desirable, the perineum can be re-

paired. The woman is partly unconscious, the tissues numbed, and the needle hurts much less than it will later. Nevertheless, anæsthesia may be required.

In a period varying from a few minutes to an hour, the hand on the uterus will note a hardening, the mass will become smaller, more globular, and rise slightly in the abdomen. A gush of blood appears at the vulva and usually the placenta follows. If it does not, or if hæmorrhage or the condition of the mother requires it earlier, the uterus may be compressed (see Credé expression) and the placenta constrained to deliver.

The nurse holds a sterile basin for its reception. As the mass drops into the pan, the membranes drag after and should be gently twisted, or the loose portions drawn upon, until the end slips out. The placenta is set aside for examination, and ergot or pituitrin may be given to enforce the uterine contraction. The process of expulsion is generally assisted by a strong voluntary contraction of the abdominal muscles.

After a short rest, the blood is washed off the genitals, clean linen and clean pads applied, and the abdominal binder or girdle is put on to hold the pads. Warm blankets are thrown over the patient and within an hour, a glass of hot milk is administered.

The legs should be kept together, and in case of hæmorrhage, the feet crossed.

The placenta is now inspected and not only its completeness or incompleteness noted, but anomalies of every kind should be looked for.

### IMMEDIATELY AFTER LABOR

Perinorrhaphy must be done if required.

A lacerated cervix is *not* to be repaired at this time, except in case of hæmorrhage, for the tissues are greatly

swollen, and if sutures are put in tight enough to allow for sufficient shrinkage, they will cut through; while if not tight, they will be useless in twenty-four hours.

#### Care of Mother.—

1. Cleanse genitals with lysol solution 0.5 per cent from above downward.
2. Put on sterile pad, with pad holder and binder.
3. Wash face and hands.
4. Take temperature, pulse, and respiration.
5. Glass of hot milk.
6. Keep on back four hours. Watch uterus for hæmorrhage and keep firm by occasional massage.
7. Put tape with case number on arm.

#### Care of Child.—

1. Clamp for the cord.
2. Place on right side with head lower than breech.
3. Keep warm and watch for cord hæmorrhage.
4. Treat eyes with silver nitrate solution 1 per cent, or argyrol solution, 15 per cent. Do not neutralize the 1 per cent silver nitrate solution.
5. Put tape with case number corresponding to mother's on arm.

To preserve the perineum from rupture is an important duty, and in a definite percentage of cases, unsuccessful. Nevertheless, it is a duty, which, in the absence of the doctor, may fall upon the nurse. How shall she meet it?

The greatest danger to the perineum comes from a too rapid advance of the head; hence, the nurse retards the delivery by putting the woman on her side where she can not bear down so successfully, and instructs her to cry out with her pains. She may also delay the labor by holding the head back with a clean pad until the vulva stretches to its fullest capacity.

The rules which the doctor follows in protecting the perineum as the head advances, may be thus summarized.

1. Deliver the patient on her side.
2. Maintain flexion of head.
3. Delay extension of the head.
4. Give chloroform to retard delivery and to prevent precipitate delivery.
5. Deliver between pains, if possible, by Ritgen's maneuver (modified).
6. Do episiotomy, if necessary.

**Perineorrhaphy.**—Lacerations of the perineum occur in about 30 per cent of all primiparas and in from 10 to 15 per cent of multiparas. They occur when the child is large or too rapidly delivered, and when the orifice is small or the tissues inelastic.

For convenience, the lacerations of the perineum are divided for description into three degrees.

The *first degree* involves only the fourchette and a small portion of the mucosa. It is rarely more than one-half an inch in depth and requires no attention except cleanliness by the nurse.

The *second degree* may tear a variable distance into the perineal body, sometimes so deeply as to expose the sphincter ani. It is usually on one side, but may appear on both sides, and be accompanied by prolongations into the vagina.

The *third degree* passes through the sphincter and sometimes well up the rectal wall. This is also called a complete tear.

The lacerations of the perineum which require sutures should be attended to *at once* unless the patient's condition is critical. In such cases the repair may wait from twelve to twenty-four hours.

For this operation the nurse will assemble and boil for fifteen minutes:

- 2 pairs of scissors.
- 2 tissue forceps, one with teeth and one without.
- 1 bull-dog forceps.



- 3 artery forceps.
- 6 needles, 3 full and 3 half-curved.
- 1 dressing forceps.
- 1 needle holder.

Suture material of catgut and silkworm gut should be ready in sterile containers. The catgut should be the twenty-day chromicized, No. 3 and 4. Even then the strands are quickly absorbed when the lochial secretions flow over them.

Silkworm gut is better, but hard to remove from the

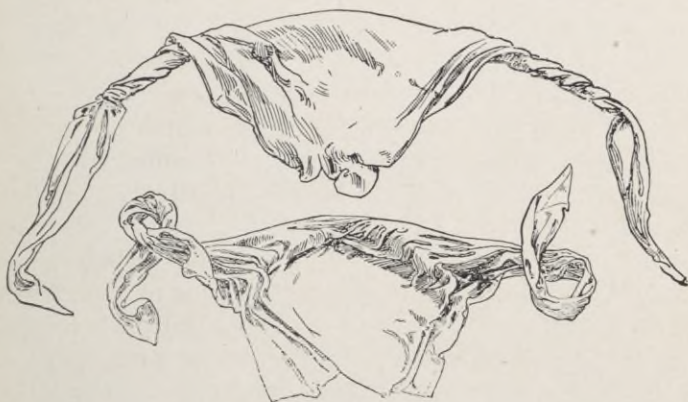


Fig. 68.—Sheet twisted into a sling. The patient lies on the unrolled portion. The rolled cords bearing against the shoulders are tied to the legs below the knees. See Fig. 112. (American Text Book.)

vagina; hence it is customary to use catgut inside the vagina and silkworm gut for the sutures outside.

The nurse renews the supplies of gauze and cotton sponges. Hot solutions are prepared, and the patient brought into a position on table or *across the bed* so that the best light may be had. The legs may be held by the husband or nurse, or both. If help is inadequate, a sheet sling can be utilized. This is made by twisting the sheet from corner to corner and passing it rope-like

over the shoulders, and back of the neck. Then each end is tied above the patient's knee on each side as the legs are flexed in an exaggerated lithotomy position.

The sutures are now introduced and tied loosely from below upward and from within outward. If tied too tightly, they will cut through. The success of the operation depends on two things: the care with which the levator ani, if torn, is found and restored; and the scrupulous cleanliness obtained by the nurse in her after-care. If the stitches become sore, a few drops of sterile glycerine should be applied with an applicator.

If catgut is used inside the vagina, the counting of the stitches is gratuitous, since they absorb without removal. If silkworm gut is used, the number of sutures must be recorded, lest one be overlooked in removal.

Binding the legs together after repair is not required, but the sutures must be given aseptic care after each bowel movement, each urination, and when the pads are changed, if they have become contaminated. The sutures are removed on the tenth day.

After *complete tears*, the bowels are kept constipated for two or three days, and then moved with a high enema of sweet oil, followed by castor oil by mouth. After the bowel movement, the nurse should wash out the rectum with normal saline solution. The nurse must look carefully at the stitches every time the pad is changed and note if the swelling is increasing or diminishing, if there is irritation or tenderness, or if they are cutting through the tissues.

The external sutures are usually left long and tied together in a knot, to prevent the ends from sticking into the patient. If she complains of this, the ends may be wrapped in sterile gauze. During the progress of the case the nurse must watch for and report any sign of fluid passing from bowel through the vagina.

The perineorrhaphy being completed, the woman is permitted to rest though the nurse will make frequent examinations of pulse and respiration. She will note the look of the face and the hardness of the uterus.

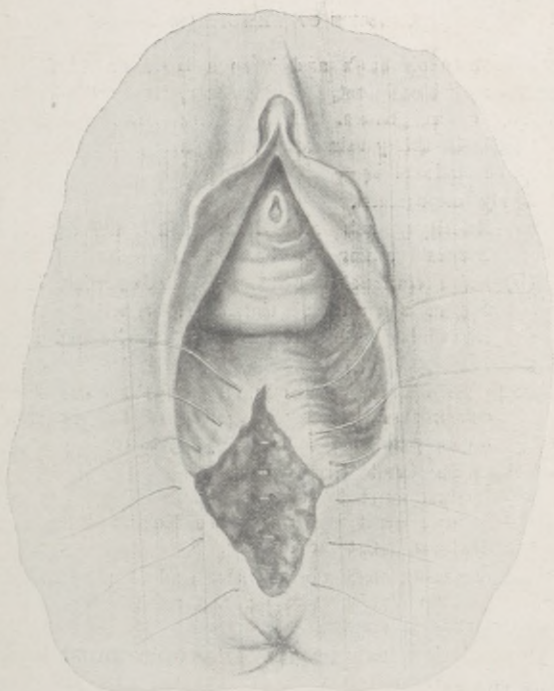


Fig. 69.—Repair of perineum. Sutures in place. (Hammerschlag.)

The pad should be watched and the amount of blood discharged, duly estimated. If the flow does not diminish or if the uterus should balloon up, the doctor should be notified and the nurse meanwhile should give a dram of ergot (fluid extract) by mouth or an ampoule of aseptic ergot hypodermically.

The doctor should remain within call of the patient for at least an hour after delivery.

In the hospital the following rules may be used as a concise guide for the conduct of the third stage:

#### CONDUCT OF THIRD STAGE.

Keep patient on back and keep a hand on fundus. Note amount of blood lost, its character, its flow, and whether steady or in gushes. The placenta should detach itself normally in thirty minutes. After thirty minutes, expulsion may be assisted by—

(1) Early expression.

(a) Massage, rub and knead the uterus, until it hardens under the hand.

(b) Seize contracted uterus by fundus with full hand, fingers behind and thumb in front.

(c) Push slowly but firmly toward the pelvic outlet.

(2) Credé expression.

Same maneuver as above, except that the fundus is compressed between thumb and fingers while the downward movement is progressing.

Conditions for Credé expression:

(a) Uterus must be contracted.

(b) Uterus must be in median line.

(c) Bladder must be empty.

If not successful, wait ten minutes and then repeat maneuver. *Never* make traction on the cord. *Never* use ergot until uterus is empty.

If placenta does not come away within an hour, manual removal must be considered. In case of hæmorrhage, it must be removed at once.

Carefully inspect placenta and be sure it is complete. (See Post Partum Hæmorrhage, p. 251.)

When the patient is put to bed, the bloody sheets and towels are put to soak in cold water, and after several rinsings, may be sent to the laundry. *Drapings stained with faecal matter must be cleansed separately.*

## CHAPTER X

### THE NORMAL PUERPERIUM

The puerperium is the name given to the period succeeding the birth of the child as far as the time of the complete restoration of the genitals. It may last from six to ten weeks, or even longer if complicated.

When the labor is completed, the most urgent desire of the patient is for rest. She is thoroughly exhausted in nerves and body. A post partum chill may appear,—a slight shiver that may last a quarter of an hour. Since the pulse and temperature remain unaffected, this phenomenon may be regarded merely as a sign of prostration or nervous revulsion.

In the course of the first three days, the *temperature* may rise to 100° F. in a case entirely normal. It has no pathological significance unless persistent or increasing. The temperature should be taken night and morning, and in complicated cases every four hours. All temperatures over 100° F., after the initial rise and descent just described, must be regarded as septic.

The *pulse* does not rise with the temperature of the first three days, but remains firm or even falls a little. When the pulse rises and the temperature sinks, it means hæmorrhage.

The *urine* is usually increased for the first few days and then returns to the normal for that patient. The labor affects the patient like a surgical operation.

The *digestion* is disturbed. The appetite is gone, and

the stomach must be treated gently until its tone is restored. The body in repose is less urgent in its demands for food. Liquids in abundance form the staple diet for the first two days. For the next three days, semisolids may be added, and after the milk is well established, a general diet is desirable; but so long as the

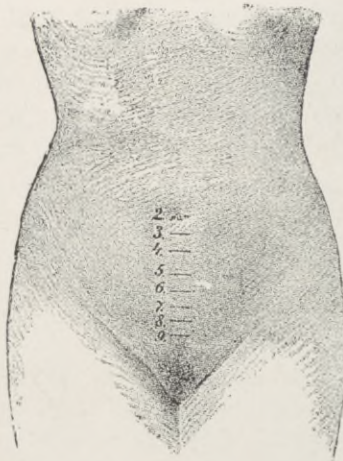


Fig. 70.—The progress of involution on the various days of the puerperium.  
(v. Winckel, from Knapp.)

mother nurses her child, the liquids must preponderate in most cases.

Meanwhile, certain changes are taking place in the pelvis that are highly important.

**Involution** is the process undergone by the uterus in returning to its normal nonpregnant state. This shrinkage can be followed abdominally and is registered by the nurse in the number of finger-breadths or centimeters above the symphysis pubis.

Edgar gives the rate of shrinkage as follows:

After delivery,	5.92 in. long, or 15.8 cm.
2nd day,	4.63 in. long, or 11.30 cm.
3rd day,	4.37 in. long, or 11.10 cm.
6th day,	3.42 in. long, or 8.48 cm.
8th day,	2.55 in. long, or 6.40 cm.
10th day,	2.22 in. long, or 5.60 cm.

The rate of involution not only varies greatly with different women, but varies much after the different labors of the same woman.

Ordinarily at the end of the first week the fundus should lie midway between the navel and the pubes, and should shrink rapidly thereafter.

The necessity for watching the rate of involution is imperative for a number of reasons. If involution is slow, or stops, it may indicate fatigue of the muscle from multiparity or over-distention (twins, hydramnios, etc.) or it may follow a post partum hæmorrhage. Subinvolution may also indicate infection, the retention of clots, or pieces of placenta. Subinvolution happens also when the woman gets up too soon or does not nurse her child. The nonfunction of the breasts delays the restoration of the mother's waistline, and diminishes the resistance of the child to disease.

**The binder** is objectionable to some doctors on the ground that it favors retroversion of the uterus during involution.

This would be a plausible theory when the uterus is high, if it were not that the vertebræ of the patient and the pelvic brim keep the uterus from being pushed out of its place and after the uterus descends into the pelvis the gentle pressure of the binder evenly distributed over the abdomen can not affect it appreciably. Furthermore, the uterus in involution shows a persistent tendency toward anteflexion and anteversion.

The binder is merely a girdle put on just tight enough

to hold in place the bandage that supports the perineal pads and to allow the patient more easily to grow accustomed to the sudden change in intraabdominal pressure which the delivery of the child creates. However, if the doctor objects to a binder, it may be left off with safety.

**The Lochia.**—When the placenta is delivered, the uterus normally closes down and all gross hæmorrhages cease; but for the next two weeks or possibly longer, a vaginal discharge continues. For the first few days it is hæmorrhagic in character and it is called lochia rubra, and consists mostly of fluid blood with occasional small clots. By the fourth day, usually it has become brown and thinner. It is now called lochia serosa. By the tenth day, it is yellowish-white, and is called lochia alba.

The lochia is the wastage from the shrinking uterus, and is made up of red blood corpuscles, epithelial cells, leucocytes, and pieces of broken-down decidua. The entire lining of the uterus is loosened, discharged and a new one formed during the puerperium. The lochia is regularly infected by bacteria in the vagina. If involution is slow, the lochial discharge may be prolonged.

**The After-Pains**—The puerperium is not infrequently accompanied by painful contractions of the uterus called after-pains. These are more common in multiparas and serve a useful purpose in maintaining a definite contraction of the uterus.

If the pains are at all severe, they are a suggestive symptom of the retention of blood clots, a fragment of placenta, or of membrane. This, of course, will occur either in a primipara or multipara. In all cases the after-pains must be differentiated from gas and from the pains of pelvic inflammation.

Gas pains can be relieved by hot spiced drinks, asa-fœtida and the high rectal tube.



**Subinvolution** is treated by the administration of fluid extract of ergot, in twenty to twenty-five drop doses, three or four times daily. This will bring about the discharge of the irritating fragment or clot, and the nurse can aid the process by gently massaging the uterus several times daily or by giving a hot vaginal douche. Codeine may be used for after-pains if absolutely necessary.

**Diet in Normal Cases.**—There is no restriction on the kind of food the patient may take, so long as she can digest it well and without gas. Acids or alkalies, cold or hot, rich or otherwise, fruits, meats or vegetables, all go to the formation of good milk if properly digested. The old idea that acids should not be eaten is fallacious. There is more acid in the stomach normally, than could be added in a meal made up entirely of citrus fruits. At the same time, the heavy foods should be avoided on account of the serious demand on the liver and kidneys in the absence of exercise.

On the other hand, if the breasts are engorged, the fluids must be reduced to a minimum, and a relatively dry diet enforced.

The patient loses about one-ninth of her previous body weight in the course of labor and the puerperium.

**The breasts** are made ready for lactation twelve hours after delivery by cleansing with sterile green soap and warm water and bathing in 50 per cent alcohol. Next, the nipple is attended to, and the infant is put to the breast.

The nipple is prepared by cleansing it with an applicator soaked in fresh boric acid solution, and after nursing, the same process is repeated. This is routine, whether the mother is in bed or walking about. In the latter case, the mother must be taught to care for her own breasts.

The child is put to the breast every three hours and given six feedings a day. This leaves a six hour interval at night, which is very necessary for the mother's rest and for the child. If the babe is feeble, seven or eight feedings in the twenty-four hours may be required for the first two weeks.

At first the breast secretes only a thick, yellowish viscid substance called colostrum, of which the child gets from a drachm to an ounce. Its protein content is high.

The irritation of the nipple by the child's mouth is begun as early as possible in order to stimulate the breasts to secrete milk and the uterus to contract, and thus aid involution and the preservation of the maternal figure.

The milk usually "comes in" on the third day and is accompanied by a sense of distention and moderate pains in the breasts. The glands may be hot, hard and swollen, but normally there is no rise of temperature with the inflow of the milk, except with nervous women who stand pain badly. There is no such thing as milk fever. If fever appears at this time, an infection must be suspected.

The engorgement of the glands may become so great that the nipples are drawn in and nothing is left for the child to grasp. If the engorgement becomes too painful, fluids are removed from the diet list, and saline cathartics administered, while ice packs are applied to both breasts. Heat should never be used *except* for the purpose of hastening suppuration.

This engorgement, or so-called "caking" of the breasts is not due to the milk, but to the infiltration of the connective tissue around the glands with serum and blood which stimulate the glands to secrete. The distention usually disappears in twenty-four or forty-eight hours, especially if the child is sturdy. Massage of the breasts

only increases their activity and tends to make the trouble worse.

The weight of the glands may be considerable and require the application of a light supporting breast-binder. Pillows under them will also give relief at times.

In putting the child to breast, the mother should lie on the side with the arm raised and the child is dropped into the hollow thus created, facing the mother (see Fig. 125). In this position the nipple will most easily and conveniently slip into the child's mouth. The child should nurse fifteen or twenty minutes and then be removed. The toilet of the nipple is made by cleansing with boric solution as previously described, and then placing not gauze but a piece of aseptic cotton cloth over it, after which the binder is readjusted. (See Breast Covers, p. 351.)

**The menstrual flow** ceases during lactation as a rule, but not invariably. The flow returns in from four to six weeks after delivery, if the child is not nursing, and about the same time after lactation ceases. There is a popular idea that conception can not occur during lactation, and many women injuriously prolong lactation in the hope of avoiding another child. The theory is fallacious and conception during lactation is not uncommon.

**The Bowels.**—A lying-in woman is regularly constipated. Lack of exercise, a nutritious diet, but one with a minimum of wastage, together with relaxed abdominal walls, all contribute to bring about a condition that is primarily due to the changes in intraabdominal pressure which follow the delivery. For weeks the intestines have been under pressure and irritation by the growing uterus, and when this is suddenly removed the intestines become sluggish.

On the morning of the second day the patient should

receive an ounce of castor oil. This dose, suspended in black coffee, beer, orange juice, or ginger ale can be taken by nearly everyone. In from four to six hours a normal saline, or soapsuds enema is given. The enema may be repeated daily, or if this is objectionable to the patient, the castor oil or Russian oil, may be given as a routine. Saline cathartics should not be used unless there is an oversupply of milk.

There is sometimes a good deal of gas following labor, which can be removed by the 1-2-3 enema (see Enema, p. 360). In giving enemas, the nurse must use great care to avoid touching or infecting an injured perineum.

Many women secrete less gas and are agreeably influenced mentally by a five grain pill of asafœtida taken thrice daily.

**Urination.**—One of the commonest difficulties after labor concerns micturition.

Owing to the swollen and bruised condition of the urethra and the nerves supplying the neck of the bladder, the usual stimuli do not act and the woman, conscious of a painful distention, is unable to pass water. The helplessness is increased by her position in bed.

The nurse must make every effort to have the bladder emptied naturally. The process is aided by letting the water run from the faucet into the toilet basin, by using hot applications to bladder or vulva, by allowing warm, sterile water to run down over the vulva and perineum, by an enema, by putting smelling salts to the nose, by using slight pressure over the bladder, or by having the patient sit up on the bedpan.

If these measures fail and moral suasion is fruitless, the bladder must be catheterized at the end of twelve hours. The two dangers of catheterization are injury to mucous membrane, and infection. Many cases of cys-

titis have resulted from an unclean catheter or the improper use of a sterile instrument.

To catheterize a patient, she is first given aseptic care during which particular attention is paid to the meatus. This should be cleansed with an applicator dipped in a solution of boric acid. Next, the nurse prepares her hands by scrubbing ten minutes in hot running water with sterile nail brush and green soap. The catheter either of soft rubber or glass, is boiled for fifteen minutes and passed, not by touch, but by sight, and the flow is received in a clean basin and the amount recorded. As soon as the urine ceases to flow freely, the tip of the index finger is placed tightly over the end of the catheter and the instrument is gently withdrawn. The finger is placed over the end of the catheter not only to avoid the dripping of urine as it is removed, but especially to prevent the disagreeable sensations produced by the inrush of air.

Usually one catheterization is sufficient, and every time the bladder fills, the nurse must take the time and trouble to make the patient urinate spontaneously, if possible, for some women form a catheter habit, from which it is difficult to break them. After natural urination and after catheterization, the aseptic care should be repeated.

**The Genitals.**—The vulvar pads should be changed as often as they are soiled. Four a day is an average number, and six or eight in the first three days is not unusual. Every time the pad is changed, the nurse should give aseptic care, and extra attention whenever the bowels and bladder are emptied.

The dried secretions should be washed off with sterile sponges, wiping always toward the rectum and throwing away the sponge. Smegma collects in the folds of the labia and about the clitoris. This should be care-

fully sponged away. If it becomes dry and hard, oil or albolene will soften it and facilitate its removal. Plenty of soap and warm water should be used, then with a pitcher or douche point, the whole area is irrigated with a solution of lysol 1 per cent. Especial care is given to the stitches if any are present. No traction must be made on the ends of the sutures, and if unusual soreness is complained of, the doctor should inspect them at his next visit.

The nurse should be careful not to get lochia on her hands as the discharge contains germs which she may carry to herself, to the baby, or to the patient's breasts or eyes.

Painful swelling of the vulva, or edema of the rectal protrusion may be relieved by hot borie dressings or by ice bags to the anus.

**The vaginal douche** is rarely employed at present except under specific indications.

If the involution is slow, it is safer to use ergot by mouth, rather than the hot vaginal douche, as sometimes recommended. The douche is a frequent source of infection, as well as a useless procedure. Nevertheless, a dainty woman gets much comfort mentally, as well as physically, if she is kept clean and free from odors; hence if the lochial discharge becomes offensive on the fifth day or sixth day, as sometimes happens, a single hot vaginal douche may be permitted. A 1:5000 solution of potassium permanganate, or a teaspoonful of formaldehyde to a quart of water may be used.

**Rest.**—Since the patient will be in bed from eight days to two weeks in normal cases, she must be made as happy and comfortable as possible, and nothing contributes so much to her satisfaction as a cheerful, competent nurse. Her mind is at ease about herself and her

child, and the companionship of the nurse can be made one of the pleasantest recollections of her illness.

Any patient who is at all reasonable can be managed by a tactful nurse without the consciousness of being opposed or directed. Gossip, hospital stories, criticism of other cases, other nurses, or of doctors should be avoided. The patient is deeply interested in her own case, and the private troubles of the nurse do not concern her nor enlist her attention for more than a few polite but unpleasant moments.

The nerves of the patient are highly sensitized, and therefore she should sleep as much as possible at night, and take an additional nap in the afternoon. Only the members of the family should be allowed to see the patient the first week, and they but for a short time. It takes the strength of the patient unnecessarily to see guests even though they be close friends. Importunate visitors may be pacified frequently by a view of the baby. The patient must be spared all household responsibilities, and if necessary, the nurse must take charge. Tact must be used to avoid being dictatorial, either to family or servants. If anything unusual arises, the nurse must show no surprise, annoyance, or bewilderment. Everything is attended to quietly, firmly, and without friction.

**Getting Up.**—It is a tradition that the woman is lazy who does not get out of bed by the ninth day.

There are three factors to be considered, the progressive involution of the uterus, the strength of the patient, and the presence of stitches. Involution may be complete on the fifth day, but the prostration from the labor may make the woman indifferent to arising. She may be strong enough to rise on the third day, but the uterus is large and heavy, and the erect position will put an unnecessary strain on the supports which may retard

involution and cause displacement or disease later. Also, it is not desirable for a woman to sit up until her perineum is well on the road to restoration.

In general, the woman should not get up until the uterus has gone down into the pelvis and is nonpalpable. If this is the case on the fifth day and she feels strong, she may get up. If she is not strong, time will be saved by staying in bed until her vigor returns, whether it is ten days or twenty.

Getting up may be followed by a return of the bloody discharge. This may come from subinvolution, from a relaxed and flabby uterus, from a cervical tear, or from change in posture.

If there has been a retroversion before pregnancy, lying prone with an occasional knee-chest position for a few moments will aid. Massage and passive exercises while in bed will aid the patient to recover and to maintain her strength. Even after she is up and about, she should lie down frequently during the day and always when nursing the babe, until she feels quite normal again. The corset may be put on when involution is complete.

For the hospital the following standing orders may be followed:

#### Standing Orders—Puerperium

##### *Breasts:*

1. Prepare for lactation 12 hours after delivery.
  - (a) Clean breasts and nipples with soapy water and green soap.
  - (b) Sponge with sterile water.
  - (c) Sponge with boric solution.
  - (d) Sterile compresses over nipples and adjust binder.
2. Babe to breast immediately after breast preparation.
3. Every morning apply fresh compresses over nipples and oftener, if necessary.
4. Cleanse nipples with boric solution (use applicator) before and after each nursing.



To dry up milk:

Restrict fluids; give saline cathartics; apply ice bags to breasts, as needed; for pain give codeine solution  $\frac{1}{4}$  to  $\frac{1}{2}$  gr. hypodermically, if necessary.

*Do not massage, do not bind, do not pump. Let breasts alone.*

When breast is inflamed:

Apply ice bags constantly until pain subsides and temperature goes down. Watch for signs of suppuration.

*Genitals:*

1. S.S. enema each morning, followed by aseptic care.  
 Cleanse from above downward—1 per cent solution of lysol and cotton pledgets.  
     1 pledget for each side.  
     1 pledget for center.  
     1 pledget for rectum (last).  
 External douche of sterile water.  
 Dry sterile pad.
2. Aseptic care following all bowel movements and urination.

*Routine:*

1. Record pulse and temperature twice a day, unless otherwise ordered.
2. Bladder must be emptied in twelve hours. If all persuasive means fail (may sit up in bed), catheterize.
3. Make daily records of conditions of uterus (firmness and height), breasts and nipples.
4. No vaginal douche unless ordered.
5. Diet: liquid two days; semisolid two days; then general.
6. Watch for hæmorrhage.
7. Keep uterus firm by occasional massage.
8. All cases to have castor oil, 1 ounce within thirty-six hours after delivery (before noon).
9. Woman may get up as soon as uterus can not be felt above pubes, if there is no contraindication.

The history sheet should be kept accurately and should show every incident in the course of the lying-in period.

The condition of the bowels, bladder, and lochia, the temperature, pulse and respiration and the height of the fundus above the symphysis from day to day must be set down in fingerbreadths or centimeters.

In the hospital, the following system will be found useful in establishing a routine for labor.

## Nurse's Record

*First Stage.*

1. When pains began.
2. Frequency and duration of pains.
3. Character vaginal discharge.
4. Time membranes ruptured.
  - (a) Artificial.
  - (b) Spontaneous.

*Second Stage.*

1. Time second stage began and ended.
2. Anæsthetic.
3. Mode of delivery.
4. Who delivered.
5. Sex of child.
  - (a) Living.
  - (b) Dead.
6. Perineum.
  - (a) Condition.
  - (b) Repair.

*Third Stage.*

1. Method.
  - (a) Spontaneous.
  - (b) Early expression.
  - (c) Credé expression.
  - (d) Manual removal.
2. Placenta delivery.
  - (a) Time.
  - (b) Size.
  - (c) Complete or incomplete.
  - (d) Length of cord.
3. Note.
  - (a) Hæmorrhage.
  - (b) Quantity.
  - (c) Color.
  - (d) Clots.

General condition—was case number put on mother and child?

Other treatments.

Medications.

Condition of uterus.

Temperature, pulse and respiration before leaving delivery room.

Signed .....

(Nurse's Name.)

## CHAPTER XI

### UNUSUAL PRESENTATIONS AND POSITIONS

**Breech Presentation.**—The pelvic pole enters the inlet first, once in thirty cases and more commonly in primiparas than otherwise.

*Etiology.*—Anything that interferes with or deranges the laws of normal gestation will predispose to, or produce this anomaly.

Thus, if the head is too large, as in hydrocephalus, or if the fœtus is too movable, as in hydramnios, or if an obstacle, like placenta previa, contracted pelvis or tumors prevent the proper approach of the head to the inlet, the mechanism will be disturbed and a breech or possibly a shoulder presentation will result.

Abnormal flaccidity of the uterine or abdominal walls, prematurity or twins also contribute definitely to its occurrence.

*The attitude* of the child generally retains its normal aspect of complete flexion. This pose, however, is not maintained invariably for on occasion the buttocks and genitals may rest upon the inlet while one or both feet may be extended on the thighs and lie beside the neck, or the thighs may be extended while the knees remain flexed, and what is known as a knee presentation, or if the foot comes down, a footling presentation results.

*Positions.*—The sacrum is the most prominent bony landmark of the breech, hence the positions are named from the relation this bone bears to the four quadrants of the inlet.

We have therefore in their order of frequency the

following designations: Left-sacro-anterior, wherein the sacrum lies to the left of the median line of the mother's body and in front; right-sacro-anterior, wherein the sa-

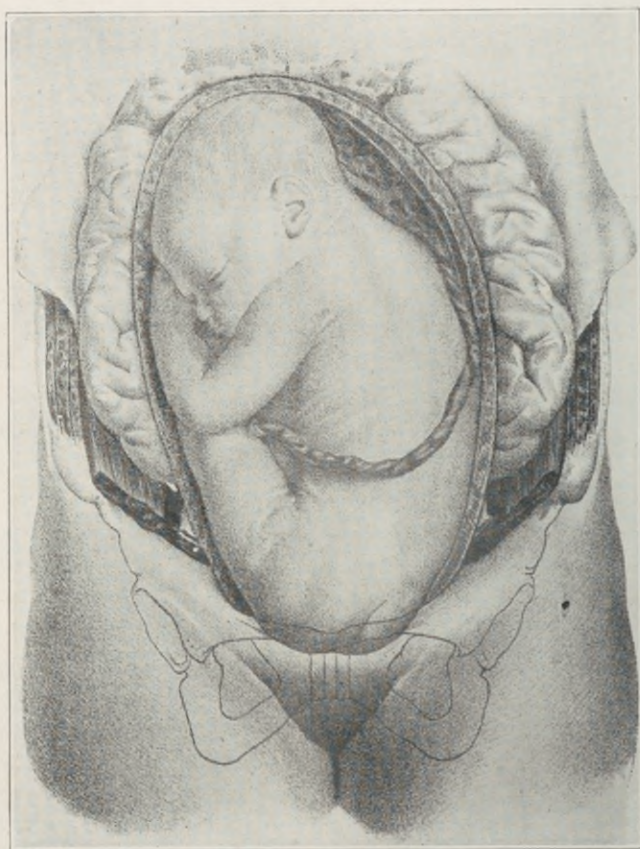


Fig. 71.—The breech. Left-sacro-anterior position. (Lenoir and Tarnier.)

crum lies to the right and in front; right-sacro-posterior, wherein the bone lies near the mother's vertebral column, and on the right side; and the left-sacro-posterior posi-

tion, wherein the bone occupies a corresponding place on the left side.

*Diagnosis.*—The recognition of this presentation is



Fig. 72.—The breech. Left-sacro-posterior position. (Lenoir and Tarnier.)

most easily secured by external abdominal palpation in pregnancy, which may be reinforced during labor by the internal examination.

Externally the palpating fingers at the pelvic brim will note the absence of the hard, round head, and feel a mass, softer, quite irregular in shape, and less defined than customary. Movements also may be appreciated that would be too far down in the uterus if the head was presenting.

Next the hard, spherical tumor of the head can be outlined somewhere in the fundus, and the heart tones, instead of being below the umbilicus will be on the same level or even higher.

Vaginally the cervix is not filled out, the presenting part does not come down, but after labor has begun the distinctive features of the breech gradually become more evident, as they are driven into the pelvis.

One or both feet, or the buttocks, may be recognized. The examining finger may possibly enter the anus and be stained with meconium or pinched by the sphincter, which differentiates this orifice from the mouth.

One after another the characteristic landmarks appear until the diagnosis can not be doubtful. As soon as the sacrum is found or the legs definitely placed, the position can be named.

*Mechanism.*—The hips always enter the inlet in one of the oblique diameters and the back is turned to the same part of the uterine wall as in the corresponding vertex positions.

The acts described in the mechanism for vertex deliveries show a somewhat different order. Descent is first, then comes internal anterior rotation, which brings the anterior hip under the symphysis and its delivery is quickly followed by the posterior hip, which rolls out over the perineum.

The body advances, as a rule, with the back toward the front of the mother. The shoulders with arms folded

move under the pubic arch and then the head delivers in a state of flexion. The head, of course, has no caput and it is not moulded.

This mechanism may be greatly impeded or complicated at any stage of the movement. The advance may be retarded to a pathological degree, the belly may be large and as it passes along the canal one or both arms may be stripped up alongside the head or even into the back of the neck. The head may be arrested at the inlet by the arms, by its degree of deflexion, or by pelvic contraction.

The rotation may not take place, or it may be abnormal, and the belly of the child look forward toward the mother's. Any of these variations adds further to the difficulty of the labor and to the danger of the partners in the event.

Artificial aid may be required which brings with it the possibility of sepsis.

The foetal mortality which averages five per cent is due mostly to asphyxiation. Interference with the supply of oxygen begins as soon as the cord passes the vulva and the child must be delivered in eight minutes from that time, or perish. Partial detachment of the placenta may also cut off the oxygen to a fatal degree, and the child may be unable to breathe when born on account of mucus sucked into the trachea by premature efforts at respiration.

Minor accidents also occur, such as fractures, dislocations, and paralysis from injury to the nerve trunks.

*Management.*—In the interest of the child, this presentation is occasionally converted into a vertex by external version during the last weeks of pregnancy or in labor before the membranes have ruptured. It is difficult, however, to maintain the vertex over the inlet.

The woman must be kept quiet in a horizontal posture and long roller splints applied to the side of the child in utero and bound on.

In primiparas, this is nearly impossible, and it is wiser, in the absence of some great necessity for changing the presentation to warn the parents of the conditions and dangers and let them share in the responsibility.

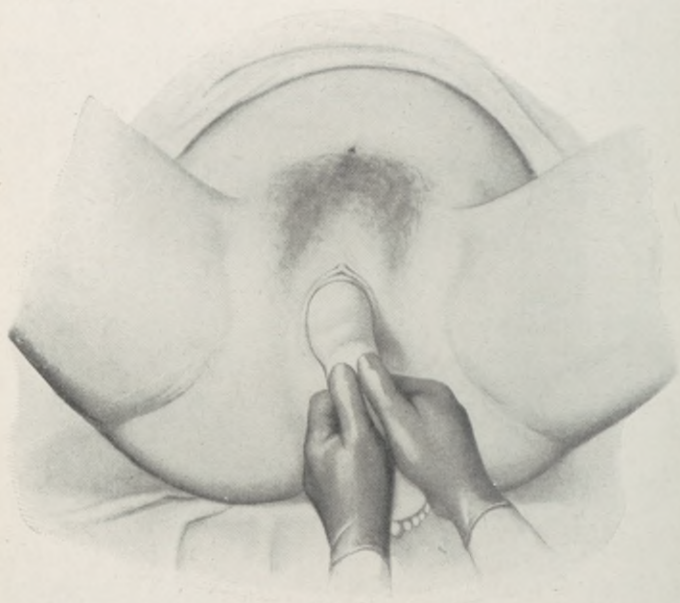


Fig. 73.—Extraction of the breech. Traction on one leg. (Hammerschlag.)

When the labor begins, the bag of waters must be kept from rupture as long as possible and when it finally breaks, an internal examination should be made to see if the cord has come down. If this happens it may be necessary to expedite the delivery by external assistance.



The doctor brings down a foot, if it is not already down, or pulls on the breech until the feet drop out. Compression of the cord must be always in mind. It is always compressed after the umbilicus has passed the navel. The shoulders are delivered by seizing the feet with the operating hand and swinging the body out of the way. This brings the posterior shoulder, which

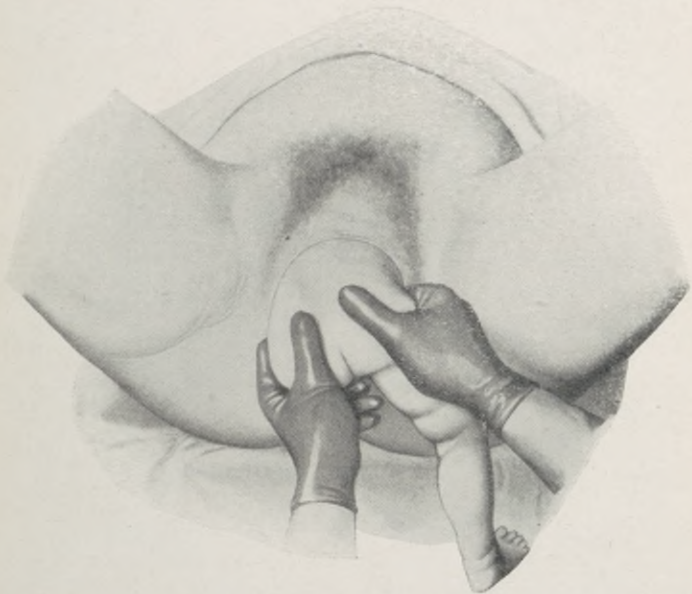


Fig. 74.—Breech delivery. Extraction of the trunk by pulling on the hips. (Hammerschlag.)

should be first, into the hollow of the pelvis. Extraction is then completed by what is called the Smellie-Veit maneuver. The child is put astride one arm, the first finger of which is hooked into the child's mouth to maintain flexion. The fingers of the other hand then grasp the shoulders of the child astride the back of the neck

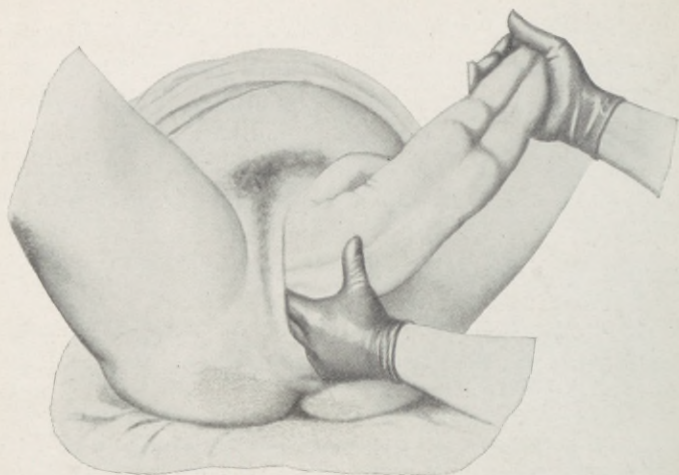


Fig. 75.—Breech delivery. Delivering the shoulder. The body is swung strongly upward and outward to bring posterior shoulder into the pelvis. (Hammerschlag.)

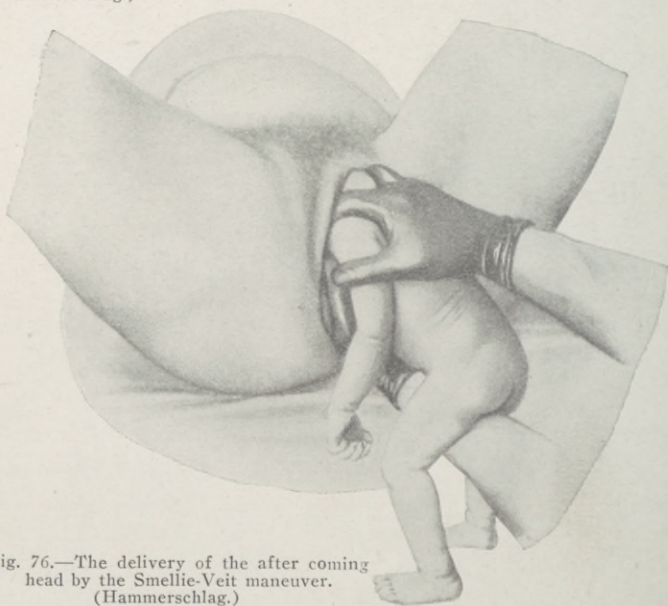


Fig. 76.—The delivery of the after coming head by the Smellie-Veit maneuver. (Hammerschlag.)

and traction is made downward in the axis of the inlet until the head slips into the excavation.

If the head is delayed at the inlet, it may be necessary to put the woman in the Walcher position (q. v.) and for the nurse to use the Wiegand compression

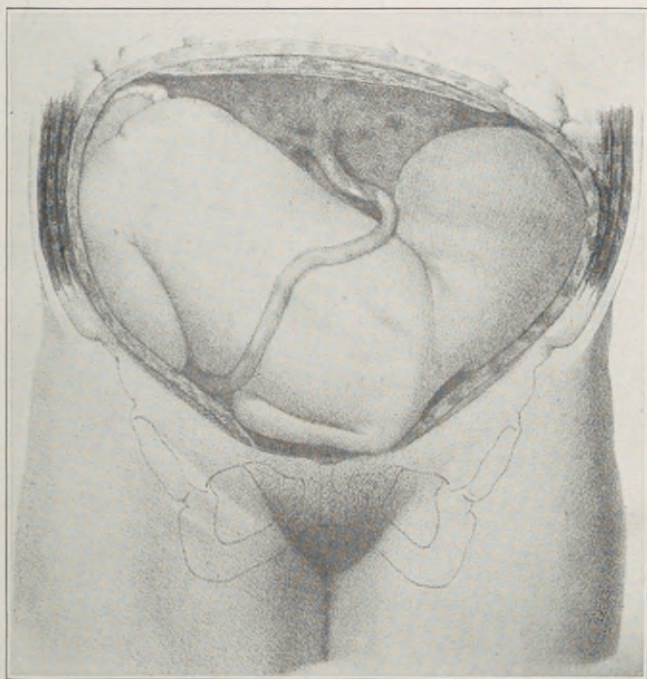


Fig. 77.—Shoulder presentation. Left-scapulo-anterior position. (Lenoir and Tarnier.)

(q. v.). The feet *must not* be fastened in stirrups for breech cases.

Forceps are *not* recommended for application to the breech as they do not fit and are liable to slip off and injure both child and mother. The fingers are best.

Forceps are *not* recommended for the after-coming head unless the child is dead. If the child lives, the Smellie-Veit is more successful; and if the child dies, the cranioclast, if possible, will save the mother much suffering and avoid some injury to the tissues.

**Transverse or Shoulder Presentations.**—These are cases in which the long axis of the child lies directly across or obliquely across the long axis of the uterus.

The shoulder (scapula) is the bony landmark, and the part which most frequently impends over the inlet. This presentation probably occurs once in two hundred labors.

It is due to the same conditions that were given for breech cases; namely, weak abdominal or uterine muscles, pelvic contraction, placenta previa, hydramnios, and twins.

It is easily recognized in pregnancy, and must not be neglected, for it is impossible of delivery without first changing it into a longitudinal presentation. If this correction is not done, rupture of the uterus is liable to occur, with the consequent death of both mother and child.

The *treatment* is invariably version.

**Face and Brow Presentations.**—The face presents once in about three hundred labors. In this case, the head is completely extended so that the occiput rests against the back of the neck. The trunk and spine are straightened out while the legs and arms remain in the normal attitude of flexion.

The causes of these anomalies must be sought in those conditions which bring about the deflexion of the chin. The most common are pelvic contraction, large child,

placenta previa, hydramnios, goiter, anencephalus and multiparity.

Face positions take their names from the location of

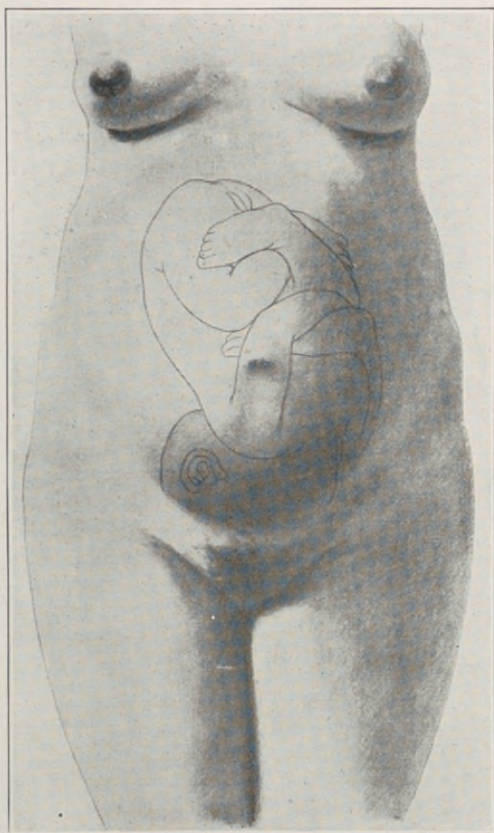


Fig. 78.—Face presentation. (Bumm.)

the chin (mentum—Latin). Thus the most frequent face position is the right-mento-posterior.

The diagnosis is not easy and may not be conclusive

until the bony prominences of the face, such as the nose and orbital ridges can be distinguished by vaginal examination.

The delivery is protracted from three to five hours beyond the average by this complication, and the mortality is higher both for mother and child. The face is badly swollen and disfigured, but the normal condition of the tissues will be restored by the end of a week.

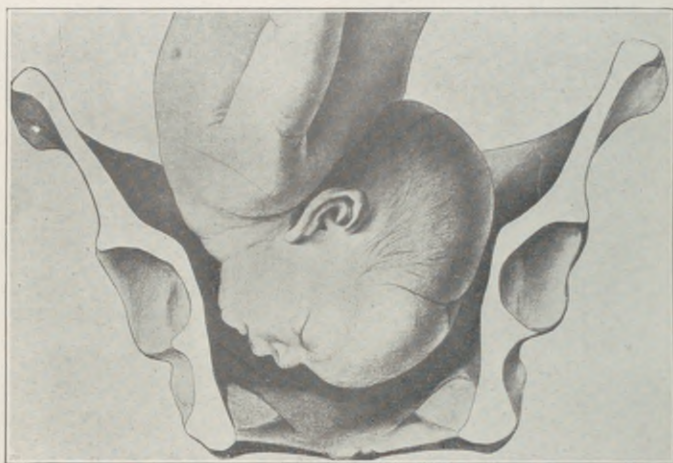


Fig. 79.—Descent of the chin in face presentation. (Bumm.)

Most face cases terminate spontaneously, but operative interference is not infrequent on account of danger to mother or child.

Version or manual correction of the presentation may be done before engagement.

Forceps is the operation of choice after the head is fixed in the pelvis, but it may be necessary to precede the delivery by a preparatory pubiotomy, or in case of failure, to do a craniotomy on the dead child.

If the chin does not rotate forward under the symphysis, the labor is impossible without pubiotomy or the destruction of the child. In general, the case should be left to nature unless some definite indication to interfere develops.

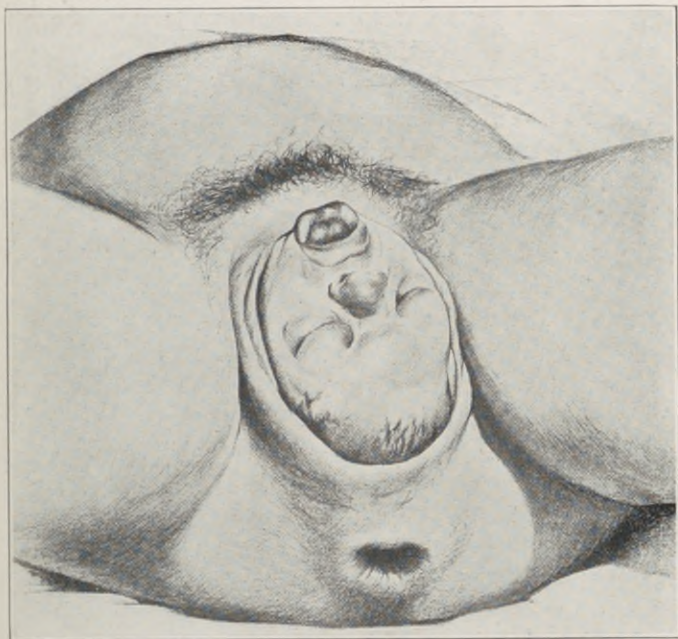


Fig. 80.—Delivery in face presentation. (Bumm.)

**The brow** presents much more rarely than the face, possibly once in a thousand labors. It is due to the same conditions as bring about the presentation of the face. The mortality for both mother and child is higher than in face cases. The whole labor is harder and longer, besides being more dangerous to life and to tissues.

This presentation, if recognized before the head is

fixed, should be converted into a breech by version, but after the head comes down, it may be possible by hand or forceps to deliver either as a face or as an occipito-posterior, but otherwise the cranioclast must be considered.

**Occipito-posterior position** is the name given to vertex cases wherein the occiput lies in one or the other of the two posterior quadrants of the pelvic inlet.

These labors are necessarily prolonged, both in the first and second stages, because the mechanism of delivery is deranged by the larger diameters brought into relation with the bony canal and by the ineffectiveness of the contractions.

The pains in the second stage may become violent and extremely painful, but the labor does not advance appreciably. After a little experience, mere observation of the course of the labor will cause the suspicion to arise in the mind of a competent nurse that the occiput is posterior. The diagnosis will be cleared up by the doctor's internal examination, which shows the large fontanelle anterior and the sagittal suture running backward.

The head is partially deflexed and it may not be possible at first to find the small fontanelle.

The position terminates by delivery uncorrected, by spontaneous rotation into an anterior position, or is corrected by the doctor.

Correction should not be attempted until it is apparent that the anomaly will not right itself, which it will do in four cases out of five.

If the correction is attempted the extraction should follow soon. A competent man will not subject his patient to two separate operations and two anæsthetic dangers when one will serve.



## CHAPTER XII

### OPERATIONS

Complications during labor may arise from abnormal positions of the head, such as face or brow; from abnormal presentations of the child, such as breech, transverse or shoulder; from twin labors; or from prolapse of a part like the foot, arm or cord.

The mother may be responsible for some of these abnormalities through having a contracted pelvis, a rigid os, or a rigid pelvic floor.

The uterus, too, may functionate abnormally by acting too vigorously, as in precipitate labor, or too slowly, as in uterine inertia. The membranes may rupture prematurely and produce a dry birth.

There may be hæmorrhages before labor (*ante partum hæmorrhage*) during labor (*intra partum*), and after labor (*post partum hæmorrhage*), or the labor may be preceded, accompanied, or followed by that extreme example of toxæmia known as eclampsia.

Face and brow presentations are rare and come to the attention of the nurse only when an operation is required for their relief. Further conditions may arise, such as danger to mother or child, which demand an acceleration of the labor.

If the head is engaged, forceps is the operation most commonly undertaken, and if not engaged, the problem may be solved either by an early version and extraction or by forceps later. The dangers to the mother are not usually difficult to diagnose if the case has been followed carefully.

Signs of danger to child must be looked for constantly. Such are:

(a) Alteration of the heart tones.

(b) Retardation of pulse in cord between pains.

(c) Escape of meconium is *not* significant unless occurring in the pain-free interval, when it may signify hypercarbonization of blood and a threat of asphyxiation.

The preliminaries for the performance of these operations may now be described, and the indications and conditions briefly tabulated.

The *preparation* should be standardized so that the same set-up of the room will do for all of the major obstetrical operations, except Cæsarean section.

The kitchen table is generally regarded as a satisfactory operating table. Its length is sufficient for delivery when the legs are doubled up. The table should be covered with a blanket or comfort on which is laid a clean sheet. A rubber blanket or piece of oil cloth is put on, so folded above the place for the patient's hips, and so pinned at the sides, that all drainage will flow off into a bucket or jar at the foot.

In front of the table is placed a straight-backed chair with flat seat. To the right of the operator, as he faces the table, stands a bench, or two chairs, side by side; or, if possible, another table. This is covered with a clean sheet for the reception of the instruments. To the operator's left, another table similarly prepared carries the solutions, sponges, etc. Every operation for delivery should have tape and cord scissors within easy reach, as well as facilities for the resuscitation of the child.

The light should come from behind the operator and fall full upon the field of operation. The room should be warm.

The patient is laid upon the table and her knees elevated in the exaggerated lithotomy position. If there are assistants enough, one can stand on either side and hold a knee, if not, a sheet sling can be made



Fig. 81.—Patient draped for operative delivery in exaggerated lithotomy position.

and slung round the patient's shoulders and tied to the knees as previously described.

An anæsthetic will be required. If a doctor can not be had, this duty will fall to the nurse.

A sterile douche bag hangs near the table. A bath tub of hot water must be provided and a tracheal cath-

eter must be ready for the removal of mucus from the child's windpipe. An abundance of hot and cold sterile water must not be overlooked. In the hospital the following synopsis for the placing of the linen may be found useful:

### **Sterile Linen for Operative Case.—**

Bring patient to foot of bed.

Put in the stirrups. (For breech deliveries *do not* use stirrups.)

Same order as for normal case except that feet are put in stirrups instead of on bed.



Fig. 82.—Dorsal position when assistants are available. (Hammerschlag.)  
(Patient should be covered and assistants gloved and gowned.)

Sterile sheet under patient extends now from basin under bed to buttocks.

Combination pad over field of operation.

Sterile sheet over abdomen.

The genitals of the patient are now cleansed with all care and attention described for labor. If this has been done within an hour, she need only be sponged off thoroughly with lysol solution (1 per cent). The feet and legs are covered with stockings, the body

kept warm, and protected by sheets and blankets, if necessary.

*Every* operative delivery is preceded by catheterization.

All instruments are boiled for fifteen minutes and brought to the table in the same container in which they are sterilized. The hot water has been poured off and a cool, weak solution of lysol (0.5 per cent) added.

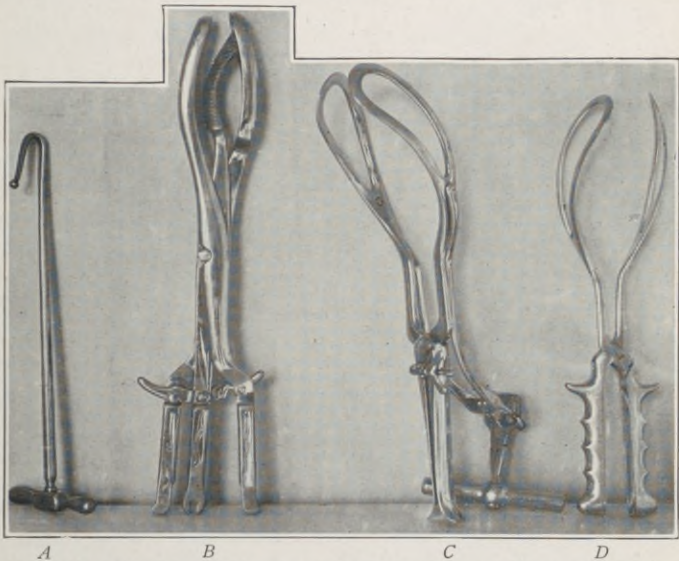


Fig. 83.—Instruments for artificial delivery of the head. *A*, Braun's blunt hook; *B*, Cranioclast (Auvard); *C*, Axis traction forceps (Webster); *D*, Low forceps (Simpson).

**Forceps.**—Before using forceps it should be determined that the woman can not deliver the child unaided, or can not be permitted to do so without too great expenditure of physical and nervous energy. The exact conditions must be recognized as to the location and position of the head, the condition of the foetal

heart tones and the size of the pelvis. When the head is high up, the axis-traction instrument is employed and patient put in Walcher's position for the traction.

Axis traction forceps are extremely dangerous to mother and child, and should be avoided wherever possible.

The following instruments are required:

- The obstetric forceps.
- 2 eight-inch forceps.
- 6 artery forceps.
- 1 vulsellum forceps.
- 1 tissue forceps.
- 1 needle forceps and 6 needles.
- 2 vaginal retractors.
- 1 pair dressing forceps.
- 1 douche point.
- 1 silver catheter.
- Suture material—both catgut and silkworm gut.

Besides these instruments, the nurse will also have solution basins as described for normal labor. For operations outside of hospitals, the nurse need not be clean, as her duties will consist for the most part in changing solutions, refilling basins, handing towels, etc., all of which can be done with sterile forceps.

The following summary may be serviceable for advanced study or reference:

#### PREPARATION.—

Thorough asepsis, both subjective and objective.

Patient should be pulled down to the foot of the labor bed with feet in the stirrups, or put upon the kitchen table or across the bed with the legs held in the lithotomy position. (For breech cases, legs should not be fastened.)

Bladder and rectum must be empty.

Anæsthetic is necessary.

The position of the head must be accurately known.

Facilities for the treatment of asphyxia neonatorum must be at hand.

#### CONDITIONS.—

Cervix effaced and os dilated, except when maternal or fetal life is threatened.

Bag of waters must be ruptured.  
 The head must be engaged.  
 The child should be living.

## INDICATIONS.—

Insufficiency of the powers of labor.  
 Deep transverse arrest of the head.  
 Complications in labor, such as:  
   Eclampsia.  
   Fever.  
   Acute or chronic disease.  
   Hernia—especially if incarcerated.  
   Placenta previa.  
   Prolapse of the cord.  
   Face and brow presentations.  
   Contracted pelvis.  
   Occipito-posterior positions.

## DANGERS FROM FORCEPS.—

*Injuries to Child.*—Overcompression, especially with axis traction forceps or in contracted pelvis.  
 Crushing of soft parts, or such lesions as abrasions, pressure marks, hæmatomata, swelling of face and eyelids.  
 Bone injuries: Spoon-shaped depression where the head has been dragged through a narrow inlet; fissures in the parietal or frontal bones; fractures. When axis traction forceps are applied antero-posteriorly, the occipital bone may be sprung inwards until it cuts the medulla.  
 Compression of the cord, especially if it is around the neck.  
 Hæmorrhage from the middle meningeal artery.  
   Injury to eye.  
   Erb's paralysis.  
   Laceration of ears when the forceps are removed.  
   Facial paralysis from pressure of the blade.

*Injury to Mothers.*—

Infection.  
 Improper application of the blades *outside* the cervix uteri.  
 Soft parts torn by too rapid extraction. When os is not dilated, it is first pulled down and then torn. The tear may extend into the vaginal vault. Fistulæ may be produced.  
 Prolapse of the uterus from prolonged traction.  
 Vaginal tears from the blades or from malplaced head.  
 Slipping of blades. Traction must be *not against* the symphysis, but down.

The forceps commonly used in this country (Simpson or Elliott) are so made that the left blade must be introduced first on account of the lock.

The mortality for the child in forceps cases is about six per cent.

The axis traction instrument is used but seldom by good



Fig. 84.—Forceps operation. The left blade, in the left hand, is introduced first into the left side of the mother so that the curve of the blade fits the child's head (inside the cervix). (Hammerschlag.)

obstetricians, since the danger to mother and child in this operation is very serious and it should be reserved for emergencies of exceptional character. Pubiotomy may precede the operation with advantage in many cases. Asphyxia of the child and maternal hæmorrhage must be prepared for.



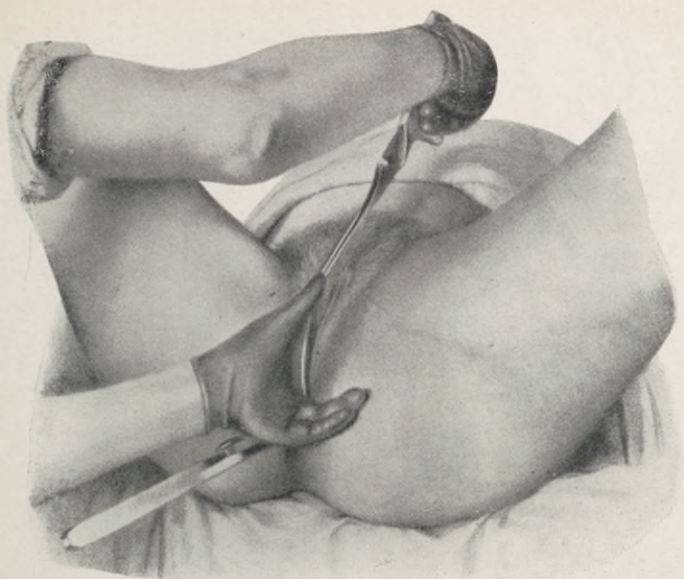


Fig. 85.—Forceps operation. The introduction of the right blade. (Hammerschlag.)

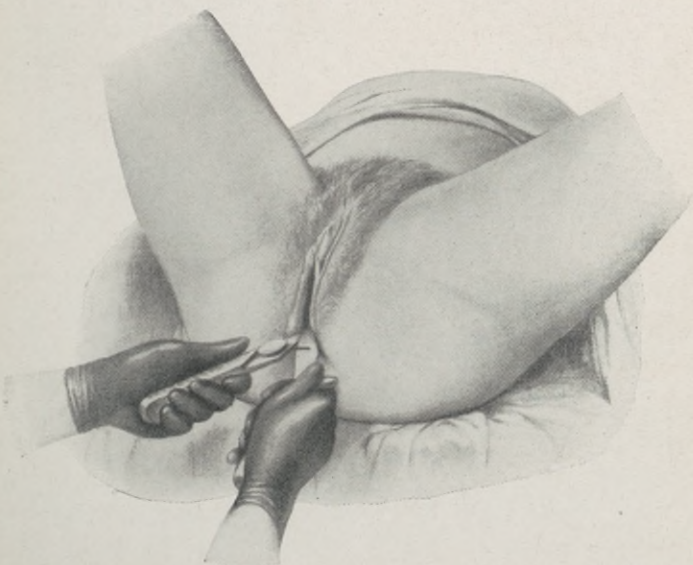


Fig. 86.—Forceps operation. Locking the handles. (Hammerschlag.)

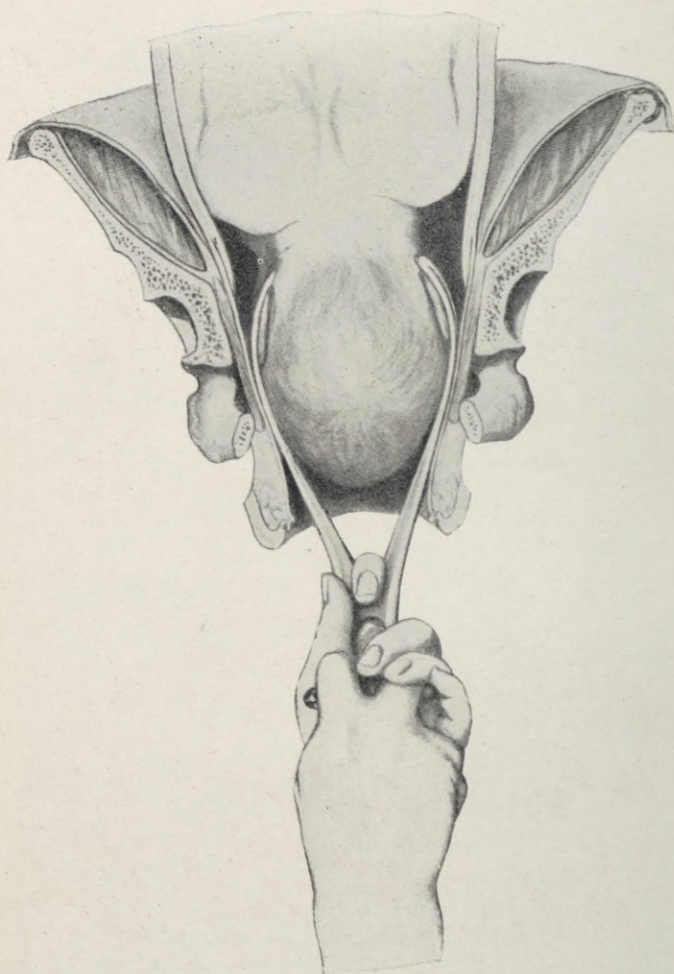


Fig. 87.—Forceps operation. The way the blades should grasp the foetal head. (Hammerschlag.)



Fig. 88.—Forceps operation. Traction on the handles. (Hammerschlag.)

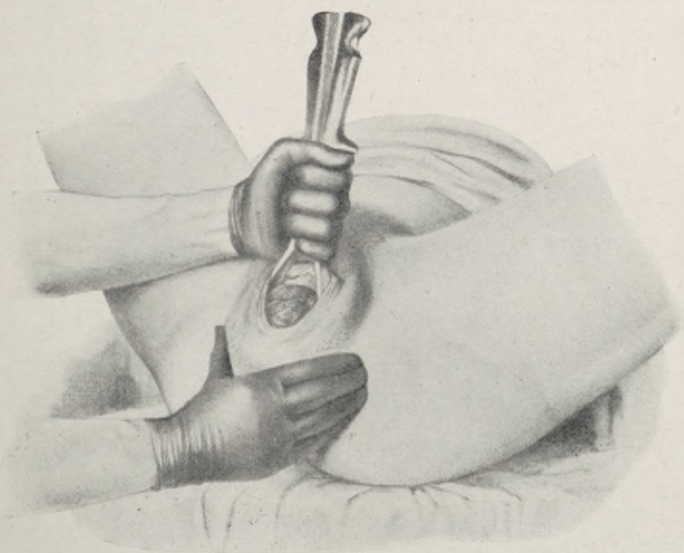


Fig. 89.—Forceps operation. The delivery of the head. (Hammerschlag.)



Fig. 90.—Version. Seizing a foot. (Hammerschlag.)

**Version (Turning).**—Version is a maneuver for altering the presentation of the child while it is still in the uterus. A vertex may be converted into a breech, a breech into a vertex or a transverse into either a vertex or a breech.

Version usually means that a transverse or a vertex

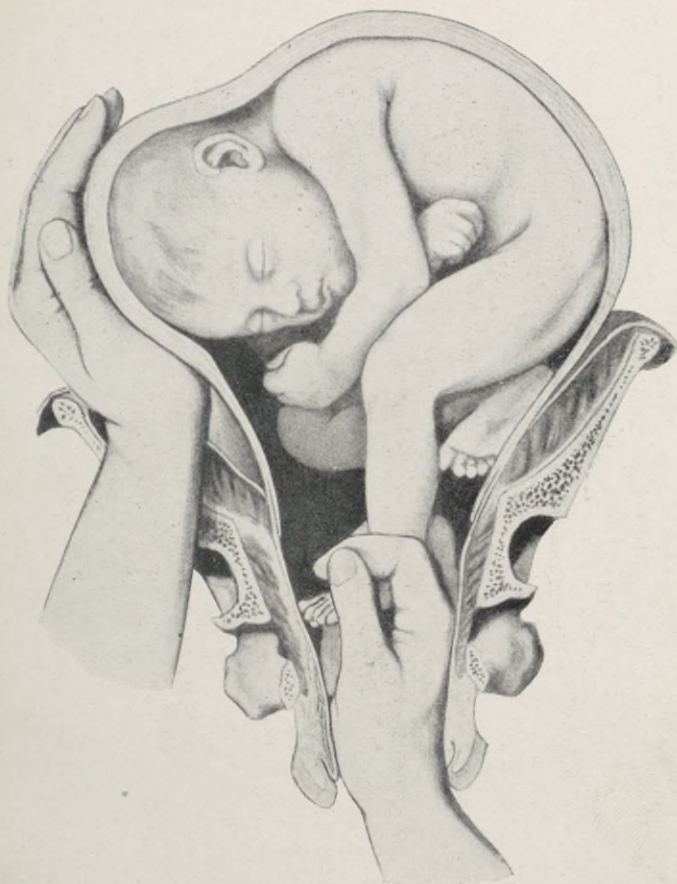


Fig. 91.—Version. The child rotates as pressure is made upon the head and traction upon the foot. (Hammerschlag.)

presentation is changed into a breech and is followed by the extraction of the child. The operation is serious and not to be undertaken without definite indications. There is always the risk of sepsis and rupture of the uterus as well as a high probability of a dead child.

Perineorrhaphy is, if anything, more frequent after this operation than after forceps.

PREPARATIONS.—The room and patient are arranged as for forceps, except that the stirrups can not be put in. The legs must be held by assistants, for the delivery of

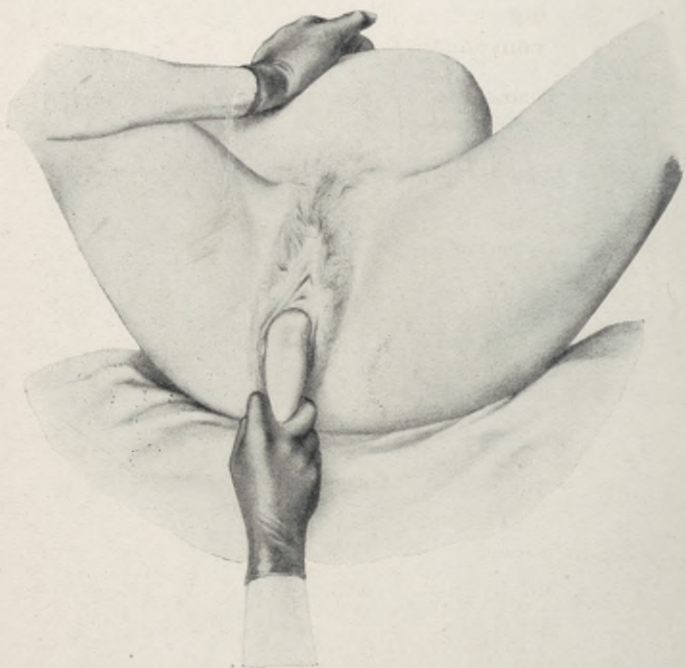


Fig. 92.—Version is complete when the knee appears at the vulva.  
(Hammerschlag.)

the aftercoming head may be complicated and require the Walcher position, which can not be quickly obtained if the legs are fast. Only eight minutes are allowed for the delivery of the child after the navel passes the vulva, if it is expected to live.

The bladder and rectum must be empty.  
Asepsis must be rigid and both subjective and objective.  
The dorsal position on a table is imperative.  
The diagnosis must be accurate and the anæsthesia carried to the surgical degree.  
Facilities for treating asphyxia neonatorum must be provided.

The following summary of the indications and conditions may be convenient for reference.

INDICATIONS.—Contracted pelvis. (Consider pubiotomy.)

Abnormal position of the head. (Face position with chin posterior.)

Prolapse of cord or an extremity with a presentation of the head.

Placenta previa.

Transverse position after the seventh month.

Any condition requiring rapid delivery.

CONDITIONS.—Cervix effaced and os dilated.

Uterus not in tetanus nor contracted down over the child.

The fœtus must be movable.

The head should not be engaged.

The *Walcher position* is produced by bringing the patient down to the end of the table so that the sacrum rests upon the edge. The thighs and legs are allowed to hang down of their own weight and the patient is restrained from falling off by traction upwards on the axillæ.

In the *Walcher position* the diameter of the pelvic inlet is increased from  $1/3$  to  $1/2$  inch (1 cm.) and thereby the delivery of heads that otherwise could not pass becomes possible.

In addition to the *Walcher position* other measures may be required to help the head through. Thus, traction from below may be carried to the limit of safety and in spite of the *Walcher position* the head may not pass the inlet.

Then pressure from above is added. This maneuver will have to be executed in many cases by the nurse.

The fingers palpate the head above the pubes. Then one or both fists are placed upon the abdomen over the head and force is exerted to crowd the head down into the pelvis. This is known as the *Wiegand compression*.

For the operations destructive to the child, craniotomy or decapitation, the same arrangements are made.



Fig. 93.—The Walcher position. (American Text Book.)

**Cranioclasia** is the crushing of the foetal skull so that in its reduced condition the child can be delivered and the mother's life spared. In addition to the solutions, the only instruments required are the Auvard cranioclast, a Naegele perforator, and a douche bag with glass, or any tip that can be sterilized.

In many of these cases, *both* mother and child could be saved if seen early enough to have a Cæsarean operation. Induction of labor at term will save many babies.

**Decapitation** is done to save the maternal life in cases of transverse or shoulder presentation. The prepara-



tions are the same as already described for forceps and version and the only instrument needed is a Braun blunt hook. (Fig. 83.)

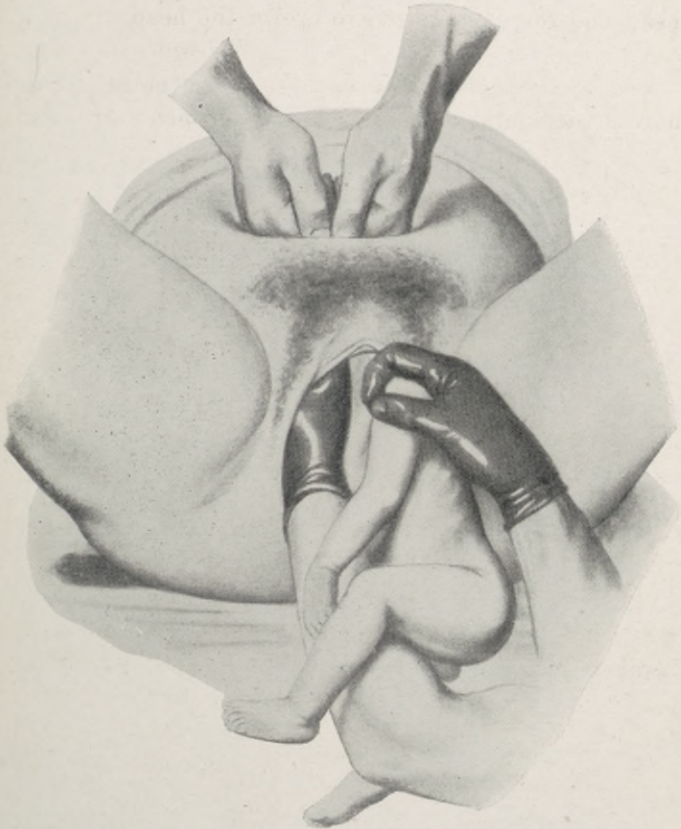


Fig. 94.—The Wiegand compression of the child's head to force it into the pelvis. (Hammerschlag.)

**Cæsarean section** is the delivery of the child through an opening in the abdomen.

It is made necessary by contraction of the pelvic

bones, or by the presence of a fleshy or bony mass which diminishes the size of the inlet. It may be required on account of the closure of the vagina or cervix by scars or on account of urgent conditions of the mother, such as eclampsia, heart disease, and sometimes placenta previa.

The technic is simple, but good judgment must be used in knowing when to do it. Many operators find it so easy that they prefer it to the harder but safer obstetrical operations.

The time of election is when the woman is at term but not in labor. This, of course, can be determined by



Fig. 95.—The Naegele perforator. (Hammerschlag.)

the history, but more certainly by careful measurements of the child.

When it becomes necessary to operate on a woman who has been in labor a long time and especially if she has been examined frequently, the mortality is disproportionately high.

It is a hospital operation, but may be done in the house. If not an emergency, the bowels are emptied by a laxative and enema the day before. Regular preparations for laparotomy are made, plus the equipment necessary for tying the cord and resuscitating the child. A table must be found large enough to hold the patient in the horizontal position at full length. Solutions of lysol 1 per cent and sterile water are placed on

each side of the table. The instrument table carries towels and suture material as well.

On a stand behind the operator are placed the hot bath and tracheal catheter. This center is presided over by someone skilled in the treatment of respiratory difficulties in the new born. Altogether, five assistants are required for the operation: an anæsthetizer, a clean nurse, and a nonsterile nurse to manage supplies, an operating assistant and one to take charge of the child.

Rubber gloves must be worn by the clean assistants.

*Instruments.*—

- 2 scalpels.
  - 2 scissors.
  - 8 eight-inch forceps.
  - 10 six-inch artery forceps.
  - 4 sponge carriers.
  - 4 tenaculum forceps.
  - 2 rat-toothed tissue forceps.
  - 4 full curved round needles for uterine wall.
  - 4 smaller needles for the fascia.
  - 2 Hagedorn needles for the skin.
  - 2 needle holders.
  - 1 dressing forceps.
- Plenty of suture material, both catgut (No. 1 and 2) and silkworm gut for the abdominal wall.

*Supplies.*—

- 1 doz. laparotomy sponges with metal rings sewed in or a long tape attached.
- 6 large laparotomy pads.
- 1 large pillow slip full of sterile cotton.
- Sponges.
- 1 laparotomy sheet.
- 1 dozen towels.
- 1 pair of leggins.
- Gowns and head dressings (gauze will do) for the operator and assistants; rubber gloves, basins and accessories.
- All are sterilized.

If the woman has been examined, the vagina should be sponged out with tincture of iodine. The abdomen is

shaved, scrubbed with green soap, gauze, and hot water for five minutes. It is then rinsed with ether and painted with iodine.

The presentation of the child, the presence and location of the heart tones must be determined before operation.

The patient is anæsthetized with ether, chloroform or gas.

The incisions are made; the child delivered to the proper assistant; the placenta and membranes removed; the sponges counted; and the uterus and abdominal wall sutured.

*After-care.*—The nurse watches the patient for sighing respiration, rapid pulse, pallor, and other symptoms of hæmorrhage, either external or internal. Artificial heat is supplied. Hæmorrhage from vagina should be looked for. It is normal. Salt solution by hypodermoclysis may be required. Hot water by mouth in small sips or tap water by rectum (drop method) will relieve the thirst. Morphine may be given if pain is extreme. An enema may be given on the second day or calomel may be started in the morning of the second day. Distention from gas, with or without nausea and vomiting, hicough and rise of temperature are all signs of danger. No milk should ever be given on account of the gas it causes.

The child is put to breast as usual after twelve hours.

The stitches are to be taken out on the tenth or twelfth day.

**Symphyseotomy** is a separation of the pelvis at the pubic joint and is done with a scalpel or a specially devised knife.

**Pubiotomy** is the division of the pelvis, three or four centimeters to the right or left of the pubic joint. The division passes through the pubic bone and is usually

done with a serrated wire called the Gigli saw. It is introduced subcutaneously by a special instrument called a pubiotomy needle. Both symphyseotomy and pubiotomy are preparatory to delivery. Pubiotomy is the more desirable and successful operation. The ends of the severed bones separate from one and a half to two inches, and the child delivers easily through the enclosed opening. The after-care is usually simple.

*Instruments.*—

- 1 scalpel.
  - 2 Gigli saws.
  - 1 pubiotomy needle.
  - 6 artery forceps.
  - 3 eight-inch forceps.
  - 1 needle holder.
  - 2 retractors.
- Suture material and sponges as usual.

The hips are strapped in circumference with zinc adhesive plaster to support the bones.

The danger of infection of the wound from the lochia is always present. The main difficulty is in moving the patient, who is more than usually helpless. The bony ring of the pelvis is broken and she can not raise her leg. The repair is cartilaginous at first, but solidifies in a few months so that locomotion is not impaired. Especial pains must be taken to avoid bed sores.

**Baptism.**—Operative labors are not infrequently attended by the death of the child.

Among Catholic families and other deeply religious people the death of an unbaptized child is a very painful event. It is therefore necessary in case of great danger to the babe to see that the customary ceremonial is performed. Either the doctor or the nurse can do this and even though the head is high up these last rites must be administered.

## CHAPTER XIII

### MINOR OPERATIONS

**Aseptic Care.**—Place patient on a clean bed pan. It need not be sterile. Drape with a sheet and arrange it so the fold may be easily raised by nurse's elbow. Have sterile basin with cotton pledgets to be filled with solution of lysol 1 per cent. Lysol must be put in basin first and the water added. Take to bedside. Nurse scrubs her hands ten minutes with a sterile brush, hot water, and green soap. Use no towel, no gloves. Keep hands wet and clean. Cleanse vulva with wet pledgets from above downward. Apply sterile pad.

**Sterile Specimen.**—To get a sterile specimen of urine without catheter, give aseptic care, tampon vagina with large pledget of sterile cotton. Have patient urinate in a sterile basin. Remove tampon.

**Sterile Specimen from Child.**—Take a glass test tube and thrust its round end through a hole in a square piece of adhesive plaster. Push it down until the plaster is caught and stopped by the enlarged rim at the mouth of the tube, with adhesive side of plaster on same side as opening of tube. Fasten the tube over the male penis or female vulva by applying the plaster to the surrounding skin. Leave until full.

**Aseptic Douche.**—Boil douche point and basin. Leave point in sterile basin. Fill douche can with sterile water, temperature 104° to 110° F. Put clean bedpan under patient who is draped with a sheet. Have at hand a sterile basin containing solution of

lysol 0.5 per cent, or boric acid 5 per cent in which cotton pledgets are immersed. Scrub the hands as for aseptic

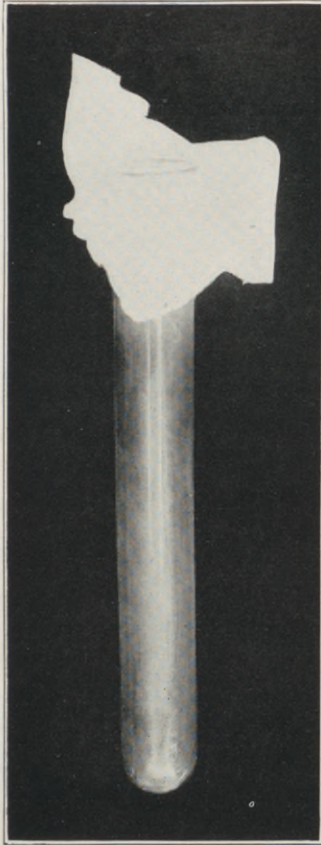


Fig. 96.—Apparatus for getting a sterile specimen of urine from an infant.

care. Cleanse the vulva with cotton pledgets, washing always toward the anus, and use each pledget but once. Adjust the douche point and introduce it just

inside the labia. The douche can should be only a trifle higher than the pelvis. When can is empty, apply a sterile pad.

If the douche is to be used as a deodorant after the fifth day of the puerperium, either of the following solutions may be employed: Potassium permanganate, 1:5000; formaldehyde 1 dram to quart.

**The vaginal douche** may be used in cases of gonorrhœal infection in pregnancy during the last weeks, in the hope of avoiding infection of the child's eyes.

It is given like the aseptic douche (q. v.) with potassium permanganate 1:5000. It should be hot (112° to 120° F.), and be begun not long before term, so that in case labor comes on, the danger to the child will be minimized. The reservoir must not be too high, nor the douche point inserted much beyond the labia. The woman should be on her back and the douche point should be rubber or glass.

**Removal of Sutures.**—On, or about, the tenth day the removal of sutures is required.

The nurse will sterilize by boiling, 1 pair of long-handled, sharp-pointed scissors, 1 pair of tissue forceps, and if the sutures extend far into the vagina, a vaginal retractor.

A basin of lysol solution (1 per cent) with cotton sponges, a sterile towel to lay the instruments on, a dish to receive the soiled dressings, sutures and discarded sponges, completes the arrangement.

The patient is now draped with sheets as for examination. The doctor prepares his hands as for operation. The nurse holds the limbs of the patient in lithotomy position and the operation is begun.

**Uterine Tampon.**—Packing the uterus is mostly employed for hæmorrhage after labor. The patient, there-



fore, has been prepared and only fresh sponging with lysol solution is required.

The *instruments* are, 1 vaginal retractor, 1 pair of dressing forceps, 1 vulsellum forceps and a jar of gauze, four to six inches wide and ten or twelve feet long. Always use a single continuous strip. A very large quantity is necessary to fill the uterine cavity. Any sterile gauze may be used, but weak iodoform is satisfactory.



Fig. 97.—Tampon of the uterus. (Hammerschlag.)

The vagina is held open with retractors, the cervix seized with a tenaculum and pulled down, the end of the gauze strip is then carried into the uterus as far as the fundus, the dressing forceps withdrawn and a new length carried in until the cavity is packed tightly from the fundus clear to the os.

Care must be taken that the strip of gauze is not contaminated by vaginal contact during the introduction. A pad and binder are now applied. If no instruments are at hand, or there is not time to sterilize, then the

nurse can grasp the fundus through the abdominal wall with her hand and push the cervix down to the vulva where the gauze can be pushed in by the doctor's fingers, if necessary.

The tampon acts as a hæmostatic through its direct mechanical pressure, and dynamically by stimulating the uterus to contract. It should be removed in from twelve to twenty-four hours.

**To tampon the vagina** the woman lies on her back across the bed, with her feet on the knees of the doctor,

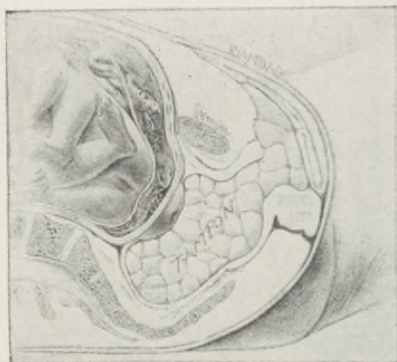


Fig. 98.—Tampon of vagina. (American Text Book.)

who sits facing her. A sterile retractor holds back the posterior wall of the vagina.

With a pair of dressing forceps the doctor seizes the pledgets of cotton or gauze out of the lysol solution and carries them one by one as far as they will go, in various directions around the cervix. One is pushed forwards toward the bladder, the next back toward the rectum, the next in the middle, and so on until no more can be introduced. A pad and binder are applied tightly.

**The uterine douche** is sometimes employed for hæmorrhage. The field of operation and the doctor's hands are prepared as usual. The nurse cools the boiled douche water down to 120° F. and if ordered, adds 2 drams of sterile salt to each quart.

The *instruments* are a vaginal retractor, a long uterine douche point, and one vulsellum forceps.

The cervix is seized and brought down, the long douche point connected with the tube from the reservoir is carried to the fundus and the water started. Care must be used that the return flow is free and unobstructed.

This method is most satisfactory in uterine hæmorrhage after the uterus has been entirely emptied. It stimulates a prolonged and profound uterine contraction.

**Intravenous Injections.**—The vein in the front of the elbow is usually chosen. (Median basilic or median cephalic.) A rubber bandage or tourniquet is wound tightly about the middle of the upper arm to make the veins stand out prominently. The surface of the skin should be sterilized for operation by scrubbing with green soap and hot water and rinsing with 50 per cent alcohol, followed by 1:2000 solution of bichloride, or by the application of tincture of iodine.

The hypodermic needle is then introduced after expulsion of all the contained air and the piston is drawn up until the blood enters. This assures the operator that the needle has entered the vein. The bandage is now loosened and the solution of the drug is introduced very slowly.

Intravenous infusion or transfusion is given in the same way. The fluid (normal saline?) must be running from the needle as it is introduced.

**Hypodermoclysis** is the introduction of normal saline solution, under the skin, or under the breasts. The solution may be transfused also into a vein.

By this operation, the quantity of fluid in the vessels is greatly increased and a circulatory stimulant is provided. Normal saline also promotes diuresis and aids in the removal of wastage.

The principal dangers arise from too great rapidity or too large a quantity of the flow.

The skin should be sterilized at the point of attack by a coating of tincture of iodine.

The *instruments* required are, a bath thermometer, a douche can (fountain syringe) with long tubes and an aspirating needle. A hypodermic needle will do, but the reservoir must be well elevated since the caliber is so small. Ordinarily the reservoir need be held only two or three feet above the point of discharge. The water should be flowing through the needle when it enters the tissues. If the fluid is to be introduced under the skin, the best place is in the loose region between the hips and the ribs in front. If under the mammary gland, the needle must go *below* and under the gland from the outside edge, not into the gland. If into a vein, such additional instruments will be needed as a rat-toothed tissue forceps, a pair of sharp-pointed scissors, a knife and some fine catgut. From four to sixteen ounces of fluid may be used at a temperature varying from 105° to 110° F.

The openings where the needles entered are closed by cotton and collodion.

**Curettage of uterus** is done for incomplete abortion or puerperal sepsis when foreign fragments are left in the uterus. The room is prepared as for delivery.

The instruments are:

- 1 vaginal retractor.
- 1 vulsellum forceps.
- 1 long uterine douche point.
- 2 dull curettes.
- 2 sharp curettes of different sizes, together with gauze for packing the uterus.

Rubber gloves should be worn both by nurse and physician as much for personal protection as for the patient's safety. In many cases of incomplete abortion or of puerperal sepsis the endometrium is more satisfactorily curetted with the gloved fingers.

**Abortion** may occur in many of the early complications of pregnancy, such as hyperemesis, nephritis, uncompensated heart lesions, tuberculosis, insanity, hydramnios, incarcerated retroversions of the uterus and the presence of hæmorrhage. These cases require an operation to be undertaken and finished by the doctor, but other conditions are not uncommon wherein, without volition on the part of the patient or doctor, an abortion begins. Some may be saved, but at times the attempt is futile.

If the egg is dead and if the emptying of the uterus seems inevitable, the function of the physician is to see that the process is finished as quickly and cleanly as possible.

This may be done in the early stages by packing the cervix and vagina with iodoform gauze and administering ergot in twenty-five drop doses thrice daily.

In case of dangerous hæmorrhage from spontaneous abortion, the vagina can be tamponed with cotton pledgets or gauze by a clean nurse while awaiting the arrival of the doctor.

When the uterus has partially emptied itself and the retained fragments prevent the complete contraction and allow of serious bleeding, or if the fragments are

septic, then their removal is required. This is done by the finger or curette.

The preparation of rooms, patient and doctor are the same whether the operation is for therapeutic or incomplete abortion. These have been described.

The instruments are:

- 1 pair dressing forceps.
- 2 vaginal retractors.
- artery forceps.
- 2 curettes of different sizes.
- 2 vulsellum forceps.
- 1 long uterine douche point.
- 1 pair Goodell dilators.
- 1 douche can.

**Therapeutic Abortion** is the name given to the operation of emptying the pregnant uterus when it is done by the obstetrician under definite indications. The cases in which such interference is permissible are extremely rare and every physician should recoil from undertaking an operation which in reality is only a form of legalized murder. Such a performance involves heavy responsibilities and demands the consent and counsel of one or more consultants who meet with the family and openly discuss the nature and reasons for the procedure. "Thou shalt not kill" must be ever uppermost in the minds of all.

If the operation is decided upon the patient should be prepared as for a full term labor. The instruments needed will be—

- |                                 |   |
|---------------------------------|---|
| 2 vaginal retractors.           | 1 long straight dressing forceps.       |
| 2 vulsellum forceps.            | 2 placenta forceps.                     |
| 3 Hegar dilators.               | 2 pairs scissors.                       |
| 1 Goodell dilator.              | 4 curettes.                             |
| 2 uterine applicators.          | 2 artery clamps (eight inch).           |
| 1 uterine douche point.         | 1 oz. sterile glycerine as a lubricant. |
| 1 long curved dressing forceps. |   |

Whether the uterus is or is not packed with gauze after being emptied is a matter of personal technic. Usually it is not packed since the drainage is better. At all events the nurse should have the gauze ready in convenient sterile strips 3 in. wide by 5 yds. long, since an emergency like hemorrhage might make its use imperative.

The after-care is really that of the disease for which the interference was undertaken.

**The induction of labor** at or near term is done for pelvic contraction, maternal disease, for danger threatening mother or child, or to avoid the birth of a post-



Fig. 99.—Pean forceps.

mature child. Either castor oil and quinine, introduction of a bougie or the Voorhees bag may be used. The latter is preferred. Before induction is undertaken for postmaturity of the child, the physician must be assured by means of the McDonald, the Ahlfeld, and the Perret measurements that the child is really mature.

*Technic.*—Assemble, and sterilize by boiling twenty minutes, a Voorhees bag No. 3 or 4, Simon speculum or vaginal retractor, 1 pair long Pean forceps, 2 pairs vulsellum forceps, 1 dressing forceps, 2 pairs compression forceps, 1 Goodell dilator, 1 tenaculum forceps, Davidson hand bulb syringe with glass tubes and rubber connections for the bag.

Patient, prepared as for delivery, is placed upon the

table in exaggerated lithotomy position. Stirrups will serve.

The vagina is retracted, a smear made from cervix, and the mucous membrane wiped clean with pledgets of gauze on forceps.

Anæsthesia is only occasionally necessary even in primiparas.

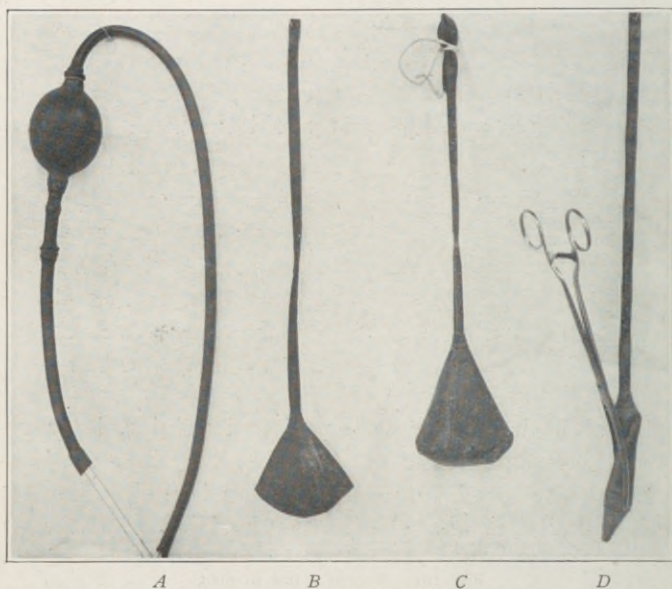


Fig. 100.—*A*, Hand bulb syringe; *B* and *C*, Voorhees bags; *D*, Bag rolled and grasped by Pean forceps ready for introduction.

Before using, the apparatus must be tested by forcibly filling the bag with sterile solution.

One lip and sometimes both are seized by vulsellum forceps and brought down. Usually, even in primiparas, the os is sufficiently patulous to admit the bag—if not, it should be dilated.



The bag, emptied of residual air and fluid, is rolled up into a compact mass like a cigarette, seized with Pean forceps so that the tips extend just to the largest diameter of the rolled bag. Turn the concavity of forceps toward patient's left leg and introduce. As the bag enters turn the mass to the left—a quarter turn—so that when operation is completed the forceps curve faces up-

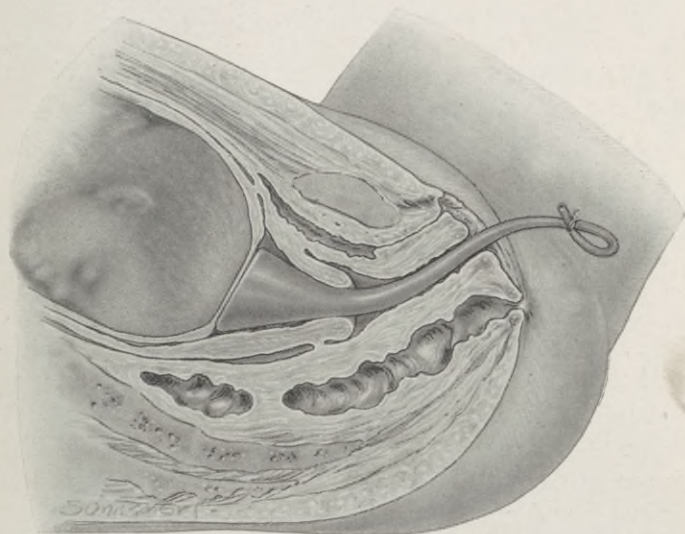


Fig. 101.—Voorhees bag in place.

ward. Release the lock on forceps. Connect the tube of the bag with syringe tube and force the solution slowly into bag. Pean forceps may be removed as bag fills. Remove vulsellum. Tie tube of bag with tape when bag is full—disconnect syringe. Put sterile pad on either side of tube.

If pains do not start within an hour, or if compression is desired as in placenta prævia or a more rapid

dilatation, then a weight of one or two pounds is attached by a tape to the protruding tube and passed over the foot of the bed.

**Digital dilatation of cervix** may be indicated in cases of rigid os or where prolonged labor or some danger to mother or child requires the hastening of the delivery.

No instruments are needed, but a complete anæsthetic is necessary.

Thorough asepsis must be observed. The patient's genitals and the doctor's hands are prepared as described for labor, and rubber gloves are imperative.

The gloved hands and the vagina and vulva are well rinsed with lysol solution 1 per cent. The operation must be done carefully, patiently and gently, lest the cervix be lacerated.

The hand is introduced into the vagina, and first the thumb and index finger are introduced into the os and separated as widely as possible, then the second finger and so on, until the dilatation is complete. (Hirst's method.)

Another method is the introduction of the tips of both index fingers, back to back. Force exerted will dilate the canal so second fingers may also be inserted. Then patiently and gently the rigid ring of the os is overcome. (Edgar's method.)

**Episiotomy.**—This is a clean incision of the vulva, which is done to avoid an apparently inevitable and ragged tear of the perineum.

The *instruments* required are either a blunt tipped knife or a pair of blunt scissors.

The operation may be done on one or both sides depending on the amount of room required. The incision begins at a point just above the lower third of the vulvar outlet when distended by the head, and passes

obliquely downward and outward. This severs unimportant tissues only, instead of allowing the valuable perineal body to suffer. It makes a clean wound that heals readily, instead of a ragged tear through bruised tissue. The cut is high enough to be free from the constant bath in infectious lochia, which troubles the healing of the usual perineal laceration.

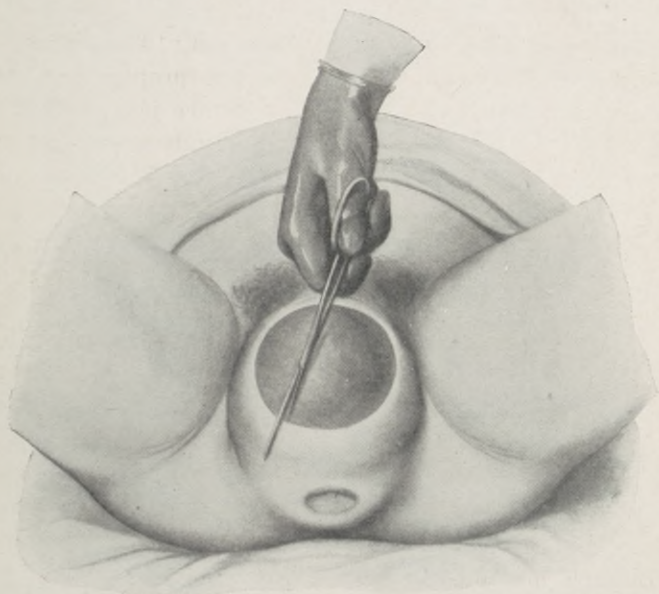


Fig. 102.—Episiotomy. (Hammerschlag.)

**Rectal Infusion (Drop Method).**—A douche bag containing normal saline solution is hung near the bed and kept warm with an electric pad, a hot flatiron, or by a hot water bag on either side. The tube ends in a catheter which is inserted into the rectum. The tube is clamped so that only a drop of solution can escape each second.

**Wet packs** are both sedative and antipyretic and may be employed for a local or a general effect.

For bronchitis the pack may be applied to the chest only as follows: The child (or adult) is stripped in a warm room (75° F.) and the chest swathed front and back with a thick towel wrung out of hot water (temperature 105° to 110° F.) Over this a woolen shirt may be drawn or a blanket wrapped, and the patient put to bed. After six or eight hours, the dressing is removed in a warm room, a hot bath administered, and the body well rubbed with alcohol, and dried. The treatment may be repeated if necessary. Do not burn the patient by applications too hot.

The general pack is most serviceable in reducing temperature and producing a diaphoresis to relieve the kidney and cleanse the system, as in eclampsia. For this purpose the entire body, naked, is rolled in a sheet wrung out of hot water and then put between heavy blankets in bed. The pulse should be taken frequently and the temperature recorded at intervals. A cool application to the head is very soothing.

The patient sweats profusely and hot drinks may be given to promote a more abundant diaphoresis. Usually the patient drops off to sleep as the fever subsides. Twenty to forty minutes is the average duration of such a treatment.

When the pack is removed, the patient is wrapped at once, without drying, in warm blankets, and left for an hour or so.

## CHAPTER XIV

### COMPLICATIONS IN LABOR

*Pelvic contraction* is not infrequently the cause of difficult or prolonged labor. The deformity is most commonly due to rickets in childhood.

There are many forms of pelvic contraction, but in this country only two are at all common; the generally contracted, and the flat pelvis.

The generally contracted pelvis is, in the main, a well shaped pelvis, only its measurements are smaller than normal.

The flat pelvis is marked by a shortening of the anteroposterior diameter of the inlet. It looks as if it had been pressed together from before backward while in a soft condition.

These and other deformities will be recognized in advance of labor by the routine application of the pelvimeter.

The value of this instrument is so great, that no competent man does obstetrical work at the present time without using the pelvimeter as a routine.

The average diameters in normal pelves may be tabulated as follows:

Interspinous—between the anterior superior iliac spines—25 cm.

Intercristal—between the iliac crests—28 cm.

External conjugate—taken from the upper border of the symphysis to the depression below the last lumbar vertebra—20.5 cm. Take 9.5 cm. from this to get the true conjugate.

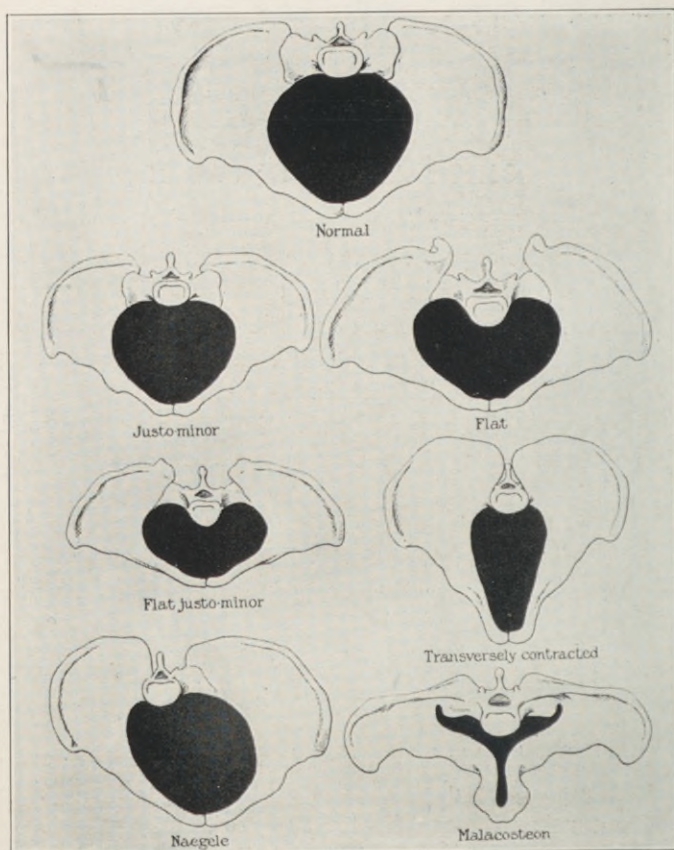


Fig. 103.—Various forms of pelvic deformity compared with the normal inlet. (Bumm.)

The circumference of the hips just below the iliac crests and above the trochanters—90 cm. It is taken with a tape line. These are the usual external measurements.

The internal measurements are made with the fingers. The diagonal conjugate is the distance from the lower

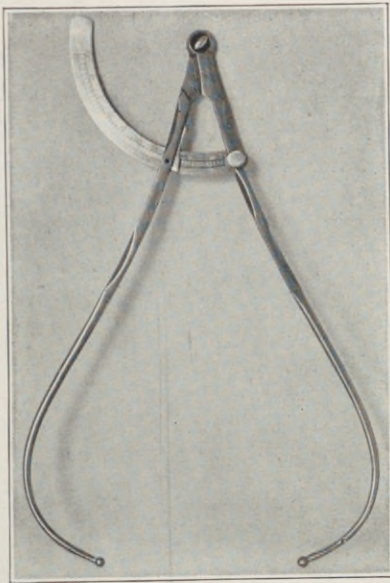


Fig. 104.—The pelvimeter.

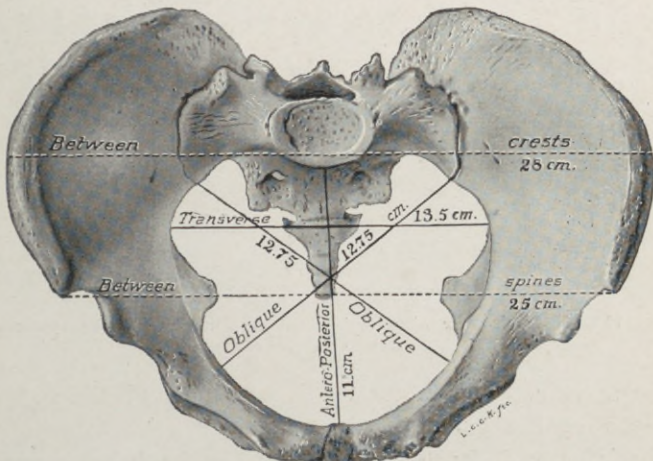


Fig. 105.—The various diameters of the inlet with the length given in centimeters. (Williams.)

border of the symphysis to the promontory of the sacrum. It should measure 12.5 cm. The first and second fingers are passed into the vagina and pushed up until the tip of the second finger touches the promontory of

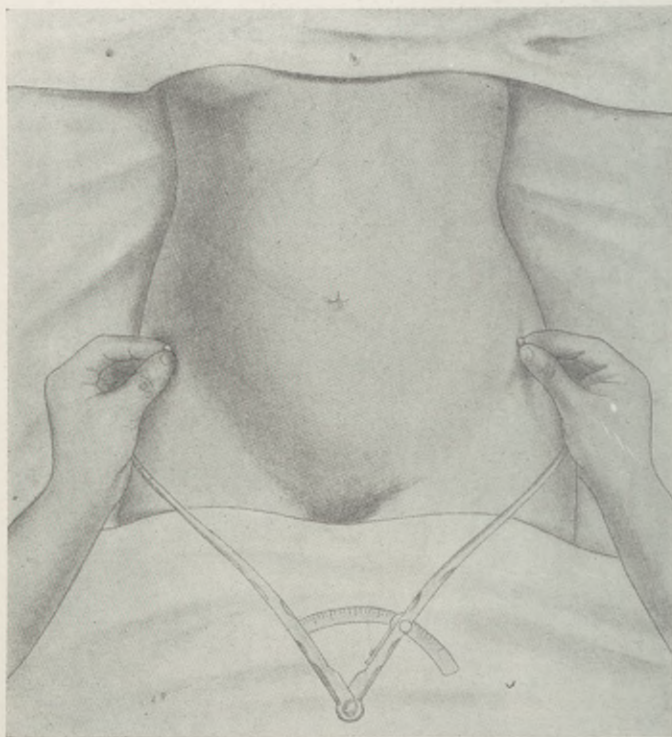


Fig. 106.—Measuring the distance between the anterior superior spines of the pelvis. (Williams.)

the sacrum. The finger of the other hand marks the depth of the examining fingers just below the symphysis. The distance is measured when the finger is withdrawn, and 1.5 cm. is subtracted. The result is the true



conjugate. These measurements carefully made and the deduction judiciously estimated, give one a fairly approximate idea of size and shape of the pelvic inlet. The aim of nearly all the pelvic measurements is to get

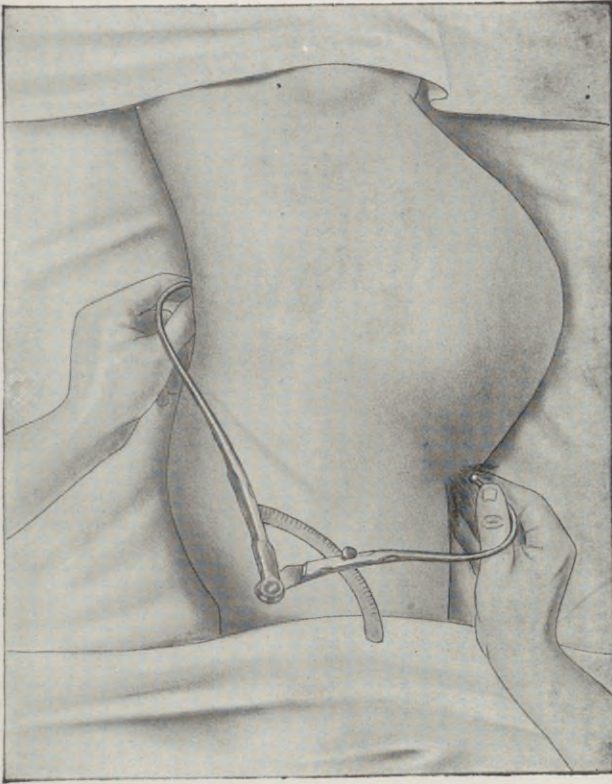


Fig. 107.—Measuring the external conjugate. (Williams.)

not only the size and shape of the inlet, but so far as possible, a working estimate of the anteroposterior diameter of the brim, which is the most important of all the diameters. In normal cases this should be 11 cm.

Thus, taking 9.5 cm. from the external conjugate (20.5 cm.) gives 11 cm.

Subtracting 1.5 cm. from the diagonal conjugate as obtained with the fingers as above described, (12.5 cm.) gives 11 cm. The subtraction is made to compensate for the thickness of the pubic bone and its inclination outwards.

A circumference of 90 cm. corresponds to an inlet of

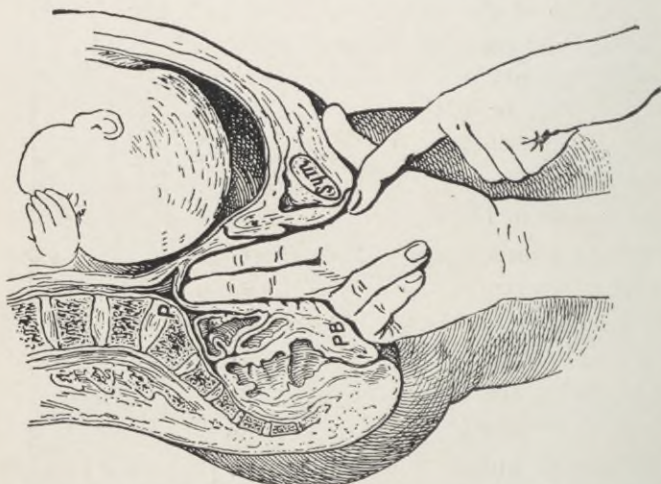


Fig. 108.—Measuring the diagonal conjugate with the finger. (Eden.)

11 cm. in its anteroposterior diameter, and every variation of 5 cm. in this circumference makes a difference of 1 cm. (either larger or smaller) in the anteroposterior diameter.

Thus, 95 cm. in circumference = 12 cm. in the diameter; and 85 cm. in circumference = 10 cm.

Complications increase in proportion to the degree of contraction in the pelvis.

The most frequent difficulties superinduced by the

small pelvis are prolapse of the cord, malpresentation and malpositions of the head, prolonged labor, and a large increase in the number of assisted deliveries.

All the possibilities and probabilities in a given case will be carefully worked out before labor by the conscientious obstetrician, and Cæsarean section, induction of premature labor, pubiotomy, forceps, or version and extraction, will be done with a sure foreknowledge.

**Prolapse of the cord** complicates labor once in about two hundred cases. It is most likely to occur when the presenting part does not enter or does not entirely fill the opening, as in transverse or shoulder presentations, or vertex presentations with small inlets.

The mother is not endangered by this mishap, but the babe is lost in from 35 to 60 per cent of the cases.

The diagnosis is easily made when a loop of cord protrudes from cervix or vulva, and the pulsation will differentiate it from everything else.

If the cord does not pulsate, the family should be informed that the child is dead and the case may be allowed to terminate normally.

If it still pulsates, the woman should be placed in the knee-chest position for ten or fifteen minutes, then upon the side, opposite to that on which the cord has prolapsed, and back again as soon as possible to the knee-chest position. A chair may be used to produce a Trendelenburg position by placing it so that the edge of seat and top of back rest on the bed. Then the patient puts her legs over the lower rungs and lies with her back against the chair back and her head on the bed.

If the cervix is effaced and the os partly dilated, reposition may be attempted either with the finger or a male catheter.

The operation will, of course, succeed most easily if done in the knee-chest position, with gravity to aid.

If the cord can be pushed back, a Voorhees bag may be inserted to keep it from coming down again. This holds back the cord, dilates the canal and stimulates the pains.

When the bag comes out, version and extraction can and should be done at once.

In general, the following summary may be useful:

### Prolapse of Cord

#### *Causes.*—

- Contracted pelves.
- Breech and transverse presentations.
- Malposition of head, or face and forehead presentation.
- Hydramnios.
- Accident.
- Low insertion of placenta.

#### *Diagnosis.*—

- Before rupture of membranes careful examination will show pulsating cord in advance of head.
- After rupture the cord may be felt in vagina.

#### *Dangers.*—

- To mother:—None but those due to causative condition.
- To child:—Compression of the cord and asphyxiation.
- Contraction of exposed vessels of cord.
- Patient may lie on cord.
- Twenty-five per cent die as a rule under best conditions.
- Fifty per cent when left to nature.

#### *Treatment of Cephalic Presentation.*—

- Extraction of child or reposition of cord, depending upon the degree of dilatation.
- If cervix is small, replace and fill cervix with Voorhees bag.
- When cervix admits hand, either replace or do version and extraction.
- With head engaged, reposition or version is not possible.
- Child living:—Rapid delivery with forceps.
- Child dead:—Craniotomy or leave to nature.
- Prolapse of one or both hands may take place. If the head is engaged, no interference should be attempted. If not, replacement or version may be done.

The soft parts may also complicate the labor process. No time need be spent here on the rarer forms of obstruction due to uterine or ovarian tumors.

**Rigidity of the cervix, or os** is not uncommon.

This may be due to a dense, almost cartilaginous consistence of that tissue, to premature rupture of the bag of waters, to weak, inefficient contractions in the first stage, or to a steel-spring-like contraction of the muscular fibers of the os.

In all cases the first stage of labor is greatly prolonged, but so long as the membranes are intact, the child is in no danger.

Two kinds of cases are met with, those in which the pains are violent, and those in which they are weak and shallow. In the first class, as soon as the condition is recognized, a dose of morphine sulphate, 1/6 gr. and scopolamine hydrobromide 1/150 gr. should be given hypodermically. The rigid ring relaxes under the influence of the narcotic, and labor proceeds rapidly and almost painlessly. Chloroform may be substituted if the morphine and scopolamine are not at hand. If the cervix is effaced and only the rigid ring of the os prevents the completion of the labor, or if the above methods fail, then the patient may be anæsthetized and the rigidity overcome by the fingers. This is an emergency that should not be attempted until all else has failed and some danger arises that makes it necessary to hasten the delivery. (See *Minor Operations*, p. 228.)

Where the constriction is due to unusual density of the cervix or to cicatricial tissue, it is sometimes necessary to make incisions under aseptic precautions so that the rigid ring may expand.

Weak and inefficient contractions can sometimes be

stimulated satisfactorily by the introduction of a Voorhees bag.

**Rigidity of the pelvic floor** may be due to inadequate elasticity of the tissues as in old primiparas or in young women who have ridden horseback for many years in the cross-saddle position.

The head may come down to the pelvic floor but will not advance further. If the tissues of the vulva do not, or can not yield sufficiently after appropriate time has been allowed, episiotomy may be done. (See *Minor Operations*, p. 228.)

The uterus itself may functionate abnormally.

**Precipitate labor** is an over rapid advance of the child wherein the stages of labor are merged into one another and the child expelled in two or three pains.

It may be due to unusual capacity of the pelvis, or to strong contractions which the patient is not aware of, or both. These cases predispose to post partum hæmorrhage and to serious lacerations of cervix and perineum.

The child is usually delivered in an undesirable place, such as a toilet basin or a street car, and perishes from the fall, from cold, from umbilical hæmorrhage, or lack of facilities for revival.

The nurse who is watching a case is responsible for the prevention of a precipitate. If the event impends, the woman must be placed upon her side with legs straight, and she should be instructed to cry out with every pain. Chloroform may be given and the head forcibly held back.

**Uterine Inertia.**—A sluggish state of the uterus may characterize the labor and the contractions will be slow, shallow and inefficient. The intervals may be prolonged, although the patient complains bitterly of pain.

The condition is seen most frequently in multiparas and is due to defective innervation of the uterus or to imperfect reflexes, and in primiparas also it may be due to the newness of the function that is suddenly called into play, or to contracted pelvis. Many times the trouble results from overfatigue and want of sleep. If this is the case, the remedy may be found in the administration of morphine sulphate  $1/6$  gr. and scopolamine  $1/150$  gr. The pains are diminished or abrogated while the contractions continue. The scopolamine may be repeated if necessary. Under proper indications and conditions this treatment is harmless, both to mother and child, but requires supervision on the part of the nurse or physician.

If the patient is not overly fatigued, the introduction of a Voorhees bag, as described under the head of Induction of Labor (p. 225) will dynamically increase the strength and frequency of the contractions, mechanically aid the effacement of the cervix and the dilatation of the os, and shorten the first stage anywhere from six to twelve hours.

As soon as the os is dilated, pituitrin may be given under due precautions, as hereafter indicated. Pituitrin has but little influence on the nonfunctionating organ, but acts well on a uterus which is definitely contracting. It should not be given during the first stage, since when the uterus contracts, there must be an adequate opening for the advance of the child. Five to seven minims is the usual dose, injected into the deltoid muscle. The injection may be repeated in an hour, if required, since the effects, which begin about five minutes after the injections, will pass off in fifty-five minutes.

By the use of pituitrin many operative procedures are

altered or avoided. A high forceps case may be converted into a case for the low instruments, and the latter in many instances avoided altogether.

The use of pituitin may be briefly summarized as follows:

### Pituitrin

(Use no alcohol to cleanse syringe or skin before injection.)

#### *Indications.*—

1. Inertia uteri or weak, shallow pains in second stage.
  2. Multiparity.
  3. Post partum hæmorrhage.
  4. To avoid use of forceps or to reduce a high forceps case to a low one.
  5. Cæsarean section.
- If the patient is a multipara, sterile linen should be on and attendants ready for the delivery before an injection is given.

#### *Conditions.*—

1. Cervix effaced.
2. Os admits three fingers. (Better if membranes have ruptured.)
3. Head should be engaged.
4. No mechanical obstacle to delivery such as tumors or markedly contracted pelvis, etc.

#### *Dangers of Long Labors.*—

Compression of cord.

Necrosis of maternal tissues.  $\left\{ \begin{array}{l} \text{Vesicovaginal fistulæ.} \\ \text{Rectovaginal fistulæ.} \end{array} \right.$

Infection—peritonitis.

Necrosis of skin over skull.

Necrosis of cranium.

Fracture of skull.

Death of child.

Maternal exhaustion and prolonged convalescence.

**Premature rupture of the membranes** not infrequently occurs from over-distention, when twins or hydramnios is present, or at any stage of the pregnancy when the membranes are weak. The liquor amnii flows off,



not all at once, but after the first gush by intermittent discharges, depending on the painless uterine contractions and the accuracy with which the head fits the pelvis. Labor usually comes on in from twelve to forty-eight hours, but it *may* be postponed for a month.

The labor is sometimes more painful and prolonged on account of the absence of the fluid wedge and the generous lubrication of the channel which is supplied by the liquor amnii. This is called "dry birth."

The danger of infection of the amniotic cavity with consequent death of the child is always to be apprehended after the escape of the liquor amnii. Also the foetal parts may prolapse and complicate the labor; or if the cord comes down, the child may be imperiled by its compression.

If near term, the rupture of the membranes is not of great importance though the case must be watched attentively. Daily observation must be made of the foetal heart tones, the amount of liquor amnii flowing away, and the presence or absence of infection. If labor does not determine in a few days or if the heart tones rise above 160 or go below 120, labor must be inaugurated. (See Induction of Labor, p. 225.)

**Rupture of the uterus** is the most serious accident that occurs in labor. It happens about once in three thousand confinements. The tear is usually in the lower part of the uterus and follows a prolonged period of labor, where the child is in a transverse presentation, and, therefore, impossible to deliver, or the pelvis is too small or the child too large. It may also follow ill-advised or unskillful efforts to change the presentation by the introduction of the hand into the uterus. Occasionally rupture is produced by external violence, such as blows or kicks upon the abdomen.

It is imperative to be able to recognize the symptoms when rupture impends or actually occurs.

*Signs of Threatened Rupture of Uterus.—*

1. High position of the contracting ring—*especially* its obliquity. The contracting ring is a ridge-like formation that may be found running across the anterior and lower portion of the uterus.
2. High position of fundus.
3. Tension of round ligaments.
4. Rotation of uterus about its long axis.
5. Tenderness to pressure of lower uterine segment.
6. Contractions persistent with no pain-free interval.

*Signs of Actual Rupture of Uterus.—*

1. Hæmorrhage is one of the earliest and most significant signs, and may be either external or internal.
2. Cessation of uterine contractions either abruptly or gradually.
3. Extreme pain felt by patient.
4. Recession of presenting part.

The patient gives a sharp cry and has the feeling that something has given way. Signs of shock rapidly supervene. A predisposition to rupture may be present from the scars of a Cæsarean section, uterine tumors, and degeneration of the muscle.

*The treatment* depends upon the degree of the injury, and if investigation shows that the uterus has opened into the abdominal cavity, immediate laparotomy is done. In other cases, the morcellation and removal of the child by the natural passage may permit the use of a uterine pack and avert the necessity for an abdominal operation. The child is usually dead and need not be considered.

## CHAPTER XV

### COMPLICATIONS IN LABOR (Cont'd)

**Vomiting** in labor frequently occurs near the end of the first stage. It is due to the sympathetic excitement of the nerves of the stomach as the last fibers of the os uteri give way. It requires no treatment.

Hyperemesis in labor is very rare, but when it does occur, the delivery should be expedited.

**Hæmorrhages** may occur either before, during, or after labor. Hæmorrhage is always serious.

Hæmorrhage before labor arises either from a premature detachment of a normally implanted placenta or from placenta prævia. The first is sometimes called "accidental hæmorrhage" to distinguish it from the latter, or "unavoidable hæmorrhage."

**Accidental hæmorrhage** may be the result of an injury or a blow, but in many cases, there is no such history. The hæmorrhage is most frequent in the later months of pregnancy, and may be without any apparent cause. The hæmorrhage may be entirely inside the uterus (concealed hæmorrhage) or it may appear externally.

The hæmorrhage, when concealed, takes place back of the placenta or between the membranes and the uterine wall. If the hæmorrhage is concealed, it is usually followed by an attempt to expel the child. If the hæmorrhage is pronounced, systems of shock appear.

*The diagnosis* is made by the symptoms which are summarized in differentiating this condition from placenta prævia (p. 246).

From this affection, nearly all the children and half the mothers die.

When the hæmorrhage is external and slight, the *treatment* may possibly be expectant for twelve hours, if carefully watched, but usually the symptoms become so serious that immediate emptying of the uterus is required either by the Voorhees bag, digital dilatation, version and extraction, or Cæsarean section, the method

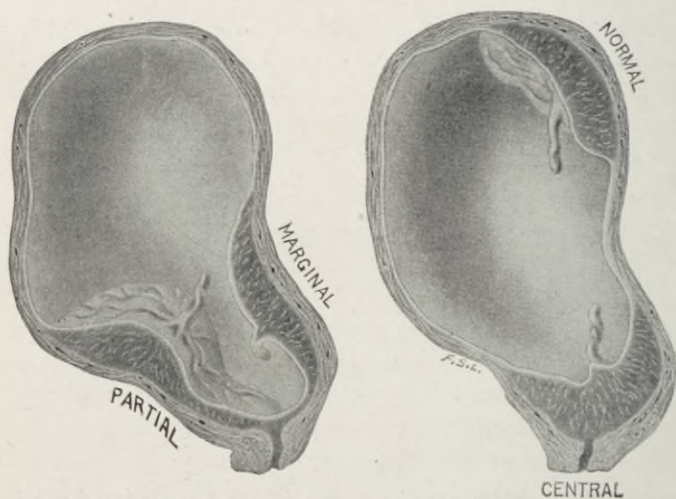


Fig. 109.—Various forms of placenta prævia compared with normal attachment of the placenta. (American Text Book—Williams.)

chosen being dependent upon the amount of the hæmorrhage, the vigor of the mother and the condition of the cervix, os, pelvis, and child.

**Placenta prævia** is the name given to a placenta that is attached low down in the uterus so that its margin or a large part of its mass overlies the os. This happens through the action of the egg which embeds itself

too far down on the endometrium—too close to the cervix.

Three different kinds are known and named from their manner of encroaching on the os, as marginal, partial, or central implantation of the placenta.

The hæmorrhage is from a loosening of the placental attachment owing to the stretching and growth of the uterus.

*There is only one symptom of placenta prævia—sudden, painless, causeless hæmorrhage.* The bleeding seldom appears before the twenty-eighth week, and no suspicion of a placenta prævia may arise before the appearance of hæmorrhage, which, as a rule, *is soon repeated.*

Labor frequently comes on prematurely and malpresentations naturally result from the inability of the presenting part to fit itself into the pelvis.

There is no bag of waters, hence the first stage is longer and bloodier and fraught with much danger.

Interference is regularly indicated to save the life of the mother, while the child also has a high mortality. Puerperal infection is not uncommon.

Placenta prævia is always an emergency. If the patient can be kept under observation in a good hospital, one may temporize, but under other conditions the uterus must be emptied at once, even if only a single hæmorrhage has developed. The indications are, (a) to control the bleeding, and (b) to empty the uterus. The life of the child must be disregarded and the mother alone considered.

If the contractions have not begun, they should be stimulated by the introduction of a Voorhees bag, which, at the same time, dilates the canal and mechanically shuts off the bleeding vessels by compression. In in-

roducing the bag, the membranes may be ruptured so the bag will pass into the uterine cavity. When the implantation is central, the finger must tear a hole through the placenta, and through this opening pass the bag inside the uterus.

If the os is partially dilated, version may be done, and a foot brought down. The leg may then be pulled upon until it compresses the bleeding area and the traction maintained with a slowly developing pressure sufficient to check the hæmorrhage, until dilatation is advanced enough for delivery. Occasionally good results are obtained by tightly packing the cervix and vagina with gauze or cotton. (See Vaginal Tampon, p. 220.)

Cæsarean section may be done in the interests of the child, as well as the mother.

The fœtal mortality in placenta prævia is said to be 60 per cent and the maternal 10 per cent.

*Differential diagnosis between*

*Accidental hæmorrhage and Placenta prævia*

Usually occurs in later months.	Any time after the twenty-eighth week.
May be concealed or open.	Always open and external.
Soon followed by labor pains.	Labor need not occur.
Uterus becomes larger if bleeding is concealed.	Uterus remains same size.
Uterus hard and woody.	Uterus, normal consistency.
In severe cases, signs of shock whether hæmorrhage is external or internal.	In severe cases, signs of shock follow the invariable external hæmorrhage.
No placenta can be felt.	Placenta can be felt through the os.
Hæmorrhage continuous.	Hæmorrhage intermittent.
No history of previous attack.	Possibly history of previous attack.
No contractions after labor begins in serious cases.	Contractions as usual.
No boggy of cervix.	Cervix boggy.

Hæmorrhages may occur *during labor* from retention of the major part of the placenta while a portion is detached. This may be due to pre-existent disease, such as endometritis, or from uterine inertia.

Normally the placenta will separate and be discharged within an hour after labor and in the absence of hæmorrhage it may go even longer than this with safety. The occurrence of severe hæmorrhage, however, requires the immediate cleaning out of the uterus by inserting the hand and peeling the placenta from its attachments.

**Post partum hæmorrhage** includes all hæmorrhages that occur after the delivery of the placenta.

The "flooding" as it is called by the laity, is most apt to come on either immediately or within an hour or so after labor. If it comes on *after* the first twenty-four hours, it is called secondary hæmorrhage. Such predisposing causes as over-distention from twins may be present, but the hæmorrhage may follow a perfectly easy and apparently normal labor so suddenly and so profusely that the woman may die in half an hour.

There are four causes for post partum hæmorrhage: namely, (a) uterine exhaustion (atonia uteri); (b) mechanical obstacles to retraction, such as clots or retention of pieces of placenta or membrane; (c) and lacerations of some part of genital passage, such as the vulva, vagina, cervix, or lower uterine segment; and (d) the systemic condition known as hæmophilia.

"Bleeders" (hæmophilias) are women whose blood lacks coagulability, owing to the absence of fibrin-producing elements.

Post partum hæmorrhage is usually an external hæmorrhage, but the woman may bleed to death into her own uterus.

Besides the external signs, the patient may show the

symptoms of acute anæmia, such as the rapid pulse, hurried, shallow respiration, pallor, cold sweat, yawning, dizziness, etc.

Nearly all these cases can be saved by prompt recognition and efficient *treatment*.

The first step is to grasp the uterus. If the hæmorrhage is due to a tear low down, the uterus may be hard, but generally it is relaxed and requires vigorous massage with both hands before it shows any signs of contraction. In the absence of the doctor, the nurse must know how to undertake this maneuver. The uterus, after labor and especially when relaxed, is sometimes difficult to identify and the nurse can only make deep massage in the pelvis until the organ responds and its hard globular mass can be appreciated. As soon as the uterus contracts, clots and contained blood are expelled, and in many cases its bleeding ceases at once. (See Conduct of Third Stage, p. 159.)

It may be necessary to keep the uterus contracted by manual massage in this way for several hours. As soon as possible, the nurse, or someone whom she directs, prepares a hypodermic of pituitrin—10 to 15 m. An injection of ergot may follow because its effect is more lasting than pituitrin. Next, a hot douche is made ready and the materials for packing the uterus are assembled.

When the doctor arrives, he sterilizes his hands, puts on gloves and introduces two fingers or the whole hand into the uterus to remove clots or any retained fragments of placenta.

The hot intrauterine douche may follow, and if the contraction is not firm and the hæmorrhage checked, the uterus must be packed with gauze. If hæmorrhage comes from cervix, it should be grasped with long for-



ceps, pulled down, and sutured. It from perineum, pack first, and afterward sutures may be introduced.

If the patient is exsanguinated, the foot of the bed is raised, coffee given by mouth, camphorated oil hypodermically, and normal saline transfused under the breasts. Fifteen per cent aq. sol. of glucose (250 c.c.) given intravenously is valuable in case of shock.

Pituitrin may be continued in larger doses. 1 c.c. will raise the blood pressure very definitely. Adrenalin also may be employed for this purpose.

The following summary may be found convenient:

#### Post Partum Hæmorrhage

##### *Etiology, Functional.*—

Atony of the uterus, especially after rapid artificial or natural emptying of the organ.

More common after uterus has previously been greatly distended.

Premature version and extraction.

Hydramnios and twins.

Imperfect development of uterine musculature.

Precipitate labors.

Haste or improper management of third stage.

##### *Etiology, Mechanical.*—

Retention of placenta—partial, total or solitary cotyledons.

Inversion of the uterus.

Placenta succenturiata.

Inflammation of decidua serotina.

Conduct of third stage, i.e., wait until placenta separates.

##### *Etiology, Systemic, Hæmophilia.*—

###### *Kind of hæmorrhage.*

Hæmorrhage *before* expulsion of placenta due to laceration of the soft parts, or

Partial release of placenta and failure of uterus to contract, or

Placenta may be attached to periphery or to one side.

Attempts to expel placenta without waiting for uterine contraction are sometimes productive of hæmorrhage.

Hæmorrhage *after* expulsion of placenta.

Hæmorrhage in interval between pains—comes from placental site.

Hæmorrhage in stream not checked by uterine contraction is due to laceration of the canal.

Hæmorrhage in abnormal quantities at beginning of pains. Pure atony—comes early.

Hæmophilia again.

*Diagnosis.*—

Palpation of uterus through abdomen.

Placental site excluded from contraction (paralysis).

View of vulva.

Injuries. Flow continuous, fluid and bright red, shows arterial origin, probably from cervix. Examine.

Atony—bleeding at intervals, clotted and dark.

Hæmorrhage from a tear begins at once.

Uterus contracted and hæmorrhage continues. Look for tear.

If hæmorrhage does not begin within ten or fifteen minutes after labor it is not from a tear.

Always have hæmophilia in mind.

*Management.*—

Third stage must be conducted properly.

Before expulsion of placenta—early expression.

Credé or manual removal—*then* secure contraction by massage.

Pituitrin, Ergot, or both.

*After Third Stage.*—

Restore an inverted uterus. Repair lacerations. See that cavity is clear and clean.

Massage, intrauterine hot water douche, hand in uterus and hand outside and rub, ergot.

Pituitrin hypodermically. Pack uterus with sterile gauze or weak iodoform gauze. Strict asepsis for all intrauterine maneuvers.

*Treat* anæmia with transfusion, elevation of foot of bed, coffee, external heat, hot rectal enemas, stimulation, bandaging of legs.

15% solution of glucose.

Strychnine sulphate, adrenalin, or camphorated oil may be required in usual dosage.

Hypodermoclysis. (See Minor Operations, p. 222.)

Sodium cacodylate (2 gr. doses may be given intravenously every third day).

After the bleeding stops, the food must be most nutritious—milk, egg-nog, rich soups, chicken and mutton

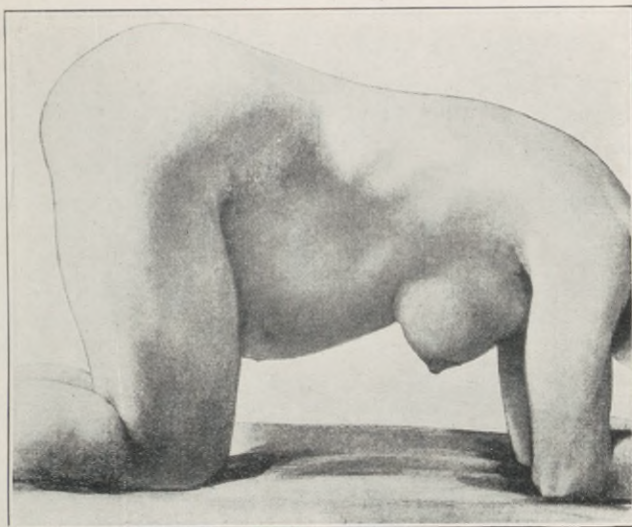


Fig. 110.—The knee-elbow posture. (Bumm.)



Fig. 111.—The knee chest posture.

broths, oyster stew, and beef steak as soon as she can take it. A diet of fluids and stimulating foods that raise the blood pressure will most quickly relieve the symptoms.

**Eclampsia** occurs in the last three months of pregnancy as a rule, and most frequently just before or during labor.

In about one sixth of the cases only, the attack may follow labor. The attack is characterized by violent convulsions, which come on with little or no warning unless the urine has been carefully watched.



Fig. 112.—The exaggerated lithotomy position obtained with a sheet sling. (American Text Book.)



Fig. 113.—The improvised Trendelenburg position. (American Text Book.)

The *prodromal symptoms* have already been described under albuminuria in pregnancy (p. 83). The marked features may be repeated for emphasis: *persistent headaches, disorders of vision*, spots before the eyes, blindness, edema of cheeks, eyelids, feet and hands,

*pain at the pit of the stomach, dizziness, nausea and vomiting* and ringing in the ears. Suddenly the convulsion occurs, the facial muscles twitch, then the limbs and body are shaken by violent muscular spasms. The body becomes rigid, the tongue protrudes and the face is livid and cyanotic. The spasm usually lasts from one to five minutes and is succeeded by coma that lasts an



Fig. 114.—The dorsal position with stirrups. (Dorland's Dictionary.)

hour or more. In some instances there is no return to consciousness before the next attack, which comes on every hour or half hour, though occasionally only one seizure is noted.

The blood pressure is greatly increased and the urine is diminished, the temperature rises to  $103^{\circ}$  or  $104^{\circ}$  F. When death ensues, it is most frequently due to edema of the lungs or cerebral hæmorrhage.

The greater the number of convulsions, the more se-

rious the outlook as to life, and it is said that after twenty seizures fifty per cent of the mothers die. Under the best treatment approximately fifty per cent of the babies die.

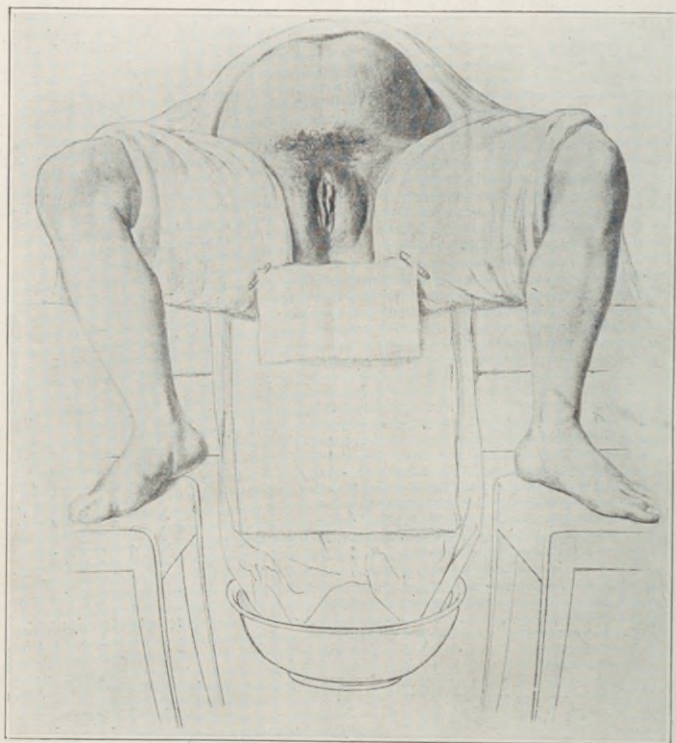


Fig. 115.—Dorsal position across the bed. (Bumm.)

There is no routine treatment for eclampsia.

The principles of management for the attack are (1) to empty the uterus, on the theory that the disease is a toxæmia of gestational origin, (2) to eliminate the poison, and (3) to control the convulsions.

The albumin in the urine and other eclamptic symptoms demand urgent attention in prophylaxis.

For the pre-eclamptic period (see Albuminuria of Pregnancy, p. 80) a rigid milk diet is indicated. The bowels, kidneys, skin and blood vessels must all be brought into service.

In the full blooded patient, venesection may be done and after drawing off ten or twelve ounces of blood, an equal amount of normal saline may be poured into the same vein.

Subcutaneous transfusion or the submammary intro-



Fig. 116.—Flexed dorsal position with feet on the table. (American Text Book.)

duction of saline solution may be done. The skin is stimulated by hot wet packs and the bowels by saline cathartics and frequent irrigation of the colon.

During the attack, the patient must be kept from injuring herself. A spoon wrapped in gauze or a small, long roller bandage should be slipped between the teeth to keep the tongue from injury. The clothing must be loosened or removed. No food, but only water is given by mouth, until the patient is conscious.

The convulsions are controlled by morphine, chloral, or both.

Morphine sulphate,  $\frac{1}{4}$  gr. is given hypodermically, followed in an hour by 30 gr. of chloral by mouth. Two hours later the morphine is repeated and six hours after the first dose of chloral, it is repeated. In this method (Stroganoff's), four doses of chloral and six of morphine are given in twenty-four hours. That is all. When the stomach will not retain the chloral it may be given by rectum in milk. If a general anæsthetic is used, it should not be chloroform, but ether.

The labor, if begun, should be expedited by forceps,



Fig. 117.—The Sims position. (Kelly.)

or version and extraction. Bleeding during delivery should be looked upon as desirable. If more rapid measures of delivery seem demanded and obstacles exist, such as pelvic contraction, imperfect dilatation, or the prospect of a prolonged first stage, Cæsarean section or forcible delivery (accouchement forcé) may be attempted.

If the labor has not begun, when the convulsion occurs and a quick delivery by the normal passage does



not seem feasible, then the Cæsarean operation may be the best treatment.

**Eclampsia.**—Among the latest treatments for eclampsia, that of Davidson is the most promising. This observer regards the whole process as a toxemia due to the blocking of the renal and hepatic systems. He treats his cases by increasing the fluid intake by mouth. In all varieties of the disease he gives by gavage, every four hours, one quart of water in which twenty grains of pot. acet. (or pot. cit.) have been dissolved. Every twelve hours he adds one or one and a half ounces of epsom salts to the mixture. The woman is delivered as soon as possible. Flatulence is met by pituitrin, eserine salicylate and enemata.

## CHAPTER XVI

### THE ABNORMAL PUERPERIUM

The practice of obstetrics has many features that are very gratifying to the nurse and physician.

Instead of a surgical operation, which has come unexpectedly and undesired; a disaster in which some part of the body is removed or altered by means of a procedure associated with extreme pain, mental tribulation and large expense, a much-wished for addition is brought to the family, with pain, to be sure, but a pain that is soon forgotten in the general joy. This is the normal condition that causes the nurse and the doctor to rejoice that such a delightful specialty has been chosen.

Then comes a case in which the labor may be complicated by some dreadful anomaly, or the puerperium burdened or disordered by some unwelcome invasion that tortures the souls of the family and may cost the life of the mother, or child, or both.

At such a time the nurse and the doctor feel the full weight of their responsibility, and after a series of anxious days and sleepless nights, they wonder why they did not choose gardening or a clerical position for their life work.

The disorders of the puerperium are many and various, but naturally the breasts and the pelvic organs are most frequently affected.

**The breasts** of the human female are not reservoirs of milk like the cow's, but a pair of highly sensitive organs that functionate and produce only as the de-

mand is made. It follows that when the milk comes in, the breasts become engorged and all the neighboring structures are involved in the new process. However, it is not milk that is overflowing the breasts, but serum, lymph and venous blood, which congest the tissues surrounding the glands and produce a hard painful mass.

The breasts become heavy, hot, and painful; supernumerary glands in the axillæ enlarge, but there is no fever. There is but little more reason for a fever when the mammary gland begins to functionate than when the lungs fill for the first time except in the case of nervous patients who bear discomfort badly.

If fever appears simultaneously with the milk, the cause must be sought in some atrium of infection, possibly in the breasts, but usually elsewhere. There is no such thing as "milk fever." The enlarged glands, the tense mottled skin on which blue veins run visibly here and there, the nipple, flattened and drawn into the swelling, so that the child can not grasp it with the mouth, all produce a sense of disorder that ought to be associated with fever—but is not. This is the "caked breast" of the laity, and if let alone, the hyperæmia subsides and the function remains. The temperature in possibly two cases out of five may rise to 100° F. for twenty-four hours, but it promptly subsides. These temperatures generally occur in neurotic women.

If the breasts are irritated by binders, breast pumps, or massage,—like the blacksmith's arm, with exercise—the trouble, if not increased, is at least much slower in disappearing.

It is reported that the young virgins of some African

tribes nurse the babies in the family, the breasts being stimulated to produce milk largely by massage.

If the condition of the breasts becomes too painful, the liquids by mouth are reduced to the last degree, saline cathartics are given until frequent watery stools result, one or more ice bags are applied to each breast and codeine sulphate may be given at night. The child nurses every four hours only. Williams was the first to show that no tight binder is necessary, but only a supporting bandage. The tight binder is a cruel and useless barbarism that has been abandoned by progressive physicians. No massage is allowed; no pumps; no irritation whatever, and in twenty-four hours the trouble has disappeared. Hot dressings to the breast are equally archaic. They should *never* be applied to any breast unless it is desired to hasten suppuration.

If the child dies, or for any reason can not nurse (inverted nipple, cleft palate, harelip) and it becomes necessary to dry up the milk, the treatment for "caked breast" is continued. After twenty-four hours the breasts are comfortable and rarely give trouble again.

*Cracks, Fissures and Abrasions of the Nipple.*—The care of the nipples should be inaugurated about six weeks before labor, as elsewhere described:

The nipple must be inspected and its possibilities determined, early in pregnancy, if possible, for many varieties of badly shaped and ill-developed nipples exist which may make nursing difficult or impossible.

Imperfect nipples especially are predisposed to fissure and crack, and will require extreme care on the part of the nurse. She should inspect them before and after each nursing and sedulously use cleanliness and asepsis in her management. In normal and tranquil as well as in neurotic women, the nipple may become so sore

as absolutely to preclude nursing, and this entails much additional work on the nurse and mother, as well as considerable peril for the child. The condition usually begins as a fissure or crack, and is accompanied by much pain. It is serious, furthermore, in another aspect since all breaks in the surface of the nipple are avenues of infection that may result in mastitis. The



Fig. 118.—Examples of imperfect nipples. (American Text Book.)

child may produce fissures or abrasions by rubbing the nipple with his mouth, by pulling too hard, or by the habit of holding it in his mouth and macerating it with his gums when he has finished nursing.

The child must not be left at the breast after he has nursed, but the nipple should be gently removed from the child's mouth by passing one finger in beside the nipple. Fissures and abrasions usually occur within ten days if at all. Abrasions or erosions are due to

the wearing away of the epithelial covering of the nipple in patches more or less extensive.

Thin-skinned blonde women suffer more than those with dark, dense oily skins.

A *fissure* is a distinct separation of tissue that goes deeply into the underlying substance.

A *crack* is a long abrasion which may deepen into a fissure.

Both fissure and crack may affect the top, the side of the apex, or the base of the nipple. They may be either longitudinal or circular. The entire nipple must



Fig. 119.—A standard nipple shield. (American Text Book.)

be kept under observation and the instant a raw surface is detected, *treatment* must begin.

Compound tincture of benzoin, liberally applied, is a favorite and successful remedy. Our routine is to apply a paste made of equal parts of castor oil and subnitrate of bismuth. This is put on after the child nurses, and must be removed carefully before the next nursing. Sometimes the child's stools become black and constipated and the trouble may be traced to imperfect removal of the bismuth preparation.

Whatever medication is used, the nipple must be protected from injurious friction by the clothing. This is best done by the hat-shaped lead nipple shield, which is placed over the nipple and held in place by a light binder. The shield should be boiled before use.

To protect the nipple during nursing, a glass shield may be used for a day or so, but not long enough for the babe to get accustomed to it, else he will form a habit hard to break. This shield must be taken apart after use, washed and kept in saturated solution of boric acid until the next nursing.

If all these measures fail, the fissure must be touched with a nitrate of silver stick once, or have a 2 per cent solution of nitrate of silver applied night and morning. It may be necessary to take the child from the breast for a day or so, in which case he nurses the other breast and the side with the bad nipple is pumped.

The care of the nipple is highly important since the apprehension and the actual pain of each nursing may prevent sleep, destroy the appetite, and diminish the milk. If begun early, most fissures will heal in twenty-four to forty-eight hours.

**Mastitis.**—From three to five per cent of lying-in women have mastitis in the European clinics, but the records in America show a much smaller number.

The disease occurs most frequently in blondes and in primiparas. It is most apt to appear during the first two weeks, when the congestion accompanying the new mammary function produces a stasis that favors the growth of germs, which may enter through the abrasion or fissures of the nipple produced by zealous activity of the child's gums. But it may also occur when the child's first teeth come and the nipple is again exposed to in-

jury. At times it is impossible to find a plausible excuse for its occurrence.

Mastitis is usually described in three forms: The (a) parenchymatous or glandular type, which affects the substance of the gland or the enveloping connective tissue; in (b) subcutaneous mastitis the connective tissue beneath the skin is attacked; and in (c) the subglandular variety, the infection finds a lodging between the gland and the chest wall.

Mastitis is always due to the presence of microorganisms which in many cases gain access to the gland through fissures or abrasions by means of the lymphatics. In other instances the germs may be in the blood and a local stasis may encourage the infection. Still again, they seem to enter through the normal nipple openings.

*Symptoms.*—The parenchymatous inflammation begins with a chill, and the temperature promptly rises to 102° to 105° F. The pulse is high. The patient complains of headache and thirst. Examination reveals hard, tender nodules in some part of the gland. The skin may or may not be reddened.

If the trouble has begun in the connective tissue, the skin will be diffusely reddened, the nodule ill-defined, the temperature will rise gradually and the chill may be absent.

*Treatment.*—The breast is put at rest. No tight binder is applied, no breast pump, no massage. No heat is allowable.

Ice bags surround the gland night and day. The liquids by mouth are restricted and saline cathartics given. Codeine may be administered for pain. Usually the symptoms subside without suppuration in from one to two days.



Should the inflammation persist for more than two or three days, in most cases the tissue will break down and form a *mammary abscess*. When it is evident that suppuration has begun, heat may be applied to the gland and the process accelerated. The abscess may be superficial or deep and will be diagnosed by a bog-giness in a circumscribed area or by fluctuation. The abscess must be opened as soon as possible.

The nurse sterilizes a bistoury and a pair of long artery forceps. Lysol solution and cotton sponges are made and sterile gauze for packing. The hands are surgically prepared and rubber gloves worn. If an anæsthetic is required, gas may be used, or chloroform. The incision is made radially from the nipple so as to minimize the injury to the milk ducts. A gauze drain may be required for a few days.

In the *after-care*, the nurse must be scrupulously clean and not convey contagion from the breast to the woman's genitals, to the child's eyes, navel or vagina, nor to her own person.

**Excess of milk** is rare, but may be observed for a short time after the glands fill. It seldom requires treatment, but saline cathartics, restriction of fluids, and putting the child on a four-hour schedule will reduce it. Pads may be worn if it runs away freely.

**Scarcity of milk** is only too common. There may be enough at first and the quantity gradually diminish, or it may be deficient from the very beginning.

The faulty secretion may be due to the age of the mother, to disease (anæmia), to bad nutrition, or to overwork. It may follow a premature child. Compression of the breasts by corsets or tight dresses may prevent development. The amount of gland tissue is very important. Many women have large, fat breasts,

but a small glandular development. Mental conditions, such as fright, worry, and anxiety, will diminish the flow of milk or stop it altogether.

*Symptoms.*—The child is fretful, goes to sleep after nursing but soon wakes up, or may nurse awhile, and then finding it useless, will cry and refuse the nipple. He loses weight and when weighed before and after feeding, the scales scarcely vary. No secretion or very little can be squeezed from the breasts. The child may be given a bottle after which he goes to sleep.

*Treatment.*—When the gland tissue is defective, no treatment can succeed.

The appetite must be improved by bitter tonics and the mind relieved of its anxieties, if possible. Change of scenery may help. The fluids must be increased, milk, cocoa, chocolate and gruel must be pushed, and such vegetables added as corn and beets. Oyster stews, clams, lobsters, and crabs will help. The diet must be full and nutritious with especial stress on those foods that raise the blood pressure. A mixed diet containing from 2500 to 3000 calories is about ideal. Malt drinks or champagne may avail in some cases. Exercise in moderation is desirable.

Artificial stimulation of the breast sometimes succeeds. Massage will irritate the glands, increase the congestion, and promote functional activity; or a Bier vacuum apparatus may be put over the gland several times a day and the air pumped out. The breast should be kept distended for fifteen to twenty minutes. There is difficulty in this country in getting glass bells of sufficient size.

**Galactorrhœa** is the name applied to an abundant secretion of milk poor in quality toward the end of a long lactation or after the child is weaned. The symp-

toms are an almost constant flow of milk with resultant anæmia.

*Treatment.*—Elix. of iron, quinine and strychnine with compression of the gland. A dry diet and the avoidance of all irritation of the breasts will aid.

To “dry up the milk,” follow the treatment for “caked breast.”

**Quality of the milk** may be such that the child will not take it or, if taken, it fails to nourish. In some cases this is due to overlong, or to irregular, periods between feedings; for when the nursing interval is too

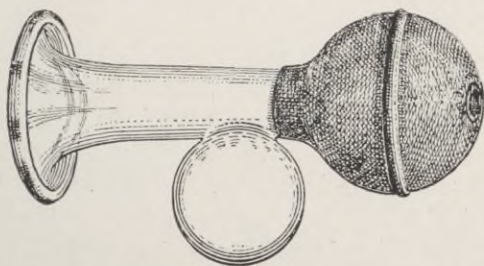


Fig. 120.—A standard breast pump. (American Text Book.)

short, the milk becomes too rich, when too long, it becomes thinner and less nutritious.

Fright, anxiety or anger may change the character of the milk so that colic, vomiting, and diarrhœa and indigestion are produced in the child. A wet nurse becomes homesick and the milk dries up. It may become extremely indigestible, as shown in cases where a wet nurse quarrels with her husband and her foster child develops green stools. If the mother's milk does not agree, the child may be put on feedings for twenty-four or forty-eight hours, while the milk, pumped from the breast, is sent to a laboratory for analysis. If a

return to the breast is unsatisfactory, artificial feedings or a wet nurse must be supplied.

**Removal of the child from the breast** may be required for a variety of reasons. Thus, the mother's addiction to alcohol or opium is good ground for taking away the child. Arsenic, bromides and iodides of potassium, saline cathartics, salicylates, alcohol, opium and belladonna must be given to the mother with great caution during lactation, for they pass over into the milk.

Acute diseases, such as erysipelas, pneumonia, diphtheria, typhoid, malaria, pronounced puerperal sepsis or persistently high fever from any cause, usually dries up the milk; while cardiac lesions, unless well compensated, chronic anæmia and tuberculosis, obviously demand the removal of the child for the sake of both. Sometimes a new conception, especially when the milk becomes poor in the last half of gestation, compels the mother to wean her babe.

A syphilitic woman may nurse her own child, provided her condition is good and the child also is syphilitic.

Theoretically, the return of menstruation in no way affects the nursing child, unless the blood is lost to the point of anæmia. Yet cases do occur in which the child has indigestion, colic and bad stools, as well as loses weight, when the mother is menstruating.

The quality of the milk is sometimes altered, but only for a day or so, and the child should continue at the breast unless some definite indication for removal arises.

**Weaning** ordinarily is completed by the ninth month, but the child should never be carried beyond the twelfth month on account of changes in the character of the milk.

When a child is weaned, the substitution of an artificial food may be made gradually,—a bottle a day, two bottles a day, etc., until, in a couple of weeks, the breasts are at rest.

The excessive prolongation of lactation is shown upon the mother by impairment of the health. The patient is pale, weak, anæmic, fretful, and thin. Headaches, dizziness, loss of appetite, and constant fatigue will be complained of.

The *treatment* is to remove the child at once and put the mother on stimulating drugs and foods. A change of air and scenery, if possible, will be highly beneficial.

**The wet nurse** is always a tribulation, which must be endured until the child can be put on artificial food. She should have a Wassermann test before entering upon her duties. Syphilis, tuberculosis, and gonorrhœa must be guarded against. She must be kept like the family cow, in a placid frame of mind, fed on nutritious food that is not too rich, and exercised enough to keep the blood circulating.

Light housework and duties that take her out of doors part of the time are advisable. Her moral character can only be assured through those who have known her. If she brings her own child with her, she will need watching to provide for an equable distribution of the milk. The first few days is never a criterion of a wet nurse's effectiveness. Change of food and surroundings may interfere with her usefulness.

**Gas** may complicate the puerperium after Cæsarean section, and even after normal labor. A rectal tube of soft rubber may be passed as high as possible into the bowel and left for some time, or enemas of S. S., tur-

pentine, asafœtida, or milk and molasses may be given. By mouth calomel or mag. cit. is valuable.

**Headache** in the puerperium should be watched carefully, and the cause discovered. Pain in the head may be a habit with the patient, or it may be a symptom of some complication either present or developing, such as toxæmia, eclampsia, or acute yellow atrophy of the liver. In general, it is due to milder conditions like exhaustion, too many visitors, excitement, nerves, or insomnia.

**After-pains.**—Sometimes patients are greatly annoyed by after-pains. The pain may be due to a clot retained in the uterus or possibly a stimulation of the uterus when the child goes to breast. Gentle massage of uterus, or ergot, quinine, or codeine may be required to bring about the expulsion of the clot or to control the pain. A reasonable degree of after-pain is of favorable significance. (See p. 170.)

**Breast Pump.**—The breast pump should be used as little as possible and with great care lest it produce a mastitis. If the nipples are too sore to permit of nursing or if the patient will not suffer the pain of nursing, she should be informed of the danger of the pump. The responsibility is then hers. It is better to put the babe on artificial food than to use the pump without judgment or for long periods.

**Manual Expression of Milk** may be done by nurse or wet nurse. The nipples are washed with sterile water and the patient seats herself with breast convenient to a sterile receptacle. Nurse or patient with aseptic hands expresses the milk by compressing, not the whole breast, but only that part corresponding to the areola. As this is compressed, the whole breast is at the same moment drawn downward and forward.

## CHAPTER XVII

### INFECTION

Puerperal fever is a wound infection, a filth disease.

The conditions of the pelvic organs during labor and postpartum, are well adapted to receive and develop microorganisms, for the healthy antimicrobial power of the vaginal secretion is absent or diminished.

A long and exhausting labor, possibly accompanied by hæmorrhage, or terminated by an operation, has diminished the immunity and broken the resistance of the tissues to a dangerous degree.

The mucous membrane of vulva and vagina are torn and bruised, the vitality lowered, and the surface covered with bloody lochia, which is an excellent nutritive medium for microbial development. The uterus is a vast, open wound, filled with fibrin, blood clot, and decomposing tissue, while the whole pelvis is maintained at exactly the proper temperature for germ propagation.

Through these wounds, toxins are carried into the circulation, and germs, nourished upon the abundant and favorable culture media, pass through the uterine walls or by way of the lymph channels first into the adjacent tissues and thence to all parts of the body.

Certain definite organisms reach the disintegrating tissues and produce a putrefaction. They do not, however, once their work is done, pass into the body. But in producing putrefaction, they also produce injurious poisons, called toxins, which do enter the body and cause an absorptive fever known as sapræmia.

Other organisms are the pus microbes, which begin their growth in any favorable location and continue to spread and flourish onward and inward by blood vessel, tissue or lymphatic, until overpowered by the resistances of the body, or until by general sepsis, they have killed the patient. These are the streptococcus, staphylococcus, bacillus coli and bacillus pyocyaneus. (See Frontispiece.) These are the germs that the nurse or the doctor may bring to the patient on hands, clothing, or hair. These are the organisms against which our scrupulous asepsis and antisepsis is directed. It is against them and their activities that the doctor and nurse prepare by the long and painful scrubbing of the hands and elbows, the rubber gloves, by the shaving and scrubbing of the patient, and by all the paraphernalia and equipment that go to furnish the modern lying-in chamber or delivery room. It is on account of these germs that the conscientious doctor or nurse lies awake nights and painfully reviews his technic when his patient has a temperature, and it is on their account that he shudders at the callous disregard of human life that is shown by those who do not observe the known laws of asepsis.

It is true that many women escape when the attendant is unclean, but this is due to a splendid immunity, and in no way absolves the man or woman who neglects his asepsis and has patient after patient running temperatures, some of whom are bound to die or be crippled for life. It is for this reason that a surgeon should do surgery and not general practice; it is for this reason that an obstetrician should limit himself to the care of women in childbirth and not endanger them by taking cases of scarlet fever, erysipelas, and unclean surgery.



In country practice, all kinds of work must be done since there are not enough men to specialize, but it is inexcusable in the city where a man can always be clean and keep clean, if he is willing to forego the income derived from attendance upon septic and infectious cases. Any article not surgically clean may contaminate the patient by contact; but ulcers, suppurating wounds, abscesses, and hands improperly or insufficiently cleaned are the deadliest causes of post partum temperature.

Infections are said to be either self-produced or brought to the patient from without.

The only organism that is demonstrably self-infectious is the gonococcus, which may be present in the vagina before labor and may infect the puerperal woman; but it is wiser, safer, and more nearly accords with the facts, to regard all infections as alien borne, as brought to the patient and introduced by the unclean hands or instruments of her medical attendants.

**Prevention.**—A conscientious and capable nurse or doctor will not go from an infected case to a confinement. Both will keep their bodies clean, the teeth filled, and pyorrhœas scraped and treated. The occurrence of pus anywhere on the body is sufficient reason for the doctor to give up his confinements for a time, and the nurse to report off duty.

No raw, and but few mucous surfaces should be touched by the fingers of the attendants, where a sterile instrument can be used.

The nurse should never make vaginal examinations unless an emergency exists, and then only when her instruction has been thorough and her experience great. Every examination is a possible source of danger, no matter how carefully the hands and patient are pre-

pared. The nurse is not to change the pads without washing her hands, and she must wash her hands always after changing the pads, before dressing the navel of the child.

The navel or eyes of the child may be infected easily by the hands of nurse, doctor, or patient. The breasts of the mother may be infected by the hands of nurse, doctor or patient. The vulva and vagina of the puerperal woman is highly susceptible to infection from the hands of nurse, doctor or patient.

Puerperal sepsis may be prevented almost certainly by observing the following rules:

1. *Have environment as aseptic as possible. Take the same care for a labor as for any other surgical condition.* This means by preference a clean hospital with sterile linen and instruments. If these conditions are unavailable they should be imitated as closely as circumstances permit.

2. *Initial sterility of hands and instruments. Then keep them so.* This means sterile rubber gloves on clean hands and a rigorous technic in keeping them sterile. An aseptic ritual brings salvation to the patient.

3. *Render vulva and adjacent surfaces free from all organisms.* This means a warm shower bath, evacuation of lower bowel, shaving of genitalia and scrubbing of hips, thighs, genitalia and lower abdomen with green soap and warm sterile water.

4. *Do not carry organisms from lower to upper part of genitalia.* This means that since the introitus cannot be perfectly sterilized one must use great care to touch the introitus as little as possible and to make no introduction of fingers or instruments, even if clean, which is not definitely indicated.

5. *Keep the uterus empty and retracted by good drainage.* Subinvolution and clots may be corrected and removed by the use of ergot, pituitrin and massage.

6. *Minimize the bruising and devitalizing of tissue during labor.* Prolonged and obstructed labors result in compression of the soft parts which is followed by devitalization and necrosis. Early recognition of the complication and its correction will obviate serious injury. Episiotomy is better than a ragged laceration.

7. *No Infection from the outside should endanger the woman.* This means that the attendants should be scrupulous about contaminating themselves or of being carriers of contagion. Asepsis is the law of safety.

*Rule.*—All temperatures arising in the puerperium are due to infection, unless satisfactorily explained by finding the source. The possibility of a slightly elevated temperature from insignificant causes may be kept in mind, but such temperatures are transient and yield quickly to appropriate treatment or to none at all.

Puerperal infection is most apt to appear during the first week of the lying-in period, and it generally develops about the third or fourth day postpartum. If the symptoms come on later than this, there is always a hope that the infection has taken its origin in something else than the labor.

*Symptoms.*—In mild cases, a rapid pulse, headache, and a temperature of 101° or 102° F. may be the only symptoms. Severe cases begin with a chill, followed by a marked rise of temperature. The temperature is always irregular and generally remittent.

The pulse rises to 120 or 130 beats a minute, headache and prostration appear, occasionally associated with vomiting.

The flow of lochia may be either increased or dimin-

ished and either offensive or free from odor. Foul-smelling lochia is a sign of putrefaction but not necessarily of sepsis.

At the same time there is some tenderness in the lower part of the abdomen, usually most marked at the sides of the uterus. The uterus is larger than it should be, and not hard, but doughy and sensitive to touch.

The involution is arrested, except in cases of pure septicæmia. This is an important reason for the daily observation and recording of the regular descent of the organ.

Whatever the point of invasion, the germs will either be confined to local and possibly superficial regions by the bodily resistance of the patient or if this is overpowered, the infective agents will extend by lymph channels and blood vessels constantly farther until their course is checked or the patient dies.

The disease runs a variable and more or less prolonged course and the prognosis is always doubtful until the event. Signs of grave import are: repeated chills, insomnia, pulse above 120, persistent vomiting and meteorism, with dry, brown tongue.

*Treatment.*—Mild cases without chill when the uterus is large and the lochia sometimes offensive, are usually sapræmic. Free catharsis, ergot in full doses, and a half sitting position to aid drainage will cause the symptoms to subside in two or three days.

In the severe type, the treatment is mostly a case for careful nursing. The more energetically the doctor acts, the more liable he is to do harm. The patient needs all her strength to fight the disease, and should not be required to fight the consequences of injudicious interference.

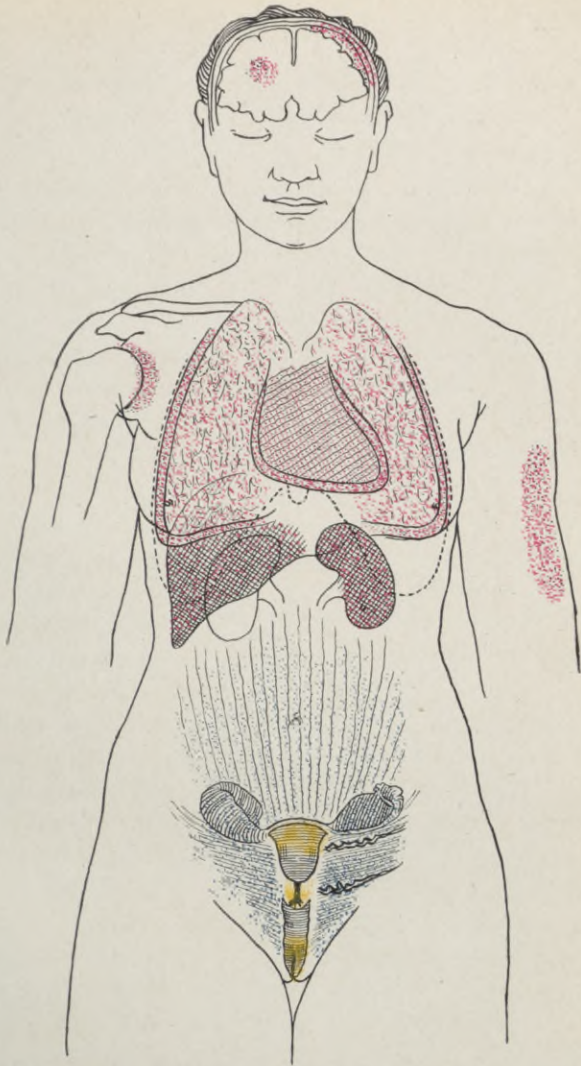


Fig. 121.—Diagram to illustrate the position of the lesions in puerperal infection. (Midwifery, by Comyns Berkeley and Fairbairn.)

In Yellow.—Primary lesions—the placental site, the cervix or the perinæum.

In Blue.—Local secondary lesions—Thrombo-phlebitis of the uterine and ovarian veins—pelvic cellulitis—salpingitis—oophoritis and peritonitis.

In Red.—Remote secondary lesions—septic pneumonia—pleurisy—pericarditis—endocarditis,—toxic or septicaemic hepatitis and pyelitis meningitis—cerebral abscess—septic arthritis—abscesses in the subcutaneous tissues.



There is still some discussion about the advisability of assuring oneself that the uterus contains no remnants of the labor. Some feel that this should be determined by curetting the uterus with finger or instrument and following the operation with an intrauterine douche. If this is the view of the attending man, the nurse must aid, for the responsibility is his and not hers.

On the other hand, the weight of authority at present seems inclined to the view that any remnant of the labor will drain out naturally or be expelled by ergot-driven contractions without the necessity of opening up new raw surfaces by interference and thus spreading the infection.

The main idea is to promote drainage in every way possible. No curette, no douche, no uterine packing. Nevertheless, the vulva may be cleansed and the vagina carefully retracted and by appropriate means a culture obtained from the uterus. If this shows streptococci, all local treatment is to be abandoned at once.

In general, the food must be fluid, and as nutritious as possible. This means milk, beef and mutton broths, oyster stew, etc. The nourishment must be pushed artfully and ingeniously. Alcohol is not indicated. The bowels are kept open.

Normal saline, drop method, by rectum, will promote diuresis, skin action, and supply the body with the much needed fluid. Subinvolution is controlled by ergot in full doses. The room must be light and as many windows opened as the weather will permit. Frequent change of posture, from side to side, from dorsal to prone and especially to the half-sitting position, will give the patient comfort and prevent decubitus (bed sores). The daily bath with an alcohol rub, keeps the skin in good condition and eases the mind.

The child should be taken from the breast, because the milk is poor in quality and quantity and it may be infectious. Besides, the mother needs all her strength. Nature usually solves the problem by drying up the milk.

All pads soiled by the patient should be collected in paper bags or rolled in newspapers and burned. Sheets, towels, and pillow slips must be boiled in the house and not sent to the laundry. They should be soaked for half a day in a 2 per cent solution of lysol before being washed, and exposed to the hot sun for a day or so afterward, if possible. No comforts should be used on the bed, and the blankets must be left suspended in the room when it is fumigated at the conclusion of the case. All dishes and utensils can be boiled. Plenty of air and sunshine are essential for the cure of the patient and to prevent the spread of the disease.

*The nurse* must use every precaution to avoid carrying the infection to herself or others. Rubber gloves should be worn while changing the dressing. It is better to have the child cared for by another nurse. The nurse must get her rest and some exercise out of doors every day. It rejuvenates her and reacts to inspire the patient.

When she leaves the case the nurse should boil her linen and wash her hair with soapsuds and hot water, and bathe frequently.

**Milk Leg.**—This is an infection characterized by swelling of one, or rarely, both, limbs, from the foot to the groin. The leg is white from the edema, and as the condition is associated with fever and since the milk diminishes or disappears about the same time, it was thought in former days that the milk went to the leg.



The cause of the swelling is a phlebitis of the external iliac or femoral vein which becomes thrombosed or so filled with clots that the return circulation is impeded.

*Symptoms.*—The attack is signalized by a rise of temperature to 102° to 104° F. There is headache, pain in the affected limb, and general prostration. It is a true sepsis.

The disease appears usually in the latter part of the second week of puerperium, when the patient has begun to congratulate herself that all danger is over. In many cases the doctor has yielded to importunity and let the patient get up before involution was sufficiently advanced and the patient will report that she got up too early.

The limb must be immobilized and kept warm. The immobility should be maintained for at least ten days after the fever has subsided and the pain gone.

The convalescence may be protracted over weeks and months.

**Bed sores** may complicate a long convalescence. Bathing with alcohol or alcohol and alum, and the frequent change of the patient's position will usually prevent them. Rubber rings and sheeting should not be used if it can be avoided. Ointments containing zinc are of great value in the cure of this affection.

**Phlebitis**, in minor degree or in localized sections, may occur in the veins of the leg and the site of the invasion will be outlined as red lines or as irregular nodules. Some fever may attend the condition. Rest of the affected member, with ice bags for the pain, constitute the treatment. Bed sores must be guarded against.

**Sudden death** in the puerperium is a shocking disaster. Rapid death may follow the complications of

labor accompanied by hæmorrhage, such as placenta prævia, rupture of the uterus, etc.; but death may be *sudden*, without warning, from pulmonary embolism, acute myocarditis, fatty degeneration of the heart, or the entrance of air into the uterine veins. This may happen several days after labor in a woman who is passing through a convalescence apparently normal in every respect. Such an event is probably due to a **thrombus** which may form in any of the veins of the body, but more frequently in those of the pelvis and legs. In the latter it may be recognized by hard lumps that form somewhere along the course of the veins in consequence of a phlebitis. There is always the menace that some fragment of this mass, which is merely a hard clot of blood, may become detached and float off in the circulation to other parts of the body, such as heart, lungs, or brain (embolism), and by interference with those structures, produce paralysis or instant death. When a thrombus is diagnosed, the affected part must be kept as quiet as possible. No massage is permissible. Tincture of iodine or 20 per cent ichthyol may be applied. The woman should remain quiet for at least ten days after the apparent disappearance of the symptoms.

## CHAPTER XVIII

### THE CARE OF THE CHILD

Hitherto the mother and the complications and changes peculiar to her condition have been selectively considered, to the neglect of the child; but the labor being over, and the nurse having assured herself that the uterus is hard, that there is no hæmorrhage, and that the mother is resting, now turns to the child lying in its blanket. A hot water bag, carefully tested, should lie at its feet wrapped in toweling or napkins.

The eyes have already received the Credé treatment, 1 per cent solution of silver nitrate or possibly a 15 per cent solution of argyrol for prevention of ophthalmia, and a thorough cleansing comes next.

In a warm room, away from drafts, the nurse takes the child in her lap, or on a table, with a blanket underneath. She first anoints the child all over, either with benzoated lard, sterile vaseline, or olive oil. This softens the vernix caseosa that covers the child and aids its removal.

The skin is wiped carefully with cotton or a soft cloth, paying particular attention to the folds of the groin, the arm pits, and the genitals. The nostrils are gently wiped out with applicators dipped in oil.

The child must be covered as much as possible during the operation and the work finished quickly. The whole period should not exceed twenty minutes.

During the cleansing process the nurse should look closely for anomalies or anatomical imperfections, like an imperforate anus or urethra, supernumerary digits, etc.

**The Bath.**—Daily, until the cord comes off, the baby is sponged with oiled pledgets, followed by a spray bath, or a sponging with lukewarm water and castile soap. The child must not be put into a full bath tub on account of danger of infecting the umbilicus. The bath water in a tub or basin quickly becomes filled

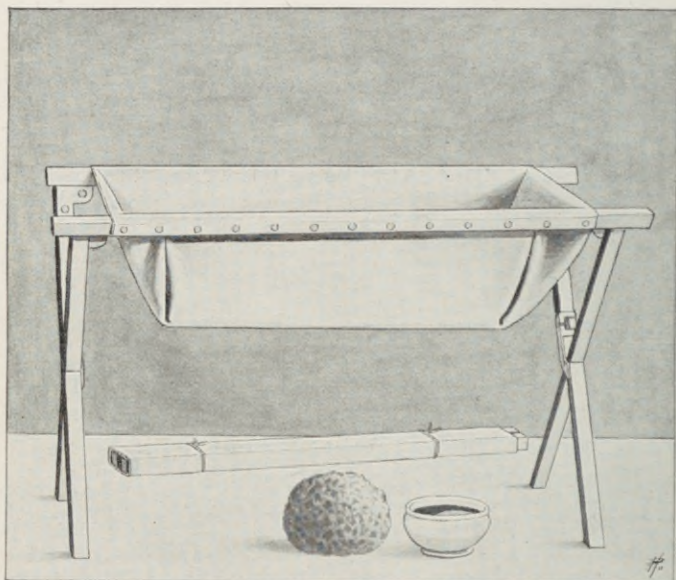


Fig. 122.—Rubber bath tub.

with bacteria from the surface of the child's body and may be conveyed quite easily to a raw wound.

All discharges must be wiped away, and the buttocks cleansed with oil. If the skin becomes irritated by urine or otherwise, the child should be well covered with talcum powder, especially in the folds of the groin

and in the genital crease. All infants are benefited by a little mild massage after the bath.

If other babies are handled, a child with infected eyes, or skin eruptions, must be quarantined and cared for separately by a special nurse. The color of the skin should be pink, changing under manipulation to red. If there is mucus in the mouth, it may be wiped out with an applicator, if in the throat, the child may be held up by the feet and the head drawn back for a few minutes so that gravity will aid the discharge of the obstruction.

After cleansing the skin, the nurse sterilizes her hands and dresses the cord. The gauze which was temporarily wrapped around the stump is removed, the cord and adjacent skin washed with alcohol and dried. The stump is powdered above and at the sides with a mixture of equal parts of boric acid and subnitrate of bismuth, and then wrapped in gauze. The band is put on, the temperature taken, and the baby dressed. Some physicians prefer to have the cord dressed in 95 per cent alcohol, which is frequently renewed. The normal separation of the cord takes place through a kind of dry gangrene, which should be favored by dry rather than wet dressings. The 95 per cent alcohol does not remain at 95 per cent after it is exposed to air, hence it does not absorb moisture from the cord as absolute alcohol would. However, the attending man is responsible, and his orders must be followed.

**The Umbilicus.**—The cord may be severed as soon as the child has cried lustily or the cessation of pulsation may be awaited, in either case the child secures a little more blood, which gives him a better start in life.

Two tapes are tied about the cord, one close to the

skin margin of the child and the cord is cut between them. A kind of mummification or dry gangrene normally develops and the stump falls off, as a rule, about the fifth day, leaving a moist, granulating area, which forms the umbilicus.

A metal clamp may be used in place of a tape to compress the cord. The advantage of the clamp is that on account of its greater width and rigidity it does not cut through the cord when applied. Furthermore, it can be made and kept more nearly aseptic. It does not soak up the juices from the cord and form a culture medium for germs. It can be removed on second day.

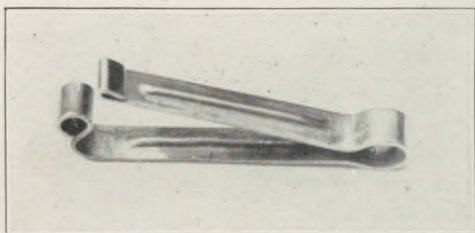


Fig. 123.—The Pettit cord clamp.

The cord usually comes off a day or so sooner than when the tape is used.

The care of the cord is extremely important, as many infections can be transmitted through it to the child. At each dressing the cord is inspected, and whether it is dry or moist, offensive or inodorous, should be noted. These facts, with the falling off of the cord, are put down on the history sheet as they are observed. The binder, after each removal, is not pinned, but sewed on. The sewing should begin below and go up in order to have the tightness low down.

**Eyes.**—After the first instillation of silver nitrate solution, a reaction appears with redness, swelling, and discharge, which passes off without treatment in two or three days. During the bath, care must be used not to get anything into the eyes nor anything from the eyes or nose upon the navel.

At each dressing the nurse should irrigate the edges of the lids gently with boric acid solution. If the eyes become red, swollen, and have a purulent discharge after the second day, ophthalmia must be suspected and they must be watched with extreme vigilance. A smear should be taken for the microscope and preparations made for energetic treatment.

The following summary may be of service in memorizing the routine of nursery procedure.

### Nursery Rules

1. Keep temperature of nursery 68° to 72° F.
2. During bath, keep temperature of nursery 75° to 80° F.
3. Temperature of bath water 98° to 99° F.
4. Never use a diaper that has not been laundered.
5. Tie case number on child's arm before leaving delivery room.
6. Watch cord for hæmorrhage.
7. Record temperature, stools and urine.
8. Give water freely between feedings.
9. Put to breast twelve hours after birth, and every three hours thereafter until the child begins to gain, then night feedings may be omitted.
10. Change binder daily.
11. Oil bath first, then shower bath on subsequent days.
12. Dress cord with alcohol 95 per cent, dry and apply bismuth subnitrate and boric acid powder, equal parts (or Dermatol) into crevices beneath clamp or tape and under edges of the crust. Change dressing daily. Cord should fall off fifth day. Report failure to do so.
13. Clamp may be removed on second day.

*Routine for the Child.*—

1. Temperature.
2. Undress.
3. Weight.
4. Shower bath.
5. Dress cord—record condition.
6. Binder daily until discharged.
7. Diaper and dress.
8. Sponge eyes with boric solution.
9. Cleanse nostrils with albolene.
10. Brush hair.
11. Drink of warm water.
12. Observe case number daily.

**Clothing.**—(See Infant's Outfit, p. 116.) The clothing must be light, loose, warm, and not irritating to the skin. The outside garment should have wing sleeves which permit free motion of the hands, but do not permit them to reach the eyes.

The band of plain outing flannel should always be worn for the first few weeks.

Birds-eye linen makes the best diapers on account of its superior absorbent qualities.

The feet must be kept warm by stockings, and artificial heat, if necessary. On hot days much of the clothing may be removed and the shirt, band and diaper may be all that are needed.

The care of the shirts and bands is part of the daily duty of the nurse. They must be washed daily, either by the nurse herself or under her supervision, as they are easily injured. After washing, in soft water, if possible, and with wool soap, they must be dried on a stretcher. Diapers must be put directly into cold water. Fæces may be brushed off with a whisk broom, and the napkin rinsed, boiled and again rinsed. No diaper should be used a second time until this has been done. No bluing may be used on the diapers and the soap



must be mild, otherwise chafing and intertrigo will follow.

The infant's toilet basket must contain:

- 4 soft bath towels.
- 1 pound of absorbent cotton.
- 1 dozen wash cloths of soft material.
- 1 small hair brush.
- 1 pair nail scissors.
- Talcum powder.
- Bath thermometer.
- Hot water bottle.
- Albolene.
- Castile soap.
- 8 oz. boric acid solution.
- 8 oz. benzoated lard.
- Paper bags for waste.
- Pitchers and basins.

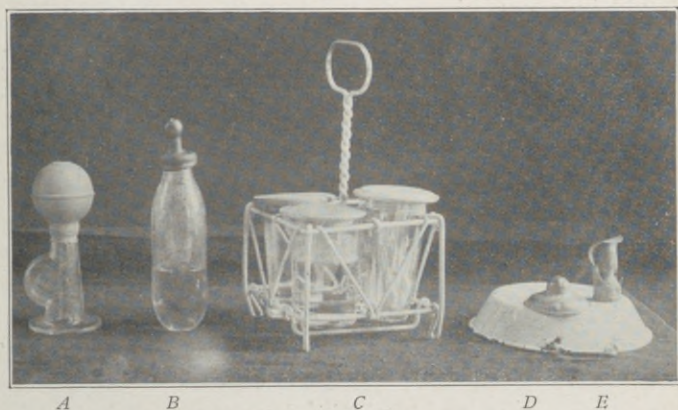


Fig. 124.—*A*, standard breast pump; *B*, standard nursing bottle; *C*, the breast tray; *D*, the Wansbrough lead nipple shield; *E*, the Brophy nipple for harelip and cleft palate.

**Weight.**—The weighing of the child should precede, for convenience, the first cleaning of the skin and the daily bath. The child is either put on the scale naked or weighed in a blanket, and the weight of the blanket,

ascertained before or after, is subtracted. The daily weight record is just as important as the temperature. A scale that registers ounces and fractions thereof must be used, and the child should be guarded from falling during the performance. Usually the child loses from eight ounces to a pound the first week, but it should gain back to its birth weight, by the end of the second week. If the child does not gain, it may be due to lack of milk from the breast, and the weight may be taken before and after feeding to verify or refute the suspicion.

**The mouth** should be inspected each morning, but not cleansed with the boric acid solution unless definitely indicated. Spots or any unusual appearance should be reported.

**The Genitals.**—The vulva of the female infant usually requires but little care besides cleanliness. There is sometimes a whitish discharge which disappears spontaneously in a few days. It is a drainage of vernix, smegma and epithelium from the vagina and labia.

With a male, the prepuce must be inspected when the child is about a week old. If it is long and the orifice small, circumcision may be suggested. Under any circumstances, the foreskin must be retracted, the adhesions broken up, and the smegma removed. This must be repeated daily until the adhesions do not recur. The maneuver should be done the first few times by the physician, for fear of a paraphimosis.

**Sleep** in the newborn is normally quite deep and almost continuous, probably twenty-two hours a day, for the first week. The rather fast respiration of the child, even when sleeping, is no cause for alarm. A healthy infant breathes about twenty-five times a minute. The

child should not be rocked, carried about, exhibited, or handled more than necessary. It should not sleep with the mother, lest it become too hot or too cold, be overwhelmed by bedding, or overlaid by the mother.

**Bowels.**—The first stools are black and tar-like,—this is meconium. It disappears by the end of the first week. The presence or absence and the character of an evacuation, as well as the number in twenty-four hours, must be daily recorded. For a breast-fed child, there should be three or four a day, for the first ten days and the number should gradually diminish until a routine of two a day is obtained.

**The diaper** of bird's-eye linen should be large and thick; two may be used if required. They should be carefully washed after soiling. Bluing must not be used, because where this substance comes in contact with the skin, irritation follows.

**Weaning** should be brought about by the gradual substitution of other foods, somewhere between the sixth and twelfth months.

**Urination** should be copious. The child is always wet, and frequent changes are necessary to keep the skin from getting raw and sore.

Both bowels and bladder should be emptied within the first twenty-four hours. Failure to do so should be reported, as an imperforate anus or urethra may exist.

Frequently a piece of ice whittled out like a lead pencil and passed into the rectum will stimulate urination.

Catheterization is practically never necessary. The child *may* go three days without injury, but the condition of the bladder above the pubes must be atten-

tively watched and its degree of fullness appreciated by percussion.

**Nursing.**—The child should be put to the breast twelve hours after birth and every three hours thereafter—no more and no less without definite reasons.

If the child is strong and vigorous, only one feeding may be given at night, and even this may be omitted in some cases where the child gets an abundance of food.



Fig. 125.—Proper position of mother while nursing child. (Witkowski.)

Six or seven feedings a day are enough. The child should stay at the breast from fifteen to twenty minutes, depending on its activity and the rapidity of the milk flow, and then be removed. It must not be permitted to sleep at the breast.

Care must be used that the child gets the nipple *over* the tongue and not under it. Many infants have to be taught to nurse. This may be due to a lack of strong animal instinct in many cases. There may be an abundance of milk and a good nipple, but the child will not

learn to nurse without a vast expenditure of time, patience, and energy on the part of the nurse. Squeezing a little milk into the mouth or filling a nipple shield with milk will sometimes aid in educating the infant, or even starting the supply with a pump, as many nurses do, is advantageous. Certain drugs, like castor oil and turpentine, taken by the mother, may affect the taste of the milk, and be reason enough for the refusal of the child to take hold. Other drugs like mercury, arsenic, potassium iodide, and alcohol may go over in the milk to the nursing child.

If the child is weak or premature, the milk must be pumped from the breast and fed to it until strength comes. The difficulty about this is the bad habit acquired, but there is no way to avoid it.

A child should get at each feeding half an ounce of milk to each pound of weight. The capacity of the stomach at various months is given by Hirst as, first week, 1/2 oz.; second week, 2 1/2 oz.; third and fourth week, 3 oz.; third month, 5 oz.; fifth month, 9 oz.; ninth month, 12 1/2 oz. Holt says that the capacity at birth should be one ounce, and increase at the rate of an ounce a month up to the sixth month.

As hunger stimulates the gastric and salivary glands, so the sight of the child arouses some emotional center in the mother, which starts the milk, and the mouth of the child provides an additional stimulus of great power. About fourteen ounces is secreted by the seventh day, and after the second month the daily average rises to three or four pints. Milk secretion is favored by drugs and foods that raise the blood pressure and diminished by substances that lower the blood pressure.

There may be too little milk in the breasts, and if so, the child will lose weight daily; also the child will waken before nursing time, fret, refuse water, but greedily seize the nipple if it is presented. It will continue to nurse long after its time is up and cling and cry when removed. The breast itself may seem flabby and loose, and no milk, or very little, can be pressed from the nipple.



Fig. 126.—Proper method of taking rectal temperature.

Normally, the breasts feel full and tense, both to patient and nurse, just before feeding time. The real test, however, is in taking the weight of the child before and after feeding. Where the milk is insufficient, the scales will not vary, and after a few repetitions the nurse can be certain. An infant should be handled as little as possible after feeding lest the milk be vomited.

**Temperature** of the newborn child varies from 98° to 99° F. It should be taken morning and evening, or oftener, if complications are suspected.

The temperature often goes up on the third or fourth day, and may stay up for several days. This phenomenon is called by some a *starvation* or *inanition fever*. The temperature may go to 106° F. and the rise is gen-

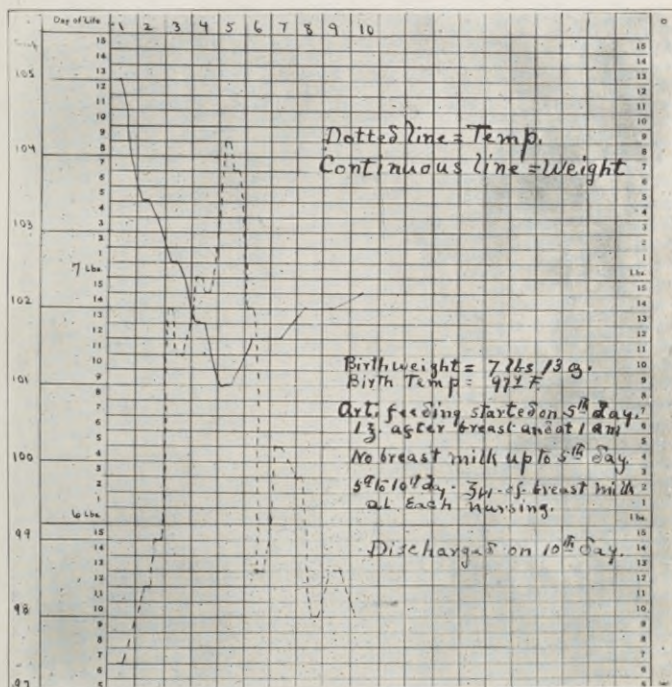


Fig. 127.—Chart in case of inanition fever.

erally associated with a hot dry skin, dry lips, weak pulse, restlessness, and great prostration. The fontanelle may be sunken and the cry sinks to a fretful, feeble whine. Objective examination of the child is negative. It is a fever without signs, though the bow-

els sometimes give off "starvation stools" (thin, slimy, dark brown or green). Strong and weak babies are alike affected.

It is important that the fever should be recognized

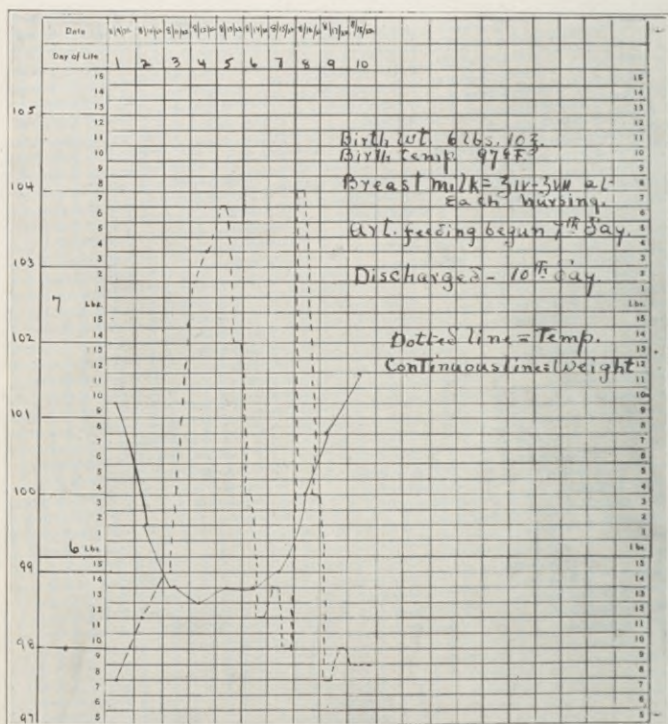


Fig. 128.—Chart in case of inanition fever.

and treated. The *etiology* is obscure. It is probably due to one or several of the numerous metabolic changes in the intestine. The fever should not be confounded with pyogenic infections, for these rarely begin before the fifth or sixth day.



The *treatment* is simple. Give water regularly every two hours by mouth, and rectal flushings of normal saline twice daily. The symptoms rapidly subside if the child is properly nourished. Hence the breasts should be inspected and the child weighed before and after feeding. Usually the milk is poor and scanty. If the temperature does not soon fall the child should be put to another breast or artificial feedings instituted.

## CHAPTER XIX

### THE CARE OF THE CHILD (Cont'd)

**Heart.**—The heart tones while in the uterus may vary between 138 and 150 per minute, but when higher than 160 or lower than 120, danger is near. After delivery, the heart runs from 130 to 140, and during the first year gradually drops to 115, approximately.

**Asphyxia neonatorum** is a condition, wherein, for some reason, the child fails to breathe after delivery. Out of every one hundred babies born, about six will die at birth or within the first ten days, and a large proportion of them from asphyxia in some form.

Asphyxia is found in two degrees: asphyxia livida (blue) and asphyxia pallida (white), or shock.

In the first, the child is deeply cyanosed. This may be due to patency of the foramen ovale, and yet it is a question whether this cyanosis is not really a normal process. The child does not undertake its first respiration because it needs oxygen, but because an excess of carbon dioxide ( $\text{CO}_2$ ) in the blood acts as a stimulant to the respiratory center, which is thus set to work, with the result that oxygen is taken in. The blue asphyxias, therefore, may be only the first step in the physiological process of respiration. In these cases, the pulse is strong and full, and the muscular tone is preserved, as well as the sensibility of the skin.

In the second degree, the condition is quite different. The face is pale though the lips may be blue. The heart is irregular and many times can not be felt. The cord is soft and flaccid, with its vessels nearly

empty. The reflexes are abolished, the skin and extremities cold. A few convulsive efforts at breathing may occur, but they soon cease.

*Treatment* is directed first, to opening up the respiratory passage. The child is held up by the feet so the mucus, blood, and fluids may escape from the mouth. Compression of the chest wall will aid. The tracheal catheter is passed into the trachea and the mucus sucked out. Next, the skin reflexes are stimulated by slapping the back, or buttocks, and by blowing upon the face.

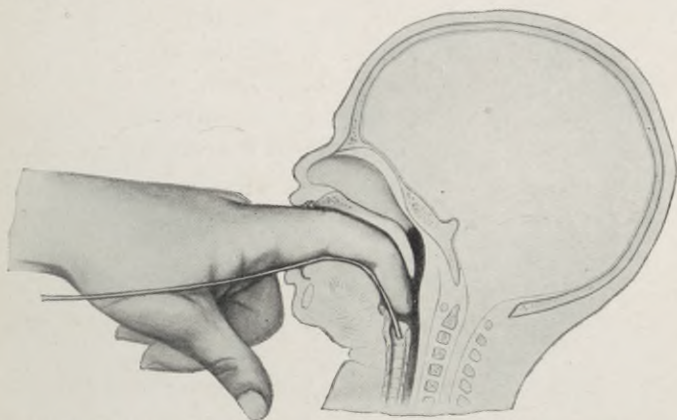


Fig. 129.—Method of passing the tracheal catheter. (Hammerschlag.)

The child at this time may be dipped in a tub of very warm water, ( $112^{\circ}$  F.) and the chest and face sprinkled with cold water. Meanwhile, Laborde's method of traction on the tongue may be tried. The tongue is seized with tongue forceps (handkerchief, napkin, or piece of gauze will do) and rhythmically drawn out and released about ten times per minute.

Further, the Byrd method of artificial respiration must be employed.

The back of the child is held in the right hand, so that the thumb and forefinger grasp the neck loosely,

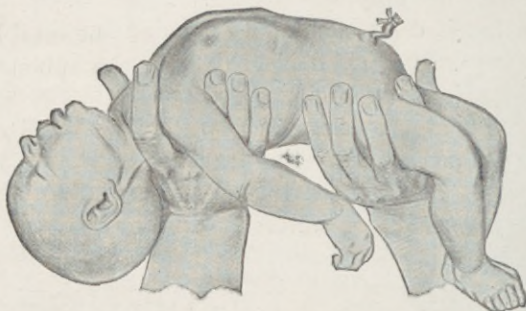


Fig. 130.—Byrd's method of artificial respiration. Extension and inspiration. (Edgar.)



Fig. 131.—Byrd's method of artificial respiration. Beginning flexion and expiration. (Edgar.)

the other hand holds the buttocks from behind and the body is slowly but firmly flexed between them until the thorax is compressed, then the grip is relaxed and

the body widely extended to allow the air to rush into the lungs. This maneuver should be repeated about twelve times per minute. When the heart ceases to beat, the child is dead and respiration can not be established.

The same treatment is employed for the apnœic child born in Cæsarean section and the oligopnœic child born under "Twilight Sleep." The method called "Schultze Swinging" is not to be recommended generally, on account of the chilling which is so necessarily associated



Fig. 132.—Byrd's method of artificial respiration. Flexion and compression. Note position of child which aids the escape of fluids from the mouth and nose. (Edgar.)

with the exposure. The nurse should learn to practice all these methods of resuscitation.

After the child breathes it must be watched carefully for at least forty-eight hours, lest the symptoms recur, and the child die.

### Asphyxia Neonatorum—

(a) Livida—body congested—blue.

(b) Pallida—body limp and pale.

Remember possibility of patent foramen ovale.

*Etiology.*—

- Too long compression of cord.
- Diminished irritability of medulla.
- Compression of brain during extraction.
- Shock during version.
- Aspiration of mucus.

*Treatment.*—

- Hold child by heels with head pulled back to straighten the trachea, and wipe out mouth and pharynx *gently* with cotton wound about the finger.
- Stimulate skin reflexes by slapping and blowing.
- Tracheal catheter, artificial respiration (Byrd) 8 to 10 times per minute.
- Hot and cold bath alternately—rub the skin and knead the muscles.
- Laborde's method of traction on tongue 10 to 12 times per minute.
- Continue efforts so long as heart beats.

**Convulsions** occur not infrequently during the first few weeks. They may develop as a result of injuries to the head during labor, or as a symptom of toxæmia. They may arise from constipation, from intestinal indigestion with curds, from fever or from hæmophila. Meningitis and other infections are associated with this symptom, and occasionally atelectasis. They may also be the manifestation of a spasmophilic diathesis. The attack may begin with such premonitory phenomena as restlessness, muscular twitching, and staring of the eyes, but more frequently the onset is without warning. The facial muscles are contracted, the neck thrown back, the hands clenched and the extremities spasmodically cramped and tightened. There may be frothing of the mouth and consciousness is lost. Respiration is feeble, shallow and irregular. The face is discolored and strange rattling noises come from the larynx. The bowels and bladder may move involuntarily. The attack lasts from a few minutes to half an hour.

Convulsions are not serious in all cases but meningeal hæmorrhage must always be suspected.

The responsibility for the management of this complication usually falls upon the nurse. She calls the doctor, to be sure, but the attacks in many cases have ceased and the child may either be dead or out of danger of a recurrence before his arrival.

The hot bath is a universal remedy and quite as efficient as anything. The temperature should be taken and the bowels washed out.

If the fontanelles are tense when the doctor arrives, a spinal puncture may relieve the tension. A specimen of the blood is drawn through a needle and sent to the laboratory for examination.

The cause must be found, if possible, and removed. A change of food may be all that is required. Cod-liver oil may be added to the diet in dram doses, three times a day, and milk curds, suspended in arrow-root water. For the acute condition, chloral hydrate is best. It is given by rectum, one or two grains in an ounce of water, and may be repeated in four hours.

**Atelectasis** is the name given to a failure of the lungs wholly to expand during the efforts at respiration. The condition may arise from prematurity, general debility, œdema or hæmorrhages. The child may live for weeks with this affection, but usually it expires within a few days.

The child has a constant tendency to get blue, the color deepens, and death may occur in spite of every aid. The treatment may be permanently efficacious in some cases, but in most, the revival is only temporary. Again, the child may live, but in a weakly, declining state for days, until death comes.

Aside from the physical signs of dullness elicited by percussion over the lungs and the atelectatic crackling,

the most conspicuous *symptoms* are the cyanosis, the intermittent but persistent whining cry and the shallow respirations.



Fig.133.—Method of giving gavage. (Grulee.)

*Treatment* is by daily or hourly spanking, and by alternating hot and cold baths, by sprinkling with cold water or by massage to stimulate the skin reflexes. The treatment may have to be repeated every twenty or



thirty minutes, and the earlier it is instituted, the more persistently carried out, the *more chance of success*. The child must not be allowed to lie quietly on its back for any length of time.

**Exercise** is just as important to the infant as to the adult. The kicking of the legs, moving of the arms and lusty cry are all means of stimulating the circulation, the muscular development, and the expansion of the lungs. The position should be changed occasionally in the crib from back to side and from side to back. Also the child's legs and back should be rubbed and massaged until the skin is red every time the bath is given.

**Flushings.**—The child is laid across the lap, or on a table. A rubber sheet is so arranged that the discharge will drain away.

A soft rubber catheter, No. 18-20 French scale, is attached to a small funnel. The apparatus is boiled and filled with normal saline, or sterile water, at a temperature of 85° F. to 95° F. Half a pint to a pint may be required.

The catheter is oiled and passed into the rectum just beyond the sphincter. It must not go farther. The funnel is then raised and the fluid flows into the bowel. This flushing must not be confused with the administration of an enema for constipation, for which, however, it is often an excellent substitute.

**Gavage** is forced feeding by means of a tube. A soft rubber catheter or tube, about No. 7, French scale, is lubricated with albolene, vaseline or sweet oil. The upper end is connected with a small tube or glass funnel holding two or three ounces.

The child is laid upon its back in the arms of mother or nurse, the baby's arms are held and the head steadied.

In case of diphtheria or scarlet fever, the tube may be passed through the nose and down the pharynx and into the œsophagus five or six inches, or even into the

stomach. It is more convenient and easier when possible to pass it through the mouth directly into the stomach. The food is then poured into the funnel, which, by elevation, empties itself into the stomach. If regurgitated, more food must be given. When withdrawn, the tube should be pinched to prevent leakage into the trachea.

The great danger in these cases is the ease of over-feeding.

For comatose adults, as eclamptics, a double mouth gag is used. Then a regular stomach or duodenal



Fig. 134.—Apparatus for gavage or lavage. (Tuley.)

tube is introduced. Moistened in water or glycerine, the tube may be passed under guidance of the finger if necessary, beyond the tracheal opening into the œsophagus. When the end reaches the stomach the outside portion is raised to allow the gas and air to escape from the stomach and the fluid is poured in. Be sure to pinch the tube during its withdrawal.

**Lavage** or washing of the stomach may be performed in the same way with the above apparatus, when necessary. As soon as the stomach is filled, the tube is lowered and the fluid siphoned out.

## CHAPTER XX

### THE CARE OF THE CHILD (Cont'd)

**Tongue-tie** is not met with so frequently as in the old days. It may, however, occur. In such a case, the frænum is unusually broad and seems to extend clear to the tip of the tongue, which apparently is bound down to the gum and to the floor of the mouth. Tongue-tie *cannot* interfere with suckling. The child nurses with its cheeks and not with its tongue.

The thin membrane may be snipped with the scissors close to the tongue and then torn back with the finger.

**Harelip and cleft palate** interfere with nursing and require continual attention to keep mucus out of the throat. Brophy has a rubber flap placed over the nipple of the bottle in such a way as to occlude the split tissue and thus enables the child to get nourishment.

These babies must be fed systematically by gavage, if necessary, until the deformity can be repaired.

**Hernia** at the navel is a common complication of infancy. It is not due to crying, to improper tying of the cord, nor to neglect by the nurse, as frequently charged. It is a congenital fault, wherein the cord opening does not close, and in time, crying and straining will drive the intestines out of the aperture like a pouch. The defect is revealed by the bulging outward of the navel when the child cries. Ordinarily the breach will close of its own accord.

*Treatment* consists in folding up the skin of the abdomen so that the groove will be over the umbilicus

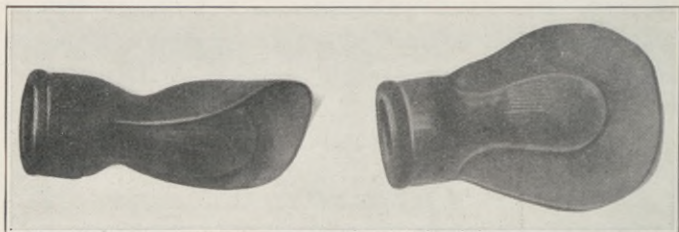


Fig. 135.—Cleft palate nipple. (Brophy.)



Fig. 136.—The device for feeding the child with cleft palate at the breast. (Brophy.)

and include it. Then adhesive tape is put on to hold it. The surfaces of skin thus coming in contact should be dusted with rice powder or stearate of zinc. Another method of treatment is to place a wooden button form, round side down, on cotton, over the opening, and bind it on with a zinc adhesive plaster. The dressing should be changed at least once a week. If the protrusion is large, an operation is indicated.

**Inguinal hernia** usually heals spontaneously also, but a truss may be required.

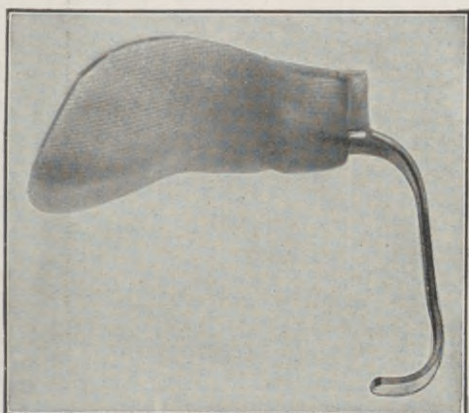


Fig. 137.—Device for assisting the cleft palate child to nurse. (Brophy.)

**Hæmorrhage** of the newborn is either accidental or spontaneous. *Accidental* hæmorrhage may arise from an imperfectly tied cord, or it may be an effusion, through compression or rupture, into any of the internal organs, such as the brain, lungs, or abdominal viscera. These latter conditions rarely give rise to symptoms, and are seldom recognized during life. There is no treatment.

The intracranial hæmorrhages are open to diagnosis

through the presence of pressure symptoms, and convulsions, but these, too, are impervious to treatment unless a vessel can be tied, like the middle meningeal artery.

*Spontaneous* hæmorrhages may develop during the first few days of life from sepsis, syphilis, Buhl's disease, hæmophilia, and true melæna neonatorum. The fragile condition of the blood vessels, the great changes in the blood and circulation after birth, as well as constitutional dyscrasias, are etiological factors of importance. All the causes are not as yet known.

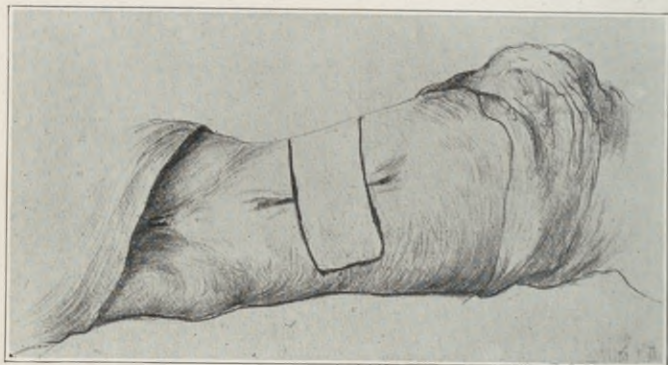


Fig. 138.—Method of strapping an umbilical hernia.

The blood may come from the umbilicus, the mucous membranes of the eyes, nose, mouth, stomach and intestines. It may be effused into the tissues beneath the skin, or into any organ of the body. Marked nosebleed is generally syphilitic in origin.

As a rule hæmorrhages in the newborn are most common in males, and strongly hereditary.

The tendency to bleed lasts only a few weeks, and if recovery takes place, it is permanent. In some cases, however, where hæmorrhage has developed in the brain,

clots may form in important centers, and the child be permanently paralyzed in speech, sight, hearing, or intelligence.

*Symptoms* of hæmorrhage begin between the second and the fifth day and almost never after the tenth day. The appearance of blood is the earliest and the most definite sign. The bleeding may come first from the umbilicus, or from the stomach, or from the intestines (melæna neonatorum). The amount lost is small, but the oozing is continuous. The temperature may be high or subnormal, and may or may not be due to the hæmorrhage. The skin is pale, the pulse feeble, prostration marked, and weight is lost rapidly. Convulsions are not infrequent.

*The diagnosis* of the condition is simple. It is only necessary to be certain that the blood is really effused, and not a temporary or accidental event such as the regurgitation of swallowed blood. Black tarry stools will show blood if placed in water.

*The prognosis* is fair. About two-thirds of these babies get well.

*The treatment* is to stop the hæmorrhage by ligature, suture, or compression if possible and to alter the character of the blood by adding to its fibrin content. This is brought about by the administration of coagulose, coagulen eiba, or by transfusion from an adult—preferably the father.

Injection of horse serum is often successful. Gelatin may be given by enema (200 c.c. 10 per cent solution) or hypodermically (10 per cent solution 20 c.c.). Calcium chlorate is also valuable.

**Paralysis of the face (Bell's paralysis)** may follow the use of forceps. The prognosis is favorable. Paralysis of the nerve in the neck (musculospiral) is sometimes

known as Erb's paralysis. It happens in consequence of difficult breech deliveries or of vertex labors when much force is required to extract the shoulders.

The deltoid, biceps, and other muscles are affected so that the arm can not be raised. The failure to raise one arm will be the symptom that will attract the attention of the nurse. Some cases recover in two or three months, either spontaneously or by the aid of electricity. If not, the injured nerve must be cut down upon and its continuity restored. Success is problematical.

**Ophthalmia neonatorum** is an infection of the eyes of the newborn by the gonococcus. The infection occurs as the child passes through the vagina or vulva, or when an unclean finger is put into the eye.

The symptoms appear on the third day. The conjunctiva is red and slightly swollen. The edges of the lids are covered with a dried yellowish secretion. When separated a yellowish watery fluid and later a thick pus exudes. The inflamed conjunctiva bleeds readily. The conditions grow worse. If untreated, the eyesight may be lost by ulceration of cornea. In the asylums twenty-five per cent of the inmates are blind from this infection; and as late as 1896, seven per cent of the blindness in the state of New York could be traced to this avoidable disease.

*The preventive treatment* consists in the frequent douching of the vagina before labor with potassium permanganate solution 1:5000. After labor, a drop or so, of 1 per cent solution of nitrate of silver is dropped into each eye and *not* neutralized.

*After the infection has occurred*, iced compresses are applied to the eye, night and day, and a solution of argyrol 15 to 20 per cent instilled into the outer corner, twice a day. Once a day the conjunctiva should be irrigated with the 1 per cent solution of silver nitrate.



In female infants with ophthalmia, the vagina must be watched for discharge which does not fail to appear in many cases. Argylol (20 per cent) should be injected with a medicine dropper and left to drain out spontaneously. All dressings used about the child should be destroyed, and the nurse should use the most scrupulous cleanliness and care of her own person.

**Separation of the cord** may be delayed in puny babies and in cases where the cord is large and thick.

Some of these cases are doubtless due to a patency or fistulous condition of the urachus. Usually the separation may be hastened by touching the constricted part with silver nitrate. Or, if the cord does not separate before the second week, it may be desirable to cut off the hanging fragment and touch the base with silver nitrate or dust with alum powder.

**Granulations** may protrude like a mulberry from the stump of the navel ("proud flesh"). These are touched with nitrate of silver stick.

**Menstruation** may appear occasionally from the vulva of the newborn. It is really a hæmorrhage which has nothing to do with precocious menstruation. It is due to local increase of the physiological irritability. It is rarely significant. There is no treatment. It disappears spontaneously in two or three days.

**The breasts of the newborn** may fill with milk and become indurated and tender. Nothing should be done to them. Let them alone and the swelling will subside in a few days and the milk ("witches' milk") disappear. The condition is produced by the absorption into the child's blood of the same excitants (hormones) which cause the mother's breasts to functionate.

**Icterus** may develop from the third to the sixth day. The child becomes yellow and stays yellow for a week,

when the color gradually leaves. It is thought to be due to the liberation of some embryonic residue in the fœtus, but nothing is known certainly. For the simple form no treatment is required. Recovery is prompt and uneventful. However, jaundice is associated with other conditions that prove fatal, hence every icterus should be watched carefully until it disappears.

**Child's Nails.**—The nails are frequently rough and ragged at ends and sides. They should be smoothly trimmed lest they become infected at the junction with the skin and give rise to paronychia. If infection does occur, the skin and flesh may be pushed back with a sterile applicator, and the point touched with peroxide of hydrogen. A syphilitic history may be traced in some of the babies.

**Thrush** is a form of contagious soreness, characterized by white flakes or patches on the mucous membrane of mouth or anus which look like milk, but can not be wiped off.

It is due to a vegetable fungus and occurs most frequently among anæmic or poorly nourished babies or those suffering from harelip. It is associated with symptoms of indigestion.

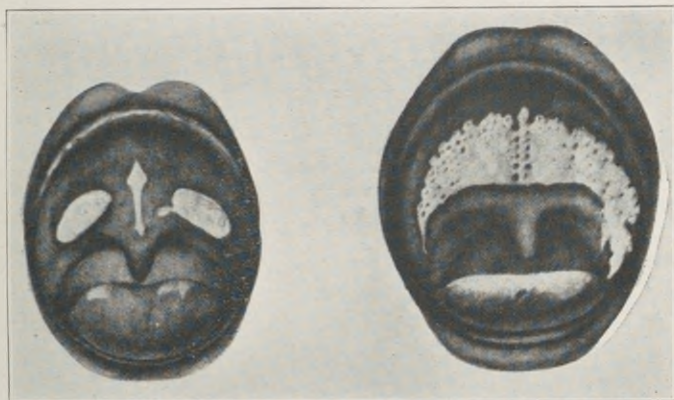
It may always be prevented by keeping the mouth and nipples clean, as directed on another page, and by keeping the bottles and rubber nipples in a solution of boric acid when not in use. When the disease appears, the mouth must be swabbed three or four times a day with an applicator soaked in saturated solution of boric acid. Two per cent solution silver nitrate is also effective.

**Aphthæ or stomatitis** is the name given to whitish vesicles, followed by superficial ulcers that occur upon the inside of mouth and lips of the infant. It is rare in

the newborn child. Boric acid solution is cleansing, and stick alum, frequently applied, will effect a cure.

**Wheals, urticaria** or "stomach spots" appear as generally distributed small spots about the size of a split pea, with a white center and a red periphery. They appear about the third day and last twenty-four hours.

They may be mistaken for insect bites and they may, or may not, be accompanied by temperature, which is probably only a coincidence.



Ulcer pterygoidea.  
(Bednar's aphthae.)

Epstein's pseudodiphtheria.

Fig. 139.—(From Von Reuss.)

The wheals disappear spontaneously without treatment.

**Bednar's disease** is characterized by the appearance of two ulcers on the hard palate, one on either side and just above the spot where the last tooth will erupt. It is most liable to occur in sickly infants and supposedly arises from the abrading of the mucous membrane by a rubber nipple or through the rough cleansing of the mouth. It is very resistant to treatment. The child

must be put in good condition by attention to the nourishment and the spots touched with tincture of iodine, 2 per cent sol. silver nitrate or hydrogen peroxide on an applicator.

**Exudative Diathesis.**—This condition is indicated superficially by a definitely bounded red patch on the cheeks. From this beginning it extends to other parts of the body. Serum exudes from the red area. Otherwise the skin is pale. The mother says “the face is chapped” or that the “baby has milk eczema.”

These children are frequently fat, but the tissue is flabby. The urine is sometimes ammoniacal. There is no marked disturbance of temperature. Fretfulness and constipation are the principal symptoms.

The symptoms appear in consequence of a constitutional predisposition to eczema. Formerly too much fat in the food was regarded as a causative factor, but this is now questioned. The disease is often found in connection with nervous disorders.

Occasionally the child must be taken off milk entirely and a soup or gruel diet substituted. Sometimes a skimmed milk diet may be tolerated very well. Then the fats may be added gradually. If chalky masses appear in the stools, the fat must be reduced again.

For local application, the following formula is sometimes beneficial: (Grulee.)

R̄ Naphthalene .....	5i
Starch .....	3iv
Zinc stearate .....	5iv
M.	

Sig. Apply frequently.

The “**cradle cap**” is a frequent sign of the exudative diathesis in its milder stages.

The term is applied to a yellowish-gray patch over the

large fontanelle. The mother calls it "dirt," which she finds hard to remove and it always recurs. The mass is composed of dry scales, which gradually change into an eczema. Vaseline or sweet oil left on over night makes the removal of the scales quite easy the next day. If a raw surface is left, zinc ointment should be applied. The diet must be changed as previously described.

**Erythema**, especially of the diaper region, is sometimes a manifestation of congenital syphilis. It is usually limited to the inner side of the thighs, the perineum, serotum or vulva, and buttocks. It must be associated with other and more characteristic signs, however, such as snuffles, cachexia, etc., before it becomes diagnostic of syphilis. Most erythemas of this area are due to irritation from moist or soiled diapers, but other factors may be important. Bluing in the diaper, gastrointestinal troubles, and circulatory disturbances are contributing causes. The local treatment is the same as for intertrigo. If the child is syphilitic, systemic measures must be instituted.

*Erythema (Physiological)*.—Nearly every newborn child exhibits a more or less definite hyperemia of the skin as soon as the vernix caseosa is removed, the bath given, the circulation in the skin inaugurated, and the temperature returns from its normal depression. This hyperemia occurs in every degree of intensity. It is caused by the reaction of the cutaneous vessels to the coolness of the air. It is especially pronounced in premature infants whose skins lack the power of quick adaptation. The erythema reaches its height at the end of the first or second day, and then gradually fades. A slight branny desquamation follows.

*Erythema (Toxic)* is a transient eruption occurring during the first week. It appears anywhere and all over

the body as efflorescences which vary in size from a pin's head to a dime. The lesions are closely set, slightly hard to the finger and intensely red. They tend to coalesce.

Papules are sometimes present like wheals. Pressure of the finger changes the red color to yellow. They disappear usually in forty-eight hours leaving no residues, no pigment spots, no desquamation. It is believed that these skin changes are in some measure due to intestinal irritation. Talcum powder is beneficial.

**Intertrigo**, or chafing, is a form of eczema due to moisture, bluing in the diapers or uncleanness. Rubber pants often retain moisture injuriously. The child should be cleaned with oil instead of water, and well powdered with stearate of zinc, or zinc ointment may be used. Talcum powder which contains boric acid is contraindicated. Dermatol or Babcock's Motiya powder is effective.

**Pemphigus neonatorum** is an eruption of blisters or blebs which seem to follow infection from the maternal passages or to be communicated by other babies who have the disease.

From three to fourteen days after birth, the blebs develop on the abdomen, neck or thighs, and show a tendency to spread to other parts of the body. The vesicles vary in size from one-fourth of an inch to two inches in diameter, and contain a serous, purulent, or bloody fluid. Other signs of general sepsis may appear.

*In diagnosis* care must be used to exclude syphilis, which also exhibits blebs, but usually on the soles of the feet or the palms of the hands. Besides, a nonsyphilitic child is generally better nourished. The prognosis is unfavorable if the child is weakly, if the blebs spread rapidly over a large area, or if the infection attacks the umbilicus.

*Treatment.*—A rigid quarantine must be enforced. In the hospital no new cases can be admitted. The alimentation must be increased, the blisters evacuated, and the surfaces cleaned and covered with a 25 per cent ointment of ichthyol, or an ointment of ammoniated mercury 2 per cent.

**Strophulus, red gum, or miliaria rubra** are names applied to an inflammation of the sweat glands when their secretion is retained. It is a "sweat rash" characterized by an eruption of scattered red papules or small vesicles which commonly appear on the cheeks or neck of young infants, or where skin surfaces come in contact. It is due to excessive clothing or heat. It is really a prickly heat. The *treatment* consists in the removal of the cause, and a generous use of stearate of zinc powder or rice powder.

"**Stork Bites**" is the popular name applied to the intense red spots which are sometimes found in the vicinity of the hair margin of the scalp, the forehead and eyebrows. The spots or streaks are possibly half an inch in width, straight or irregular, but always sharply defined. The redness disappears under pressure but quickly returns. Usually they vanish spontaneously in the course of weeks or months. They must not be confused with *nævi* or true "birth marks" which as a rule are much darker in color.

**Multiple Abscess of the Skin (Impetigo, pustular folliculitis, impetiginous eczema)** is an affection peculiar to the newborn.

The abscesses are limited in most cases to the superficial fascia and differ radically from boils by reason of their slight inflammatory manifestations. They usually occur during the first week of life in any child,

whether robust or weak, mature or immature. The pustules develop in any part of the body, either singly, in groups, or coalescent. There may be hundreds of them ranging in size from a pin's head to a walnut. The skin over the abscess varies in color from yellow to purplish red. If very superficial the disease may appear as vesicles of pus on a reddish and sometimes indurated base. The contents of these abscesses is a yellow or yellowish green pus of peculiar odor. After incision the wall sinks in, collapses, immediately. Fever is slight or altogether absent. The disease is quite generally confused with impetigo from which it differs in many respects.

#### MULTIPLE ABSCESS

1. Lesions are single, double or confluent.
2. Area of redness at base of lesion.
3. No crusts.
4. Lesions do not disappear unless opened.
5. Occurs anywhere on body.
6. Eruption primarily pus.
7. Base indurated.
8. Lesions in superficial fascia or beneath it.
9. Lesions appear during first two weeks.

#### IMPETIGO

1. Lesions discrete.
2. Lesions have no area of redness unless rubbed.
3. Always crusts.
4. Lesion absorbs.
5. Lesion most common on cheeks and extremities.
6. Eruption primarily watery.
7. Base not indurated.
8. Lesions apparently sit on top of skin.
9. Lesions most common in child whose age is from two to six months.



The etiological factor in the disease is the staphylococcus pyogenes aureus in every case we have examined. Streptococci, however, have been demonstrated.

Whether the organisms come from without (contagion) or from within by way of the blood from the intestinal tract of the babe, or through contamination of the mother's milk is unknown. It is possible also that certain proteins in the maternal milk may reduce the resistance of the skin, as in the exudative diathesis, and favor external infection.

This disease gave us much trouble in the Wesley Maternity until it was decided to abandon the use of lard and other unguents in cleansing the baby's skin. Sterile green soap took the place of the fats at the first bath and the infection ceased.

The prognosis is good where the child is properly cared for. Isolation is imperative until the etiology is understood. Nutrition must be maintained, the skin kept clean and the linen changed frequently. After the cleansing bath the entire body should be dredged with Babcock's Motiya Powder, (a talcum which contains .075 per cent of formalin) or, with Dermatol (subgallate of bismuth). The abscesses should be opened as early as possible.

**Birth Injuries** are due to the various traumatic factors which act during the birth of the child. There is always a certain amount of pulling and pressure as the child passes and a general venous congestion from local or central interruptions of the circulation. Injuries may arise in the genital passages of the mother or from obstetric maneuvers. In spontaneous delivery they are associated with disproportions between the pelvis and the child or to anomalous complications. In assisted

deliveries like versions and extractions and forceps operations they are a little more common. All portions of the child's body are exposed to injury but the trunk possibly is less often affected. On the head we find the caput succedaneum, cephalhematoma, injuries to eyes or skull as well as superficial and deep pressure marks. Paralysis of face and shoulder, wry neck and fractures of the clavicle are not uncommon. Dislocations and fractures of the limbs are observed while the brain and even less protected organs are subject to injurious pressure which is sometimes fatal. Birth injuries may be noted in any case apparently without reference to whether the labor was easy or difficult, quick or prolonged, natural or assisted.

## CHAPTER XXI

### THE CARE OF THE CHILD (Cont'd)

**Constipation** in the newborn may come from many causes. The amount of food may be so inadequate that no residue is left, and the bowels move only once in forty-eight hours. Over-stimulation of the bowel by castor oil or colonic flushings in the early weeks of life to correct colic may diminish its sensitiveness and produce atonic constipation. In the artificially fed infant too much fat in the food is a very common cause of the trouble.

*Treatment.*—Correct the amount of fat in the milk. If the child is breast-fed, the mother's diet should be non-nitrogenous and vegetables should preponderate. Drugs should not be given until all else has been tried. Gluten suppositories will furnish a mild irritation to the rectum. Orange juice and prune juice may be given, or Mellin's food or oatmeal water added to the milk. Milk of magnesia  $\frac{1}{2}$  to 1 teaspoonful, or Husband's magnesia, in same dosage, may be given daily. Senna is also efficacious.

**Diarrhœa** is generally significant of an error in diet which is usually a plain indigestion, though there may be too much sugar in the food.

The stools are more frequent and always softer than usual, possibly fluid.

Diarrhœa means increased intestinal action due to irritation from *something*. It may be due to indigestion, to the presence of hard curds, to acidosis, or it may accompany almost any disease of infancy as a symptom

merely. The odor is due to gases formed in the canal by bacterial action. There is but little odor in fermentation, but much in putrefaction. Mucus appears either as balls or strings. The balls come from the small intestine, strings from colon. Blood indicates ulceration at some point in the bowel, or an erosion just above the sphincter.

Fatty curds may be either white, granular, sand-like

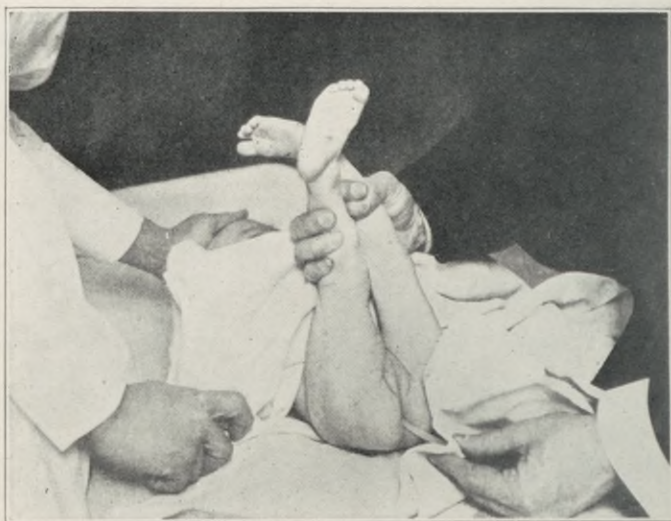


Fig. 140.—Proper position for introduction of a suppository. (Grulce.)

masses, or small, soft, and yellow. The protein curd is large and smooth, or white and bean-like. Both occur only when the artificially fed infant is given raw milk (Brenneman). If the milk is boiled for two minutes these masses will not form.

The cause must be determined. The frequent stools, however, are exhausting, and may have to be checked with opiates or mechanical astringents.

When due to indigestion, all food by mouth may be stopped for two or three days and only barley water administered.

In a breast-fed child, diarrhœa is sometimes checked by diluting the milk with a little barley water, given just before nursing. With these infants, not much change in the sugar content can be made by alterations of the maternal diet, but where artificial food is used, the amount of sugar is easily reduced to a satisfactory degree.

**Colic** is a cramp-like pain of the bowels. Previous to the attack the child is restless, expels some gas, and has the "colic smile," which leads the mother to believe the child is quite well. When the attack comes on, the thighs are flexed on the abdomen, and the legs on the thighs. The child has a sharp cry, that is nearly continuous, but in some way related to the nursing period, for the attack comes on a few minutes, and sometimes an hour, after taking the breast. The belly is rigid, the arms wave aimlessly. Diarrhœa may be present, and the movements are accompanied by much flatus. Distention is nearly always present. When the belly is tapped it gives a drum-like note and the child belches gas, sometimes accompanied by milk, which seems to relieve.

*Treatment.*—Colonic flushings to relieve the bowel of irritating curds. The child may be laid face down with a bag of hot water under the belly. Mixture of asafœtida gtt. xx to xl, or whiskey and hot water should be given for the attack, followed later by a full dose of castor oil. The diet should be rigorously investigated.

**Vomiting** may or may not be serious. The child may nurse too rapidly or too much, and the over-distended

stomach simply empties itself. Many infants "spit up" their excess of milk, and thus relieve themselves. This is a simple regurgitation, usually of unchanged milk, though it may be acid from admixture with the gastric juice.

Vomiting, in a breast-fed child, may come during an attack of colic when the eructations of gas appear. It may be a symptom of gastrointestinal intoxication, of too much fat in the food, too short intervals between feedings, or too much sugar in the food.

Projectional vomiting awakens suspicion of a pyloric stenosis or meningitis, and must be reported to the physician at once.

Vomiting which occurs within twenty minutes after feedings is not serious ordinarily, even though gas and large curds are expelled, but all vomiting later than this, is significant of a pathology.

*Treatment.*—Regulation of the hours of feeding is most important, and next, the character of the food. If the child vomits an hour or so after nursing, it may be that the milk is too rich (fat). Try a longer interval, or give an ounce or so of cereal water before putting the child to the breast.

**Prematurity** exposes the child to three distinct dangers, which arise, respectively, from atmosphere, food, and infection. Very few children born before the seventh month survive. A child born at the eighth month, or with a weight of three pounds, or more, can be saved almost always. The premature child up to the time of birth, has been protected very carefully against temperature variations by the liquor amnii, and when suddenly precipitated into a new environment, which its vitality barely tolerates, the consequences are serious.

These infants have a poor heat production, and the natural warmth of the body must be preserved. This is best done by incubators, which supply air and moisture in stable and appropriate amounts. Chilling of the child for even a few moments may be fatal. A room may be fitted up to produce the necessary conditions of light, air, heat and moisture. The child, wrapped in sheets of cotton, except the face, is then covered with a blanket, and surrounded by a temperature varying from 88° to 95° F., which is gradually lowered to 80° F. as the child gains strength. An occasional whiff of oxygen, as prescribed for an atelectatic child, is sometimes advantageous.

*Bathing.*—Premature infants must not be bathed, but the skin should be cleansed with cotton and warm sweet oil or albolene. All unnecessary handling is to be avoided.

*Food.*—Breast milk is the secret of success with these cases. Since most of the infants are too weak to take the nipple, the breasts must be pumped, and the child fed with spoon or pipette.

The interval between the feedings depends a little on the amount taken, but it should not be less than one and one-half hours, nor more than two hours. As the child gains, the interval may be lengthened to three hours. Lack of sufficient nourishment is shown by cyanosis and loss of weight, and overfeeding, by vomiting and diarrhœa.

The child must be fed by hand until strong enough to nurse the breast. In certain cases of prematurity, as well as in diseases like pneumonia, scarlet fever, and diphtheria, the child must be fed by gavage. Nutritive inunctions of benzoated lard or cod-liver oil are also valuable, not only for the passive exercise supplied, but

for the absorption of a certain amount of the unguent.

**Marasmus** means wasting, but the term is applied to infants that steadily lose weight. The bodies of infants are so largely composed of fluid, that loss of weight occurs quite easily and rapidly. Loss of weight may be sudden or gradual. It comes on rapidly after acute diarrhœa, either with or without vomiting, or it may follow persistent vomiting without diarrhœa.

Malnutrition from defective feeding is the most common cause of wasting in infants. This may be from lack of sufficient food or lack of proper ingredients, as well as irregularity of intervals, and disease. Rickets, congenital stenosis of the pylorus, congenital syphilis, and tuberculosis are all possible factors in the etiology.

In any case, no treatment can be instituted until these conditions have been confirmed or excluded.

**Pyloric stenosis** (the account follows Grulee) may be a thickening of the muscular coat of the outlet of the stomach (pylorus) or a spasmodic contraction. The condition is most frequent in males and in the first born.

*Symptoms* usually begin before the second week. There is constipation with small ribbon-like stools, and the urine is scanty. The most marked sign, however, when it is present, is the excessive, uncontrollable vomiting, which ordinarily occurs fifteen to thirty minutes after eating, but may be delayed for several hours. The vomiting may be of the common type, but more frequently it is projectile in character, like that seen in meningitis. The contents of the stomach are violently expelled, sometimes several feet. Physical examination may reveal the stomach bulging under the arch of the ribs and peristaltic waves moving back and forth across its surface. The pylorus itself may sometimes be felt as a lump or tumor.



*Prognosis.*—About fifty per cent die.

*Treatment.*—Dietetic and surgical. Grulee recommends small amounts of food, poor in fat, be given at short intervals. Belladonna will relieve many cases of pyloric spasm. If this fails, operation is required.

**Pneumonia** in the newborn most frequently results from the aspiration of mucus out of the maternal passages as the child is born. This may happen when the cord is compressed, or at any time when a partial asphyxiation impels the child to try to breathe.

It may also come on when a feeble child has been chilled by a prolonged first bath.

The disease develops about twenty-four hours after birth in a child apparently well. The temperature rises, respiration becomes rapid, and cough develops. The child is fretful, restless, refuses the nipple, and gasps for breath. It may become cyanotic. The prognosis in newborn infants is very serious.

*Treatment* is stimulation. A mustard bath will benefit where the respiration is rapid and the child blue. Tincture of digitalis may be administered in drop doses every three or four hours. Carbonate of ammonia,  $\frac{1}{4}$  gr., in mucilage of acacia, half a dram, may be given for cough.

Child must be fed on mother's milk *pumped from breast*.

**Snuffles** may be due to improper clothing, to drafts of air, or to syphilis. If due to cold, camphorated oil may be rubbed on the nose and the passages kept clean with an applicator soaked in albolene. If this fails, a small pellicle of anæsthone, or 10 per cent argyrol, may be placed in each nostril, and the child laid upon its back until the ointment melts and runs back into the pharynx.

**Furuncles** (boils) may be numerous. They come from irritation of the skin by atmosphere, soap, water, and clothing, whereby infection enters. This is especially liable to occur in the hair.

Keep the boils washed with boric acid solution and open them as soon as the focus, or head, appears.

**Phimosis** is such a close adjustment of the prepuce to the glans penis that it can not be retracted. In some cases there may be obstruction to the outflow of urine, but generally a tiny portion of the glans can be seen. The prepuce may or may not be redundant. This condition makes cleanliness impossible and balanitis may result.

On account of the straining required to urinate, prolapsus ani, hernia, and hydrocele of the cord sometimes develop. Symptoms may arise from preputial adhesions, as well as phimosis. Frequent or difficult micturition, nocturnal incontinence, priapism, pruritus, and masturbation may develop out of the irritation, as well as nervous manifestations, such as insomnia and night terrors.

The condition should be recognized and corrected in infancy. If the adhesions are dense, an incision can be made down the dorsum of the prepuce, the tissue forcibly separated from the glans, and the flaps cut off. Stitches may be required. In other cases circumcision may be necessary.

**Paraphimosis.**—When a prepuce with a small orifice is forcibly retracted over the glans, it occasionally happens that it cannot be pulled forward again. If allowed to remain this way, the parts will swell, and the penis become strangulated as if with a ligature.

The danger arises from the stoppage of the circulation, which may be followed by ulceration and gangrene.

Reduction must be brought about by manipulation, if possible, but where this fails, the constricting band must be cut through and sedative applications used.

**Balanitis** is inflammation of the prepuce from the decomposition of smegma, which collects under a tight foreskin. The condition is quickly relieved by cleanliness and a few applications of vaseline or zinc oxide ointment. Circumcision should not be done until the inflammation has subsided.

**Circumcision**, either as a physical necessity or as a religious rite, is frequently performed.

The nurse prepares a table with sterile linen, a basin with antiseptic solution and sponges, sterile towel, and sterile vaseline, with a roll of gauze bandage an inch wide.

The object of the operation is to remove the prepuce and leave the glans exposed.

The instruments needed are a pair of sharp scissors, a pair of dissecting forceps, two pairs of artery forceps, small, full curved needles, and fine catgut.

The nurse gives the child some gauze to suck, which has been soaked in brandy and sugar-water, brandy one dram to an ounce of water. Then taking her place at the child's head, she flexes the thighs back upon the abdomen, and widely separates them. The field of operation is thoroughly washed with soap and warm water, the prepuce is then retracted and the smegma wiped away. Then the body and limbs should be covered with clean linen, except the penis, or a sterile towel may be used with a hole in it through which the penis is drawn. The redundant tissue is removed and fine catgut sutures put in.

The operation being completed, the wound is covered

with sterile vaseline and wrapped with a sterile gauze bandage, leaving the end of the glans exposed.

The gauze and vaseline are changed whenever saturated with urine. Healing ought to be complete by



Fig. 141.—Hydrocephalus. (Bumm.)

the seventh day. The nurse should examine the dressing at frequent intervals during the first twenty-four hours, since serious hæmorrhages may occur from vessels that have not been included in the sutures.

**Priapism** is a condition of functional fullness and firmness of the penis that is more than ordinarily constant. Its importance lies in the fact that it may be a symptom of spinal irritation, balanitis, worms, phimosis or hydrocele of the cord.

**Spina bifida** is the most common congenital deformity. It is characterized by a fluid tumor, which protrudes from an opening in the vertebral column. It may appear anywhere along the spine, but is found most frequently in the lumbar or cervical region. The



Fig. 142.—Anencephalus. (Williams.)

deformity is supposedly due to an arrest of development. It is nearly always fatal inside of two weeks, though cases have been known to reach mature years.

Operation saves some cases, otherwise there is no treatment except protection from injury.

**Hydrocephalus** is sometimes, but not necessarily, associated with *spina bifida*.

The ventricles of the head are filled with cerebrospinal fluid, and the fontanelles are widely separated. The cause of the anomaly is unknown.

This condition may render labor difficult or impossible until the diagnosis is made and the skull perforated. Rupture of the uterus may result from the futile efforts to expel the child. If born alive, the child nearly always dies, or if it grows up, the intelligence is imperfect in most cases.

**Anencephalus** is a monster, having a body, but only a part of a head. The eyes protrude, the tongue may hang from the mouth, and the brain is under-developed.

**Sudden death** of infants that are apparently healthy comes with a shock to the physician as well as the parents, and in some instances, no plausible reason can be assigned for it. Apoplexy, pneumonia and stoppage of the trachea by milk curds may explain some cases. Suffocation by lying on the face in wet bedding, or overlying by the mother will account for others. Internal hæmorrhage into lungs, pleura, stomach, or brain is also known to be causative.

**Retention of Testicle.**—Abnormalities in the position of the testicle are not obvious enough to be always recognized in the newborn. In many babies the inguinal canal permits for a long time the return of the testicle which may occur under the influence of cold. In most cases the gland acquires its normal position through its gradual increase in weight. Operation may well be deferred until puberty.

## CHAPTER XXII

### INFANT FEEDING

A well fed infant is a happy little animal, who sleeps approximately twenty-two hours a day, and gains from four to six ounces a week. If properly fed at the breast, this condition is easily obtained; but if artificial food is necessary, the resources and skill of the attendants may be tried to the utmost before the welcome result is brought about.

The feeding of infants may be considered under three heads, (1) the breast; (2) breast and bottle combined (mixed feeding); and (3) artificial, which is really modified cow's milk.

Breast feeding has been taken up elsewhere, but the same care should be taken in feeding from the bottle as in feeding from the breast, so far as concerns the intervals between the feedings and the duration of the same. Since it takes from one to two hours longer for cow's milk to digest than it does for mother's milk the longer interval of three or four hours between feedings is better for the artificially fed child. With such an interval there will be less vomiting, less colic, less tendency to overfeed, and a better natured baby.

One feeding should be omitted at night, and if possible, two.

Length of time for taking the bottle depends somewhat on the child, but it should not exceed fifteen minutes, as a rule.

**Supplemental Feeding.**—A mother who has too little

milk may have it supplemented by a modified mixture in one of two ways.

First, the quantity furnished by the breast must be determined by weighing the infant before and after feeding, and then the total amount for twenty-four hours can be deduced. With this information, it is not difficult for the doctor to know how much cow's milk to prescribe. The supplemental feeding may be given by alternating the bottle and the breast, or by giving the breast and following it immediately with the bottle. In the meantime, the mother must be put on tonics with an abundance of fluids, and a generous diet that will raise the blood pressure, in the hope that the milk will increase sufficiently to enable her to feed the child entirely from the breast.

When it becomes necessary to substitute some other food for the breast milk, it means that the milk of some other mammal must be modified for the purpose. The most convenient and abundant source of supply is the cow.

While in many respects cow's milk is similar to mother's milk, it is in reality quite a different product. Mother's milk is taken, undiluted, directly from the breast, while cow's milk is given from a bottle, hours after milking, and not only must it be diluted, but certain ingredients must be added to aid its digestibility.

When taken into the stomach in its natural state, mother's milk is a liquid, while under the same conditions, cow's milk forms a semisolid gelatinous mass.

It is essential that the milk should be as fresh, clean, and free from bacteria as possible, and this can be approximated only in certified milk. This milk is required by law to have its constituents definitely standardized. Thus, there must be 4 per cent of fat, 4 per cent of protein, and 4 per cent of sugar, and it must be so free



from bacteria that not more than 10,000 per cubic centimeter can be found. The cattle also are tuberculin tested. The following comparison is from Holt:

<i>Mother's Milk</i>		<i>Cow's Milk</i>	
Sp. Gr.	av. 1.031		av. 1.031.
Fat .....	4. %	Fat .....	4. %
Protein .....	1.50%	Protein .....	3.50%
Sugars, .....	7. %	Sugars .....	4.50%
Salts .....	.2 %	Salts .....	.75%
Water .....	87.3 %	Water .....	87.3 %
Reaction .....	Alkaline	Reaction .....	Acid
Bacteria .....	Very few	Bacteria .....	Many

Both range from 1.026 to 1.06.

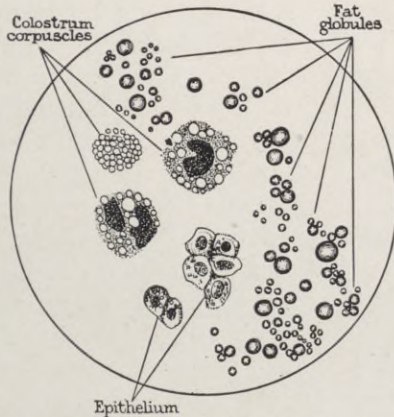


Fig. 143.—Elements of human milk. (Eden.)

The fats are substantially the same, but the fat of cow's milk is less easily digested than the fat of mother's milk.

The protein of mother's milk is virtually half lactalbumin and half casein, which is only slightly coagulated into soft flocculent curds by the action of rennin and acids, while the casein of cow's milk is nearly three



The infant should not take more than two ounces of milk to a pound of weight in each twenty-four hours.

**Proprietaries.**—Baby foods are not to be recommended nor condemned. They are placed on the market as substitutes for mother's milk with definite instructions as to preparation. They are also very expensive. They are not to be condemned, because many of them are invaluable when used in connection with cow's milk. Sometimes a child will not tolerate anything but malted or condensed milk, or Nestle's food, for example. The malt sugars, such as Horlick's and Mellin's, are easily assimilated, fattening, and laxative.

All foods in the modification of milk should be of the best. The standard sugars are Merck's milk sugar, Mead's Dextri Maltose, Nährzucker, cane sugar, and Mellin's and Horlick's foods. Robinson's barley flour or Johnson's are the best known. Imperial granum is a partially dextrinized flour and corresponds to the home-made "flour ball."

## FOOD PREPARATION

**Buttermilk Made from a Culture.**—Bring two quarts of milk to a boil, cool to the temperature required for inoculation (80° to 100° F., depending on the culture employed). Introduce the culture, and allow it to stand at the temperature of the room until a solid clabber forms. Place on ice, whip with an egg beater or break up with a churn before using. If a fat-free buttermilk is desired, use skimmed instead of whole milk.

There are many kinds of buttermilk cultures on the market, but Hansen's is considered one of the best, because it is not too acid, besides which, it has a good flavor, and the culture can be utilized over and over for a week or ten days.

In preparing a subsequent portion, it is only necessary to use two or three ounces of the first buttermilk, which may be reserved for the purpose. This amount is introduced into the freshly boiled milk, instead of the original powder, and the preparation is continued exactly as described for the mother culture.

In every case the mixture must be placed on ice as soon as the clabber forms, as it becomes too sour otherwise.

**Eiweiss Milk.**—Heat one quart of whole milk to 145° F. and coagulate with pepsin, rennin, or chymogen, which is 10 per cent rennin. Let it stand until clabbered, which takes about ten minutes. Pour into a gauze bag and let it stand until all the whey is drained off. To the dry curd, add 1/2 ounce of flour ball, and one pint of skimmed buttermilk, the whole to be rubbed through a very fine wire mesh sieve (as fine as a tea-strainer, at least), three separate times; or, it may be ground twice through a special mill to break up the curd as minutely as possible. Add a pint of water and measure. There should be a quart and three or four ounces over. Place upon a slow fire and bring to a boil while stirring constantly. Boil two minutes, then cool, strain, measure, and add water to make up for evaporation. Shake well before measuring, as the curd is heavy and settles to the bottom.

**Peptonized Milk.**—(See p. 363.)

**Whey.**—To a pint of fresh, warm cow's milk, add rennin as pepsin, or chymogen, and stir until mixed. Let it stand until coagulation is complete. Then the curd should be broken up with a fork, and the whey drained off through coarse muslin. This removes the coagulable proteins from the milk. A ten per cent cream can be had at home by allowing a quart of milk

to stand for six hours and then using the upper one-fourth.

**Whey-Cream Mixture.**—Make whey as described and mix with cream, in the proportion of whey 1 1/2 ounces to cream, 1 dram for each feeding.

**Barley Water. No. 1.**—Use one ounce of barley pearls to a quart of water. Wash thoroughly, put on a slow fire and boil for six hours. Add water to make up for evaporation, and add a pinch of salt. Strain and cool rapidly.

**Barley Water. No. 2.**—Use one heaping teaspoonful of Robinson's patent barley flour to each pint of cold water. Boil twenty minutes and add water to make up for evaporation. Add a little salt, strain and cool rapidly.

**Other cereal waters**, like rice and oatmeal, are made like barley water No. 1, and in the same proportion.

**Flour Ball.**—Take four cups of ordinary wheat flour and wrap it in a piece of muslin, and tie it tightly. Drop the mass into boiling water and boil six hours. Then take it out, cool it and remove the outer peeling with a sharp knife. Break into small pieces, the size of an English walnut, and dry thoroughly in a slow oven. Pulverize in a mill or meat-grinder, sift and keep in a dry place.

**Milk** may be sterilized, pasteurized, or boiled.

*Sterilization* kills both germs and spores, but it is not nearly so necessary as it is to have the right proportion of sugar and fats. Place in an autoclave and keep at a temperature of 160° F. for an hour.

*Pasteurization* is desirable when a good, clean milk is not attainable. It kills the germs, but not the spores. The process must be carefully attended to, or the milk will sour more easily. Heat a quart of milk to 160° F. for twenty minutes. Cool rapidly to 40° F.

*Boiling milk* for two minutes kills all bacteria, and renders the casein more easy of digestion and prevents the formation of curds.

### PUTTING FOODS TOGETHER

**Whole milk** contains 4 per cent fat, and must be thoroughly shaken before it is measured, for otherwise one child will get all the fat and another all the skimmed milk.

**Fat-free, or skimmed milk**, contains about 0.1 per cent fat. The cream has been removed by a siphon or centrifuge. If unable to get a fat-free milk from a dairy, the cream can be removed from a quart of whole milk quite easily with a siphon.

**Sugars and flours** should be weighed when used, for they vary greatly in volume.

In using flour ball or imperial granum, the flour must be mixed with water or cereal water, to make a smooth paste and brought to a boil. If the milk is to be boiled also, add the milk to the paste and boil all together. Cool and strain.

All baby feedings should be strained, as tiny lumps of food will clog the rubber nipple and the nurse may think the baby is not taking its feedings well. The following is a typical formula:

Whole milk	15 oz.	} 5x6x4
Barley water	15 oz.	
Sugar	$\frac{1}{2}$ oz.	
Flour ball	$\frac{1}{2}$ oz.	
Boil two minutes.		

Weigh the sugar and flour ball and make a paste with the barley water. Shake the whole milk, measure out 15 oz. in the graduate, and add the barley water mixture. Boil two minutes. Cool in running water,

strain bottle and put on ice. The figures at the side mean that five feedings of six ounces each are to be given at four hour intervals.

It is necessary to cool all feedings as soon as modified, and keep them on ice for preservation until used.

The only accurate way is to make up the whole quantity for twenty-four hours, put into separate bottles the exact amount of each feeding and give at the time ordered, after the bottle has been properly warmed. In warming the food, care must be used to get it neither too hot nor too cold; 100° F., or when it feels warm to the back of the hand, is about right. The child should be held in the arms while taking the bottle.

A buttermilk feeding must not be heated to more than 100° F. because it curdles and can not be used.

**The rubber nipples** should be washed thoroughly after use, boiled once a day, and kept in boric acid solution.

**The necessary articles** for home modification of milk can be obtained anywhere. One set of utensils should be kept for this purpose exclusively and boiled each time before the food is prepared. A list is convenient:

A 16 ounce glass graduate.

One tablespoon and one teaspoon may be used for measuring purposes, if unable to get a satisfactory scale.

1 2-quart aluminum cooking dish.

1 long-handled aluminum spoon.

1 fine wire mesh strainer, thirty holes to the inch.

1 dozen bottles, 5 ounce size if the child is small, and 10 ounce if the child takes large feedings.

The bottles should have wide mouths, straight sides, and round bottoms, which clean easily. Paper caps or corks that fit tightly should be used instead of cotton stoppers. Close rubber caps are best, for, as the milk cools, a vacuum is created, the rubber is drawn in and

the milk remains air-tight until opened. If infants are kept on a milk diet alone for too long at a time, they do not thrive so well, hence as early as six months, other things may be given. At this stage, the most desirable additions to the food would be cereal, farina or cream of wheat, orange juice, vegetable broth, toast crumbs, etc. The administration of orange juice should be started when the child is only a few weeks old.

The quantity of all these foods may be increased as the child gets older, and by the end of a year the diet is broadened still further. Beside a quart of whole milk, it may have thickened soups, vegetables, such as cauliflower, spinach, carrots, creamed celery and a little baked potato. Fruits, orange juice, grape fruit juice, prune sauce, apple sauce and scraped apple may be given, but no bread. In place of bread, use toast, Huntley and Palmer wafers and biscuits, and soda or oatmeal crackers. Sweet desserts should be avoided, but flavored junket or simple custard is unobjectionable.

No meats are permitted until the child is eighteen months old, except, perhaps, a little crisp bacon, or a bone to suck.

None of these supplemental foods should be given between meals, but always at the feeding hour. The above list supplies a dietary so varied that no child will tire of it.

In reporting the condition of the infant to the physician, the following form may be used to advantage. It is a clear cut, concise summary of what he wishes to know.

#### Infant's Daily Report

1. *Food*: Does baby take it all? Is he satisfied?
2. *Bowel movements*: How many in last 24 hours? What is the color? Are they hard, soft, or watery? Any odor?



Any curds? Any slime? Any blood? Any colic? Much gas?

3. *Does baby vomit? When? How much?*

4. *Does baby sleep well? Is he good natured?*

5. *Any fever? What is the weight?*

**Significant Symptoms and Conditions.**—In an artificially fed baby, the normal condition of the bowels is constipation. The stools are formed, alkaline in reaction, rather hard, and usually only one a day.

The stools should have a characteristic color, according to the food taken. Thus:

*Sugar or starch* will color the movement a dark brown, like vaseline.

*Too much fat* gives a pale yellow stool, almost white, like putty.

*Eiweiss* feedings show as a pale yellow, somewhat like the fatty stools, but constipated.

*Barley water* gives a brown liquid stool.

*Starvation stools* are thin, slimy, dark brown or green.

*The consistency* of the movements is also important.

Too much sugar or starch means diarrhœa, with thin, green, acid stools, and much gas and regurgitation, or, sometimes foamy, mucous discharges.

*Diarrhœa* may also be due to indigestion. Mucus in the stools usually signifies intestinal irritation.

*Constipation* may exceed the normal limits of the artificially fed child when the food contains too much fat.

*Bad odors* of the stools result from putrefaction.

*Colic* means imperfect digestion with gas. There is less colic when the intervals between the feedings are lengthened.

*Curds* are of two kinds. The soft friable ones due to fat, and the hard bean-like masses of protein. Curds occur with feedings of raw milk only, and though associated with symptoms of indigestion, they signify

overfeeding. If the sugar content of the food is low, the child will gain very slowly.

*Vomiting* is an important phenomenon. It may be due to overfeeding, to excess of sugar or fat in the food, or to pyloric stenosis. Excess of fat is shown by vomiting and regurgitation of small quantities of food one or two hours after feeding. It may be associated with constipation.

If vomiting occurs immediately after feeding, it is probably due to the taking of an excessive amount, or to the too rapid ingestion of the regular bottle. If the vomiting takes place later than twenty minutes after feeding, it is probably pathological. It may be the result of indigestion, meningitis, or of pyloric stenosis (q. v.).

For the first weeks of life, mother's milk should be obtained at all hazards, if possible, but if this is not to be had, the artificial feedings may be started.

A desirable milk modification for the first weeks of life should begin with a low food value. For example, a child one week old weighing seven pounds, should start on a formula like this:

Whole milk .....	7 oz.
Water .....	7 oz.
Cane sugar .....	$\frac{1}{2}$ oz.
Boil two minutes.	

This will make seven feedings of 2 oz. each, and one is given every three hours with one feeding omitted at night.

Cane sugar is *less* liable to produce colic than sugar of milk.

Lime water, or sodium citrate may be added, if the child vomits, or if other indications arise. Both are alkalies.

The strength of the mixture, as well as the quantity, must be increased as the child gets older and it is seen that the formula will agree.

The percentage of protein is kept down by dilution, with plain or cereal water, while fats (as cream) and sugars are added to make up the strength lost by the dilution.

## CHAPTER XXIII

### CLEANLINESS AND STERILIZATION

**The nurse** is called to a case on account of her special qualifications, but also she should lead her patient in all things, even in gentility. It is her part to anticipate the wants of the patient, and regard it as a reproach if the patient has to remind her that it is time for food, medicine, bath, or for child to come to the breast. Regularity, promptness, and thoughtfulness must be supreme. Be on hand when the doctor calls and stay until he goes. Be as cheerful as Mark Tapley, however dreary the prospect, and do not make noises either by the swish of overstarched skirts, the squeak of shoes, or the moving of equipment. Above all things, the nurse must keep her patient's room, her patient, and her own person rigorously clean. She should not allow her hands to touch infectious material without protection by rubber gloves. This is as necessary for her own safety as for the patient and family. Her hands should be manicured frequently, her hair shampooed at short intervals, and her teeth kept in order. If the hands get hard, take a teaspoonful of sodium carbonate and one of chloride of lime, mix in the palm of the hand with enough water to make a cream, and rub well into palms and about the nails. Rinse in clean water. (Weir.)

The nurse's dress should be neat, always mended, and carefully adjusted. The nurse who is slovenly in appearance will be slovenly in her mind and slovenly in her

work. She should not wear her uniform on the street. It is bad taste, unprofessional, and unsanitary.

She should bathe at least three times a week. There is always some odor of perspiration about the body, and especially around the axillary spaces which are filled with hair. Nothing is more offensive and nauseating than being leaned over and waited on by a person who has a strong body smell.

The prodigal use of warm water and soap will aid, but there are large sebaceous glands in the armpits and their decomposing excretions are retained by the hair so lastingly that more radical measures are necessary. The axillæ should be shaved at least once a month, and then the soap and water becomes more efficacious. After thorough cleansing, the armpits should be dredged with Babcock's Motiya powder, and the annoying and offensive odor will disappear.

If the patient is a refined and dainty woman, who may happen to be afflicted with the same misfortune, she will be deeply grateful to the nurse who tells her how to get rid of it.

That some doctors, unfortunately, have strong odors about the person—the mixed effluvia of tobacco, alcohol, bad teeth, and uncleanness—is no excuse for the nurse. The doctor should know better, but at all events, his offense rarely needs to be suffered more than a few minutes at a time, while the nurse is in constant attendance.

The trained nurse should be polite to, but not familiar with servants, as she is looked upon as the highest type of the professionally educated gentlewoman, and she must be constantly alert that her reputation in this respect is not diminished.

## BATHS

**Hot Baths.**—Temperature from 98° F. to 120° F.

Water should be tepid at first and the hot water gradually added until the required degree is obtained.

*Warm bath* 92° F. to 98° F.

*Tepid* 85° F. to 92° F.

*Cold* 33° F. to 65° F.

**Sedative Bath.**—The patient is stripped and stands for an hour in the hydrotherapy room, while a hot spray is played up and down the spine. The temperature of the water is 104° F. to begin with, and gradually increased to the point of toleration.

**An alkaline bath** is prepared by adding an ounce of sodium carbonate to each gallon of water.

**Bran Bath.**—Add two ounces of bran to each gallon of water. Mix the bran in a small amount of boiling water and add to the bath water.

**Mustard Bath.**—To three gallons of water at a temperature of 105° F. add a tablespoonful of mustard. Leave the child in the water for five minutes, all the while rubbing and stroking the limbs and back. Then wrap naked in a warm blanket and leave for half an hour.

## STERILE DRESSINGS—ANTISEPTIC SOLUTIONS— STERILIZATION OF INSTRUMENTS

The preparation of sterile dressings, antiseptic solutions and the sterilization of instruments, is particularly the work of the nurse, whether in the hospital or in a private home. The following directions are therefore desirable:

As soon as the nurse is sure her patient is in labor, she boils a milk bottle, fills it two-thirds full of 95 per cent alcohol, puts a pledget of sterile cotton in the bottom and then boils a pair of dressing forceps, which are placed, handle up, in the alcohol. (See Fig. 60, page 148.) *With this forceps, she handles all clean dressings, instruments, and rubber goods that may be contaminated by touch.*

**Dressings and Supplies.**—The necessary dressings and supplies may be prepared one or two weeks before labor according to the following instructions:

*Five Yard Packing.*—Draw threads at either end of five yard lengths of gauze to its full width. Fold the cut edge across until it lies one-third the distance from the opposite side. Next, fold the double edge over, and bring it to the outside edge of the first fold. Keep it perfectly straight. When folded full length, roll from the end and wrap in strong muslin wrappers. Sterilize in the autoclave or Arnold sterilizer.

*Pads for the Vulva.*—Unroll a whole bale of common cotton and cover it with a  $\frac{1}{2}$  inch thickness of absorbent cotton. Cut in lengths of 12 in. by 4 in. wide. Cover with gauze cut 12 by 14 inches, and fold the ends of gauze over absorbent cotton. Roll from the end, wrap in paper, seal, and sterilize.

*Pledgets.*—Tear two yard strips, lengthwise of the roll of absorbent cotton, pull from these, three inch pieces, roll them in the hands until round, place in clean bags, and sterilize.

*Breast Covers.*—Squares of old, soft muslin 4 by 4 inches, with all strings removed, make the best dressings for the nipple. Do not use gauze, because the papillæ of the nipple may get caught in the mesh and when it is taken off, the tender nipple is irritated or abraded.

*Breast Binders.*—These are made of single material, because they would be too warm otherwise. They are sleeveless and jacket-shaped and measure 16 inches from shoulder to waist, 40 inches long, and 10 inches for the arm scallop. A binder of this size, if properly adjusted, will fit a patient of any size. Three will be sufficient for the case.

*Abdominal Binders.*—The abdominal and breast binders are worn during the bed period only. The abdominal binder is made of unbleached muslin, double material, 14 by 40 inches, and hemmed. In the center of the back, on the lower edge, a curved space, six inches wide, is cut out to prevent the binder from getting soiled. To this curved edge, the pad holder is attached by two safety pins, one on either side. The abdominal binder is adjusted by pinning firmly above the fundus, and loosely below.

*Pad holders* are made of unbleached muslin, and measure 6 by 16 inches.

*Cord Dressings.*—Cut squares of surgical lint 4 by 4 inches, and cut through to the center on one side. Gauze may be used, but it is not ideal.

*Nursery Cotton.*—Tear absorbent cotton into narrow lengths and pull out small one inch pieces. Roll them, place in a clean bag and sterilize.

*Applicators.*—Use absorbent cotton and toothpicks. Tear off small pieces of cotton, moisten the toothpick point with water, place in the middle of the cotton, and roll firmly.

*Gauze Sponges.*—Cut gauze into squares 6 by 6 inches, and fold from each side to the center. This brings all the ragged edges inside. Fold into squares, place in jars, and sterilize.

**Sterilization of Instruments.**—Place scalpels in car-



bolic acid 95 per cent for ten minutes. Lift with sterile forceps, and put in a basin of 95 per cent alcohol for ten minutes. In the absence of carbolic acid and alcohol, the scalpels may be dropped in a 2 per cent solution of lysol for twenty minutes. Cleanse with hot sterile water. (*Do not boil scalpels; it dulls the sharp edges.*)

All other instruments may be placed in a sterilizer (dishpan or wash boiler) with enough water to completely cover them; boil twenty minutes. Cool in sterile pan, which may be set in cold water. Do not use soda on the instruments during sterilization, as it makes a thick, gummy precipitate on the metal.

*The sterile handling forceps* must be immersed at all times for two-thirds their length in 95 per cent alcohol.

*Brushes.*—After using, all brushes should be thoroughly washed, boiled, and dried, wrapped in waxed papers, and sterilized in the autoclave. In the absence of the autoclave, boil thirty minutes.

*Basins, pitchers, and douche pans* are sterilized by wrapping in strong muslin bags and put to boil for forty-five minutes in the basin boiler or wash boiler. They will not remain sterile longer than one week, even when kept in a clean place and well wrapped. Bedpans should be washed in a strong solution of soap and water, rinsed every morning and boiled for thirty minutes.

### **Sterilization of Rubber Goods.—**

*Tracheal Catheters.*—Drop in a solution of bichloride 1:5000 and leave for twenty minutes. Lift with sterile forceps into a basin of warm sterile water and leave for ten minutes, or until used.

*Voorhees Bags.*—Boil twenty minutes. The bags and catheters may be given a longer life by keeping them in a 25 per cent solution of glycerine and water when not in use. Kerosene vapor is also preservative.

*Rubber Catheter.*—Boil twenty minutes.

*Hot Water Bags, Ice Caps, Rubber Bed Rings.*—Soak in 10 per cent lysol solution for two hours, wash with warm water, and dry thoroughly. The inside of the ice caps can be dusted with powder.

Never leave rubber gloves in a damp place or lying in a solution. It stretches them and weakens the rubber. To sterilize, they must be washed in a strong solution of soap and water, dried, and paired. Then they are wrapped in a heavy cloth covering and put in the autoclave for twenty minutes.

*Wet Process for Rubber Gloves.*—Wrap in gauze or cloth and boil for thirty minutes. Lift with sterile forceps and place in lysol solution 1 per cent until used. They are easily drawn on by filling them with the solution as the hand goes in.

*The autoclave* is not always available, but an Arnold or Rochester sterilizer is readily portable, and takes the place of the hospital machine.

**Fumigation of rooms** is sometimes necessary. Remove all curtains, bed linen, and other washable fabrics from the room. Open the drawers of dressers, doors of closets, and loosen up and separate everything left so the air can get to it. Close the windows and seal the crevices with cotton and make the room as air-tight as possible. Place a large pan containing six ounces of potassium permanganate crystals in the center of the room. Pour over this twelve ounces of formalin, close and seal the outside doors of the room and leave for twelve hours. If the case has been a very septic one, it is always a good plan to wash the walls of the room before using again. The insides of the drawers and the bed should be thoroughly washed with water and green soap. A formaldehyde lamp is also quite satisfactory if obtainable.

## CHAPTER XXIV

### DIETS AND FORMULAE

The nurse should serve everything in the most cleanly and appetizing way if it is only a cup of tea; and all waste, soiled dishes, napkins, and excreta must be removed as delicately as possible.

**Diet for Pregnancy.**—Fresh fish, boiled, broiled or baked; and shell-fish raw or cooked,—any way but fried.

Meat, once or twice a day, except when contraindicated by condition of the kidneys. Veal is best omitted.

All farinaceous foods and vegetables may be eaten freely.

Desserts should be plain, but tempting.

No alcohol is taken without direct permission from the doctor, and coffee and tea should be limited.

**Diet for Puerperium.**—First two days, milk, buttermilk, soup, gruel, cocoa, toast and tea, chicken, oyster and clam broth.

In the next two days, under ordinary conditions, the diet is increased and made somewhat heavier.

Semisolids are added like milk-toast, eggs, poached or boiled soft, oysters, clams and boiled fish.

After the milk comes in, the woman is put on a general diet as fast as she can digest it.

**Farinaceous diet—melons and oranges.**—

*Breakfast.*—Cereal, coffee with milk and sugar, if desired, bread and butter, corn bread, rolls, toast, muffins, hominy, cereal with cream.

*Lunch.*—Vegetable soups, bread, butter, potatoes, beans, rice, macaroni and cereal, peas, buttermilk, pudding, such as rice, tapioca, bread cornstarch, jellies, fruit juices, pumpkin, squash, turnips, tomatoes, etc.

*Dinner.*—Bread, butter, milk-toast, hominy, rice, celery, fruit salads, lettuce, apples, pears, prunes, stewed fruits or fresh melons, etc.

*The following diets are routine at many hospitals:*

**General Diet.**—Full tray of food in season as furnished by the hospital. Three meals daily.

**Light Diet.**—Foods from the following list may be selected, and served three or five times daily, as desired:

Soups of all kinds. When leguminous foods are employed, their outer coverings must be removed by rubbing them through a sieve or colander.

Vegetables of all kinds, except green vegetables (provided they have been reduced to a pasty consistency). Those with excess of fiber or cellulose, such as turnips, celery, asparagus, and cabbage, should be chopped after thorough boiling, then mashed, while those having tunics should be sieved or colandered.

Grain foods of all kinds thoroughly cooked, excepting corn preparations containing much cover, as hulled corn.

Prepared foods such as tapioca, macaroni, and vermicelli, require prolonged cooking.

Meats, scraped beef.

Eggs, soft boiled, raw or soft poached.

Bread of all kinds, stale, homemade.

Puddings, ices.

Beverages, all kinds unless otherwise ordered.

**Forced Diet.**—This includes the general diet with the addition of one quart of whole milk and four eggs. The

milk may be given plain or as an eggnog at seven, ten, three, and eight o'clock. The eggs may be given raw or cooked soft in any form.

**Milk Diet.**—Twelve ounces of whole milk (375 c.c.) may be given every two hours; i. e., at six, eight, ten, twelve, two, four, five, and eight o'clock, or the patient may sip it at her pleasure.

The milk may be given raw, boiled, diluted with plain water, lime water, Vichy, seltzer, or Apollinaris to taste. The daily amount should include three quarts of whole milk. Koumiss, buttermilk and milk soups are sometimes allowed. Note the exact amount taken, and give reasons for failure. Watch the stools for undigested milk.

**Liquid Diet.**—Whole milk, buttermilk, koumiss, beef tea, or beef, chicken, mutton, oyster, or clam broth, in eight ounce portions, or two ounces of beef juice, every two hours. Lemonade, orangeade, ice cream, or fruit ices, at intervals and amounts as desired.

**Ulcer Diet.**—Whole milk and cream, equal parts, three ounces every two hours. Sodium bicarbonate, thirty grains, in a small amount of water, to be given before and thirty minutes after feeding. Albumin water, soft boiled eggs, scraped beef, custard, and cream soups to be added later by direction of the physician. No seasoning except salt is allowed.

**Prochownik Diet.**—This diet is advised where some necessity exists for preventing a large child. It is administered in the last six weeks of pregnancy only.

*Breakfast.*—Small cup of coffee, two slices of toast (1 ounce).

*Lunch.*—Small piece of meat, fish or an egg, a little sauce. A vegetable prepared with fat, lettuce, a small piece of cheese.

*Dinner.*—Same as lunch with three slices of bread and butter, and a little milk.

A pint of water daily is allowed; taken in sips it lasts longer.

Soup, water, beer (all fluids) and sugar, pastry, and potatoes are forbidden.

**Skimmed Milk Diet (Karell).**—Skimmed milk, to which a pinch of salt is added, 3 to 6 ounces, three or four times daily, increasing the amount gradually, taken slowly to allow thorough mixture with saliva, warmed in winter, room temperature in summer.

**Acute Nephritis Diet.**—Whole milk, 1000 c.c.; cream, 250 c.c.; water, 150 c.c.; stewed fruit, well sweetened, 50 c.c.

Bread, well buttered, may be toasted, 150 gm. (equal to three slices) 150 gm.

Green salad of lettuce, celery, apple, pear or grape fruit, and served either with olive oil, or with a mayonnaise dressing made from olive oil, egg and lemon juice, with salt (but no pepper or condiments) may be given in two small portions daily.

Cooked cereals (cream of wheat, etc.) with cream and sugar, one portion equal to about two ounces, once daily.

The above represents a daily fluid intake of about 1500 c.c. The diet is to be given in "three meals," at eight, one, and six o'clock, with fluid nourishment at eleven, three, and nine o'clock.

## RECTAL FEEDING

Nutrient enemas should be given every six hours, unless otherwise ordered. It is necessary to cleanse the lower bowel with a saline or soapsuds enema at least once a day. The cleansing enema should be given one hour before the nutrient enema is to be given. The proper quantity for the nutrient enema is four to six

ounces for an adult, and one to three ounces for a child. Nutrient enemas should be given slowly at very low pressure, the level of the fluid in the can being not over eight to ten inches above the level of the rectum. If the injected material is thick, a piston syringe may be required. The patient should be placed upon the left side with the hips well elevated and should be kept in that position for fifteen to twenty minutes after the enema has been given. The tube should be oiled and not be inserted more than three or four inches. The temperature of the enema should be about 98 degrees. If there is a strong tendency to evacuate the enema, pressure should be made against the rectum with a pad.

The following nutrient enemas may be ordered by name.

**Glucose Enema.**—Glucose (dextrose, grape sugar) 1 ounce, normal salt solution 5 ounces.

The glucose should first be dissolved in hot water. The amount of glucose may be increased, upon order, if no irritation is produced.

**Pancreatinized Milk Enema.**—Add 1 tube of peptonizing powder, or 1 to 2 drams of "Pancreatic solution" to 1 pint of skimmed milk. Stir well and place in a warm water bath for one-half hour. Add 1 dram of salt.

**Milk and Egg Enema.**—Thoroughly beat the whites of 2 eggs, add  $\frac{1}{3}$  dram of salt, and 6 ounces of skimmed milk. Add one tube of peptonizing powder, or 1 to 2 drams of "pancreatic solution," stir well, and place in a warm water bath for one-half hour.

**Milk, Egg, and Beef Juice Enema.**—Mix the beaten whites of 2 eggs, 2 ounces of fresh beef juice, 6 ounces of skimmed milk, and  $\frac{1}{3}$  dram of salt. Add 1 tube of peptonizing powder, or 1 to 2 drams of "pancreatic solution," stir well, place in a warm water bath for one-half hour.

**Milk and Glucose Enema.**—Add 1 tube of peptonizing powder to 6 ounces of skimmed milk, stir well, place in a warm water bath for one-half hour. Add 3 drams of glucose and 1/3 dram of salt.

### ELIMINATIVE ENEMAS

**Impaction Enema.**—

Castor oil or olive oil, 1 ounce.

Soapsuds (100° F.), 1 quart.

Mix as thoroughly as possible, add one dram of spirits of turpentine beaten up with the yoke of one raw egg.

**Soap Suds Enema.**—Use 1 ounce of dissolved hard soap to a quart of warm water.

**S. S. and G. Enema.**—

Soapsuds, 1 quart.

Glycerine, 1 ounce.

**Asafœtida Enema.**—

Milk of asafœtida, 8 ounces.

Water, 8 ounces.

**1-2-3 Enema.**—

Magnesium sulphate, 1 ounce.

Glycerine, 2 ounces.

Water, 3 ounces.

**Milk and Molasses Enema.**—

Milk, ordinary cooking molasses in equal parts, possibly 8 ounces of each. Heat, but do not boil.

**Turpentine Enema.**—

Soapsuds, 1 pint.

Turpentine, 1 dram.

It acts quickly and effectively.



All enemas should be given through a colon tube. The patient should be on the left side and the temperature of the injection should be about 100° F.

### DIET LIST (FLUIDS)

**Albumin Water.**—Take white of 1 egg, stir until separated. Add a little lemon juice and 1 pint of water. Ice and serve. Sugar or salt may be used.

**Barley Water.**—Wash 2 ounces of barley with cold water. Boil for 5 minutes in fresh water. Strain. Then cover with 2 quarts of water and cook slowly down to 1 quart. Flavor with thinly cut lemon rind and sugar. Do not strain unless patient requests.

**Beef Juice.**—Cut into cubes 1½ inches each, 1 pound round steak. Place in a clean, ungreased pan, and fry one and one-half minutes on each side. Pour into hot meat press and apply pressure. In absence of a press, a potato ricer may be used. Season with salt and pepper. May be served iced or heated by putting in double boiler and stirred all the time. Do not allow to curdle.

**Beef Tea.**—Put 1 pound of finely chopped round steak into a quart glass jar, fill with cold water. Place jar in kettle of warm water. Leave over slow fire for four hours. Strain, season with salt and pepper.

**Champagne Whey.**—Boil 8 ounces milk for fifteen minutes. Strain through cheesecloth. Add 1½ ounces champagne.

**Chicken Broth.**—Skin and chop in small pieces one small or one-half large fowl. Boil bones and all with one blade of mace, a sprig of parsley, and 1 tablespoonful of rice, 1 crust of bread and 1 quart of water, for one hour. Skim from time to time. Strain through coarse colander and season to taste.

**Cinnamon Water.**—One-half ounce stick cinnamon, 2 cups boiling water.

Break sticks in small pieces. Add water, boil twenty minutes. Strain and serve hot or cold.

**Clam Broth.**—Wash thoroughly 6 large clams in shell. Put in kettle with 1 cup of cold water, bring slowly to boil, and keep temperature for one minute. Pour off broth and serve hot. Add salt and pepper.

**Eggnog.**—Beat an egg, white and yolk separately. Add to the yolk 1 dram of vanilla extract, a pinch of salt and 4 oz. fresh milk, and 1 dram of sugar. Add  $\frac{1}{2}$  dram of sugar to white of egg, stir a portion into the glass and heap remainder upon top of glass.

**Egg Cordial.**—One egg white, 1 teaspoon sugar, 1 tablespoon brandy, 2 grains salt, 2 tablespoons cream.

Beat white until stiff. Add cream, continue beating, add other ingredients, and serve cold.

**Egg Lemonade.**—Beat 1 egg and 1 teaspoonful of sugar until very light, add  $\frac{1}{4}$  cake of yeast dissolved in one-fourth cup of water, two tablespoonfuls of sugar, pour into bottles with patent stopper, fill bottles only two-thirds full, cork tightly. Shake well. Allow to stand on ice twenty-four hours.

**Flaxseed Tea.**—One ounce of whole flaxseed, 1 ounce powdered sugar,  $\frac{1}{2}$  ounce licorice root, 1 ounce lemon juice. Pour over these materials 1 quart of boiling water and allow to stand four hours. Strain off liquor.

**Gum Arabic Water.**—Dissolve 1 ounce of gum arabic in 1 pint boiling water. Add  $\frac{1}{2}$  ounce sugar, a wine-glassful of sherry, and juice of one lemon. Serve with ice.

**Junket.**—Take  $\frac{1}{2}$  pint of fresh milk in a saucepan. Add 1 teaspoonful of essence of pepsin, stir just enough to mix. Pour into custard cups. Let stand until

firmly curded. Serve plain or with grated nutmeg. Sherry may be added.

**Koumiss.**—Heat four cups of milk, then cool; when lukewarm, add  $\frac{1}{4}$  cake of yeast dissolved in one-fourth cup of water, two tablespoonfuls of sugar, pour into bottles with patent stopper, fill bottles only two-thirds full, cork tightly. Shake well, allow to stand on ice twenty-four hours.

**Milk Shake.**—White of 1 egg, 1 ounce sugar, 1 ounce chipped ice, 1 ounce cream. Shake in milk shaker two minutes. Add milk to fill glass. Flavor with vanilla and lemon.

**Mutton Broth.**—Boil slowly  $1\frac{1}{2}$  pounds of lean loin mutton, including the bone. Add a little salt and  $\frac{1}{2}$  onion. Pour broth into a basin. Skim off fat when cool. Warm as used.

**Oatmeal Gruel.**—One teacup oatmeal flakes, cover with 1 quart cold water. Place on slow fire and soak three hours. Strain, add 4 teaspoonfuls of sugar and 1 teaspoonful of salt.

**Oatmeal Water.**—Cover 1 teacupful oatmeal with 1 quart cold water. Let it stand two hours. Stir often. Strain. Serve with salt, sugar and ice.

**Peptonized Milk. Warm Process.**—Dissolve the contents of Fairchild's peptonizing tube in 4 tablespoonfuls cold water. Add to 1 pint of milk. Put in glass jar, and place jar in vessel of warm water. Heat slowly to  $115^{\circ}$  F. Stir slowly and allow it to remain thirty minutes. Place on ice at once to check further digestion.

**Peptonized Milk. Cold Process.**—In a clean quart bottle, put one peptonizing powder (Fairchild). Add 1 teacupful of cold water. Shake. Add 1 pint fresh cold

milk. Shake well. Place on ice. Do not heat before using.

**Rice Water.**—Pick over and wash 2 tablespoonfuls of rice. Put in a saucepan with 1 quart of boiling water; simmer two hours. When rice is dissolved, strain. Add teaspoonful salt. Serve warm or cold. Sherry may be added.

**Rum Punch.**—Two teaspoonfuls powdered sugar, 1 egg well beaten, warm milk, 1 large wineglassful; 4 ounces Jamaica rum. Flavor with nutmeg.

**Scraped Beef.**—Place on breadboard a round steak. Scrape with tableknife but do not take any shreds of muscle. Salt and pepper. Spread on thin slices of bread. Place in toaster until seared.

**Toast Water.**—Three slices of stale bread well browned, but do not burn. Put in a pitcher, pour over them 1 quart boiling water. Cover closely, and allow to stand until very cold. Strain. Wine and sugar may be added, to stimulate.

**Wine Whey.**—Put 1 quart new milk in a saucepan and place over fire. Stir until nearly boiling. Add 2 ounces of sherry wine. Boil slowly for fifteen minutes. Skim off curds as they arise. Add 1 tablespoonful sherry. Skim again, then strain through gauze.

## CHAPTER XXV

### SOLUTIONS AND THERAPEUTIC INDEX

**Acid, Boric.** 5 dr. in a pint of water makes a 4% solution, or 1:25.

**Acid, Carbolic.** 15 m in a quart of water makes a 0.1% solution, or 1:1000. 5 dr. to the quart makes a 2% solution; and 1¼ oz. to the quart, a 5% solution.

**Formalin.** 1 dr. to the quart of water makes a solution of about 1:500.

**Mercury Bichloride.** 15 gr. to quart of water makes a 0.1% solution, or 1:1000. 1½ gr. to the quart makes a 0.01% solution, or 1:10,000.

**Normal Salt Solution.** 2 dr. of salt to the quart of water, or 0.9%.

**Physiological Salt Solution.** Take normal salt solution as given above and to every 3½ oz. add 15 gr. of carbonate of soda.

**Potassium Permanganate.** 2½ dr. to the quart makes a 1% solution. 3 gr. to the quart makes a 1:5000 solution.

**Silver Nitrate.** 4½ gr. to the ounce of water or 1 gr. to 1-7/10 dr. makes a 1% solution.

For general reference the following valuable table is appended:

## PERCENTAGE SOLUTION TABLE

By ALFRED I. COHN, PHAR. D., in *Merck's Report*

## GRAINS OF SALT OR DRUG REQUIRED TO MAKE SOLUTIONS OF PERCENTAGE STRENGTH INDICATED

Quantity of solution to be made	GRAINS OF SALT OR DRUG REQUIRED TO MAKE SOLUTIONS OF PERCENTAGE STRENGTH INDICATED																		
	0.5%	1%	2%	3%	4%	5%	6%	8%	10%	15%	20%	25%	50%	1:500	1:1000	1:2000	1:3000	1:4000	1:5000
½ fl. oz.	1.15	2.3	4.6	6.9	9.3	11.7	14.1	19	24	36.8	50.2	65	151.2	0.46	0.228	0.12	0.075	0.06	0.05
1 fl. oz.	2.3	4.6	9.2	13.9	18.6	23.4	28.2	37.9	47.9	73.5	100.3	130	302.5	0.91	0.456	0.23	0.15	0.12	0.09
2 fl. oz.	4.6	9.2	18.4	27.8	37.2	46.8	56.4	75.8	95.8	147	200.6	260	605	1.8	0.91	0.46	0.3	0.23	0.18
3 fl. oz.	6.9	13.8	27.6	41.7	55.8	70.2	84.6	113.7	143.7	220.5	301	390	907.5	2.7	1.37	0.68	0.46	0.34	0.27
4 fl. oz.	9.2	18.4	36.8	55.6	74.4	93.6	112.8	151.6	191.6	294	401.2	520	1210	3.64	1.82	0.91	0.61	0.46	0.36
5 fl. oz.	11.5	23	46	69.5	93	117	141	189.5	239.5	367.5	501.5	650	1512.5	4.55	2.28	1.14	0.76	0.57	0.46

The table shows the quantity of drug required to yield a given *volume* of solution of the percentage strength desired. Thus, to make one fluid ounce of a 5 per cent solution it is merely necessary to dissolve 23.4 grains of the salt in *sufficient water to make one fluid ounce*.

## THERAPEUTIC INDEX

*Young's Rule for Dosage:* The age of the child is divided by the age of the child plus 12, and the result is the appropriate dose for the child. The doses given below are for the adult unless otherwise specified.

**Absorbent.** A medicine or dressing that promotes absorption, such as potassium iodide, Tr. iodine, glycerine, or hot vaginal douches.

**Adrenalin.** The blood-raising principle of the suprarenal glands. It is hæmostatic and astringent. Acts somewhat like digitalis on the heart.

*Uses.*—Vomiting of pregnancy, increased glandular activity, hæmorrhage, inflammation of mucous membranes.

*Dose.*—Internally, 5-10 m. of the 1:1000 solution. Externally, the solution of 1:1000 or 1:10,000 may be applied.

**Albolene.** An oily white substance obtained from petroleum. It is used on the nipples and skin of the mother and to remove the vernix caseosa from the skin of the child.

**Aloin, Strychnia, and Belladonna.** A laxative pill which usually contains aloin 1/6 gr., strychnia sulph. 1/60 gr., and Belladonna 1/12 gr.

**Ammonia Carbonate.** Antispasmodic, stimulant, and expectorant.

*Uses.*—Stimulant to heart. Stimulating expectorant in pneumonia and bronchitis.

*Dose.*—5-20 grains in mucilage or syrup.

**Anæsthone.** A mixture of adrenalin chloride (0.1%) and chlorotone (5%) in an ointment base of wool fat and petrolatum. Astringent, antiseptic, anesthetic and germicide. Useful application to swollen mucous membranes or in coryza.

**Argyrol (Silver Vitellin).** Antiseptic and germicide.

*Uses.*—Like Silver Nitrate, but less irritating to the tissues. 3-5% solution in water is an injection for gonorrhœa. 15% solution dropped in the eyes of the new-born may prevent ophthalmia. 25% solution may be used twice a day as a remedy for existing ophthalmia, but the strength should be reduced after three or four days. 10-15% solution is used as an injection in cystitis. An ounce or more of the solution may be left in the bladder until the next evacuation.

**Asafœtida.** A fetid gum resin. Carminative, antispasmodic, mild stimulant, and expectorant.

*Uses.*—Gas pains of adults and infants. Hysteria and indigestion.

*Dose.*—5-10 gr. t.i.d. For infantile colic, an emulsion called the *mistura of asafœtida* may be used in 2-4 dram doses. For adults 1-2 tablespoonfuls.

**Babcock's Motiya Powder.** A talcum powder for the toilette which contains .001% formalin. It is a deodorant to the axilla and other folds of the body. Useful to dry up moist eczemas and intertrigo.

**Belladonna.** Nervine, mydriatic, sedative, narcotic, antispasmodic and anodyne. Makes the throat dry and dilates the pupils.

*Uses.*—Night sweats, nervous cough, pain, incontinence of urine and to restrain glandular activity.

*Dose.*—Fl. ext. 1-3 ℥; dry ext.  $\frac{1}{2}$ -1 gr. Tincture 8-20 ℥. Solid ext.  $\frac{1}{2}$ - $\frac{1}{4}$  gr. All for adults. For infants, proportionately less. *See Rule for Dosage.*

**Benzoin.** Antiseptic and externally a styptic and protective for sores.

*Uses.*—Sore nipples and urticaria. Lard is also benzoinated for use in removing vernix caseosa. Compound Tr. of benzoin contains, benzoin, purified aloes, storax, balsam of Peru, and alcohol.

**Benzoinol.** Albolene mixed with benzoin.

**Bismuth Subnitrate.** A white heavy powder. Antiseptic and astringent.

*Uses.*—Subacute gastritis, pyrosis, diarrhœa and vomiting of pregnancy. Particularly desirable in infancy because it is free from arsenic, lead and silver.

*Dose.*—5-60 gr. in the adult.

**Boric Acid (Boracic Acid).** A white crystalline powder. Antiseptic.

*Uses.*—As a dressing and lotion for eyes, navel, mouth, nipples, and all mucous surfaces. In solution to preserve the sterility of rubber nipples until they are needed.

*Dose.*—Internally, 5-15 gr. Solutions are usually about 4% or 5%. A saturated solution in water is about 6%. In hot water 25%.

**Boroglyceride.** An antiseptic paste of boric acid and glycerine. When an excess of glycerine is present the preparation is called boroglycerol.

*Uses.*—An oxydizer in endometritis. It is applied to the cervix on cotton tampons.

**Calcium (Lime).** Stomach sedative, soothes the irritated or burned skin, corrects hyperacidity, increases the clotting power of the blood (?).

Lime water is a saturated solution of calcium hydrate and is used for nausea, to break up the curds of milk, and to increase its digestibility. It is mildly constipating.

**Calomel.** *See Mercury.*

**Camphor.** A solid volatile oil. Nerve sedative. Anaphrodisiac. Antispasmodic. Stimulant.

*Uses.*—The monobromated camphor is given internally for hysteria, neuralgia, and as a hypnotic.

*Dose.*—1-10 gr.



**Camphorated Oil.** A solution of camphor in cottonseed oil. Rubefacient and stimulant.

*Uses.*—Internally in collapse. Externally as an application to the child for colds of chest and nose.

*Dose.*—5-20 m hypodermically in collapse. The injection should be made deep into the muscle.

**Carbolic Acid (Phenol).** Derived from coal tar. Antiseptic, deodorant and local anæsthetic.

*Uses.*—Vomiting of pregnancy, pruritus, eczema, sterilization of instruments. Usual solution is 2½% to 5%. For sterilization of knives, scissors and other sharp instruments the 95% is used. In pruritus, the following wash will aid: carbolic acid, 12 dr., glycerine 2 dr., alcohol, 4 3 water q.s. 1 pt. Apply.

**Cascara Sagrada.** Stimulant laxative, and cathartic. Useful in pregnancy, but after labor there is evidence that it may go over in the milk to the child.

*Dose.*—Fl. ext. 10-20 m. The Hinkle pill contains cascara.

**Castor Oil.** Oil expressed from the seeds of the castor plant. A cathartic. Acts in four or five hours.

*Dose.*—For adults, ½ oz. to 1 oz. For infants 10 to 60 drops given with a dropper—not with a spoon.

Castor oil cocktail.—Rinse out the glass with lemon juice or whiskey. Pour in teaspoonful of lemon juice and a teaspoonful of whiskey, add castor oil in amount required, cover with whiskey and give.

A paste is made from the mixture of castor oil and bismuth subnitrate in equal parts, which is an excellent preparation for sore nipples.

**Cerium Oxalate (and Cerium Valerianate).** Sedative and nerve tonic. The oxalate is a white crystalline powder, odorless and tasteless.

*Uses.*—Vomiting of pregnancy, seasickness.

*Dose.*—2-10 gr. several times daily.

**Charcoal.** Administered in tablet form or as a powder between two slices of buttered bread.

*Uses.*—Acid stomach. Vomiting of pregnancy.

**Chinosol.** Nonpoisonous, nonirritating and odorless. Antiseptic deodorant, styptic and analgesic. Dissolves instead of coagulates secretions.

*Uses.*—Antiseptic solutions for hands and sponges, deodorizing wash for vagina post partum, intrauterine douche, wash for gonorrhœa and cystitis.

*Dose.*—For douche or hand solution 1:1000 or 1:5000. For dusting powder, 1 part to 10 or 20 of starch, talcum, boric acid, or bismuth subnitrate.

Chinosol will corrode unplated steel. It may be mixed with salt, but not with soap.

**Choral Hydrate.** White crystal masses. Pungent in odor and taste. Hypnotic, antispasmodic, antiseptic and analgesic.

*Uses.*—Insomnia, eclampsia, convulsions, and to restrain secretion of milk.

*Dose.*—By mouth, 10-30 gr. By rectum, not to exceed 60 gr. In infants 1-2 gr. by rectum in an ounce of water.

**Chymogen.** A preparation of rennin (10%) made by Armour & Company.

**Coagulen Ciba.** A physiological nontoxic styptic, prepared from the natural coagulents of the blood. A 10% solution in water will hasten the beginning and end of coagulation. May be applied to bleeding surfaces directly, or given under the skin, into the muscle, or into a vein. 3½% to 5% solution in distilled water, should be sterilized by boiling 2-3 minutes. Do not filter. Inject.

**Cocaine Hydrochlorate.** Anæsthetic, sedative, anodyne, anti-pruritic.

*Uses.*—Vomiting of pregnancy, with *caution*.

*Dose.*—Internally ½-1½ gr. Externally a 4%-10% solution in water.

**Codeine.** Alkaloid of opium. Less narcotic than morphine.

*Uses.*—After-pains and pain of over-distended breasts.

*Dose.*—¼-1½ gr. by mouth. ¼-¾ gr. hypodermically.

**Compound Licorice Powder.** *See Senna.*

**Condylomata.**

*Use*—

℞ Acid. Salicyl.	gr. x
Acid Boric.	gr. xxx
Calomel.	3 i
M.	

*Sig.*: Apply twice daily.

**Dermatol.** The subgallate of bismuth. A yellow astringent anti-septic powder.

*Uses.*—Externally on wounds, umbilical stump and as a desiccator in cases of multiple abscess.

Internally for diarrhea in doses of 10-30 grs.

**Digitalis.** Cardiac tonic. Diuretic. Stimulant.

*Uses.*—Weak heart. Syncope. Collapse.

*Dose.*—For adult: of the tincture, 5-15 ℥, fl. ext. 1-3 ℥, ext. gr. ⅙-½.

**Digipuratum.** A preparation of digitalis from which the inactive substances have been removed. It is used in the same conditions as digitalis.

*Dose.*—The tablets contain 1½ gr. and one is given four times daily until ten are taken. *Then stop.* Hypodermically. Each viol contains 1 c.c. of fluid and equals 1½ gr. of digipuratum. Each dose contains enough of the active principle of digitalis to kill a 30 gm. frog.

- Ergot** (*Fungus of Rye*). Contracts unstriped muscle fiber.  
*Uses.*—To check hæmorrhage after labor. To promote involution. Must not be given in labor until the uterus is empty.  
*Dose.*—By mouth 15-60 m of the fl. ext. Hypodermically, 10-20 m.
- Ergotole, Ergotine.** Concentrated solutions of ergot, 2½ times as strong as the fluid extract. They are sterilized and preserved in glass ampoules.  
*Uses.*—See Ergot.  
*Dose.*—30-60 m.
- Green Soap.** A soap made of linseed or other oil, potash, alcohol and water.  
 “The adoption by the U. S. Pharmacopoeia of the term Sapo Viridis (green soap) is unfortunate, since soft soap even if made from green hempseed oil will become brown-yellow unless artificially colored.”—U. S. Dispensatory.
- Hæmophilia.** A condition of the blood wherein its clotting power is diminished or absent.  
 Coagulen, horse serum, or diphtheria antitoxin may be given hypodermically. Direct transfusion of blood from another is best.
- Hyoscine, Morphine, and Cactin.** (H. S. & C. Tablets). A proprietary combination of drugs. The action is said to be similar to that of morphine and scopolamine.
- Iodine, Tincture.**  
*Uses.*—To sterilize the skin before operation. In vomiting of pregnancy it is sometimes effective. Drop doses may be given well diluted. Externally it is applied to ulcers, as in Bednar’s disease, and sometimes as a dressing for the cord. In pruritus vulvæ it is a valuable application.
- Iron.** Tonic emmenagogue.  
*Uses.*—To increase the number of red blood corpuscles. To raise blood pressure and to increase the secretion of milk.  
*Dose.*—3-5 gr. Bland’s pill contains the carbonate in a form that is easily assimilated.
- Laxatives.** Laxatives are unirritating and excite moderate peristalsis. Sulphur, magnesia, cassia, manna, cascara sagrada, the Hinkle pill, and the A, B & S pill are usually mild in action.
- Lysol.** Disinfectant and antiseptic for hands and instruments. It is a brown syrupy fluid made from coal tar oil, which is distilled and mixed with fat, soap, etc. It has a creosote odor and contains 50% cresol. Readily soluble in water.  
 Used in ½-4% solutions.
- Magnesia, Calcined.** Antacid and cathartic. Comes in white cakes.  
*Uses.*—Acid stomach, vomiting of pregnancy, “heartburn,” and constipation.  
*Dose.*—30-120 gr.

**Magnesia, Milk of.** A mixture of magnesia and water. Has the same properties as the above.

*Dose.*—For adults, 2-3 teaspoonfuls. For infants,  $\frac{1}{4}$ -2 teaspoonfuls.

**Magnesia Sulphate** (*Epsom Salts*). Saline cathartic.

*Uses.*—The profuse watery stools produced by magnesia are valuable aids to elimination when the kidneys are overworked or defective. In congestion of the breasts and threatened eclampsia, or in any case where it is desirable to drain off waste or dehydrate the system.

*Dose.*—1 teaspoonful daily in hot water before breakfast.  $\frac{1}{2}$ -1 oz. as a single dose or 1 oz. by rectum, as in the 1-2-3 enema.

**Menthol** (*Mint Camphor, Japanese Peppermint*). Analgesic, antiseptic, anæsthetic, and vascular stimulant.

*Uses.*—In pruritus vulvæ, vomiting of pregnancy, and hemorrhoids.

*Dose.*—By mouth 3-5 gr. In tampons, one part to five of oil. In ointments one part to sixteen. To the vulva for pruritus, use the spirits in 5% solution.

**Mercury** (*Hydrargyrum*). Cathartic, alterative, antisyphilitic, antiseptic and disinfectant. Readily absorbed by the unprotected mucous surface and relatively inert when the membrane is covered by a discharge. Solutions of the bichloride when used as a lotion unite with the albumin of a mucous discharge and form an albuminate of mercury, which is inactive. Bichloride solutions have small place in obstetrics. They are hard on the hands and destructive to instruments. Other agents like lysol, ziratol and chinol have satisfactory germicidal properties and in addition are nonpoisonous, lubricative and cleansing.

Mercury should only be given to the infant in the form of calomel (the mild chloride). The dose is  $\frac{1}{12}$ - $\frac{1}{8}$  gr., repeated if necessary.

**Morphine.** Alkaloid of opium.

Antispasmodic, hypnotic, analgesic and narcotic.

*Uses.*—To relieve pain, produce sleep, check diarrhœa, and to control the pain, as well as the contractions of abortion. To relax a rigid os.

*Dose.*—In "Twilight Sleep" and rigid os the first dose is Morph. sul.  $\frac{1}{6}$ - $\frac{1}{4}$  gr. and scopolamine hydrobromid 1/200-1/150. The scopolamine to be repeated if required, in one-half or three-quarters of an hour. The usual dose of morphine hypodermically is  $\frac{1}{12}$ - $\frac{1}{2}$  gr.

**Nitroglycerine** (*Glonoin*). Vasomotor dilator, arterial stimulant.

*Uses.*—For the prostration following hemorrhage.

*Dose.*—1/200-1/50 gr. hypodermically.

**Novocaine.** Local anæsthetic, similar to cocaine, but less toxic.

For local anæsthesia in solutions of 0.25% to 2% usually in association with adrenalin (5-10 drops of the 1:1000 solution to each 10 c.c. of novocaine solution).

**Nux Vomica.** The plant from which strychnia is derived. Tonic, stomachic, and stimulant to muscle, nerve, and heart.

*Uses.*—Bitter tonic and stimulant. Vomiting of pregnancy and agalactia.

*Dose.*—Ten drops of the tincture in water before meals.

**Opium.** The concrete juice of the poppy. Relieves pain. Constipates.

*Uses.*—Hæmorrhoids in adults, colic and diarrhœa in infants.

*Dose.*—One grain in suppository night and morning for adult. For infant, as paregoric only. Two to five drops only, not repeated. *Children bear opium badly.*

**Pepsin.** A ferment in the gastric juice that digests proteins. In commerce it is obtained from the pig.

*Uses.*—Imperfect digestion.

*Dose.*—For adult, 10-15 grs. For infant, 2 gr.

**Phenolphthalein.** A nonofficial coal tar derivative. Mild laxative.

*Dose.*—2-3 gr. Phenolax and chocolax are preparations of the drug.

**Pituitary Extract (Pituitrin).** A substance derived from the infundibular portion or the posterior lobe of the hypophysis cerebri. Nontoxic, stimulant to unstriated muscle.

*Uses.*—Uterine inertia, post partum hæmorrhage, Cæsarean section and tympany. Will not produce abortion nor premature labor. May be tried in acute anæmia to raise the blood pressure.

*Dose.*—5-15 m. Repeated if necessary.

**Potassium (or Sodium) Bromide.** White granular powder. Soluble, 1 to 5 in water. Sedative, hypnotic, antiepileptic.

*Uses.*—Neurasthenia, convulsions, nymphomania, vomiting of pregnancy.

*Dose.*—20-60 gr. In enema with chloral. Pot. bromide 40 gr. and chloral 20 gr. in several ounces of water or milk.

**Potassium Iodide.** Alterative emmenagogue. Uric acid solvent.

*Uses.*—Syphilis rheumatism, swellings, slow inflammations, excessive secretion of milk.

*Dose.*—2-10 gr. increased as required.

**Potassium Permanganate.** Dark purple opaque prisms. Soluble in water 1 to 16. Disinfectant, deodorant, antiseptic, astringent.

*Uses.*—As an injection in leucorrhœa and gonorrhœa, 1:5000 solution.

**Purgatives.** Simple purgatives produce free discharges from the bowels with some griping. Senna, aloes, rhubarb, castor oil, and calomel are examples. Saline purgatives are followed by profuse watery evacuations. Magnesia sulphate, and citrate, potassium and sodium tartrate, and sodium phosphate belong to this class.

Drastic purgatives bring about a violent action of the bowels with much griping and tenesmus. Such are jalap, colocynth,

elaterium, and croton oil. Hydrogogue purgatives combine the results of the salines and drastics. They have much griping with profuse watery stools. The hydrogogues are elaterium, gamboge, croton oil, and potassium bitartrate.

**Quinine Sulphate.** (Derived from Cinchona bark.) Antipyretic, tonic, antiperiodic, antiseptic, emmenagogue and ebolic.

*Uses.*—Valuable stimulant in a slow first stage. It is combined with castor oil to bring on labor at term. Castor oil 1 oz. and quinine sulphate 10 gr. is given as the first dose, followed in an hour by another 10 gr. of quinine, and an hour later by another.

*Dose.*—2-20 gr.

**Regulin.** A mixture of agar-agar in dry form with extract of cascara sagrada.

*Uses.*—A laxative in chronic constipation.

*Dose.*—Teaspoonful to tablespoonful in stewed fruit or mashed potatoes, once daily.

**Russian Oil** (*Liquid Petrolatum*). Laxative in pregnancy and puerperium. Acts mechanically and as a lubricant. Not unpleasant to take.

*Dose.*— $\frac{1}{2}$  oz. at bedtime, and, if necessary, before each meal. May be given to breast-fed babies in doses of gtt. xv three times daily.

**Senna.** Laxative and purgative. Acts especially on the large intestine. Sometimes passes over in the milk to the child.

*Dose.*—Fl. ext. 1-4 teaspoonfuls. In compound licorice powder the dose is 30-80 gr. (about 10 gr. of senna to the dose).

**Silver Nitrate.** Caustic, antiseptic, stimulant, irritant and antigonorrhœic. Table salt neutralizes it.

*Uses.*—2% solution in water for pruritus vulvæ. 1% solution dropped into the eyes of the new-born to prevent ophthalmia neonatorum. Do not neutralize the 1% solution.  $\frac{1}{4}$  gr. silver nitrate with 2 gr. of pepsin in capsule for pernicious vomiting of pregnancy.

**Sodium Bicarbonate** (*Baking powder*). Antacid, antirheumatic.

*Uses.*—Gout, dyspepsia, acid stomach, acidosis, vomiting of pregnancy. Soothes the skin when burned.

**Sodium Chloride.** (Salt.)

For normal saline use 10 gr. to  $3\frac{1}{2}$  oz. of water. For physiological salt solution, add 15 gr. of Sod. Carb. to every  $3\frac{1}{2}$  oz. of normal saline as made above.

**Sodium Citrate.** A white odorless, granular powder with cooling salty taste.

*Uses.*—Diuretic, antipyretic and refrigerant. Retards the coagulation of albumin in milk and aids the digestibility of proteins. May be indicated in gout and cystitis.

*Dose.*—Internally, 15 to 60 gr. In the modification of cow's milk about two grains should be used for each ounce of the mixture.

**Spirits of Nitre, Sweet** (*Spirit Nitrous Ether*). 4% solution of nitrous ether in alcohol. Diaphoretic, diuretic, antipyretic, stimulant, antispasmodic.

*Uses.*—Fever, dropsy, vomiting of pregnancy, colic, anuria.

*Dose.*—For adult, 20-60 gtt. For infants small doses often repeated.

**Stramonium** (*Jimson Weed*). Hypnotic, narcotic, antispasmodic.

*Uses.*—For hæmorrhoids take Ung. Stramonii and Ung. Galli in equal amounts and apply.

**Urotropin.** (Trade name for hexamethylenamina.) A white powder soluble in water. Urinary antiseptic, diuretic.

*Uses.*—Cystitis, typhoid bacilli in urine, gout. It makes the urine irritatingly acid when given long. It does not act in alkaline media.

*Dose.*—7½-10 gr. well diluted.

**Valerian.** Anodyne, stimulant, antispasmodic and nervine.

*Uses.*—Hysteria, hypochondriasis, headache.

*Dose.*—30-60 ℥ of the fl. ext. by mouth, or by rectum 2 oz. of the following mixture may be used P.R.N. for hysteria:

Pot. Brom. 1 oz.

Ext. Valerian fl. dr. vi.

Normal saline q.s. oz xii.

**Veratrum Viride** (*Hellebore*). Sedative, emetic, diaphoretic, diuretic. Retards the heart's action without weakening it.

*Uses.*—Eclampsia.

*Dose.*—1 to 4 ℥ of the fl. ext. is given hourly until the pulse comes down to 80.

**Veronal.** (Barbitol) White crystalline powder. Safe, reliable hypnotic.

*Uses.*—Insomnia from hysteria, neurasthenia, and mental disturbance.

*Dose.*—5 to 15 gr. dissolved in hot tea, milk, or water. May repeat.

**Zinc.** Tonic, astringent, antispasmodic.

*Uses.*—Stearate of zinc is a valuable dressing in excoriations of buttocks and external genitals.

**Zinc Ointment.** It is indicated for bedsores (decubitus) eczema, herpes, and intertrigo. Zinc ointment contains one part of zinc oxide to four parts of benzoinated lard.

## GLOSSARY

[Adapted from Dorland and Standard Dictionaries]

- Ab-nor'mal.** Not normal; contrary to the usual structure or condition.
- A-bor'tion.** 1. The expulsion of the fœtus before it is viable. 2. Premature stoppage of a morbid or a natural process.
- Ab-ra'sion.** 1. A rubbing or scraping off. 2. A spot rubbed bare of skin or mucous membrane.
- Ab'scess.** A localized collection of pus in a cavity formed by the disintegration of tissues.
- Ac-couch'e-ment.** Delivery in childbed; confinement.
- Ac'e-tone.** 1. A colorless liquid found in pyro-acetic acid and in naphtha. 2. Any member of the series to which the normal or typical acetone belongs.
- A'ci-do'sis.** Acid intoxication of the system from the elaboration or too much acid by faulty metabolism or the imperfect disposition of normal amounts of acid.
- A-ci'nus,** pl. *acini*. One (acini, more than one) of the smallest lobules of a compound gland.
- Al'bo-lene.** An oily white substance derived from petroleum.
- Al'bu-mi-nu'ri-a.** The presence of albumin in the urine.
- Al'ka-line.** Having the reaction of an alkali.
- A'men-or-rhœ'a.** Absence or abnormal stoppage of the menses.
- Am-mo'ni-a.** A colorless alkaline gas,  $NH_3$ , of penetrating odor, and soluble in water, forming ammonia-water. Ammoniacal urine contains ammonia, which is one form of nitrogen excretion.
- An-æ'mi-a.** A condition in which the blood is deficient in quantity or in quality.
- An-æs-the'si-a.** Loss of feeling or sensation, especially loss of tactile sensibility, though the term is used for loss of any of the other senses.
- An-æs-thet'ic.** 1. Without the sense of touch or of pain. 2. A drug that produces anæsthesia.
- An'al-ge'si-a.** Absence of sensibility to pain.
- An-aph'ro-dis'i-ac.** A drug that allays sexual desire.
- An'a-sar'ca.** An accumulation of serum in the cellular tissues of the body.
- An'en-ceph'al-ous.** Having no brain.
- An'ky-lo'sis.** Abnormal rigidity or stiffness of a joint.
- An'o-dyne.** A medicine that relieves pain.
- An'te par'tum.** Latin for "before delivery."
- An-te'ri-or.** Situated in front of, or in the forward part of.



- An'ti-pe'ri-od"ic.** A drug that tends to prevent recurrent attacks of disease.
- An'ti-sep"tic.** 1. Preventing decay or putrefaction. 2. A substance destructive to poisonous germs.
- A-pe'ri-ent.** Mildly cathartic.
- Ap-nœ'a.** The absence of respiration—especially that form which occurs in a child delivered by the Cæsarean operation.
- A-re'o-la.** The darkish ring around the nipple.
- As-ci'tes.** Dropsy (an accumulation of fluid) in the abdomen.
- A-sep'sis.** Absence of septic matter, or freedom from infection.
- As-phyx'i-a.** Suffocation.
- As-trin'gent.** 1. Causing contraction and arresting discharges. 2. An agent that arrests discharges.
- At'e-lec-ta"sis.** Imperfect expansion of the lungs at birth; partial collapse of the lung.
- At'on-y.** Lack of normal tone or strength.
- A'tri-um.** *L.*, a hall.) The point of entrance of a bacterial disease.
- At'ti-tude.** A posture or position of the body. The relation which the various parts of the child's body bears to its own long axis. The attitude of the fœtus normally is complete flexion.
- Aus'cul-ta"tion.** The act of listening for sounds within the body.
- Bac-te'ri-a.** The vegetable microorganisms (*Schizomycetes*) especially the short-rod forms.
- Bal'an-i"tis.** Inflammation of the glans penis. It is usually associated with phimosis.
- Bal-lotte'ment.** The diagnosis of pregnancy by pushing up the uterus by a finger inserted into the vagina so as to cause the embryo to rise and fall again like a heavy body in water.
- Bar'tho-lin glands.** The vulvo-vaginal glands.
- Bleb.** A skin vesicle filled with fluid. A blister.
- Breg'ma.** The point on the surface of the skull at the junction of the coronal and sagittal sutures.
- Cæ-sa're-an sec'tion.** (Named from Julius Cæsar, who is said to have been thus born). Delivery of the fœtus by an incision through the abdominal and uterine walls.
- Ca'put.** Any head, or head-like structure.
- Ca'put suc'ce-da"ne-um.** A swelling formed on the presenting part of the fœtus during labor. It is due to the effusion of fluid into the subcutaneous tissues of the scalp and its retention there.
- Car-min'a-tive.** Drugs that stimulate the circulation, the mental faculties, and intestinal peristalsis. Asafœtida, camphor, capsicum, cardamon, chloroform, ether, ginger, horseradish, mustard, and the oils of anise, cloves, spearmint, nutmeg and valerian are carminatives.
- Car'ne-ous.** Fleshy.
- Cath'e-ter, tra'che-al.** A long slender tube designed for introduction into the babe's trachea as a means of sucking out mucus.
- Cath"e-ter-ize'.** To introduce a tube and draw off fluid, as urine or mucus.

- Caul.** 1. The great omentum.  
2. A piece of amnion which sometimes envelopes a child's head at birth.
- Cell.** 1. Any one of the minute protoplasmic masses which make up organized tissue.
- Ceph-al'ic.** 1. Pertaining to the head. 2. A medicine for the head.
- Ceph'al-hæ-ma-to''ma.** 1. A tumor or swelling filled with blood beneath the pericranium.
- Cer'vix.** The neck or any neck-like part.
- Chlo-as'ma.** The yellowish brown spots or patches that appear on the skin of pregnant women.
- Cic'a-tri''cial.** Pertaining to, or of the nature of, a cicatrix.
- Ci-ca'trix.** A scar; the mark left by a sore or wound.
- Cil'i-a.** 1. The eyelashes. 2. Minute lash-like processes that characterize certain cells.
- Cli'mac-ter''ic.** A particular epoch of the ordinary term of life at which the body is believed to undergo a radical change—especially applied to the menopause.
- Cli-ni'cians.** Men who teach and explain diseases by showing actual cases.
- Clit'o-ris.** The sensitive organ of the female, homologous with the penis in the male.
- Coc'cyx.** The small bone situated at the end of the sacrum. The very last portion of the spine.
- Col-lapse'.** A state of extreme prostration and depression with failure of circulation.
- Col'les' mem'brane.** A layer of tough sensitive fascia back of the perineum and on either side of the vagina.
- Co-los'trum.** The first fluid secreted by the mammary glands after functional activity begins. It contains casein and more albumen than milk, as well as numerous fatty globules.
- Col'peu-ryn''ter.** A dilatable bag, used to distend the vagina.
- Co'ma.** Profound stupor occurring in the course of a disease or after severe injury.
- Co'ma-tose.** Pertaining to, or affected with, coma.
- Com'pli-ca'tion.** A disease or diseases concurrent with another disease.
- Con-cep'tion.** The fecundation of the ovum.
- Con'dyl-o''ma.** A wart-like excrescence near the anus or vulva. It may be as large as a cauliflower.
- Con-gen'i-tal.** Born with a person; existing at or before, birth.
- Con'ju-gate.** The anteroposterior diameter of the pelvic inlet.
- Cor'o-nal.** Pertaining to the crown of the head, as the coronal suture.
- Cra'dle cap.** The dirty looking patch of epithelial scales and sebaceous material that develops over the anterior fontanelle of babies who have the exudative diathesis.
- Cra'ni-ot''o-my.** The cutting in pieces of the fetal head to facilitate delivery.
- Cre-dé Expression.** The maneuver in which the uterus is grasped in the hollow of the hand and squeezed and pressed down upon to aid in the expulsion of the placenta.

- Cre-dé Treatment.** The instillation of a 1% solution of nitrate of silver into the eyes of the new-born to prevent ophthalmia.
- Curd.** The coagulum of milk, consisting mainly of casein.
- Cy'an-o''sis.** Blueness of the skin, often due to cardiac malformation causing insufficient oxygenation of the blood.
- Cys-ti'tis.** Inflammation of the bladder.
- De-cid'u-a.** The membranous structure produced in the uterus during gestation and thrown off after parturition. **D. capsularis**, the part of decidua which is reflected upon and surrounds the ovum. **D. Basalis**, the late decidua; the part of the decidua vera which becomes the maternal portion of the placenta. **D. Vera**, the true decidua; the portion of the decidua which lines the uterus.
- De-cu'bi-tus.** 1. An act of lying down. 2. A bed-sore.
- De-hy'drate.** To remove the water.
- Di'a-be''tes.** A disease marked by an habitual discharge of an excessive quantity of urine and the presence of sugar therein.
- Di''aph-o-re'sis.** Perspiration, and especially profuse perspiration.
- Di''aph-o-ret'ic.** 1. Stimulating the secretion of sweat. 2. A medicine that increases the perspiration.
- Di-ath'e-sis.** Natural or congenital predisposition to a special disease.
- Dif'fer-en''tial.** Pertaining to a difference, or differences.
- Dis-crete'.** Separate lesions which do not blend or coalesce.
- Di'u-re''sis.** Increased secretion of urine.
- Dor'sum.** The back or any part corresponding to the back as the dorsum of the penis or foot.
- Duc'tus ve-no'sus.** A fetal blood vessel connecting the umbilical vein with the post-cava.
- Dys-cra'si-a.** A depraved state of the system, and especially of the blood, due to constitutional disease.
- Dysp-nœ'a.** Difficult or labored breathing.
- Dys-to'ci-a.** Painful or slow delivery or birth.
- Ec-bol'ic.** An agent that accelerates labor.
- E-clamp'si-a.** A sudden attack of convulsions, especially one of a peripheral origin.
- Ec-top'ic.** Out of the normal place.
- E-de'ma.** Swelling due to effusion of watery liquid into the connective tissue.
- Em'bo-lism.** The plugging of an artery or vein by a clot or obstruction which has been brought to its place by the blood-current.
- Em'bry-o.** The fœtus in its earlier stages of development, especially before the end of the third month.
- Em-men'a-gogue.** A drug that aids or stimulates menstruation.
- E-mul'sion.** An oily or resinous substance divided and held in suspension through the agency of an adhesive, mucilaginous, or other substance.
- En'do-me''tri-um.** The mucous membrane that lines the cavity of the uterus.

- En-gage'ment.** The head is said to be engaged when the largest diameters have passed the inlet.
- En'si-form.** Shaped like a sword.
- Ep'i-si-ot'o-my.** Surgical incision of the vulvar orifice laterally for obstetric purposes.
- E-ro'sion.** An eating or gnawing away.
- Er'y-the'ma.** A morbid redness of the skin due to congestion of the capillaries, of many varieties.
- Et'i-ol'o-gy.** The study or theory of the causation of any disease.
- Ex-co'ri-a'tion.** Any superficial loss of substance such as that produced on the skin by scratching.
- Ex-os-mo'sis** (*Ex-os-mose*). Diffusion or osmosis from within outward.
- Ex-san'guin-a'tion.** An exhaustion of the blood from a part or the whole of the body.
- Ex-trac'tion.** The process or act of pulling or drawing out, particularly the removal of a child by pulling either with hands or forceps.
- Ex'tra-u'ter-ine.** Situated or occurring outside of the uterus.
- Ex'u-da'tive di-ath'e-sis.** A congenital predisposition to eczema in various parts of the body, as well as to infections of the respiratory tract.
- Fæ'ces** (*or fe'ces*). The excrement or undigested residue of the food discharged from the bowels.
- Fen'es-tra-ted.** (*L., fenestrum, a window.*) Pierced with one or more openings, like windows.
- Fer'ment.** Any substance that causes fermentation in other substances with which it comes in contact.
- Fi'brin.** A substance which, becoming solid in shed blood, plasma and lymph, causes the coagulation of these fluids.
- Fil'let.** 1. A loop-shaped structure. 2. A loop, as of cord or tape, for making traction.
- Fis'sure.** A cleft or groove, normal or other.
- Fis'tu-la.** A deep, sinuous ulcer, often leading to an internal hollow organ.
- Flu'id ex'tract.** A concentrated solution of the active principle of a drug in such strength that 1 c.c. of the product equals 1 gr. of the crude drug. The fluid is a mixture of alcohol, water and glycerine in varying proportions. One may be omitted.
- Fœ'tus** (*or fe'tus*). The unborn offspring of any animal that brings forth living progeny; the child in the womb after the third month.
- Fon'ta-nelle".** Any one of the unossified spots on the cranium of a young infant. It is so named because it rises and falls like a fountain.
- Fo-ra'men.** A hole or perforation, especially a hole in a bone.
- Four-chette'.** The fold of mucous membrane at the posterior junction of the labia majora.
- Fræ'nium** (*or fre'nium*). A fold of the integument or of the mucous membrane that checks, curbs, or limits the movements of an organ in part—as the frænum of the tongue.
- Func'tion.** The normal or proper action of an organ or set of organs.

- Func'tion-al.** Of or pertaining to a function.
- Fun'dus.** The base or part of a hollow organ remotest from its mouth.
- Ga-lac'tor-rhœ"a.** Excessive secretion of milk.
- Ga-vage'.** Feeding by the stomach tube; also the therapeutic use of a very full diet.
- Gen'it-als.** The reproductive organs.
- Ger'mi-cide'.** An agent that destroys germs.
- Ges-ta'tion.** Pregnancy.
- Glans cli-tor'i-dis.** The distal or outside end of the clitoris.
- Glans pe'nis.** The head, or terminal end, of the penis.
- Gon-or-rhœ'a.** A contagious catarrhal inflammation of the genital mucous membrane.
- Graaf'i-an fol'li-cle.** Any one of the small spherical ovarian bodies, each of which contains an ovum.
- Hæm'o-phil'i-a.** A condition of the system wherein bleeding occurs readily, and the blood clots slowly or not at all.
- Hæm'or-rhage.** A copious escape of blood from the vessels; bleeding. **Accidental h.,** hæmorrhage during pregnancy, due to premature detachment of the placenta. **Post partum h.,** that which occurs soon after labor, or childbirth. **Unavoidable h.,** that which results from the detachment of a placenta prævia.
- Hæm'or-rhoid.** A pile, or vascular tumor of the rectal mucous membrane.
- Hy-dat'id.** An encysted vesicle containing an encysted fluid. From the *Greek* "*Hydatis*," meaning a drop of water.
- Hy-dat'i-form.** Resembling a hydatid in form.
- Hy-dram'ni-os.** Dropsy of the amnion.
- Hy'dro-ceph" a-lus.** A fluid effusion within the cranium. This disease is marked by enlargement of the head, with prominence of the forehead, atrophy of the brain, mental weakness, and convulsions.
- Hy'giene.** The science of health and of its preservation.
- Hy'men.** The membranous fold which partially or wholly occludes the external orifice of the vagina, at least during virginity.
- Hy'per-em"e-sis.** Excessive vomiting. **H. gra-vi-da'rum,** excessive vomiting of pregnancy.
- Hy'per-æ"mi-a.** Excess of blood in any part of the body.
- Hy-per'tro-phy.** The morbid enlargement or overgrowth of a part.
- Hyp-not'ic.** A drug that induces sleep.
- Hy'po-der-moc"ly-sis.** The introduction, into the subcutaneous tissues, of fluid in large quantity.
- Hy'po-gas"tric.** Of or pertaining to the lower anterior region of the abdomen in the middle line of the body. The hypogastric arteries arise from the internal iliac in addition to the branches given off from those vessels in the adult.
- Hy'po-phos"phite.** Any salt of hypophosphorous acid.
- Ic'ter-us.** Jaundice.
- Id'i-o-syn"cra-sy.** An effect abnormal to the one usually produced. An effect peculiar to the individual.

- Im-mu'ni-ty.** The condition of being immune or exempt from disease, especially the condition arising from inoculation, or from a peculiar resistance of the organism.
- Im'preg-na'tion.** 1. The act of fecundation or of rendering pregnant. 2. The process or act of saturation, a saturated condition.
- In'farct.** A mass of substance extravasated either into the substance of an organ or into a vessel due to the obstruction to the circulation.
- In''fan-tile' pel'vis.** A pelvis which has not responded to the developmental stimulation of the sexual glands at puberty, and therefore remains in its infantile shape. A masculine pelvis.
- In''fan-tile' u'ter-us.** An undeveloped uterus.
- In-fec'tion.** The communication of disease from one person to another, whether by effluvia or by contact, mediate or immediate; also the implantation of disease from without.
- In'fil-tra'tion.** To cause a liquid or gas to penetrate or enter by pores or interstices.
- In'flam-ma'tion.** A morbid condition characterized by pain, heat, redness and swelling.
- In-nom'in-ate.** Not having a name, as the innominate bone.
- In-som'ni-a.** Inability to sleep; abnormal wakefulness.
- In'ter-sti'tial.** Pertaining to, or situated in, the interstices or interspaces of a tissue.
- In'ter-tri'go.** A chafe, or chafed patch of the skin; also the erythema or eczema that may result from a chafe of the skin.
- In-tro'i-tus.** The entrance to any cavity or space.
- In-ver'sion.** A turning inward, inside out, upside down, or other reversal of the normal relation of a part.
- In'vo-lu'tion.** 1. A rolling or turning inward. 2. The return of the uterus to its normal size after parturition. 3. A retrograde change, the reverse of evolution.
- Is-chu'ri-a par-a-dox'a.** A condition in which the bladder is over-distended with urine, although the patient continues to urinate, generally in dribbles.
- Jaun'dice.** Yellowness of the skin, eyes, and secretions, due to the presence of bile pigments in the blood.
- La'bi-a.** Lip-shaped organs. The external folds of the vulva, labia majora, and the internal folds of the vulva, labia minora.
- Lac'e-ra'tion.** 1. The act of tearing. 2. A wound made by tearing.
- Lac-ta'tion.** 1. The secretion of milk. 2. The period of the secretion of milk. 3. Suckling.
- Lan-u'go.** The fine hair on the body of the fetus.
- Lav-age'.** The irrigation or washing out of an organ, such as the stomach or bowel.
- Le'sion.** Any hurt, wound or local degeneration.
- Leu'cor-rhoe'a.** A whitish, viscid discharge from the vagina and uterine cavity.
- Light'en-ing.** The sense of lightness and easier breathing that follows the descent of the head into the pelvis during the last three weeks of pregnancy. It is most likely to occur in primiparas.

- Lo'chi-a.** The vaginal discharge that takes place during the first week or two after childbirth.
- Lymph.** A transparent slightly yellow liquid of alkaline reaction which fills the lymphatic vessels.
- Mal-aise'.** An uneasiness or indisposition, discomfort or distress.
- Mal'po-si"tion.** Abnormal or anomalous position.
- Mam'ma.** The mammary gland; the breast.
- Mam'ma-ry.** Pertaining to the Mamma.
- Ma-ras'mus.** Progressive wasting and emaciation, especially such a wasting in young children when there is no obvious or ascertainable cause.
- Mas-sage'.** The systematic, therapeutic friction, stroking and kneading of the body.
- Mas-ti'tis.** Inflammation of the breast.
- Me-a'tus.** A passage or opening, as the meatus urinarius.
- Me-læ'na ne-o-na-to'rum.** The passage of dark pitchy stools containing blood pigments and blood that has been extravasated into the alimentary canal of the newborn babe.
- Mem'brane.** A thin layer of tissue which covers a surface or divides a space or organ.
- Men'o-pause.** The period when menstruation normally ceases; the change of life.
- Mis-car'riage.** Abortion; premature expulsion of the fœtus; birth of the fœtus before the twenty-eighth week.
- Milk-leg** (*Phlegmasia Alba Dolens*). A condition developing in one, and rarely, in both, legs, after delivery. It is due to occlusion of the veins of the pelvis and leg by thrombosis or to septic inflammation of the pelvic connective tissue.
- Mole.** 1. A fleshy mass or tumor formed in the uterus by the degeneration or abortive development of an ovum. 2. A nevus; also a brownish spot on the skin.
- Mons ven'er-is.** A rounded prominence at the symphysis pubis of a woman.
- Mor-bid'i-ty.** The condition of being diseased or morbid.
- Mor'cel-la"tion.** Division and piecemeal removal.
- Mu'cus.** The viscid watery secretion of the mucous glands.
- Mul-tip'ar-a.** A woman who has borne more than one child.
- Mum'mi-fi-ca"tion.** Dry gangrene; also the drying up and shrivelling of the fœtus.
- Myd'ri-at"ic.** A drug that dilates the pupil.
- Nau'se-a.** Tendency to vomit; sickness at the stomach.
- Ne-cro'sis.** Death of a tissue, especially of a bone.
- Ne-phri'tis.** Inflammation of the kidney.
- Neu-rot'ic.** 1. Pertaining to or affected with a neurosis. 2. Pertaining to the nerves.
- Neu'tra-lize.** To render neutral or ineffective.
- Ni'tro-gen.** A colorless gaseous element found free in air.
- Nod'u-lar.** 1. Like a nodule or node. 2. Marked with nodules.

- Nu'cle-us.** 1. a spheroid body within a cell, forming the essential and vital part. 2. A mass of gray matter in the central nervous system. 3. In chemistry, the central element in the molecule of a compound.
- Nu'tri-ent.** Nourishing; affording nutriment.
- Nym'phæ.** The labia minora.
- Ob-stet'rics.** The art of managing childbirth cases; that branch of surgery which deals with the management of pregnancy and labor.
- Ob-ste-tri'cian.** One who practices obstetrics.
- Oc'ci-put.** The back part of the head.
- Ol'i-go-hy-dram"ni-os.** Scantiness of the liquor amnii.
- Ol'i-gop-nœ'a.** A delay following the birth of a child before the first respiration is established.
- Oph-thal'mi-a.** Severe inflammation of the eye or of the conjunctiva.
- Or'gan.** Any part of the body having a special function.
- Os.** (*L.*, a mouth.) The orifice in the uterus or vagina.
- Os-mo'sis.** The passage of a fluid through a membrane.
- O'va.** Latin plural of ovum, egg.
- O'vu-la'tion.** The formation and discharge of an unimpregnated ovum from the ovary.
- O'vule.** 1. The ovum within the Graafian vesicle. 2. Any small egg-like structure.
- O'vum.** 1. An egg. 2. The female reproductive cell which, after fertilization, develops into a new member of the same species.
- Ox'y-di'zer.** Anything that combines with oxygen.
- Pal-pa'tion.** The act of feeling with the hand; the application of the fingers with light pressure to the surface of the body for the purpose of determining the consistence of the parts beneath in physical diagnosis.
- Par-al'y-sis, Erb's.** 1. Same as birth-palsy. 2. Partial paralysis of the brachial plexus affecting various muscles of the arm and chest-walls. It is revealed by an inability to lift the arm toward the head.
- Par-al'y-sis facial (Bell's).** Paralysis of the face, due to lesion of the facial nerve or of its nucleus.
- Par'a-me-tri'tis.** Inflammation of the parametrium, or cellular tissue about the uterus.
- Par'a-phi-mo'sis.** Retraction of a narrow or inflamed foreskin which can not be replaced.
- Pa-ren'chy-ma.** The essential or functional elements of an organ as distinguished from its stroma or framework.
- Pa-ri'e-tal.** Of, or pertaining to, the walls of a cavity.
- Par'o-nych'i-a.** Infection and suppuration about the junction of nails and skin.
- Par'ox-ysm.** A sudden recurrence or sudden intensification of symptoms.
- Path-o-log'ic.** Pertaining to pathology.
- Pa-thol'o-gy.** That branch of medicine which treats of the essential nature of disease, especially of the structural and functional changes caused by disease.
- Pel-vim'e-ter.** An instrument for measuring the various diameters of the pelvis.



- Pel-vim'e-try.** The act of determining the dimensions of the pelvis by means of a pelvimeter.
- Per'i-ne-or"rha-phy.** Saturation of the perineum, performed for the repair of a laceration.
- Per'i-ne"um.** The space or area between the anus and the genital opening.
- Pe-riph'e-ry.** The outward part or surface.
- Per'i-to-ne"um.** The serous membrane which lines the abdominal walls.
- Per'i-to-ni"tis.** Inflammation of the peritoneum.
- Per'i-stal"sis.** A worm-like movement by which the alimentary canal propels its contents.
- Per-ni'cious.** Tending to a fatal issue.
- Phe-nom'e-non.** Any remarkable appearance; any sign or objective symptom.
- Phys'i-o-log"ic.** Pertaining to physiology.
- Phys'i-ol"o-gy.** The science which treats of the functions of the living organism and its parts.
- Phi-mo'sis.** Tightness of the foreskin such that it can not be drawn back over the glans.
- Phle-bi'tis.** Inflammation of a vein.
- Pig'men-ta"tion.** The deposition of coloring matter.
- Pla-cen'ta prae'vi-a.** A placenta which intervenes between the intra-uterine cavity and the inner orifice of the cervical canal.
- Pla-cen'ta suc'cen-tur'i-a"ta.** An accessory or subsidiary placenta.
- Pled'get.** A small compress or tuft as of wool or lint.
- Pleth'o-ra.** A condition marked by vascular turgescence, excess of blood and fullness of pulse.
- Po-dal'ic.** Pertaining to, or accomplished by means of, the feet.
- Pol'y-hy-dram"ni-os.** Excess in the amount of the liquor amnii in pregnancy.
- Po-si'tion.** 1. The attitude or posture of a patient. 2. The relation of the presenting part of the fœtus to the quadrants of the maternal pelvis.
- Pos-te'ri-or.** Situated behind or toward the rear.
- Post par'tum.** After delivery.
- Pre'ma-ture.** 1. Occurring before the proper time. 2. An infant born before its proper term, but viable.
- Pre'ma-tu"ri-ty.** The condition of a child that has been delivered before term, and before maturity or ripening has taken place.
- Pre-mon'i-tory.** Serving as a warning.
- Pre'puce.** The fold of skin covering the glans penis; the foreskin.
- Pres'en-ta"tion.** 1. The appearance in labor of some particular part of the fœtal body at the os uteri. 2. That part of the fœtal body which first shows itself at the os in labor.
- Pri-mip'a-ra.** A woman who has given birth, or who is giving birth, to her first child.
- Prod'ro-mal.** Premonitory. Indicating the approach of an event, phenomenon, or disease.
- Prog-no'sis.** A forecast as to the probable result of an attack of disease; the prospect as to recovery from a disease afforded by the nature and symptoms of the case.

- Pro-jection-al vom'i-ting.** Sudden violent emesis.
- Pro-lapse'.** The falling down, or sinking, of a part or viscus.
- Pro-lep'sis.** The anticipation and nullification of complications before they arise.
- Prom'on-to'ry.** A projecting eminence or process.
- Pro'phy-lax'is.** The prevention of disease.
- Pro'te-in.** Any one of a group of nitrogenized, noncrystallizable compounds similar to each other, widely distributed in the animal and vegetable kingdoms, and forming the characteristic constituents of the tissues and fluids of the animal body. They are formed by plants, the animal organism receiving them as food and transforming and assimilating them. They all contain carbon, hydrogen, nitrogen, oxygen and sulphur. Some of the most important are albumin, casein, legumin, fibrin, myosin and glutin.
- Psy'chic.** Pertaining to the mind.
- Pu'bes.** That part of the lower central hypogastric region which, in the adult, is covered with hair. The pubic region.
- Pu'bic.** Pertaining to the pubes, or os pubis.
- Pu'ber-ty.** The age at which the reproductive organs become functionally operative.
- Pu'bi-ot'o-my.** (*He-bos'te-ot'o-my.*) The operation of cutting through the pubic bone, lateral to the median line.
- Pu'er'pe-ral.** Pertaining to childbirth.
- Pu'er-pe'ri-um.** The period or state of confinement. The puerperium is the time succeeding labor which is necessary for the restoration of the genitals to their condition previous to pregnancy, or as near it as possible. It varies from 6 weeks to several months.
- Pu'ru-lent.** Consisting of or containing pus.
- Py-æ'mia.** Blood-poison of microbic origin.
- Py'e-li'tis.** Inflammation of the pelvis of the kidney.
- Py'or-rhœ'a.** A discharge of pus, especially from infection around the roots of the teeth.
- Py-ro'sis.** Heartburn. Acidity of the stomach. Eructations of acid.
- Re'flex-es.** Reflected actions or movements. Impulses received and transmitted by the nervous system without conscious volition. Involuntary responses to irritation. Automatic movements.
- Re-frig'e-rant.** Relieving fever and thirst. A cooling remedy. Acidulous drinks and evaporating lotions are refrigerant.
- Re-gur'gi-ta'tion.** 1. The casting up of undigested food. 2. A backward flowing of the blood through the left auriculo-ventricular opening, on account of imperfect closure of the mitral valve.
- Re'lax-a'tion.** 1. A lessening of tension. 2. A mitigation of pain.
- Re'nal.** Pertaining to the kidney.
- Res'ti-tu'tion.** 1. An act or process of restoration. 2. The rotation of the presenting part of the fœtus outside of the vagina.

- Re'tro-gres"sive.** Going or moving backward. Passing from a better to a worse condition.
- Re'tro-ver"sion.** The tipping of an entire organ backward.
- Rick'ets.** (*Ra-chi'tis.*) A constitutional disease of childhood in which the bones become soft and flexible from retarded ossification, due to deficiency of the earthy salts.
- Ro-ta'tion.** The process of turning around an axis.
- Rough'en-ing.** Any rough, coarse food that gives bulk to the intestinal contents without much nutrition.
- Ru'be-fa"ci-ent.** An agent that reddens the skin.
- Ru'gæ.** Wriakles or folds.
- Rup'ture.** 1. Forceful tearing or breaking of a part. 2. Hernia.
- Sa'crum.** The triangular bone situated at the end of the spine. It is formed of five vertebræ, amalgamated and wedged in between the two innominate bones.
- Sag'it-tal.** Shaped like, or resembling, an arrow.
- Sal'i-va"tion.** An excessive discharge of saliva.
- Sal'pin-gi"tis.** Inflammation of an oviduct or of the eustachian tube.
- Sal"var-san'.** A compound invented by Ehrlich for the treatment of diseases caused by the *Spirillæ*, such as syphilis and recurrent fever. It is popularly called 606.
- Sa-præ'mi-a.** Poisoning of the blood by the absorption of toxins from localized infections as from the uterus.
- Scap'u-la.** The shoulder blade.
- Scro'tum.** The pouch which contains the testicles and their accessory organs.
- Se-ba'ceous.** 1. Pertaining to sebum or suet. 2. Secreting a greasy lubricating substance.
- Se-cre'tion.** 1. The process or function of separating various substances from the blood. 2. Any secreted substance.
- Sec'un-dines.** All that remains in the uterus after the birth of the child is called secundines—placenta, membrane and cord.
- Se'men.** 1. A seed or seed-like fruit. 2. The thick whitish liquid fecundating secretion produced in coition.
- Shock.** Sudden vital depression, due to an injury or emotion which makes a sinister impression upon the nervous system.
- Show.** The appearance of blood that foreruns a labor or menstruation.
- Sin'a-pism.** A plaster or paste of ground mustard-seed; a mustard plaster.
- Sin'ci-put.** The portion of the head lying in front of the anterior or large fontanelle.
- Si'nus.** 1. A recess, cavity or hollow space. 2. A dilated channel for venous blood, found chiefly within the cranium and uterus during gestation. 3. An air-cavity, in one of the cranial bones, especially one communicating with the nose, such are the ethmoidal frontal maxillary and sphenoidal sinuses. 4. A suppurating channel or fistula.
- Smeg'ma.** A thick, cheesy, ill-smelling secretion found under the prepuce and around the labia minora.
- So-lu'tion.** 1. The process of dissolving. 2. A liquid containing dissolved matter.

- Sor'des.** The dark brown matter which collects on the lips and teeth in low fevers.
- Spas'mo-phil"ic di-ath'e-sis.** Is a condition characterized by an increased elective irritability and a tendency to spasm, like contractions of one or more groups of muscles. (Grulee).
- Spe-cif'ic.** 1. Pertaining to a species. 2. Produced by a single kind of microorganism. 3. A remedy specially indicated for any particular disease.
- Sper'ma-to-zo"on.** The motile generative element of the semen which serves to impregnate the ovum.
- Spi'na bif'i-da.** Congenital cleft of the vertebral column with meningeal protrusion.
- Spi'ro-chæ"te.** A genus or form of flexile spirobacteria.
- Sta'sis.** A stoppage of the flow of fluid in any organ or any part of the body.
- Ste-no'sis.** Narrowing or stricture of a duct or canal.
- Ster'ile.** Nonfertile.
- Ster'il-i-za'tion.** The act or process of rendering sterile.
- Still-birth.** The birth of a dead fœtus.
- Stim'u-lant.** 1. Producing stimulation. 2. An agent or remedy that produces stimulation.
- Strep'to-coc"cus.** A genus or form of bacterial organism, which grows in consecutive links, like a chain.
- Stri'a, pl. striæ.** Streaks or lines.
- Stro'ma.** The tissue which forms the ground substance, framework, or matrix of an organ.
- Styp'tic.** Astringent, an agent for arresting hæmorrhage.
- Sub'in-vo-lu"tion.** Incomplete involution; failure of a part to return to its normal size and condition after enlargement from functional activity.
- Sup-pos'i-to-ry.** An easily fusible medicated mass to be introduced into the vagina, rectum, or urethra.
- Su'ture.** 1. Surgical stitch or seam. 2. The line of junction of adjacent cranial or facial bones.
- Sym'phys-e-ot"o-my.** The division of the fibrocartilage of the symphysis pubis in order to facilitate delivery by increasing the anteroposterior diameter of the pelvis.
- Sym'phy-sis.** The line of junction and fusion between bones originally distinct. The symphysis pubis.
- Syn'chro-nous.** Occurring at the same time.
- Syph'i-lis.** A contagious venereal disease leading to many structural and cutaneous lesions, due to a microorganism called the spirochæta pallida.
- Tam'pon.** A plug made of cotton, sponge, or oakum.
- Te-nac'u-lum.** A hook-like instrument for seizing and holding tissues.
- Te-nes'mus.** Straining, especially ineffectual and painful straining.
- Throm'bus.** A plug or clot in a vessel remaining at the point of its formation.
- Tinc'ture.** The solution of medicinal substances in fluids other than water or glycerine. There is usually about one part of the drug to eight of alcohol.
- Tis'sue.** An aggregation of cells, fibers and various cell-products forming a structural element.

- Tox-æ'mi-a.** Blood-poisoning.
- Tox'in.** Any poisonous albumin produced by bacterial action.
- Trau'ma.** A blow, wound, or other violent injury.
- Trau'ma-tism.** A condition of the system due to injury.
- Tu'mor.** 1. Swelling; morbid enlargement. 2. A neoplasm. A mass of new tissue which persists and grows independently of its surrounding structures, and which has no physiological use.
- Tym'pa-ni'tis.** Distention of the abdomen from gas.
- Um-bil'i-cal.** Pertaining to the umbilicus.
- Um-bi-li'cus.** The navel.
- U'ra-chus.** A cord that extends from the apex of the bladder to the navel. It represents the remains of the canal in the fœtus which joins the bladder with the allantois.
- U-re'a.** A white crystallizable substance from the urine, blood and lymph.
- U-re'ter.** The fibro-muscular tube which conveys the urine from the kidney to the bladder.
- U-ræ'mi-a.** The presence of urinary constituents in the blood and the toxic condition produced thereby.
- U-re'thra.** A membranous canal conveying urine from the bladder to the surface and in the male conveying the seminal ejaculations.
- U'rin-al'y-sis.** The chemical analysis of urine.
- U'ter-us.** The hollow muscular organ which provides lodgement for the fœtus from conception to birth. The womb.
- U'ter-us bi-cor'nis.** A womb wherein the two sides have been incompletely joined during development, and two horns, or protrusions, appear on the fundus.
- U'ter-us di-del'phys.** A womb in which there has been separate development and incomplete fusion of the two sides.
- U'ter-us du'plex.** A double uterus.
- U'ter-us sep'tate.** A uterus that is divided by a partition or septum.
- Vari-cose veins.** Of the nature of, or pertaining to, a varix. The permanent dilatation of a vein.
- Ven'e-sec'tion.** The opening of a vein for the purpose of letting blood.
- Ven'tral stalk.** An embryonic process which is the rudimental precursor of the umbilical cord. It is known as the ventral stalk because somewhat later in the course of development it becomes attached to the ventral (abdominal) surface of the embryo.
- Ver'nix cas'e-o'sa.** A fatty substance that covers the skin of the fœtus.
- Ver'sion.** The act of turning, especially the manual turning of the fœtus in delivery. **External v.**, that which is performed by outside manipulation. **Internal v.**, version performed by the hand introduced into the uterus. **Braxton Hicks' Version**, a version done with the whole hand in the vagina and two fingers entering the uterus through the partially dilated os.
- Ves'i-cal.** Pertaining to the bladder.

- Vi'a-bil'i-ty.** Able to live after birth.
- Vil'i.** 1. The finger-like projections that develop on the outside of the egg and connect it vascularly and otherwise with the uterus; a vascular chorionic tuft. 2. A minute club-shaped projection from the mucous membrane of the intestine.
- Vul-sel'lum.** A forceps with teeth on the ends of the jaws.
- Walch'er's position.** The patient on the back with the hips at the edge of the table and the legs hanging down.
- Whar'ton's jelly.** The soft pulpy connective tissue that constitutes the largest part of the umbilical cord.
- Womb.** Same as uterus.

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