THE

# DISEASES OF WOMEN.

## CHAPTER I.

INTRODUCTORY: ANATOMY OF PELVIC ORGANS: THE OVARIES; FALLOPIAN TUBES; UTERUS; DOUGLAS'S POUCH; AXIS AND MOVEMENTS OF UTERUS; CHANGES UNDER MENSTRUATION; VAGINA; VULVA.

IT may seem superfluous to state that a clear knowledge of anatomy is the antecedent condition of a correct understanding of disease, diagnosis, and treatment. All sound medicine is based upon this proposition. But it is more strictly true of the diseases of women than it is of disease in general. For example, it is quite possible to imagine a satisfactory diagnosis to be made of a fever and to treat it successfully, without any precise knowledge of anatomy; but in the diagnosis and treatment of morbid conditions of the female pelvic organs it is hardly possible to move a step without precise knowledge of their anatomy and physiology; that is, without imminent risk of falling into error in practice.

It therefore becomes especially desirable to introduce the study of the medical and surgical diseases of women by an adequate description of the organs specially concerned. It might be thought to be sufficient to refer the reader for this to any one of the many admirable works on anatomy which we now possess; but this, it would quickly be found, would very imperfectly answer the purpose. Anatomical text-books teach *pure anatomy* only, certainly as far as the diseases of women are concerned. What we want is the *applied anatomy* of the sexual system.

Almost every physiological or pathological condition of the pelvic organs is attended by variations more or less marked either in their tissues, in their shape, size, or in their relative positions, and often in all. Hence the necessity of keeping constantly before us the normal standard by which we may estimate the abnormal deviations and understand how these are to be corrected.

The principal organs we are concerned with are all contained *within the true pelvis*. They are further inclosed or packed between the peritoneum above and the perineum below.

These organs are the ovaries, the Fallopian tubes, the uterus, the vagina, and vulva. The rectum and bladder, also contained within the

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same region, are indirectly important, in consequence of their physiological and pathological relations to the genital organs.

The pelvic organs are all related to each other by position, by connecting tissues, and by a system of bloodvessels common in their source, and intimate in their mutual play. The organs of the pelvis in their relative positions are displayed in section in Figs. 1 and 10, and from above in Fig. 2: 1 is diagrammatic, and Breisky's is taken from nature from a frozen body.

FIG. 1.
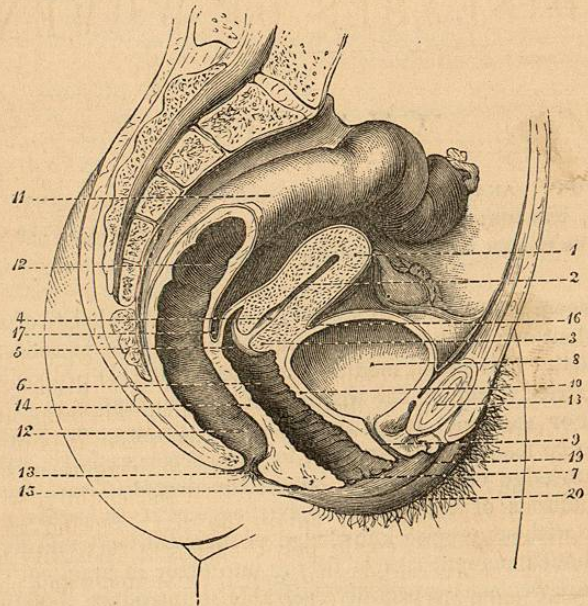


Showing the Pelvic Organs in Section—(after Sappey).

1, body of uterus ; 2, its cavity ; 3, the vaginal portion ; 4, canal of cervix ; 5, os uteri externum ; 6, the vagina ; 7, orifice of the vulva ; 8, interior of bladder ; 9, urethra ; 10, vesico-vaginal septum ; 11, rectum ; 12, its cavity ; 13, anus ; 14, recto-vaginal septum ; 15, perineum : 16, vesico-uterine sac of peritoneum ; 17, recto-vaginal, or Douglas's sac of peritoneum ; 18, os pubis ; 19, labium minor ; 20, labium majus.

The connective tissue being distributed everywhere at the points of union of the organs, carries the bloodvessels, nerves, and lymphatics to the organs.

In certain parts this connective tissue is limited by fasciæ.

In addition to these organs, we have to remember that the pelvis is traversed by bloodvessels and nerves, which are not strictly related to the genital organs, but which are liable to be implicated in various ways, as by pressure, during gestation and labor, by tumors, or displacement of the ovaries or uterus. These vessels and nerves lie in close contact with the walls of the pelvis, and have their exit at the sacro-sciatic notches, at the brim under Poupart's ligament and the obturator foramina.

Then there are muscles all cushioned by fat and cellular tissue.

The strictly genital organs consist of—1st, two glands, the *ovaries*, in which the ova are formed ; 2d, the *uterine tubes*, called Fallopian, which are true excretory ducts to the ovaries ; 3d, the *uterus*, a muscular organ in which the fecundated ovum is received and is developed, and

FIG. 2.
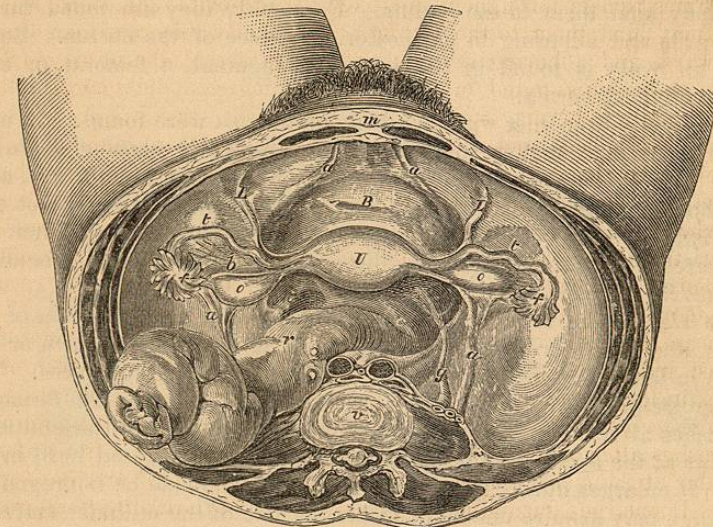


Transverse Section just above Pelvic Brim, showing the Relative Position of the Organs as seen from above—(after Savage).

*m*, pubes ; *a*, *a*, (in front) remains of hypogastric arteries ; *a*, *a*, (behind) spermatic vessels and nerves ; B, bladder ; L, L, round ligaments ; U, uterus seen by its fundus ; *t*, *t*, Fallopian tubes ; *o*, *o*, ovaries ; *r*, rectum ; *g*, right ureter resting on the psoas muscle ; *c*, utero-sacral ligaments forming the lateral borders of Douglas's pouch ; *v*, last lumbar vertebra.

which is the principal agent in the expulsion of the fœtus ; 4th, the *vagina*, a canal which connects the uterine cavity with the exterior, and serves in copulation ; 5th, the *vulva*, an assemblage of organs placed around the entrance of the genital organs. Associated with the genital organs are the *breasts*, whose function it is to secrete the milk, the first nourishment of the infant.

THE OVARIES.

1. The *ovaries* are so called from their containing small vesicles or ova. They are two ; they are placed in front of the rectum, from which they are often separated by convolutions of the small intestine, on either side of the uterus, behind the Fallopian tubes, and in that portion of the broad ligaments which is called the posterior wing or fold. They are maintained in position by the broad ligaments, which make for them a kind of mesentery, and by a special ligament, the *ligament of the ovary*. The situation, however, varies according to the age and the condition of the uterus. In the fœtus, they are placed in the lumbar region, like the fundus of the uterus. In mature women, the ovaries lie nearly on a level

with the fundus of the uterus. If enlarged or increased in weight, they tend to fall, and thus to drop into the Douglas's pouch behind the lower segment of the uterus. During pregnancy they rise in the abdomen with the body of the uterus, to the sides of which they are applied. Immediately after delivery, they occupy the internal iliac fossæ, where they sometimes remain throughout life, fixed by accidental adhesions, or adhesions may bind them to the rectum. Frequently they are found turned backwards and adhering to the posterior surface of the uterus. Sometimes an ovary is found in the sac of an inguinal, a femoral, or even of an umbilical hernia.

Cases have been met with in which no ovaries were found. It must be very rare that organs so essential are absolutely wanting *ab initio*. There is a preparation in University College Museum from a girl, aged 20, who had never menstruated. The uterus presents the features characteristic of early childhood, and no ovaries are manifest. When not discovered, the ovaries may have disappeared by atrophy, the result of some morbid process.

The *size* of the ovary varies according to age, the condition of the uterus, and health or disease. In the adult it measures an inch or two inches in length, an inch in breadth, and half an inch in thickness. The average *weight* is 87 grains. It is proportionally larger in the fœtus; it diminishes after birth, it enlarges considerably, becoming softer and more vascular at the epoch of puberty, and becomes atrophied and hard in old age. It enlarges during menstruation; and if an ovule be impregnated, the ovary may acquire double or treble the size of the ordinary state.

FIG. 3.
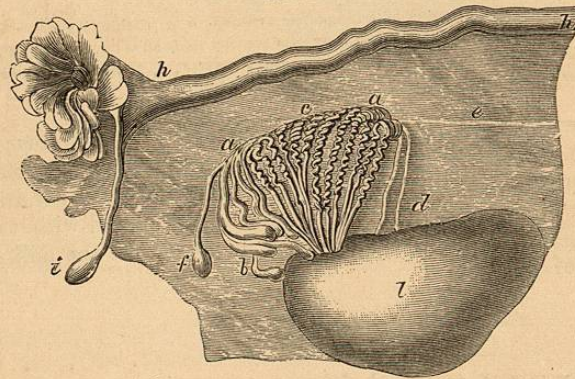


Adult Parovarium, Ovary, and Fallopian Tube—(after Kobelt).

*a, a*, tubules of the original Wolffian body or parovarium; *b*, remains of the upper set which occasionally become distended by collections of fluid, and constitute one form of dropsy of the broad ligament; *c*, middle set of tubules; *d*, lower set atrophied; *e*, atrophied remains of the excretory duct of Wolffian body; *f*, terminal bulb of the same, converted here into the hydatid often seen attached to the broad ligament; *h*, the former duct of Müller, now the Fallopian tube, with its infundibulum from which hangs *i*, the terminal bulb, now converted into a pedunculated hydatid; *l*, generative gland, now the ovary.

The *shape* is that of an ovoid, a little flattened from before backwards; the outer extremity, that looking towards the fimbriated end of the Fal-

lopian tube, is rounder and thicker than the inner extremity, which looks towards the uterus. The anterior surface, like that of the uterus, is flatter than the posterior, which is gibbous. The upper border is convex; the lower one is straight or concave. The color is whitish. The surface is smooth during childhood (as seen in Fig. 3); after puberty it becomes scarred by the repair of the rents made in the tissues to afford escape to the ova at the menstrual periods (as seen in Fig. 4); but in young women smooth interspaces may still be seen. The ovary is free in front,

FIG. 4.
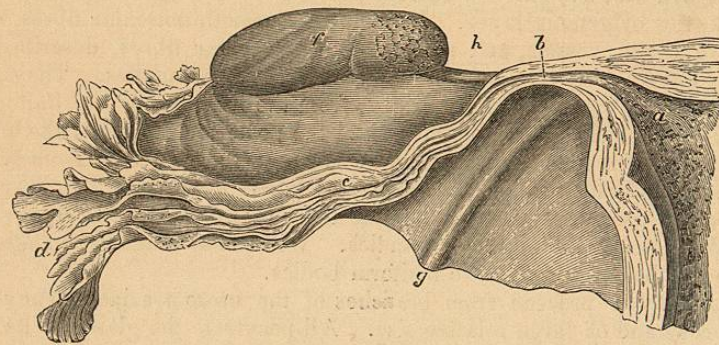


Right Fallopian Tube laid open. From an Adult who had not borne Children—(after Richard).

*a*, funnel-shaped canal, leading from the uterus to *b*, uterine portion of the tube; *c*, point at which the large plicæ commence; *d*, infundibulum covered by plicæ, continuous with those lining the canal; *e*, tubo-ovarian ligament and fringes; *f*, ovary; *g*, round ligament; *h*, ligament of the ovary.

above, and behind; it floats in the pelvic cavity, fastened, 1st, by its lower border to the broad ligament which is furnished with a peritoneal investment, and represents the hilum of the gland. Along this border bloodvessels penetrate and emerge; 2d, it is fastened by its outer extremity to the pavilion of the Fallopian tube (see Fig. 4); and 3d, by its inner extremity to the corresponding side of the uterus, a little below the superior angle of this organ, by a cord named the *ligament of the ovary* (see *h*, Fig. 4). This cord is fibrous and muscular, and is simply a prolongation of the proper tissue of the uterus.

The ovary is usually described as composed of an investment and parenchyma; the investing structure consisting of the *peritoneal* or *serous coat*, and of an inner fibrous coat called also the *tunica albuginea*. The two, however, are so intimately blended that it is impossible to separate them; nor is it easier to separate a fibrous coat from the parenchyma. Indeed, Sappey denies the existence of peritoneal coat and fibrous coat alike. The peritoneum is represented only by a simple layer of epithelium; and of tunica albuginea there is not even a vestige.[1] When the ovary is divided perpendicularly to its surface, it is seen to consist of two very different parts: 1st, a superficial part, white, of firm consistence, of homogeneous aspect; 2d, a central part, reddish, spongy, clearly formed of various elements. The superficial or peripheral part is the exclusive seat of the ovarian vesicles. The deep or central part is essentially made up

[1] Sappey, Anatomie Descriptive, 1874.

of vessels, muscular fibres, and laminar fibres. The first part Sappey calls the *glandular* or *ovigenous*, and the second the *vascular* or *bulbous* part. Direct observation and anatomical analysis establish very precisely the line of demarcation between them. The glandular portion is only 1 mm. thick, sometimes less. It assumes the aspect of a bark which covers both faces, both ends, and the free border of the ovary. It is this which, its nature and uses alike misunderstood, has been especially described under the names, proper tunic or fibrous tunic. The central portion forms nearly the whole mass of the organ.

We will first examine the *bulbous portion*. Upon this is spread, so to speak, the ovigenous layer. It comprises smooth muscular fibres, connective tissue, vessels, and nerves. The muscular fibres, described in 1858, by Rouget, very numerous, are disposed in bundles. They proceed from the ligament of the ovary, from the ligament of the Fallopian tube, the posterior round ligament, and the posterior winglet of the broad ligament. The fibres arising from these sources are directed from below upwards, radiating in all directions, and partly crossing. The fibres of connective tissue especially follow the track of the vessels, binding them together, and to the muscular bundles. With these fibres are mingled a large number of fibro-plastic fusiform bodies.

The *arteries* proceed from branches of the utero-ovarian. They are numerous and of large relative size. All penetrate the gland by its adherent border, and thence radiate towards the periphery. These arteries are extremely flexuous; most of them twine around a fictitious axis, describing a spiral, the turns of which approach so closely that, strongly compressed between two laminæ of glass, they still preserve the shape of a corkscrew. This spiral character is manifested in injected specimens even before the arteries enter the ovary. The arterial divisions in their course anastomose, and ultimately form a network, the meshes of which become smaller and smaller as they approach the surface of the gland.

The *veins* are remarkable alike for their number and their size. They therefore constitute a large proportion of the bulbous part. They begin, as all veins do, by radicles continuous with the capillaries. But they rapidly get larger, become knotty, as if varicose at points, and form by anastomoses a plexus with singular meshes. From this plexus emerge trunks which run parallel to the arterial divisions and terminate in the utero-ovarian vein.

The *lymphatic vessels* are also remarkable for their size. Their origin has not been made out. From the convergence of their radicles result six or eight trunks which run towards the hilum of the gland to join the lumbar ganglia. M. His points out that the lymphatics in the hilum are often filled with pus, the consequence of puerperal peritonitis, which is often complicated with ovaritis and inflammation of the lymphatic vessels.

The *nerves* come from the ovarian plexus which, passing beneath the adherent border of the ovary, gives up to it the greater number of its twigs. These penetrate with the arterial divisions into the interior of the organ.

M. His[1] is of opinion that the entire interstitial tissue of the ovaries is

[1] Beobachtungen über den Bau des Saugethiereierstocks. Max Schultze's Archiv f. mikrosp. Anat., 1865.

nothing but a peculiarly modified and confused mass of muscular tissue, and he proposes for it the name "fusiform mass." Rouget regards the arrangement by which these muscular fasciculi accompany the vessels in the form of sheaths, as analogous to that which obtains in erectile tissues. But Sappey points out this distinction, that erectile tissue is especially formed of big capillaries, very short and anastomosing, supported by muscular scaffolding, and into which the ultimate divisions of the arteries open; whilst in the ovaries it is not only simple capillaries that we see, but true veins exhibiting their usual arrangement. There are no dilated capillaries, no areolæ, no framework. And Waldeyer observed[1] that at present we cannot be said to possess any direct observations on the erection of the ovaries.

The uses of the bulbous portion are to support the ovarian vesicles and the ovules by offering them to the contact of the pavilion of the Fallopian tubes; and to supply the vesicles and ovules with the elements of nutrition.

The peripheral or cortical or *ovigenous* portion constitutes the essential part of the ovary, that in which the ovule is formed. It is the first part formed in the embryo. In it are distinguished the *ovisacs* or *Graafian vesicles*, destined to secrete and expel the ovum.

Immediately beneath the serous epithelium the stroma is found composed of bundles of connective tissue variously crossed; near the bulbous substance it presents the irradiations of the connective fibres of this part. What distinguishes the connective tissue is the enormous quantity of interstitial nuclei revealed by acetic acid, described by Rouget as fusiform fibro-plastic bodies. Between these two layers of connective tissue is a layer, the variable thickness of which mainly determines the differences in size which the ovary presents. It consists essentially of fusiform nucleated cells, strongly compressed against each other, and sometimes furnished with filiform prolongations, very short and penetrating into the interstices of the adjoining cells. The Graafian vesicles or follicles are scattered in the stroma of the cortical substance, chiefly in the most superficial layer. The limitation of the ovules to the peripheral portion is most marked in infancy. After puberty they are apt to invade the bulbous portion. Towards puberty the follicles are found close together. Their number is very great. To give an approximate idea, Henle makes the following calculation: In the ovary of a person eighteen years old an antero-posterior section, forming about a sixth of the periphery of the organ, showed 20 follicles; in the entire section there would be 120 follicles; and as it would be possible to divide the ovary into 300 sections, it follows that each ovary contained 300 times 120 or 36,000 follicles, or 72,000 for each woman.

Sappey makes a much higher estimate. The ovaries, he says, contain on an average 600,000 to 700,000 germs. Woman possesses already in the embryonic state all the ovisacs she is ever to have. The number remains what it was, subject to diminution by maturation, by atrophy, by the cicatricial process, by inflammations, and other influences.

A great number of *vessels* spread out in the ovigenous layer. They

[1] Stricker's Manual of Histology, N. Sydenham Soc. 1872.

form by anastomoses a very rich network. Most of the capillaries end at the periphery of the ovary forming arches and irregular loops. The minute arterioles which are lost in this capillary network preserve the spiroid direction which they had in the bulbous portion. Their last divisions are spread around the ovarian vesicles. The veins are remarkable for their size, and by the frequent swellings observed in their course. The lymphatics spring from the peripheral layer. Sappey says that it is not rare to find in the alar mesentery, especially round about the ovary, several cystic ovules, some of them the size of a pea. They may be regarded as stray ovules, which have failed to become incorporated in the ovary. They may possibly be the germs of some of the cystic tumors observed in the broad ligament.
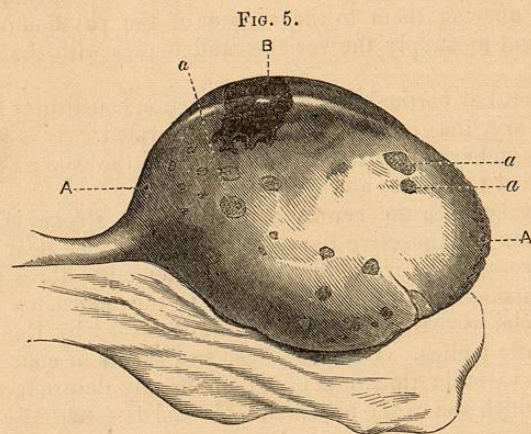
Fig. 5.



A, A, ovary enlarged under menstrual nisus; B, ripe follicle projecting on surface; *a, a, a*, traces of previously burst follicles—(after Raciborski).

The follicles, at first microscopic, rapidly grow after puberty when they are destined to mature. They form a hemispherical bulging on the surface of the ovary. This ripening appears to take place rapidly, since only a small number of follicles is usually made out by the naked eye; that is, in process of development; yet it is certain that every month one follicle, at least, arrives at complete maturation.

When ripe, the *follicle*, or *vesicle*, or *ovisac*, consists of an *investing membrane* and *contents*. 1. The investing membrane presents an outer or *fibrous tunic*, a middle or *proper tunic*, and an inner or *epithelial* or *granular layer*. The first is thick, very vascular, and very retractile; it is united to the stroma by a loose cellular tissue: hence it is easily isolated. It is formed of compact bundles of connective tissue arranged in concentric layers. The tunica propria is also composed of connective tissue; but this is in a more embryonic state, and contains a multitude of nuclei and fusiform cells. This tunic is also much less retractile than the fibrous tunic. The *epithelium* which lines the membrane of the follicle inside is composed of one or more layers of polygonal cells, inclosing a large nucleus and some fatty granules. The epithelium is much thicker at the part which surrounds the ovum. At the level of this part the

accumulated cells form a warty swelling, which bulges into the cavity of the follicle. This swelling is the *cumulus* or *discus proligerus*. The ovum is situated in the middle of the cells of the proligerous disk, part of which it carries along with it, when, after the dehiscence of the follicle, it leaves the ovary to enter the oviduct. The ovum is a spherical vesicle; it may be represented as a simple cell. The membrane of the cell is called the *vitelline membrane;* it is very thick, perfectly hyaline and transparent, resisting and very elastic. The contained matter is called the *vitellus;* this is a viscous liquid of yellowish color, in which are seen a multitude of granulations. A large vesicular nucleus, called the *germinal vesicle*, is situated excentrically in the vitellus, and itself contains a small *nucleolus*, the *germinal spot*. It is rare to find two ova in the same follicle.

The follicle contains a transparent, yellowish fluid, resembling serum; at first this is very small in quantity, but increases gradually as the follicle approaches maturation, until the tunics, swollen and thinned by this
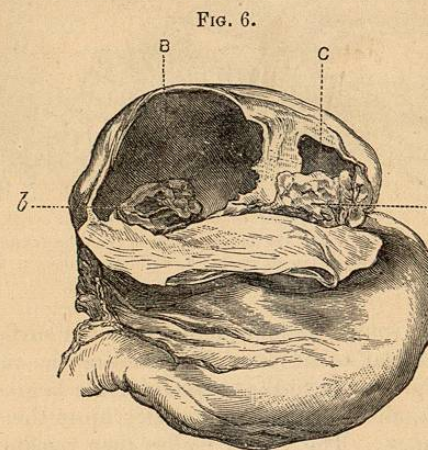
Fig. 6.



Showing Menstrual Corpus Luteum and Ovary—(after Raciborski).
B, cavity of Graafian sac from which ovum has escaped; *b*, clot of blood in sac.

accumulation of liquid, burst at the culminating point, and discharge their contents.

*Corpora Lutea.*—When the follicles have burst, and the ovum has escaped, a process takes place which results in the formation of the so-called yellow bodies. On the bursting of the follicle, its membranes collapse. The retraction is due entirely to the fibrous membrane; the internal membrane and the granular layer having no elasticity simply follow the movements of the fibrous tunic, and form folds, just as the mucous membrane of the stomach does under the influence of the contraction of the muscular coat. The cavity of the follicle is thus greatly contracted; a small quantity of blood, escaped from some ruptured vessels, is retained, but only as an exception, according to Coste, in the cavity, which is early invaded by a plastic and gelatinous secretion furnished by the inflamed part. Soon the cellular and granular layer, a

part of which has been expelled with the ovum, undergoes a kind of hypertrophy, which gives it an enormous size. Every cell becomes about six times as large as before; this growth is especially due to the accumulation, in the inside of the cells, of a multitude of yellow granules of albuminous nature, giving to the whole follicle the color which suggested the name of yellow body. Owing to this hypertrophy and to the folding of the inner membrane, the cavity of the follicle is at last completely closed. The circumvolutions of the inner membrane coming into contact grow together; and even after having obliterated the cavity they continue to grow, and thus, not finding room in the retracted external tunic, they often project as a hernia through the rent of the follicle, and are seen outside resembling luxuriant fleshy granulations. At this stage

FIG. 7.
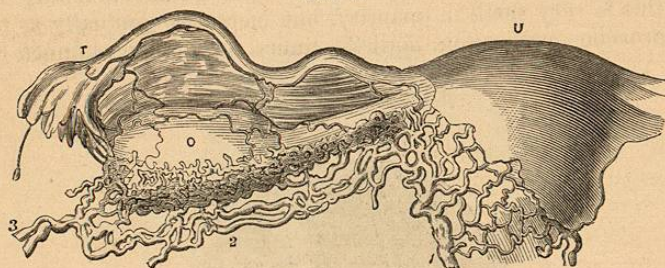


Bulb of Ovary—(after Savage).

The venous erectile system of the ovary, the anterior layer of the tubo-ovarian mesentery dissected off. U, uterus; o, ovary and utero-ovarian ligament; T, Fallopian tube. 1. Utero-ovarian vein; 2, Pampiniform venous plexus; 3, commencement of spermatic vein.

the burst follicle is a rounded tumor, bulging on the surface of the ovary, in size sometimes equal to or exceeding that of the rest of the organ. The process which gives rise to the *corpus luteum* begins soon after the escape of the ovule, and increases in activity up to the thirtieth or fortieth day of pregnancy. The yellow bodies then remain stationary until near the end of the third month, and from that date they begin to decline; the convolutions, united together by adhesions more or less intimate, atrophy and leave true fibrous bands; at the same time the yellow granulations are absorbed, the cells disappear, whilst the vessels retract and are atrophied. At the moment of labor the corpora lutea are large, but the process of absorption goes on after delivery, and ends by bringing about their complete disappearance. Then there remains on the surface of the ovary nothing but an irregular scar to mark the place of the rupture.

There are considerable differences in the evolution of the corpora lutea. The most remarkable is that which depends upon whether the discharge of the ovum has been followed by pregnancy or not. In the latter case the yellow bodies run through all their stages rapidly, and never reach a great development; these have been called *false corpora lutea*. They wither early; and, at the end of one or two months, only traces of them are found on the surface of the ovary.

*Development.*—The ovaries, like the testicles, are developed at the expense of a secondary blastema which forms upon the inner edge of the

Wolffian body. They are relatively larger in the fœtus than in the adult. This great proportional development is especially observed in the length; for, instead of being ovoid, they are thin and flattened. The surface is perfectly smooth and polished. Placed outside the cavity of the pelvis, in the lumbar region, it seems analogous in this respect to the testicle. But this appears to be due simply to the want of development of the pelvis, the bladder and uterus being also as yet seated in the abdomen. At this period the ligament of the ovary is so little developed that the inner extremity of the ovary touches the corresponding border of the uterus. The ovarian follicles exist already in the fœtus; and, at the moment of birth, they are seen in very compressed layers throughout the whole cortical substance of the ovary. They are composed of a small rounded mass of granular substance, surrounded by a simple layer of cells. The stroma divides them into groups, separated from each other by bundles of connective tissue, which send finer prolongations between the follicles of each group. An extremely fine membrane bounds the follicles externally. On the inner surface is a layer of epithelial cells, each of which contains an elongated nucleus. The contents of the follicles consist of a finely granular substance in which is distinguished a spherical transparent vesicle. The ovaries are extremely small after birth, and undergo no change until the epoch of puberty. This epoch is more precocious for the ovaries than for the other genital organs. In girls of thirteen and fourteen years old, whose internal genital organs, and the uterus itself, still showed all the characters of the fœtal state, the ovaries had already acquired their full development: they were ovoid, soft, spongy, and full of blood.

At the epoch of puberty very important changes take place in the ovary, the merit of pointing out which is due to Négrier,[1] Gendrin,[2] Girdwood, Pouchet, Letheby,[3] Bischoff,[4] and Raciborski. From the facts brought to light by these observers it results: 1st. That every menstrual period is accompanied in the ovary by a particular process, which appears to be limited to one Graafian follicle, which increases remarkably in size, raises and thins the fibrous investment of the ovary, and finally ruptures it. 2d. That this rupture of the Graafian follicle has for its object to permit the passage of the ovule of Baër into the Fallopian tube. 3d. That hence there takes place in woman, at every menstrual period, independently of any special cause, something analogous to the spontaneous oviposition of the Oviparæ. 4th. That the same phenomenon is effected in the females of the Mammalia at the time of heat. 5th. That the follicle of Graaf, immediately after its bursting, becomes the seat of a special process, which gives rise to the corpus luteum. 6th. That in consequence of the work of resorption in the corpus luteum, the follicle will be replaced by a slate-colored cicatrix, which penetrates more or less deeply into the substance of the ovary. 7th. Lastly, that the cicatrices or scars on the surface of the ovaries and the corpora lutea, are not the result of follicles

[1] Recherches anatomiques et physiologiques sur les ovaires de l'espèce humaine, etc. Paris, 1840.
[2] Traité philosophique de Médecine pratique. Paris, 1839.
[3] Philosophical Transactions. 1852.
[4] Zeitschrift für rationelle Medicin. 1853.

torn by the act of fecundation or of any erotic excitation, as Haller believed.

The ovaries maintain, throughout the period of menstrual life, the development acquired at the epoch of puberty. Throughout this period, also, we meet with Graafian follicles in progress to maturation, so that the question arises: Do the vesicles, found in such multitude in the fœtus,

FIG. 8.
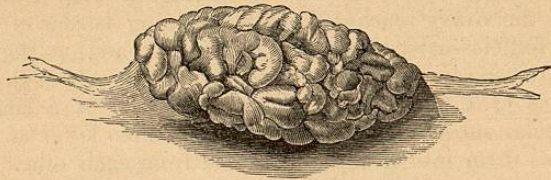


Showing Ovary in Old Age—(ad Nat.) (R. B.)

continue without change until the time when they are roused to complete development, that is, from the age of fifteen to fifty? or are these first vesicles destroyed at the end of a certain time, to be replaced by others of more recent formation? Another question, not less interesting, is whether a single vesicle arrives at maturity at each menstrual period, or whether several accomplish their full development at the same time?

These questions are not yet clearly solved. Sometimes several corpora lutea are found in the same ovary. If only a single vesicle were spent at each menstruation, it would take about 300 vesicles for the same number of menstruations, which, excluding the suspensions during pregnancy and suckling, take place during the reproductive period of life. Setting aside, therefore, the possibility of the new formation of vesicles, there exist in the ovary of the fœtus infinitely more vesicles than are wanted for all the purposes of reproduction. After the critical epoch the ovary is deprived of follicles. It shrinks, shrivels, and in old age loses its ovoid form, becomes flattened, atrophied, rough, knotted, and seems reduced to its shell (see Fig. 8).

Bischoff says that in every instance the full consequences of menstruation are not necessarily carried out, but that a follicle may swell and the ovum ripen without the bursting of the follicle or the escape of the ovum. Such a condition will cause sterility notwithstanding menstruation.

The ovaries, then, are the essential organs of generation. The destruction of one ovary by disease, or its loss by extirpation, does not entail sterility; but the destruction or loss of both condemns the woman to absolute sterility.

In connection with the history of the ovary, it is convenient to describe an organ immediately contiguous—*the organ or body of Rosenmüller.* This body is placed in the thickness of the broad ligament, between the outer extremity of the ovary and the last convolution of the Fallopian tube (see Fig. 3, p. 20). It is a small tubular organ to which Kobelt[1] gave the name of *parovarium.* It has been described with great care by M. Follin.[2] It is seen when the broad ligament is put on the stretch and

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[1] Der Nebenstock des Weibes. Heidelberg. 1847.
[2] Recherches sur les Corps de Wolff. Thèse inaug. Paris, 1850.

held up to the light; but is made out more clearly by removing the thin peritoneal lamina which covers it. It is situated in front of the ovarian vessels; it is of triangular shape, the summit directed towards the ovary. It is generally composed of fifteen to twenty small tubes, slightly flexuous, of unequal length, from 0.12 inch to 0.20 inch in diameter, and separated from each other by a variable space. In the adult woman this collection of tubes is attached to the outer half of the ovary; in the fœtus at term, it corresponds to the upper border of this gland. One tube, that which occupies the upper border of the body of Rosenmüller, is distinguished from the rest as performing the part of a common excretory duct. In its middle it lies transversely; its two ends bend downwards at right angles, and are directed towards the upper border of the ovary. The other tubes spring perpendicularly from the transverse portion of the marginal tube, and converge slightly towards the ovary. In this course they are flexuous, of unequal calibre, and sometimes the seat of cystic or hydatidiform enlargements. Their ovarian extremity ends in a cul-de-sac. The wall of these tubes is composed of an outer investment formed of annular fibres; and of an inner tunic, having longitudinal fibres, and lined in its interior with a layer of vibratile epithelium. As an appendage to the organ of Rosenmüller, we must mention a vesicle more or less pedunculated, situated at the outer extremity of the broad ligament, and often adhering to one of the fringes of the pavilion of the Fallopian tube. This is the analogue of the vesicle of Morgagni in man. M. Follin has searched the broad ligament in order to find something analogous to the duct of Gaertner which is seen in some animals; but, like de Blainville, he has seen nothing resembling that which has been described by A. C. Baudelocque, Gardien, and others. It appears to be established that the organ of Rosenmüller is the remains of the Wolffian body, a transitory organ which very probably fulfils the functions of the kidney before the development of this gland.

## THE FALLOPIAN TUBES.

The Fallopian or uterine tubes are truly *oviducts.* They are, in fact, the excretory ducts of the ovaries, differing, however, from all other excretory ducts in being entirely detached from their proper glands. They are situated in the thickness of the broad ligaments, and extend from the superior angles of the uterus to the sides of the cavity of the pelvis. Radiating from the same point spring two other structures—the round ligament in front, the ligament of the ovary behind. The Fallopian tube lies between at the highest margin of the broad ligament, occupying what has been called the upper or middle winglet of this structure; the round ligament occupies the anterior winglet, the ovarian ligament and ovary, the posterior winglet (see Figs. 2, 4, and 9). Floating in the pelvis between the ovaries which are behind, and the round ligaments which are in front, the tubes occupy the middle wing of the broad ligaments, of which they form the upper border; they run at first transversely outwards, and, just before terminating, bend downwards, backwards and inwards, to approach the outer end of the ovary, to which they are connected by a remarkable prolongation (see Fig. 4,