

He observed that they were often found at the same time in both organs, as in the specimen referred to of Dr. Ramsbotham. Dr. Baillie also was struck with the identity of structure, and observed that these tumors of the ovary ran the same course, and were liable to the same cartilaginous and bony transformations as the fibroids of the uterus.

In Guy's Museum is a specimen (No. 2246) consisting of uterus and ovaries. "The latter are converted into large tumors, each the size of a cocoa-nut, by the production of a fibro-plastic material. The stomach was affected in the same way by a growth which resembled that seen in the recurrent fibroid tumors." No. 2225 in the same museum shows both ovaries converted into solid tumors. The tumors are quite smooth externally, and the section exhibits a perfectly homogeneous appearance.

A specimen in St. George's Museum (No. XIV. 140) seems to offer the clearest features of a fibrous tumor of the ovary. It is represented in Fig. 73. It is described in the catalogue as "A fibrous tumor of the ovary from a woman aged 50, who died of disease of the heart. The uterus also contained a fibrous tumour in its walls." The position of the tumor in this case in the centre of the ovary excludes the objection urged against other cases, that its origin might be uterine.

Dr. Goodhart and Mr. Walsham each exhibited (*Pathological Transactions*, 1875 and 1876) a fibroma traced "unmistakably" to the true fibrous capsule of the ovary. A specimen at St. George's (XIV. 139) shows calcareous degeneration of an ovarian tumor presumed on this account to be fibro-muscular.

A specimen exhibited at the Obstetrical Society was examined by Dr. Wilson Fox, who described it as a "loculated fibroid; as having in the more central and transparent parts of the loculi a great number of non-striated muscular fibres."

In most of the presumed fibrous tumors the cystic cavities have been the most noticeable features. The cysts may be more or less obliterated by the hyperplastic condition of their walls. These overgrown partitions are made up of a fibrous vascular mass, not in any way distinguishable from that usually seen in cyst-walls. This kind of fibro-cystic tumor grows very rapidly, and has a strong hemorrhagic disposition, causing in some cases effusion of blood into the cyst-cavity.

It appears then to be highly probable that most of the apparent fibrous tumors of the ovary differ from undoubted cystic tumors, chiefly in the greater relative proportion of the fibrous walls, and the lesser development of the cyst. Scanzoni's larger specimen referred to above seems to confirm this view.

Dr. Wilks reporting on three tumors of the ovary exhibited to the Pathological Society¹ says "the specimens referred to afford examples of the various grades of disease which the ovaries may undergo. We may see in them the connection between a hard fibrous tumor and the simple cystic disease. We may have in the first place a multilocular cystic disease; then a similar disease with the addition of solid fibro-cellular growths between the sacs; thirdly, a disease made up of the same parts, but where the solid predominates; fourthly, a uniform fibrous tumor;

¹ Pathological Transactions, vol. ix.

and lastly, a hard dense fibrous growth resembling the analogous tumor in the uterus."

Dr. Bristowe and Mr. Hutchinson suggest that the absence of muscular fibres in ovarian tumors distinguishes them from the uterine tumors. But this test is fallacious. They admit that large fibrous tumors may grow from the ovary.

B. Enchondromatous Tumors.—Kiwisch says he has observed two examples of this tumor. In one, cartilaginous concretions surrounded the ovary in the form of numerous scales or rounded protuberances. In the other case the right ovary was transformed into a tumor the size of the fist, surrounded with false membranes of which the external layers inclosed cartilaginous nodules, coarse and hard, whilst the interior resembled a cartilaginous mass, hyaline and of less density.

Diagnosis.—During life it will be difficult to arrive at more than a conjectural diagnosis of the nature of solid ovarian tumors, or even to distinguish them from some fibroids of the uterus. Mobility or fixity is the important clinical point.

Treatment.—We may be called upon to interfere, in the event of tumors getting locked in the pelvis and obstructing the bowel or bladder. The first indication would be to dislodge them from the pelvis, by pushing from below either by rectum or vagina. Extirpation might have to be discussed if dislodgment failed. In this case operating by gastrotomy will be generally preferable to attempt at removal by vagina or rectum.

CHAPTER XII.

OVARIAN CYSTIC TUMORS: THEIR NATURE—SIMPLE; MULTIPLE, PROLIFEROUS; CYSTO-SARCOMATOUS; TUBO-OVARIAN; DERMOID CYSTS.

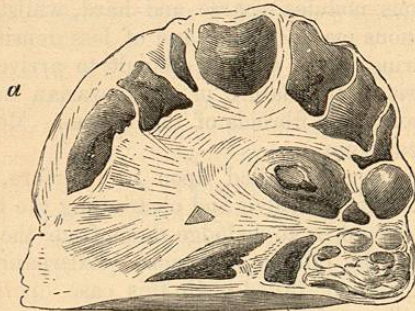
WE have already observed that tumors of the ovary may, for clinical purposes, be divided roughly into solid and cystic. The solid tumors have been described in the preceding chapter. The cystic are the most common, and practically the most important.

Ovarian cysts are distinguished by Paget as *A. Simple or barren*, containing fluid or unorganized matter: and *B. Compound or proliferous*, containing variously organized matters. They may further be usefully distinguished as *Malignant or benign*. All these tumors, on account of their glandular origin, are grouped together as *adenoid*. In association with ovarian cysts proper it is convenient, and even necessary, to

study certain *extra-ovarian or pseudo-ovarian cysts*. For example, there are cysts which are developed in the broad ligaments, or which are formed in structures so close to the ovaries that they closely simulate ovarian cysts in the living, and are not always easily distinguished by dissection in the dead.

A. Simple ovarian cysts. The most simple idea of an ovarian cystic formation is derived from the observation of certain specimens of distension or enlargement of Graafian sacs in the early stage. By examining, for example, such a specimen as that represented in Fig. 74, which re-

FIG. 74.



Section of Ovary. Early Stage of Cystic Disease (R. B.).
(Nat. size.) St. Bartholomew's Museum.

presents a section of an ovary in St. Bartholomew's Museum, one cannot help being struck with the appearance of the cysts arranged in a row close to the free border of the ovary, just as the Graafian sacs are disposed in the normal ovary. Fig. 75, from a specimen in Middlesex Museum, illustrates the same points. These are, in fact, morbidly dilated Graafian sacs. In different specimens we may see similar appearances, the cysts being larger and larger, until their distinct existence is lost by the septa between them being absorbed by pressure and atrophy.

That such is the real history and nature of the ordinary simple ovarian cyst is proved by the following observations. 1. The structure of its walls is identical with that of the Graafian sac.

2. Rokitansky¹ has found ova in cysts of this kind; and this very interesting, if not crucial fact, was verified by the late Dr. Ritchie in 1864. Dr. Woodham Webb confirmed Ritchie's report.

Dr. Ritchie² further says: "Since August, 1864, I have succeeded in finding ova in a large number of ovarian cysts. Some of the ova were perfect, with a sharply-defined zona pellucida, a germinal vesicle, and a germinal spot; others were more or less imperfect, many having the appearances mentioned by Rokitansky. I have never found an ovum in a loculus larger than a cherry, and never in a loculus which contained jelly-like contents."

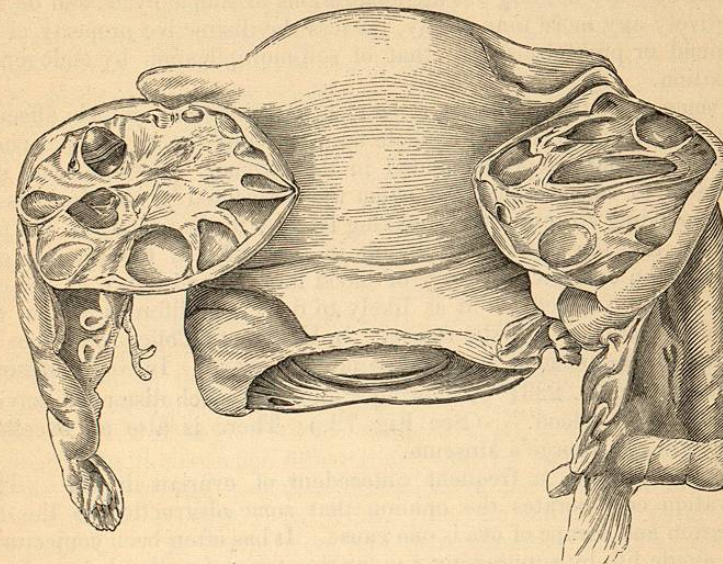
There is an excellent "Hunterian" preparation in the College of Sur-

¹ *Wochenblatt d. Zeitschrift d. kk. Gesellschaft d. Aerzte zu Wien*, 1855.

² *Ovarian Physiology and Pathology*, 1865.

geons (No. 2616), showing incipient ovarian cystic disease. It is "an enlarged ovary, in the anterior of which are numerous small oval, smooth-walled cysts, with distinct thin walls, all probably enlarged Graafian vesicles."

FIG. 75.



Showing Incipient Cystic Enlargement of the Graafian Follicles in both Ovaries.
Middlesex Museum (R. B.).

3. Cystic disease of the ovary rarely begins except during the period of normal ovarian activity. Cysts have indeed been found in young girls, even under ten; but menstruation sometimes is premature; and some cysts springing from the broad ligaments may have been erroneously regarded as ovarian.

4. Cysts are more frequent in the ovaries than in any other organ; and in many respects they differ from the cysts seen elsewhere. The small cysts sometimes seen on the peritoneal investment of the ovary and of the uterus are different in nature from the true ovarian cyst.

Although it is frequently the case that several, if not many Graafian sacs are affected together, this is not always so. Even in cases where one or more sacs have become so large as to have called for removal by abdominal section, menstruation has continued, and portions of healthy ovary have been found.

Frequently the degeneration of the follicles is symmetrical, both ovaries being affected in a similar manner as in Fig. 75.

Up to a certain point several follicles may enlarge with tolerable uniformity, as in Figs. 74 and 75. But after a while, one generally takes precedence of the rest, and growing more rapidly compresses them, so that they either remain small, or their walls becoming atrophied and thinned, the cysts hitherto distinct are fused into one. By a kind of

natural selection one obtains predominance, absorbing the others, or destroying them. Sometimes portions of the minor cysts remain in the form of projecting processes, constituting chambers or loculi, communicating with the large cyst. In this way what are called *multiple cysts* are formed. They are really simple in their nature. Although multiple in number, they are nothing but agglomerations of simple cysts, and do not, collectively any more than singly, possess the distinctive property of the compound or proliferous cyst, that of self-multiplication by endogenous gemmation.

In some cases there appears to be one, or chiefly one, follicle affected, and when this happens this follicle may be found not at the periphery of the ovary, but deeply imbedded in the stroma. In these cases it is reasonable to surmise that the ovum was prevented by the thickness of the surrounding structure from making its way to the surface at the proper time; that the effort would result in distension of the sac, the outpouring of an excessive quantity of blood into it; and hence, if the epithelial lining retained, as it is likely to do, its proliferous virtue, the gradual formation of a cystic tumor. In University College Museum (T₄^B) is a good specimen of hemorrhage into the ovary. In Guy's Museum is a specimen (No. 2231²⁰), showing "an ovary much distended, having been filled with blood." (See Fig. 72.) There is also an excellent specimen in St. George's Museum.

Dysmenorrhœa is a frequent antecedent of ovarian dropsy. This observation corroborates the opinion that some obstruction to the due maturation and escape of ova is one cause. It has often been conjectured that a single life by suppressing one ovario-uterine function led to abnormal action of the formative-force. Out of Spencer Wells's 500 cases 221 were unmarried, and 18 were widows. On the other hand, the complication of ovarian dropsy with pregnancy is not very uncommon.

What is the beginning of this transformation of the Graafian follicles? The formative-force is peculiarly active in the ovary. If interrupted or hindered in its ordinary progress, it may be supposed that, still persisting, it will reveal itself in abnormal results. In University College Museum (No. 866) is an interesting specimen, which may serve to illustrate the effect of obstruction to the healthy course of menstruation. It exhibits cysts in the ovaries and tubes, and a fibroid tumor of the uterus inside which probably obstructed the uterine openings of the tubes. Rigby says he traced in one case an ovarian dropsy from its beginning in oophoritis. Scanzoni says there is no doubt that dropsy of the Graafian follicles is sometimes caused in this way; the menstrual congestions in the ovaries do not attain sufficient intensity to effect the bursting of the follicular wall, and the result is that an increase of secretion and its accumulation in the cavity thus takes place. The follicular wall is thus gradually hypertrophied, and by the formation of new vessels causes a permanently increased secretion. The comparatively great frequency of these follicular dropsies in women who have long suffered from chlorosis or other diseases, combined with amenorrhœa, speak in favor of this view.

B. The principal varieties of the *complex or proliferous ovarian cysts* have been described, as Paget truly says, "to the very life," by Dr.

Hodgkin, to whom we are indebted for the first knowledge of their true pathology. Hodgkin divides them into two principal or extreme forms of endogenous cysts; namely, those which are broad-based and spheroidal, imitating more or less the characters of the parent cyst, and those that are pedunculated, clustered, and thin-walled. Between these forms many transitional and mixed forms may be found. A typical example of the first is in the Museum of the College of Surgeons (figured p. 417 of Paget's work). It is a large cyst, with tough, compact, and laminated walls, polished on both their surfaces. On its inner surface there project, with broad bases, many smaller cysts, of various sizes and variously grouped and accumulated. These nearly fill the cavity of the parent cyst; many of them are globular; many deviate from the globular form through mutual compression; and within many of them are similar but more thickly-walled cysts of a third order.

Respecting the mode of generation of the endogenous cysts, they appear to be derived from cell-germs, developed in the parent cyst-walls, and thence, as they grow into secondary cysts, projecting into the parent cavity; or disparting the midlayers of the walls, and remaining quite inclosed between them; or more rarely growing outwards, and projecting into the cavity of the peritoneum.

Dr. Wilson Fox¹ says, "All the forms of cysts met with in the ovary originate from the Graafian follicles, and that the multilocular forms are not the result of any special degenerations of the stroma of the ovary, but are due to secondary formations from the interior of parent cysts thus formed." He divides them into three classes. The first and most frequent manner in which secondary cysts are formed is the result of the production of a series of glandular structures, presenting a tubular type, on the inner wall of the parent cyst. Dr. Fox describes the mode of formation of these glands as differing from those of other glands, which for the most part originate in the embryo as diverticula from surfaces. The process in this case commences with a stratification of the epithelium, into which project papillæ formed of the stroma of the wall of the parent-cyst, each papilla carrying a delicate vascular loop.

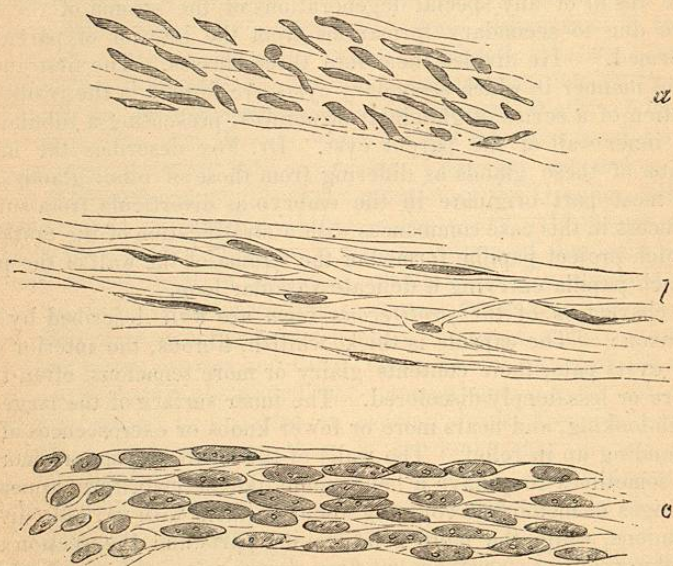
The characters of the *proliferous form* are well described by Wilks and Moxon: "The capsule is thick, whitish, fibrous, the interior of the greater cysts pale, their contents glairy or more tenacious, often turbid, and more or less deeply-discolored. The inner surface of the large cysts is softish-looking, and bears more or fewer knobs or excrescences of some form standing up in relief. The walls of the smaller cysts are more vascular; sometimes they have a honeycomb-like or cribriform appearance from fringes of membrane coursing about on them with variable divisions and reunions, while the more solid-looking parts and the section of the solid-looking excrescences are, at first glance, not unlike cancer, being pink, creamy, and vascular.

"The appearances under the microscope differ according to the part chosen. The wall of a large cyst is fibrous, generally laminated, the inner part more delicate and areolar, with vessels visible in it; the lining

¹ Medico-Chirurgical Transactions, 1864.

covered with epithelial cells, generally cylindrical; these are easily removed. The same cylindrical epithelial cells, perhaps generally ciliated, usually much defaced, float in the mucous fluid; but pus or blood may be present. If you take the wall of a smaller cyst it shows signs of greater activity, and is more full of vessels and the epithelium more regular. But the most striking characters of this kind of cysts are seen in the formation of bud-like processes within the cysts; they are best brought to view in the most solid-looking parts, and especially within the larger or smaller excrescences on the walls of the principal cysts. These microscopical bud-like knobs grow out and branch, uniting with each other, forming arches, or they extend across the cavity they are in, and thus spaces are inclosed which, in section at least, look very like mucous follicles; and they are lined with the cylinder epithelium, which usually everywhere clothes the buds. The buds have vessels in them; they branch and branch until they no longer are clothed with a distinct epithelium, but the twigs confuse each other, and the cells are massed together like those of cancer. This we have seen in parts of a tumor where other parts showed the usual bud, and in this case there were metastatic formations in the liver, thus showing that this form of tumor, when very vivid and rank in its growth, will prove malignant like any other."

FIG. 76.



x 220.

Fibrous Stroma of Compound Cystic Tumor of Ovary (by H. Arnott).

The histology of these tumors is well illustrated in Figs. 76 and 77, for which I am indebted to Mr. Henry Arnott. Fig. 76 represents three thin sections from the solid stromal portions of a multilocular cystic tumor, removed by Mr. Croft, in November, 1872. The specimens were fresh

and stained with carmine. All show varieties of developing fibrous tissue.

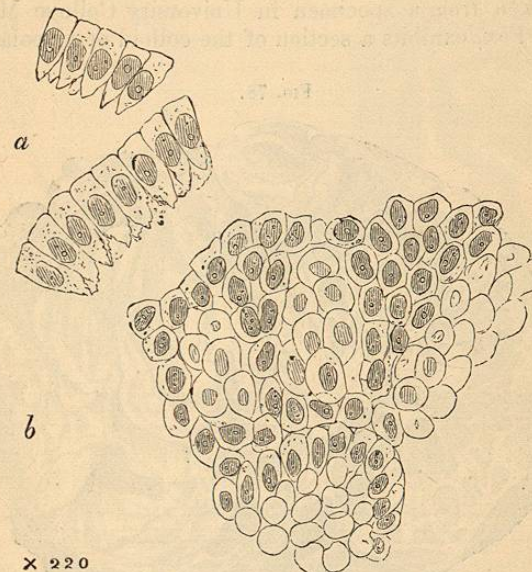
Fig. 76 *a*. Dense connective tissue, studded with irregular rod-shaped nuclei; the outlines of the cells not discernible.

b. Delicate connective-tissue, with slender cells at rare intervals.

c. Rapidly-growing connective tissue, rich in nuclei, plump and oval, which can be seen, here and there, to be contained in large spindle-cells.

Fig. 77 shows epithelium from the inside of the same compound cystic tumor.

FIG. 77.



x 220

Epithelial Lining of a Compound Ovarian Cyst (H. Arnott).

a. Detached flakes of columnar epithelium, viewed sideways.

b. Part of a large surface of epithelium, lining a small cyst; showing the polygonal aspect of the columnar cells as seen from above, and showing, besides, dilatation of the wall, in which the cells appear swollen and partly out of focus, rendering their nuclei less distinct.

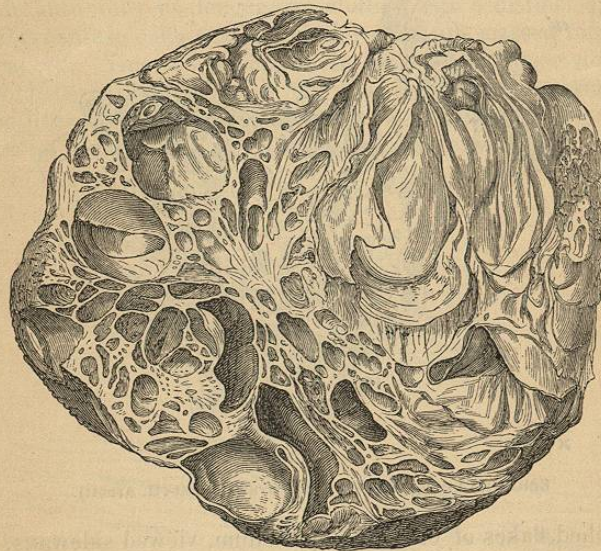
Cysto-sarcoma of the ovary.—Müller applied this name to those tumors in which the fibrous intercystic substance equals or exceeds in quantity the contained fluid. Brodie called them sero-cystic sarcomata. However, all degrees may be observed in different tumors, and we cannot therefore venture to separate abruptly ovarian cystic tumors into different classes. Good typical examples of all of them—*a*, the simple; *b*, the simple but multiple cyst; *c*, the proliferous or compound cyst; *d*, the proliferous or compound cyst, with colloid contents; *e*, the proliferous, with large sarcomatous formation—may frequently be met with; but in a large majority of instances, ovarian tumors share the characters of two or more of these varieties. The more active the proliferous tendency, the further the departure from simplicity of organization, the more nearly

does that tumor approach in its relations to malignancy. Whether, however, any form of ovarian tumor, excepting the fungoid (medullary) is truly cancerous in its tendencies, is a matter of much doubt; and practically all must be treated as if it were proved that they are not so, unless they are solid.

Alveolar or colloid tumor of the ovary is a not infrequent form of the compound cyst. It contains very numerous loculi, which are filled with a semi-solid tenacious substance resembling gum. It, however, often complicates tumors in which many cysts contain fluid, and which resemble those of the common compound form.

Fig. 78, taken from a specimen in University College Museum, prepared by Dr. Fox, exhibits a section of the colloid or alveolar tumor.

FIG. 78.



Section of an Ovarian Tumor showing the Alveolar Structure (R. B.).
Univ. Coll. Mus., No. 5054 (from nat. half-size).

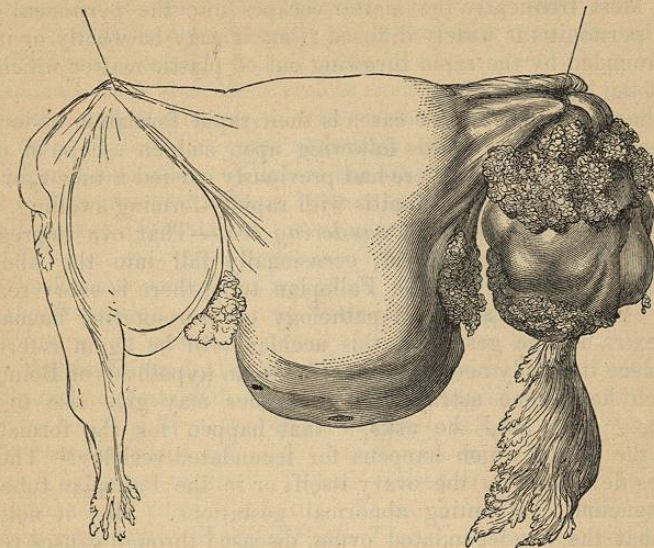
Fig. 79, also from a preparation in University College Museum, exhibits a form of proliferous cyst. Both ovaries are affected. In one the cyst is perforated by a dendritic proliferation. By eccentric pressure, the result of endogenous growth, the capsule of the ovary has given way, so that the dendritic processes project on the surface.

Tubo-ovarian Cysts.—Adolph Richard¹ first described a form of cyst, into the composition of which both the Fallopian tube and the ovary entered. He detailed five observations, and cited analogous cases from Morgagni, Frank, Chambon, Boivin and Dugès, Kiwisch, and others. He demonstrated that ovarian cysts may open into the uterus by the tubes; that after having received the fluid of the cyst, the tube continues to

¹ Mémoires de la Société de Chirurgie, 1856.

undergo a pathological action, by which its calibre increases, its length being doubled, its walls thickened, the folds of its mucous membrane

FIG. 79.



Both Ovaries affected with Proliferating (Malignant?) or Papillary Disease. Dendritic Processes perforating the Investing Structures (R. B.).
Univ. Coll. Mus. (from nat. two-thirds size).

smoothed out; that lastly, the dilatation extending gradually to the internal part of the oviduct, the communication between the canal of the dilated tube and the cyst remains, and there is thus made up a cavity or cyst compounded of dilated tube and the ovarian cyst.

My former colleague at the Western General Dispensary, Mr. Anderson, described a clear case of tubo-ovarian cyst. A woman who was waiting to be tapped began to pass an excessive quantity of urine, and her distress subsided. The fluid passed was albumenized serum, with cholesterine plates. After six months the woman died from a sudden outburst of hæmoptysis. A large empty cyst was found lying, collapsed and loose, in the belly; it had thick walls, and included some lesser cysts. A good-sized staff passed with the greatest facility from the cyst along one of the Fallopian tubes into the uterus and vagina. The supposed urine did not come from the bladder, but was cystic fluid which escaped by the tube, uterus, and vagina.

We may conclude, then, that tubo-ovarian cysts may be formed: 1. By the establishment of a communication between an ovarian cyst and the Fallopian tube, the outer end of which dilates to form one cavity with the opened ovarian cyst; 2. By the bursting of a Graafian follicle, diseased or healthy, under circumstances which provoke peritonitis and the formation of adhesions uniting the fimbriated extremity of the tube to the ovary, the communication with the Graafian sac being maintained or