ART. XV.—*Examples of Cystic Disease; with some further Observations on Cancer.* By MAURICE H. COLLIS, M.B., F.R.C.S., Surgeon to the Meath Hospital; Member of Council, Royal College of Surgeons; &c. &c.

1. CYSTIC DISEASE OF BREAST, WITH ENDOGENOUS GROWTH IN THE INTERIOR OF THE CYSTS, SHOWING THE MODE OF ORIGIN OF THE CHRONIC MAMMARY OR ADENOID TUMOUR.
2. CYSTIC DISEASE OF THE BREAST, COMPLICATED WITH CANCER.
3. SINGLE ENCYSTED HEMORRHAGIC OR FIBRINOUS TUMOUR IN THE POPLITEAL SPACE.
4. MULTIPLE ENCYSTED FIBRINOUS DEPOSITS IN THE TESTIS.

THESE cases are given as types of diseases, and it is not to be inferred that the accompanying observations are founded solely upon them. The deductions arrived at are the result of some study of the subject; and it would be both tedious and unprofitable, even were it possible, to enumerate all the steps by which I have been led to form them, or the entire data on which they rest.

CASE I.—*Cystic Disease of Breast, with Endogenous Growth in the interior of the Cysts, &c.*

Mrs. S., a healthy lady, about forty-five years of age, the mother of several healthy sons and daughters, consulted me, two years ago, about a tumour in her breast, which had begun to give her some uneasiness. The account which she gave me was to the following effect:—Many years before (at the least, fourteen), while stooping to caress a pet lamb, she received a blow in her breast from the animal's head. This caused her some temporary pain; and a small, movable tumour was soon after perceived in the part. After several years, she suffered another injury in the breast, upon which the tumour increased in size; however, as the pain resulting from the injury did not continue, she did not consider the temporary uneasiness sufficient to render surgical interference necessary. Three or four months before she consulted me, she sustained a third injury in the breast. From this out she suffered constant uneasiness, and almost continual pain in the part. The tumour now rapidly increased, projecting the skin forward, and rendering it livid over the most prominent point. The superficial veins, also, became enlarged and tortuous. To the eye it had much of the appearance of an encephaloid tumour. Upon handling it, fluctuation became evident; and although there was a basis of solid matter, the bulk of the tumour was plainly of a cystic

nature. The solid portion lay deep, and, as well as we could make out, was hard and firm; we could trace no adhesions, and there were no large glands in the arm-pit or about the collar-bone. As it was a source of much uneasiness, both of mind and body, and as the cystic growth was rapidly increasing, and, moreover, as there was a solid and probably not a cancerous basis to the growth, I resolved to remove it: the entire breast was condemned, because of its small size, and the probability of the cysts permeating it in all directions.

I need not weary the patience of the readers of this journal by a minute detail of the operation or subsequent treatment. Suffice it to say, I secured a clean and bloodless surface by a little extra care in tying or twisting all bleeding points; and I brought the edges together with a number of wire sutures: the wound healed with rapidity, and the patient was out of my hands within a fortnight. I have frequently seen her since, and her health continues excellent, and her spirits are much improved by having lost what had long been a source of anxiety to her. No return of the disease is to be expected in this case.

A dissection of the breast showed multitudes of small cysts, the size of pin's heads or small peas, a few as large as hazel nuts, one the size of a hen's egg, and two of somewhat smaller dimensions; some contained a sero-sanguineous fluid; some were filled with solid matter. A careful study of several gave the following interesting results, which illustrate the progress from cystic to adenoid tumour:—First, in the largest cyst I found a solid growth, projecting towards the centre, and attached by a pedicle to the lining membrane of the cyst; then, in another cyst a similar mass was found, completely filling up its cavity; while in a third, which was similarly filled up, the pressure of this endogenous growth had produced an atheromatous degeneration of the walls; the fragmentary remains of other cysts could be made out round some other of these endogenous growths. The minute structure of these substances was exceedingly elementary; there was a certain amount of common fibrous stroma binding together a mass of simple fibrine cells, which deviated in no apparent manner from the undeveloped cells of plastic lymph. They were arranged in acini, attached to a pedicle, like minute cauliflower growths, but of a firm consistence, and devoid of the creamy juice which permeates all cancers. The mode of increase was evidently like that of a tree, not only increasing by interstitial deposit, but by additional branches. The resemblance to the genuine structure of the mammary gland was confined to the mode of arrangement. There were no ducts, no cavities in the lobules, and, of course, no epithelial lining. The substance was identical with that of

Sir Astley Cooper's chronic mammary tumour, or Velpeau's adenoid tumour. It was evident that the cystic growth was in process of being superseded by the fibrinous, and that a time might have come when all trace of cysts would have disappeared; we had first the cyst pure and simple; then, the endogenous growth, filling the cyst more or less; and, lastly, the cyst disappearing under the pressure of the new growth. The cyst perished by the ordinary oily degeneration; there was nothing special in it, different from the mode in which effete material is removed from the economy under common circumstances; only there was no reproduction, just as in all fatty degeneration. The new material neither infiltrated nor inflamed the tissues on which it pressed.

Indeed, with the exception of cancer, I know of no morbid growth which acts as a foreign body when living; and further investigation may, perhaps, show us that cancer does not so act until the cancer-cell has lost its vitality. In the present case, there is no doubt about the matter. The cell-growth filled up the cyst, and still continued to grow, while the cyst, unable to expand, became compressed, lost its vitality, became oily, and was finally absorbed, or burned up, and removed. This is probably the history of most, if not all, chronic mammary growths, as has been ably stated by Mr. Paget and others. My reasons for recording the case are not so much to confirm these views, as to contrast and compare it with the remaining cases on my list, which are types of other forms of cystic growths.

The second case, cancer with cysts, has been already alluded to in this Journal, vol. xxv, p. 335. I shall briefly reproduce it. A lady, aged 38, mother of one child, very large and stout, complained to me of a small swelling in the upper part of the left breast; it was movable under the skin, and attached to the gland, but standing up from it; it was hard and nodulated, the seat of lancinating pains of much severity, and it had enlarged veins over its surface; it was far from the nipple, which was not retracted; it increased very slowly, the lady had been in bad health, with fatty heart, and occasional congestion of lungs. Consequently, I temporized, giving iron, arsenic, and iodine, and at first using discutient lotions, then doing nothing locally, as I found that interference increased both general and local uneasiness. Gradually, I observed the breast to swell, until it became raised to the level of the original tumour, which was almost lost in the new development. The surface of the breast felt granulated, as if shot were scattered

under the skin. Bloody serum oozed from the nipple, almost from the first. With all this (which took nine months to occur), the lady's health became considerably improved; and as I could not assure her that she had no cancer, although the bulk of the tumour was cystic, I was urged to remove the breast. This was done three years ago (Oct., 1857), and as yet there is no reason to apprehend a return of the disease. The growth, which first showed at the top of the breast, was composed of the tough, fibrous tissue of the breast, inflamed and condensed by the presence of large, oily, cancer-cells, stained with melanotic pigment. The remainder of the breast was studded with small cysts of simple form; many of them communicated with the ducts of the gland; they were filled with sero-sanguineous fluid; and some of them contained minute secondary cysts, with slightly-scolloped edges, attached by a pedicle to the lining membrane. These secondary cysts were full of a similar fluid. In no instance was there any endogenous growth of a solid nature: I searched for it with care. Nor were there any cysts in the cancerous portion of the gland, owing, no doubt, to its great density. Hence, I was driven to conclude that the two diseases, though coincident in the same breast, were, in reality, independent in origin and progress,—the cyst originating in inflammatory action on the ducts of the gland, and the cancer having its seat in the interstices of its fibrous stroma. It would have been most interesting to have found the two together in the same section of the breast, and to have observed whether the cancerous substance would have appeared as an endogenous growth springing from the cell-wall, and destroying it, as the more simple fibrinous growth seemed to do in the former case. But, however interesting this might have been in a scientific point of view, it was infinitely more satisfactory to have removed it while the cancer was in a quiescent state.

CASE III.—*Hemorrhagic Fibrinous Tumour in the Ham*.—One of great interest to me. It was that of a labourer, who received a blow from a spade-handle in the thigh, close to the vessels as they pass into the popliteal space. A small, soft tumour quickly appeared, which gradually increased in size and solidity, and remained of an oval outline; when it came under my observation, several years after the injury, it had grown to a large size; it filled the popliteal space, and projected considerably on its inner margin; it was firm, heavy, rolling loosely in the somewhat loose areolar tissue of the ham, painless, but very troublesome from its weight and interference with the motion of the limb. No glands were enlarged in the groin,

nor was the current of blood interfered with in the veins; there was neither œdema nor varicosity. Had it been in the testis I might have concealed my ignorance of its nature under the name of sarcocele; but, situated in the ham, it was termed a tumour of plastic material, certainly not a cancer, and nothing more. I removed it, but with some difficulty, as often happens with glandular tumours of apparently loose connections. The man got well, left hospital, and went to a distant part of the country, where I heard, in a few months, that he was suffering from an enormous semi-fluid tumour in the ham. He subsequently died of pain, and exhaustion from profuse discharge; but the particulars of his relapse I have never been able to learn with accuracy, as he was not seen by any medical man, and I only heard of him through a third party. The section of the tumour was most singular; I had never seen a similar at the time, and I have only seen one since perfectly alike. The centre was occupied by a black semi-fluid coagulum; outside this was a layer of soft, dark-coloured lymph, the result of a previous clot in process of organization; outside this again was another, and another layer, less and less dark, and more thin and firm; until the outermost of all, which was a dense, firm, fibrous envelope, closely adherent to the layer which lay next beneath it, and endowed with vessels as abundantly as any natural fibro-areolar tissue of similar density. It was strikingly like the section of a cured aneurism to the eye, so much so, that I at once named it, "The hemorrhagic fibrous tumour." It was similar in its central cavity, filled with fluid blood, and in its concentric laminæ of variously organized lymph; it differed from it only in its origin from a clot of blood; in its growth, by internal hemorrhages, as well as by interstitial deposit, and in the layers of lymph being more firm, and less brittle. I could not trace any special connexion with vein or artery, such as would have accounted for the hemorrhage; and its cystic envelope must be looked upon rather as an accidental development of the most external layer, than as the original source of the hemorrhage. The disease commenced, evidently, as an effusion of blood from injury; the clot, instead of being absorbed, became organized; and, once organized, it came under the action of that mysterious law by which tumours grow—the law of independent vitality, by which they grow out of proportion to neighbouring parts, and often at their expense—a law which is but another expression of the fact, that like breeds like,—a law in virtue of which cell-growths, whether normal or abnormal, reproduce their own kind, and which in the present case, from a simply organized clot of

blood, produced a tumour, which grew by successive hemorrhages. I have since seen a perfectly similar tumour to the above. The situation of it was the testis; and the tumour had acquired an enormous size, completely destroying all vestiges of the proper structure of the organ, the fibrous tissues of which could be distinguished, pushed to one side, and compressed. The section of the tumour was similar to that described above, and the history was also much the same; there was super-added some infiltration of the supra-pubic areolar tissue, and of the inguinal glands. In this case the disease had been set down, by some, as schirrus, which its size alone ought to have disproved, the schirrous testis being a small tumour; while others, who looked carelessly at the resemblance of the fresh section to brain-matter, gave it the title of encephaloid, which its great chronicity equally disproved. Having seen the former case, I was able to name it; and, as there was difference of opinion, which gave rise to remarks disparaging the value of microscopic examinations, I sent a portion to Mr. Paget, with a request that he would do me the favour to examine it. This he most kindly did; and, without being aware of what my opinion had been, he fully corroborated it. He stated that the form of tumour was one he had not met with before; that it was composed of small nuclei and cells, differing but little from lymph-cells; that it was probably of slow growth, and was certainly no form of cancer. The tumour had been years growing; and caused the death of the patient, from gangrene, the result of self-inflicted injuries.

CASE IV.—*Multiple encysted Fibrinous Deposits in the Testis.*

A labouring man, aged 40, received some injury of the testis six years ago. Soon after he observed a small, hard kernel on its inner side. This increased slowly up to last April, and became gradually troublesome from its size and weight. Since April it has rapidly enlarged, and by its traction on the cord has become the cause of much pain; there had been no second injury, as far as he can remember, to account for the sudden increase in the rate of growth. He has lately made some attempts to reduce the tumour by mercurial ointment, strapping, and the use of iodine, with little, if any, success. He is otherwise healthy, has never had venereal in any form, and is not married. The tumour is now the size of a cocoanut, measuring $5\frac{1}{2}$ inches by 4 in its diameters; it is oval in outline, departing little from the form of the healthy organ. It is firmly elastic in all parts, except the upper and anterior,

where a collection of fluid evidently exists; pressure in this point gives the feel as if the finger sank through the fluid into a cup-like depression in the solid tumour. No enlargement of glands could be made out; the skin was not adherent in any part to the tumour; nor was there any pain experienced, except what was referable to the traction on the cord. The man's health was good; the tumour interfered with his work; it was not cancer, and I removed it. He made a rapid recovery, and is since well.

A section of it showed a number of cysts, filled with lymph, organized in the peculiar manner which is characteristic of the organization of coagula. The cysts were perceptible on the first section, and their glistening whiteness contrasted strongly with the pinkish colour of their contents, and with the gray tubular substance of the testis, much of which could be seen in detached islets through the tumour. All the cysts were full of these remains of coagula; when hardened by a day's immersion in Goadby's solution, the coagula became brittle, and could be readily turned out of the cysts, to which, however, they had a minute vascular attachment; they were not attached by any pedicle to the wall of the cyst, as in the proliferous variety; but seemed, as in Case III., to be hemorrhages into the substance of the organ, which had acquired an independent vitality, and had become surrounded by a cyst. A superficial examination would readily confound them with masses of encephaloid, which their colour and outline caused them to resemble; a careful inspection, independent of aid from the microscope, showed them to be more firm, and less juicy, more friable, and less pulpy, less evenly white, and more yellow, than encephaloid. Of course, under the microscope, they are readily distinguished, the cells being smaller than the nuclei of the cancer-cell, and unable to resist the action of dilute acetic acid, as the latter do. I have often urged on young microscopists the necessity of using a few chemical reagents in all cases admitting of a doubt; and I take this opportunity of repeating the advice, as many otherwise good observers have fallen into blunders by its neglect. Many a time when the cancer-cell cannot be seen in a specimen, the addition of the acid will cause the characteristic nuclei to start into view in great numbers; and the converse is equally true, that cells which deviate but slightly from the lymph-cell may be mistaken for free cancer nuclei, until their cell-wall is broken up by the acid.

I shall now give in a tabular form the signs by which, as a

rule, these various tumours are to be distinguished from one another, and from the two leading types of cancer:—

Schirrus (chronic cancer.)	Encephaloid (acute cancer.)	Hemorrhagic Fibrinous.	Simple Cysts.	Adenoid.
Grows slowly.	Grows rapidly.	Generally slow at first; often increases with energy.	Same as preceding.	Slow generally.
Is small, hard, and heavy.	Is large, soft, elastic, and of moderate weight.	Whether large or small, is always elastic; heavier than encephaloid; lighter than schirrus.	Very variable in size; granular when small; fluctuating when large; light.	Small, hard, and heavy generally, but sometimes acquires a great size
Early adhesion to neighbouring fibrous structures.	Adhesion is slow to take place in proportion to rate of growth.	Adhesions rare, trivial, and probably accidental.	No adhesion.	Loosely rolling single, or pediculated tumours.
Many small, roughly nodule surfaces.	Many large, smoothly nodule surfaces.	A few large, smoothly nodule surfaces.	Hard, small, detached granules or large smooth surfaces, with intermediate forms.	No adhesion, unless when ulceration mechanically takes place.
Immediate poisoning of lymphatics, and rapid secondary deposits in glands.	Poisoning of glands or lymphatics seldom occurs prior to ulceration.	Poisoning very rare; probably never without ulceration.	None.	None.

I have thus striven to place in a tabulated form the marks that will generally enable a careful observer to distinguish these tumours, especially in the earlier periods of growth. It is of the greatest practical importance to be able to give a decided opinion at the outset; and, where our own minds are made up as to the proper course to be adopted, to urge it upon our patient in the most effective manner. It is perfectly possible, and by no means difficult, to recognize a genuine cancer, whether schirrus or encephaloid, of the smallest size. In the majority of cases of schirrus, the eye can make the diagnosis, though no prudent surgeon will trust to it alone; but it is a fact that, if a good light be thrown upon the skin, minute dimples or depressions will be seen over or near the tumour. These mark the attachments of the subcutaneous bands which run towards the tumour, and are produced by the shortening

of these bands. It is not necessary to have actual infiltration of the skin by cancerous matter to produce them; they are, in fact, the forerunners of this infiltration, and are often valuable as giving warning of the earliest approaches of it. They are not present in pure encephaloid, which is to be recognised by the other signs given above, nor are to be found, as far as I know, in any of the more innocent growths.

If the skin be carefully pinched up over the tumour, and over a neighbouring sound part, the difference of adhesion can be felt and seen most easily, if it exist in ever so slight a degree, just as comparison assists in ascertaining slight shades of dulness in phthisis.

Of growths which are not cancer, but which equally with it have their origin in the lymph-cell, and are interstitial or infiltrating, there are almost as many varieties as there are cases. After reading most of what has been written about them, and having seen a good many, I am satisfied that this whole class may, for practical purposes, be included in the following formula:—"The nearer in form and power of development that the constituent cells of a tumour are to the healthy lymph-cell, the more innocent is the tumour: the further removed, the more destructive." To expand this a little, and make it intelligible, we find the healthy lymph-cell small, circular, slightly granular, with a little nucleus, and developing into a fibre. Our simplest tumours are composed of cells, scarcely, if at all, to be distinguished from the above; and these white fibrous, or desmoid tumours, are the most innocent possible growths, as a general rule. A stray exception may occur, now and then, to prove the rule. We then come to fibroid, fibro-nucleated, recurrent fibroid, fibro-plastic, fibrinous tumours, named according to the fancy of writers, who recognize alike their similarity to simple fibrous tumours, and their divergence from them. These are of variable malignancy; they are of as variable minute construction. Not only do their constituent cell-elements differ more or less in form from the primary lymph-cell, but they also differ in power of development. Some remain always as cells, and never develop into fibres; these are the most recurrent. Some make attempts at development, and hence the caudate cell of various form; some appear as nuclei, only without external cell-wall. Again, power of development into fibrous forms is quite different from active reproduction; generally it is not associated in the same cells. The recurrent tumours are masses of rapidly produced cells, or nuclei, with no attempts at the formation of fibre.

Of these I have seen many examples, none more remarkable.

ble than the case of a man from whose shoulder such tumours have been removed, at least twenty times, by Professors Rawdon Macnamara, Senior and Junior, and by other surgeons. My friend, the present Professor of *Materia Medica* to the College of Surgeons, knowing the interest I took in such subjects, kindly gave me an opportunity of seeing the tumour on one occasion. It was a mass of most elementary cells, low in organization, active in reproduction, and was the most recurrent tumour I ever heard of. There is some tendency to this form of growth in all secondary tumours, whether glandular or local relapses.

Cancer itself can be brought under the above law. It is no heterologous or parasitic formation. It is simply a monstrously abnormal plastic growth; its cells differ as widely as possible from the healthy type. In acute cases they are rapidly produced, make scarcely an attempt at development, and die off with rapidity; in schirrus they are formed more slowly, and in much smaller numbers, live longer, and make some attempt at caudation, but they are still farther removed in form from the typical cell of healthy tissues.

The more I think over the subject of morbid products, the more am I convinced that, in the above formula, we have the expression of a law that includes most of their phenomena. It will, slightly modified, apply not only to large classes of tumours, but also to tubercle and to pus. Tubercle is a lymph-cell, of low vitality, incapable of development into healthy fibre, dying after a short existence, and generally becoming a foreign body. Pus may be described in words almost identical—their material difference being one, probably, more of chemical constitution than of vital power—for both are possessed of almost a minimum of vitality. Tumours are composed of cells whose vital force is greater than pus or tubercle; and this vital power is rather spent in reproduction, than in development, as in the healthy cell. The ordinary plastic cell goes through certain phases, dies, and is removed; its place is taken by a new cell, developed, probably, from the nucleus of its predecessor. The abnormal cell fails to arrive at perfection, often becomes a monstrosity, and has a tendency not only to reproduce itself from its nucleus, but to generate in neighbouring lymph organisms similar to itself. Thus the constituent cell of the tumour has a certain independent vitality, similar to that of the entire tumour; or rather the converse is true—the tumour is composed of cells of independent vitality, and hence it possesses the same form of life with the cell. And, as the life of the cell is of a low type, so is that of the tumour. I cannot but

think that many of the able minds which have been engaged in studying cancer, in its minute anatomy, have failed to make an adequate impression upon practical surgery, because they have been led away to look on cancer as a thing quite different from any of the ordinary structures of the body, instead of a perverted form of a natural structure. And I am sure that their views, carried out to their legitimate conclusion, would lead us to despair of any remedy for cancer but the knife, or other agents of destruction. Whereas, if we regard the cancer-cell merely as a perverted lymph-cell, we shall never rest until remedies are found which will influence it to a more healthy type.

I am sure we neglect too much the auxiliary treatment of good tonics, especially mineral tonics, good air, and abundant food, with proportionate exercise; and we should have slower tumours, and fewer relapses, if we compelled the attention of our patients to these matters.

Whether chemistry, combined with the microscope, will ever lead us to the knowledge of how best to effect our purpose, is more than I can say. The study will, at all events, lay open many valuable truths—it will amply repay any one who can give time to pursue it. The actions of many medicines, may I not say most, are involved in obscurity; and we prescribe them on grounds which our utmost efforts cannot rescue from the taint of empiricism. Microscopic chemistry will solve some, at least, of these problems. For example:—The diuretic power of bitartrate of potash is explained when we see the force with which it dissolves the epithelial cells of the kidney; its value in certain conditions of the liver is similarly explained. Ether is not only useful for its stimulant properties (the result of its rapid combustion, as chemistry has taught us), but also for its expectorant action, which is due to its solvent power over the bronchial epithelium: for this knowledge we are indebted to the microscope; and many other valuable results will reward those who apply themselves to it.

A word or two with regard to local treatment, after operation for the removal of tumours. A rapid cure is of the highest importance: it is obtained with less inflammatory action, and is so far less favourable to the plastic exudations in which secondary growths will spring up. I do not believe that suppuration is at all beneficial as a preventive of relapses, nor can I conceive on what imaginable grounds such a theory could rest. To obtain union as rapidly as possible, it is not enough to secure all bleeding vessels at the time; we must also prevent the possibility of blood lodging under the flaps; and

we must do this without exerting such pressure on the latter as will either provoke reaction or interfere with healthy circulation in them.

The mode of dressing I adopt is as follows:—Let us suppose an amputation of the breast. I insert a wire suture at every inch; having twisted them, I cut the wires off at about an inch from the twisted portion; when this is completed, and the edges of the wound lie nicely in contact, I lay along each side of it, and parallel with it, two large compresses of lint filled with soft cotton, taking care to get their edges under the ends of the wire: these compresses are for the purpose of making elastic pressure all along the sides of the wound, thus preventing any accumulation of blood under the flaps; and they also interpose between the skin and the cut ends of the wire sutures, and prevent chafing; over the track of the wound a wet compress can be laid, and the whole secured by a few turns of a roller, applied with moderate tightness. If there has been any dissection of glands from the pouch of the axilla, a sponge rolled in lint, or a handful of cotton, can be similarly used, to prevent accumulation of blood; and when the arm is brought to the side, sufficient pressure is made. A little ingenuity will adapt this mode of dressing to many operations. I have used it in amputations of limbs, castration, the removal of all tumours, and for the dressing of scalp wounds (omitting the stitches, or inserting as few as possible), and I have found it most useful. One advantage it possesses is, that we can easily inspect the line of wound, and sponge it clean without disturbing it: blood in the wound is the great cause of delay and danger after all operations—it prevents adhesion, causes suppuration, and tends to produce phlebitis and purulent absorption, or angioleucitis; and, as this mode of dressing prevents its accumulation, it so far diminishes the risk of operating.

ART. XVI—*On a New Sign of Post-partum Detachment of the Placenta.* By JOHN CLAY, M. R. C. S., Senior Professor of Midwifery, Queen's College; and Surgeon Accoucheur to the Queen's Hospital, Birmingham.

THE rules usually given in obstetric manuals, and text-books, for the management of the placenta, after the birth of the child, are:—to wait for a pain; or, to carry the finger along the cord to the os uteri, and, if its root can be felt, it may be fairly assumed that the placenta is thrown off, and may be easily extracted by gentle traction of the cord, with the aid of external manipulation. If these instructions be faithfully carried out,