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Surgeon
from the
Author

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BY

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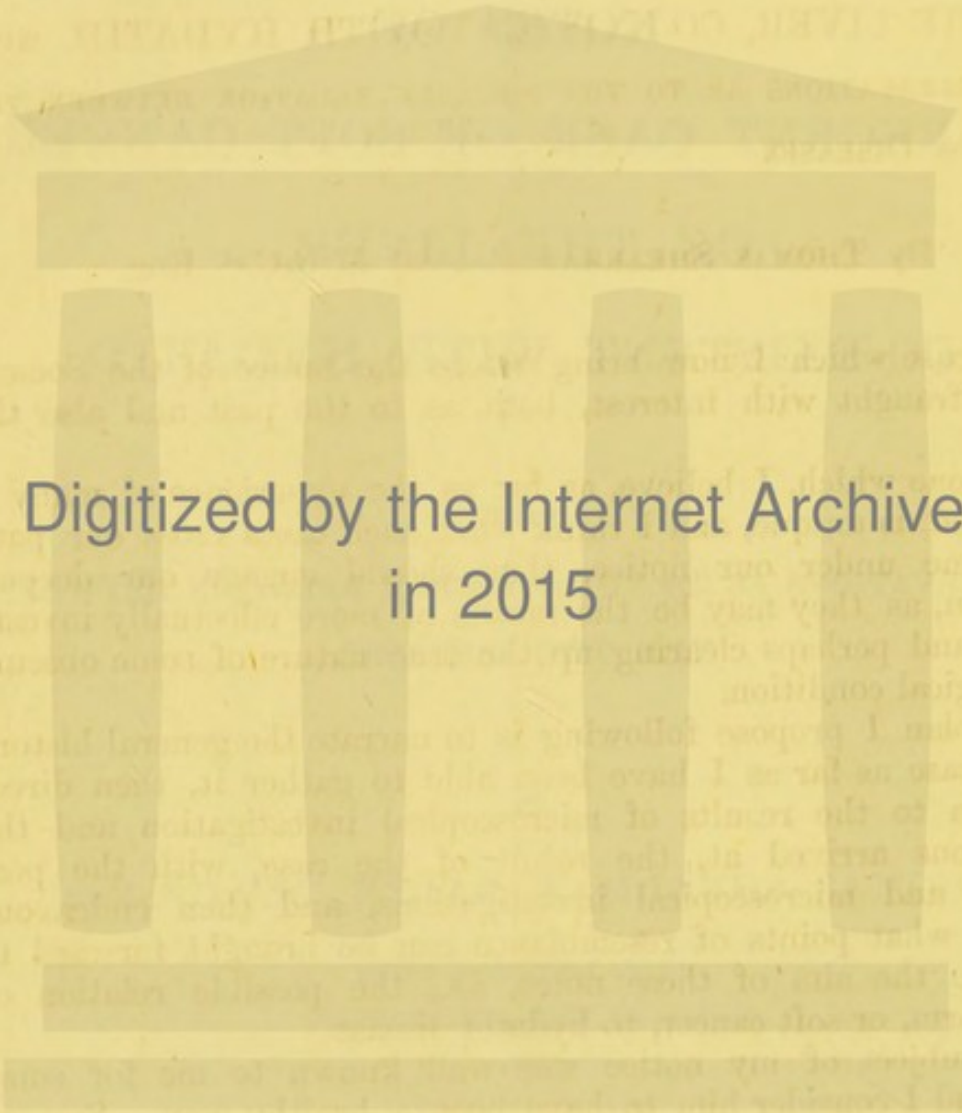

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NOTES OF A RECENT CASE OF SOFT CANCER OF THE LIVER, CO-EXISTENT WITH HYDATID, WITH OBSERVATIONS AS TO THE POSSIBLE RELATION BETWEEN THE TWO DISEASES.

By THOMAS SHEARMAN RALPH, M.R.C.S. Eng.

The case which I now bring before the notice of the Society is one fraught with interest, both as to the past and also the future.

It is one which, I believe, as far as the experience of many is concerned, is unique, and I think when such cases cross our path and come under our notice, they should engage our deepest attention, as they may be the means of more effectually investigating and perhaps clearing up the true nature of some obscure pathological condition.

The plan I propose following is to narrate the general history of the case as far as I have been able to gather it, then direct attention to the results of microscopical investigation and the conclusions arrived at, the result of the case, with the post mortem and microscopical investigations, and then endeavour to show what points of resemblance can be brought forward to illustrate the aim of these notes, *i.e.*, the possible relation of cerebriform, or soft cancer, to hydatid disease.

The subject of my notice was well known to me for some years, and I consider him to have been a healthy man. Several of the members of his family and his parents also have been under my observation, and I have every reason to believe they are quite free from any cancerous taint.

It appears that he (the subject) was rather suddenly taken ill with general symptoms of collapse, accompanied by pain and distress about the epigastrium, somewhere about the 18th of June last, and in consequence was laid aside from work for a few days. The view which was taken of his case was that a hydatid tumour had probably burst in the peritoneal cavity, and some mild symptoms of peritonitis appear to have supervened.

About three weeks or a month after, he was seen by another medical practitioner, in consultation with his first attendant, and the surmise of hydatid disease was still entertained, but some suspicion of cancer of the liver arose in the minds of his attendants. There was then a distinct swelling below the edge of the liver, with some indication of a nodular state in or about that organ. In order to ascertain the nature of the case, a fine trocar was introduced about two inches below the ribs and three to the right of the linea alba. Nothing seems to have been obtained from this exploration but a small quantity of blood, which merely trickled down the side of a large bottle in a narrow stream, and was left unexplored. Some ten days or thereabouts after, the tumour appears to have been noticed as extended below the umbilicus, and about two inches below this point a trocar was introduced, and by means of an aspirator about an ounce and a half of blood and serum was removed.

The examination of this under the microscope yielded to the observer cancer cells. At this point of the case, *i.e.*, about the 20th of August, the above-mentioned fluid, which was about two days old, was sent me for examination.

The first investigation of its nature made me satisfied that it contained parasitic elements, which opinion I immediately expressed by letter to the medical man in charge of the case, adding that, in consequence, I could not view it as a case of cancer, as I had no knowledge of the coexistence of the two diseases. I then saw the patient, and from that period attended him to his death, which took place some eight weeks after.

The condition of the patient at the time I first saw him was as follows:—There was no special cachexia indicating cancer. The abdomen was occupied by a large distinct tumour, having a lobulated form, extending from the edge of the liver to about three inches below the umbilicus, and laterally five or six inches to the right of the linea alba, and about three to its left; and yielding some fremitus. The girth of the abdomen on a level with the umbilicus was $34\frac{1}{4}$ inches; while that on a level with the lower ribs was 35 inches.

One month after, the following change was noted—girth, on level with umbilicus, 36 inches; lower ribs, 37 inches. I also noticed that the dulness above the liver extended nearly to the nipple; the intercostal spaces being enlarged, the right side of the chest measuring one-and-a-half inches more than the left.

So fully was I satisfied of the parasitic element being present in the case, that I advised a fuller exploration, in order to set all doubts at rest; for I found, on consulting those who had preceded me, that they were fully persuaded that the case was one of cancer, and they almost entirely dismissing the idea of any hydatid cyst, while I, on the other hand, felt convinced that one had been

explored, and had yielded results which had not been recognized. Thus the case proceeded for a while, when about the 18th of September a third exploration was made, more to the right of the first, and below its level; by this, a very small quantity of blood-coloured fluid was obtained, which was withdrawn with difficulty by the aspirator. The result was not immediately ascertained, but several days after I found two hooklets of an echinococcus in a coagulum of blood, which was withdrawn from the tube. The other materials did not yield exactly the same result as the first and second explorations had done; yet they were to my mind parasitic as to their character. Within forty-eight hours after the operation a great portion of the skin was affected with an irritable red rash, and from the point of the punctured spot the integuments became œdematous with blood-coloured serum, the swelling extending over the right side of the chest, up to the nipple and down as far as the groin; this passed away gradually after a week or so.

The discovery of the hooklets thus obtained, giving satisfactory evidence of the parasitic nature of the disease, induced a proposal for a further operation, which was fully to set at rest the nature of the tumour below, or to promote its removal, for doubts were still held out against the hydatid view of the case, and at the same time the following expression was used, to the effect that if one was quite certain of the hooklets being obtained from the liver, we might dismiss the cancer view of the case.

An exploratory incision made below the umbilicus led to the determination that no further attempt should be made, as the tumour appeared to be cancerous, but was not penetrated, nor was the peritoneum cut into. Death took place twenty-four hours after from exhaustion, which had been coming on during several days prior to this event. The sufferings of the patient were considerably alleviated by the frequent subcutaneous injection of morphia during the last four weeks of his life. I may here notice that food was constantly or rather daily rejected by the stomach, and as some suspicion arose that an opening into it might have taken place, the discharges were examined, but nothing satisfactory indicating or confirming such a view was afforded.

Post mortem examination.—On laying open the chest and abdomen the heart and lungs were found healthy; the diaphragm above the liver was pushed up as high as the space between the fourth and fifth ribs. The stomach was completely pushed over to the left side by the enormous size of the liver, which presented on its anterior surface two cancerous nodules and two large cerebriform cancer-masses, extending from the edge of the liver down to half way between the umbilicus and the pubes; the small intestines were agglutinated at portions below and

behind this mass, and there was a considerable amount of blood-stained serum effused into the cavity of the abdomen.

The impression conveyed to those who were present was that the first diagnosis was the right one, and under this some left. I proceeded, with the help of my friend Dr. Fishbourne, who conducted the post mortem examination for me, to examine for a hydatid cyst. This was found at last ruptured, and situate behind the gall-bladder, at which part you may see its remains. The cancer element had literally ramified through the liver in all directions, so that when a nodule was cut into, it could be traced in a narrow band of cancer matter deep into the substance of this organ.

At this point of my observation I will now direct your attention to the facts obtained by the explorations. The first made below the edge of the liver contained, as far as I could ascertain, no cancer elements; in it I found ova-like bodies and plenty of fragments of some parasitic form. In the second, which you will remember came to me first for examination, and obtained from below the umbilicus, I found two ova-like bodies, besides various matters which I referred to parasitic origin; and from the third exploration I obtained elements of a parasitic nature, and ultimately hooklets. Here then we have an important point to consider, the first exploration pierced into what? a cyst, or a cancer mass, with parasitic elements? The second exploration, as we know, entered a cancer mass and yielded undoubtedly parasitic elements; and as I said to Mr. Girdlestone, on examination of that portion, I quite justify you in calling those cancer cells, they are so recognised; but I have noticed such like from pure hydatid cysts obtained from a sheep, and the difficulty was to believe that the cancer element was inextricably mixed up with parasitic objects.

Thus, the issue of the case has been, that all parties concerned have been right, and the wrong has been the exclusion of the other element, and this because the two diseases could not be supposed to be co-existent in the *same spot;* so that when a trocar was introduced into a cancer mass, it brought away both cancer materials as well as elements yielded by a hydatid cyst.

We have come thus far in the history of the case.

What was its origin? Are we to consider that a hydatid cyst existed in the liver and that at the same period a cancer mass also ready to develop? Or shall we regard it as a case in which a hydatid cyst having discharged its contents, these themselves have gone on to constitute the cancer growth? Of course the former is the most facile view to adopt, but is it the most philosophical? Will it do for us to rest here and wait till hydatid cysts are more frequently observed in cancer masses of this kind. For perhaps these may not have been fully searched into for any such element,

in or immediately about them, and indeed in this very case, if it had not been for persistent search, the fact would never have come to light, and your colleague would have been left out in the cold and obscurity.

I come now to that portion of my notes, as to the possibility of the relation of these two diseases. Let me then place before you a few facts which must be taken in faith, until some have taken the matter in hand for themselves and examined them, and also, until further experiments and observations have been instituted, with the object of correcting or confirming these views of mine.

I know that what I have to advance, as to the connection between soft cancer and hydatid disease, is likely to be met by this objection, *i.e.*, that numbers of cases of cancer of the liver have been noticed, and that no traces of hydatid have been detected, hence, what I may have advanced is merely a surmise and no more. I object to this line of argument, it is much of this nature : as if we were to say, that of the numerous cases of hydatid cysts which have been noticed occurring in the liver, no one has ever seen a tænia in any such cyst, and yet it is admitted on all hands that hydatid cysts are derived from tape worm, which amounts to saying that these cysts are of parasitic origin. Hence, I would state it thus, that soft cancer may be of parasitic origin, and that the parasite giving rise to it need not necessarily be always a hydatid cyst. If we view the matter under this aspect, and I believe it to be the most reasonable one, we shall not at once close the door of the hypothesis (not to call it a theory) of the origin and connection of these two diseases, as we should be apt to do if we lent an ear to the adverse argument to which I have alluded.

First of all, in order to clear the way, let me remind you that the elements which compose the majority of hydatid cysts are not known. These cysts contain so many different forms of organic cells, that it is impossible to convey by words and descriptions, or diagrams, any distinct idea of their size, number and relationships, and yet all these peculiarities need to be studied carefully ere we can be in a position to deny their value as indicating a relationship to cancer cells, and the progress of that disease.

In order then to illustrate my views, I must begin at the hydatid cyst proper. Now, these cysts are scarcely ever alike in all their details, and it is by carefully examining their contents, that we can expect to arrive at a knowledge of the great variety of objects which can be obtained from them. In the first place, we have in many cysts a thick jelly-like wall of the usual laminated character; embedded in these walls are organisms of various degrees of development, and it is to such I desire to call attention.

Here is a portion of a hydatid cyst : the walls are laminated, and at one part we see an ovoid or pear-shaped body surrounded by layers of hydatid membrane, and in the interior of this body we

see a number of various sized objects, some of them are granulated. This represents a young state of a secondary cyst, or perhaps a grand-daughter cyst, as it is termed. Also, we have objects of $\frac{1}{1500}$ of an inch in size, of a pale yellow brown, the surface closely studded with dots, or prickles, or elevations. Here again is another—an oblong body, with thick walls and containing granular matter; its nature I have not been able to determine, it appears to be cylindrical. So again, there is another form obtained from a hydatid cyst—it is irregularly triangular, with a dense wall and a central nucleus of a yellowish tint, and another apparently of a rounded form.

The common or well-known echinococcus form is sometimes not to be met with, while at others they are present in hundreds, and when present there are also many to be seen in an embryo condition, wherein no hooklets can be traced. These echinococci are usually about $\frac{1}{250}$ inch, and when fully developed exhibit in their interior a variable number of oval or rounded shining bodies, which are apparently homogeneous. If we place these on a slide, charged with glycerine and gum and a little salicylic acid, and take care to mark down our specimens, we shall in the course of a few days note that some of them will have undergone some changes—not decomposition—but organic changes, and that some have advanced further than the rest. As for example, in one, a central dot or nucleus will be noted; in another, a line of separation following the contour of the oval or round body, and so in process of time a separation effected between the outer and the inner portions. In others, vacant spaces will make their appearance and ultimately, as I have observed, some have given rise to three cells closely united, presenting all the characters of a minute hydatid cyst. Almost every organised element contained in a hydatid cyst I have noticed has undergone change—not decomposition, but an increment or change of form—and this has occurred at the ordinary temperature of a room, *i.e.*, from 60 to 80° F., and during a period of a few days to a few weeks, the action of the salicylic acid not causing their organic life to cease, while putrefaction and bacteria forms appear to have been excluded. And I believe this process goes on while their proper pabulum exists, either in the fluid around them, or in the neighbouring objects with which they may be associated, as flakes of hydatid membrane, &c. Now, all these points are in keeping with what we commonly meet with in a largely developed hydatid cyst, wherein we obtain daughter cysts, grand-daughter cysts, great grand-daughter cysts. The lengthened life and opportunities for extended growth and favouring circumstances afforded in the body of the animal occupied by the mother or primary cyst, aid in such develop-

ment. Hence the necessity for repeated observations on the contents of all cysts. It was from such observations years ago I was led to suspect that cancer might in some way be related to parasitism, and I find the following note in my microscopical memorandum, being dated 1865 :—"Can cancer be shown to be of parasitic origin," and this with reference to hydatid disease.

And now I will point to another set of facts which I have derived from observations made on the cancer materials which first came into my hands in this case, wherein I noticed from the first a great number of large pale solid-looking bodies, or nuclei, contained in the general mass of cells of all kinds. These nuclei after having been kept in glycerine and salicylic acid have undergone changes — inasmuch as many of them have become cellular ; first developing a nucleus, and then exhibiting cavities in the general cell covering. These nuclear bodies are of the same size and appearance as those which occupy the two remarkable ova-like bodies to which my attention was directed in the first instance, as I have already noticed. And, as I have already observed about other objects, these have also made increase ; and these changes I cannot refer to a process of decomposition, but to growth.

So, again, in order that we may become more certain of the relationship of these two forms of disease, it will be necessary for us to cultivate or keep the so-called cancer cells of soft cancer under continued observation ; and I may here notice that at present I have not been able to keep such specimens at a temperature of 90-95° F., in order to facilitate their transformation—a degree of heat which we may reasonably suppose will be more in accordance with their natural condition within the body; and it will also be necessary to supply various kinds of pabula, such as serum, &c. One precaution I must here advert to, *i.e.*, that such cancer cells and hydatid cells should be taken first from the animal. Most of the elements derived from a dead body having been in some degree subjected to the action of gases resulting from decomposition, as well as having been deprived of oxygen, supplied through the action of blood while in the living body, are very likely to fail us in our experiments, and in place of undergoing and exemplifying organic change, suffer decomposition. Observe also a feature in this case in keeping with the views I am advocating : when a nodule of soft cancer was cut into, it could be traced down into the body of the liver like a narrow band, as if the cancer element had ascended through the liver substance, and when freed from the surrounding pressure, the cancer materials situate on the surface began to expand in a nodule or globular form ; and we are pretty well assured that when pressure on a hydatid cyst is lessened, it also rapidly expands by growth. In fact, the investing envelope of the hydatid

elements constitutes the safe preservation of them from diffusion; and when rupture occurs we have peritonitis, or pleuritis, as the case may be, mild or severe. And if the hydatid elements come into contact with nutrient fluids, they will rapidly bisect, and repeat themselves as far as the powers of each separate organism, and we have then soft cancer to consider and observe. Here, then, we have a nodule, and in it we have found undoubted hydatid elements, say, a cyst of minute size (minute as compared with the parent cyst).* Whence came this cyst into this position —into the nodule? Are we to suppose that when the hydatid burst, this particular small cyst travelled through the liver substance to the part where it was found—a distance of two or more inches from the ruptured cyst? Or is it not more in accordance with our knowledge of growing bodies, that this particular cyst was evolved in the part where we met with it, and therefore it was a descendant of the cells which preceded it in other localities in the liver? We are bound to offer some mode of explanation of such phenomena, or else acknowledge our ignorance.

Let me here briefly allude to some general matters for consideration. There are various forms of cancer now admitted to exist. Cancer seems also at first to be a localised affection, and when thus established becomes diffused, very likely through the blood, to other parts or organs. Again, is it not a question for us to consider, whether, in a country eminently marked by the presence of hydatid disease, both in animals and man, we are gradually adding to our number of cancer cases; in other words, is not cancer on the increase?

I am fully aware that I am venturing upon untrodden ground, and that everyone so doing is liable to be suspected of being biassed in favour of his own special views. What, therefore, I claim is a hearing, and that whatever adverse or opposing arguments may be brought forward, they shall have for their basis a fair knowledge of the objects which constitute the ground-work of this communication, our aim and desire being a distinct advance in our professional career, and the future benefit of our race.

P.S.—Since the conclusion of this paper, I have had another case, in which I detected parasitic elements in the urine, which had suddenly assumed a blood-stained aspect, and in which ultimately pus cells made their appearance; and there was also indubitable evidence of cancer invasion in the same subject.

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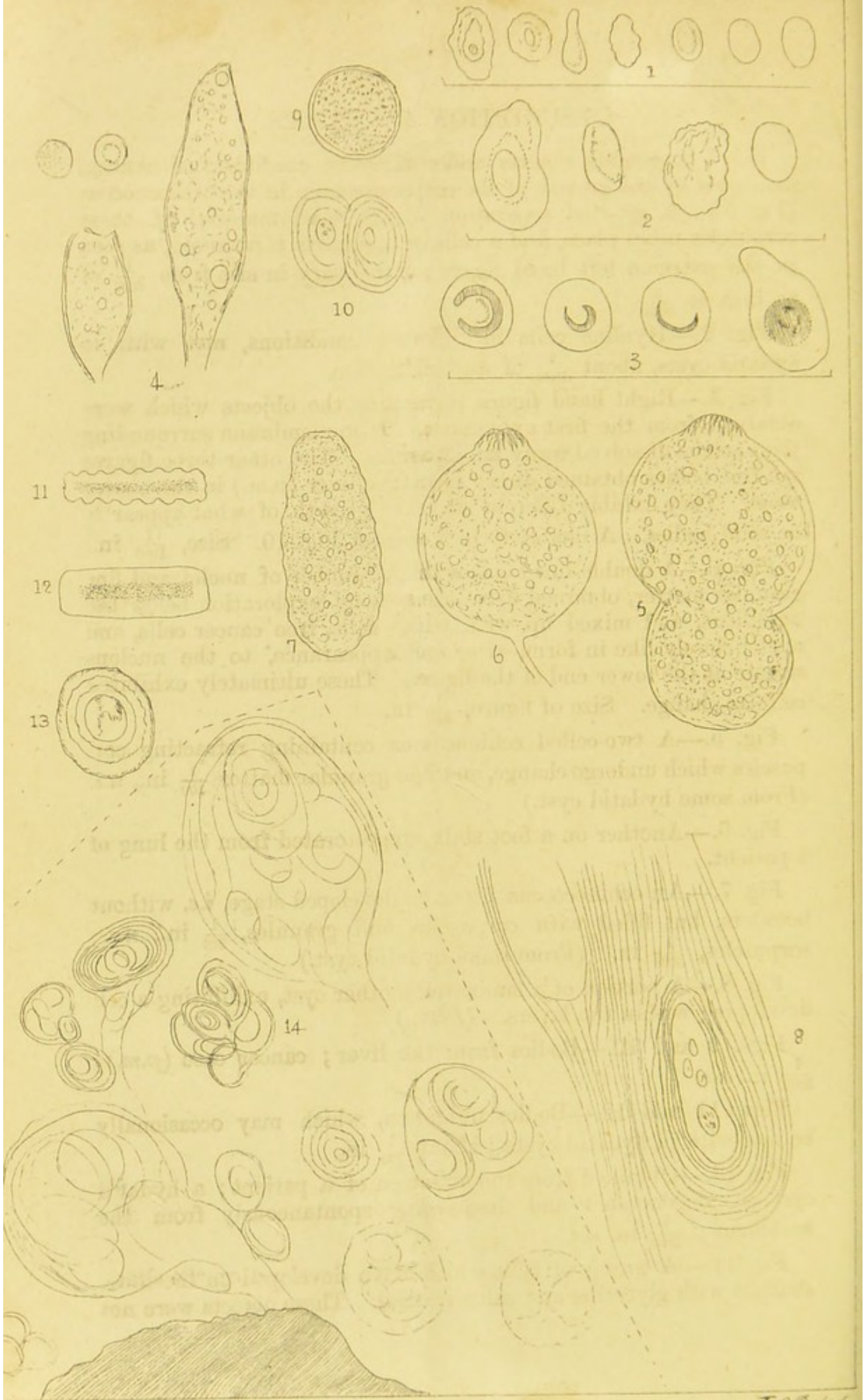
* See Figs. 3 and 10.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DESCRIPTION OF PLATE.

Fig. 1 represents objects under different conditions of change, exhibited by the growth of the corpuscles seen in the echinococcus (Fig. 5.) A gradual separation in the solid material of these corpuscles takes place, and a cellular condition is attained, as seen in the extreme left hand figure; these vary in size from $\frac{1}{3000}$ of an inch to $\frac{1}{1000}$.

Fig. 2.—Hyaline cells in different conditions, met with in hydatid cysts, about $\frac{1}{1000}$ of an inch in size.

Fig. 3.—Right hand figure represents the objects which were obtained from the first exploration. The membrane surrounding the nucleus dissolved away in glycerine. The other three figures are free bodies obtained direct from the liver (*p.m.*) in the cancer mass. They exhibit different stages of growth of what appear to be solid bodies. A double form is seen at Fig. 10. Size, $\frac{1}{1000}$ in.

Fig. 4.—A double lined cell, with a number of nuclei and fine granular matter, obtained from the second exploration below the umbilicus, and mixed up with white cells, free cancer cells, and nuclei closely like in form, size, and appearance, to the nucleus situate at the lower end of the figure. These ultimately exhibited cellular change. Size of figure, $\frac{1}{250}$ in.

Fig. 5.—A two-celled echinococcus containing refracting corpuscles which undergo change, and fine granular matter $\frac{1}{100}$ in., *n.s.* (From some hydatid cyst.)

Fig. 6.—Another on a foot stalk, expectorated from the lung of a patient.

Fig. 7.—An echinococcus in an undeveloped stage, *i.e.* without hooklets, but filled with corpuscles and granules, $\frac{1}{200}$ in., *n.s.*; corpuscles, $\frac{1}{3000}$ in. (From some hydatid cyst.)

Fig. 8.—A portion of a laminated mother cyst, exhibiting a cell developing within the layers. (*Idem.*)

Figs. 9 and 10.—Bodies from the liver; cancer case (*p.m.*); $\frac{1}{1000}$ in. *n.s.*

Figs. 11 and 12.—Bodies unknown, which may occasionally be met with in hydatid cysts; about $\frac{1}{700}$ in.

Fig. 13.—Obtained from the abdomen of a patient; a hydatid cyst (?), degenerated and discharging spontaneously from the umbilicus; $\frac{1}{1000}$ in. *n.s.*

Fig. 14.—A group of cells which have developed on the slide, charged with glycerine and salicylic acid. These objects were not

present when the original membrane to which they are attached was prepared, and which was obtained (*p.m.*) from the liver affected with cancer. They have developed in clusters like grapes, and are evidently delicate sacs containing laminated cysts, or solid material becoming cellular. They vary in size from $\frac{1}{1000}$ to $\frac{1}{500}$ in. At one part (left hand) a portion is depicted growing from the solid tissue. These cells all polarise beautifully and exhibit a cross. Inasmuch as these have grown in salicylic acid, it is possible that their polarisation may be due to salicine organically incorporated. I have had no time to determine this question. These cells by some would be regarded as cancer-cells, if due notice was not taken of the laminated structure of the solid matter. The apparent amyloid character of the contents of these cells, evidenced by the cruciform polarisation, is in accord with observations of mine on hydatid cysts frequently exhibiting purple re-action under iodine.

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