

## ON THE ENTOZOA, ESPECIALLY THOSE INFESTING THE HUMAN SUBJECT:

BEING THE SUBSTANCE OF A LECTURE GIVEN AT QUEEN'S COLLEGE.

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WE have to-day, gentlemen, to consider the entozoa, a group which, though possessing many characters in common, can perhaps scarcely be called a natural one; yet one which, in the present state of our knowledge, we should be doing violence to nature if we attempted to divide, since parasites of this class, apparently the most distant from each other, have been found, by the discoveries of late years, to be in reality most intimately connected. In treating of these parasites, I shall turn your attention more especially to those which infest man; and you will excuse me if I wander slightly from my province, and give at the same time some few remarks on the best modes of curing those affected by them.

The entozoa are divided into five groups, which perhaps, at some future date, will be condensed into three. The five now are—1. The Gregarinæ; 2. The Cystica; 3. The Cestoidæ; 4. The Trematoda; and 5. The Nematoidæ.

1. The *Gregarinæ* are simple unicellular animals; some therefore class them with the protozoa; but others among our best helminthologists regard them as only one stage in the metamorphoses of the filariæ. Each gregarina consists of a single cell, which cell contains a distinct nucleus, and, in addition, much granular matter. They are of elongated form, and move slowly by contractions of the body. Many species have now been discovered; they inhabit the intestinal canal of various invertebrate animals; and I have also seen them in the nidamenta of molluscs, and more especially in those of *purpura lapillus*.

At one period of their life, they appear to become doubled, and to consist of two cells instead of one; and at this same time a numerous brood of "navicella-like" bodies are formed in their interior. No one has traced the development further; and whether this is only the first stage in a series of metamorphoses, or whether these bodies are changed at once into gregarinæ, must be regarded as yet unknown. Kölliker looks on this double appearance as a division of the single cell by fission. Stein believes that two individuals unite, as in the conjugation of the lower algæ; he affirms that the contents of the two cells are mixed before the development of the navicella-like bodies. Kölliker states decidedly that no such admixture takes place.

The evidence as to whether the gregarina is in itself a perfect animal, or only a transition stage towards some higher form, is equally conflicting. Kölliker looks on the gregarina as fully developed, and propagated by the germs found in its interior. His arguments are rather of a negative than of a positive character. It has been supposed that they are related to the nematoid worms; now, he says that an "alternation of generations" in these would be without precedent; but here he seems to have forgotten the case of *filaria medinensis*, in which such alternation is proved to occur. Leydig and Bruck regard the gregarina as a stage in the metamorphosis of a filaria; and Leydig gives an interesting account of the changes as he has seen them in a gregarina infesting the intestinal canal of a terebella. He found five gradations from the simple gregarina to a pretty nematoid worm; but he seems to be in doubt whether to regard the gregarina as sprung from the worm, or the worm from the gregarina. He regards the psorosperma of fish as identical with the navicella-like germs alluded to above. These bodies were first found by J. Müller, in minute cysts, in the eye of a young pike; and, in the next year, he discovered somewhat similar bodies in the swimming bladder of *gadus callarius*; and Leydig has since found them in various parts of many species of fish, even in the blood and peritoneal cavity. They occur in the gall-bladders of cartilaginous fish in different stages, from one which he regards as

a perfect gregarina, to gregarinæ containing psorosperms, and finally to free psorosperms themselves. He also looks upon the hæmatozoa of Valentin as other forms of gregarinæ.

Such is a brief account of these interesting unicellular parasites. None of them infest man, and as yet very little is known about them; their interest to us rather consists in the relation which they may possibly be found to bear towards such worms as the *trichina spiralis* or *filaria medinensis*.

2. The second group are the *Cystica*, or, as they are often termed, *hydatids*. The researches of every succeeding year make it appear more and more probable that these and the cestoid worms are in reality only different stages of one and the same group. This change has been distinctly traced in more than one species; but the best known examples are the development of the *cysticercus fasciolaris*, which inhabits the liver of the mouse, into the *tænia crassicolis* of the cat; and the change of the *cysticercus pisiformis* of the rabbit into the *tænia serrata* of the dog; yet, if the success of experiments open from their very nature to so much of fallacy can prove anything, species from each of the three groups, *echinococci*, *cysticerci*, and *cænuri*, have been developed from segments of different *tæniæ* given purposely with the food. Van Beneden, Von Siebold, and Huxley, have all done much to elucidate this difficult question.

We said that the hydatids might be divided into three groups, of which the *echinococcus*, the *cysticercus*, and the *cænurus*, might be regarded as representatives. The two first of these alone infest man; the latter we shall consider in the *cænurus cerebialis*, a parasite well known as the cause of the disease called "staggers" in sheep. It is probable that all these cystic worms are only other forms of different cestoids; but, even admitting this, there are yet two ways of looking at this relationship. The hydatid may be a necessary link in the chain of development of the *tænia*; it may be absolutely necessary for the existence of a cestoid worm that it should previously have lived in a cystic form; or, secondly, it may only be an accidental or aberrant thing. The ovum of a *tænia* has found its way into the liver instead of the intestinal canal; and accordingly, just as the spores of fungi produce different looking plants, varying with the nidus in which they grow, so the ovum in the liver becomes an hydatid from its change of position. This will be a very difficult problem to solve, and one which may perhaps for ever remain doubtful. But, from the researches of Dujardin on the development of the *tænia pistillum* in the shrew mouse, it may be regarded as a settled point that the first stage of a *tænia* is, strictly speaking, an hydatid, or cystic worm. It seems to me probable that, if it fastened itself by its hooklets in the intestinal canal, it would there become a *tænia*, and the hydatid stage of its development would soon be ended; but if it passed into some parenchymatous organ, its development would remain arrested at the hydatid stage, though its growth would proceed as far as the limits of its position allowed. Nor is such a supposition without analogy. A difference in the size of the cell and the quality of the food will change the larva of a working bee into a queen, or, in other words, will produce a perfect instead of an imperfect female. Now, the development of generative organs is, strictly speaking, the only difference between the hydatid and the tapeworm.

Yet probably the most fertile source of these pests is by transference from one being to another; but we have, even on this supposition, the mystery of how the hydatids are themselves conveyed to their *habitat* to account for, and also an increased difficulty as to the source of *tæniæ* in granivorous animals, or in such birds as the grouse, to which, it is well known, they are especially fatal. We must look, therefore, for another source of infection; and the most probable is water. The ova of *tæniæ* might be passed with the excrements of animals, and might remain long undeveloped, though yet alive, until they are, so to speak, drunk in by some being in whose intestinal canal they can find a fitting home; and this may be said to be

certainly the case in some of the nematoid worms, as, for example, the *gordii*, which doubtless become parasitic. But, with regard to these parasites in man, I think that water can scarcely be regarded as a probable source; and, strange as it may at first appear, it seems to me that the flesh of diseased animals is a far more likely origin. One reason for this is the more frequent occurrence of both cestoid and cystic worms in the poor than in the wealthy or middle classes. I am not aware that we have any statistics to prove this; but most practitioners will, I think, have the same general impression on the point with myself. Now, water would be a source of infection open alike to all; whereas that of diseased meat is one to which the poor are chiefly exposed. The cystic worm, which, for several reasons, is, in my opinion, the most likely source of our common tapeworm, is the *cysticercus cellulose*—a parasite not of rare occurrence in hogs, causing in them the disease called "measles". Now, raw bacon is a frequent food of the poor; and they also often use lard instead of butter; and these may be possibly the sources of danger. Should this prove to be the true origin, there will be no difficulty in tracing the metamorphoses of our common *tæniæ*; the hog would obtain its *cysticercus* as the ova of *tæniæ*, from the filthy sewers in which it loves to feed; the man in turn would derive his *tæniæ* from the hog; nor would it be a cause of wonder if occasionally the *cysticercus* becomes parasitic on man, when we remember how many sewers open into the Thames or other streams, which are afterwards drank; though its rarity shows that it is scarcely a natural torment of our species. But, as we said before, it does not seem impossible that the *tænia* germ perhaps may occasionally be the direct source of the tapeworm, no hydatid intervening.

The hydatids which infest man are the *echinococcus hominis* and the *cysticercus cellulose*. Of these, the *echinococcus* is by far the most common; and it seems to me more than usually so in this town (Birmingham). During the four years which I have stayed here, through the kindness of various practitioners, I have seen these cysts many times in the liver, once in the spleen also, once in the heart, and once in the kidneys. Other situations have been recorded; and I have myself also seen them in the lungs. They have been met with in the brain, and in the shafts of the long bones; and Andral records a case in which they occurred in the pulmonary artery. But by far the most common seat of their occurrence is the liver; and this is also the only situation where the diagnosis of their existence can be made with tolerable certainty. Strangely enough, Rokitansky makes the improbable assertion, that they do not occur in this viscus before the age of puberty. Fortunately, we can disprove this by referring to one of the cases operated on by Sir B. Brodie, in which the patient was a boy twelve years old.

Doubt yet hangs over the question as to whether there is more than one species of *acephalocyst* in the human subject. Dr. Allen Thompson says, "It seems very probable that in the end they will all be found to contain *echinococci*." Dr. Carpenter, on the contrary, seems to incline to the view of a plurality of species. All that I can tell you is, that those which I have seen have contained *echinococci* or their claws. H. Goodsir's account of the anatomy of one of the cysts seems to me very accurate; he says, "In examining an *acephalocyst* from without inwards, we find firstly a layer of condensed tissue, and secondly a strong fibrous membrane of considerable thickness, and containing numerous blood-vessels: these belong to the infected animal, and are produced by inflammation set up by the presence of the parasite; the latter of these especially is only seen when the hydatid is large. We next come to the hydatid itself; its external coat is gelatinous, and presents only indications of a fibrous structure. The next or middle membrane is much thinner and more delicate, and has the characters and office of a germinal membrane; from this the young hydatids are developed, and push the internal membrane before them. The *echinococci* are thus seen attached, either singly or in groups, to the internal surface.

The *echinococcus* resembles in itself the head of a *tænia*, with a double row of hooks, four suckers, and a vesicular termination. I imagine the cyst to be nothing but an *echinococcus* with the vesicular termination abnormally developed; whilst the teeth and suckers are atrophied, its low vitality is kept up by the vessels in the enveloping cyst of the being on which it is parasitic.

I cannot here enter on the diagnostic signs of hydatid tumour in the liver; but, speaking in general terms of a case without any unusual complications, Dr. Budd says truly, "that a large globular tumour connected with the liver, that has grown slowly without much pain, without jaundice or ascites, and without fever or general constitutional disturbance, is almost evidence enough that the tumour is hydatid."

Now, there are two modes of cure followed by nature, one in which the hydatid dies, and the cyst becomes filled up with a chalky or putty-like matter; the cyst walls having also an osseous or rather earthy deposit in them; and the patient recovers. Dr. Carpenter attributes this to the parent cyst being developed too deeply in the tissues. It is often difficult in these cases to pronounce decidedly on the hydatid nature of the tumours; but the little hook-like teeth will generally be met with, if a careful microscopic examination be made, very often mixed up with the well known crystals of cholesterine. I have found such a cyst in the dissecting room, where the patient has probably lived and died unconscious of his malady. In a case shown to me not very long ago, by the kindness of one of my colleagues, there were found, at the *post mortem*, cysts in this degenerate condition, associated with medullary carcinoma of the liver, in the form known as Farre's tubercle—a rare and of course accidental complication, though noticed by authors, and particularly by Rokitansky.

The other mode of cure is by the bursting of the hydatid sac; and here, if adhesion has been previously set up, the opening may form either externally, or into the intestine, or through the diaphragm into the lung; and the patient may recover in either of these cases. Sometimes, indeed, the sac may burst into a large duct, and the hydatid cysts escape by this means into the common duct, and be passed in the same manner as gallstones: and this is the most favourable mode of rupture which possibly can take place.

Now, in attempting a cure by artificial means, we must try to imitate these modes; and, in the first place, it has been tried by medicine to cause the death of the hydatid. Such a plan seems to me to promise very little chance of success; an animal of such low vitality as the *acephalocyst* is scarcely likely to be affected in this way. Iodide of potassium is the remedy which has been supposed most efficacious in these cases; but, owing to the little success of this mode of treatment, and the comparatively little danger of opening abscesses of the liver in Indian practice, it was proposed to open the sac externally, when its situation admitted of this; and many cases so treated have recovered perfectly. The incision must be free, in order to allow of the escape of the inclosed lesser cysts, which are often the size of gooseberries, or even larger. The chief danger of this practice seems to be from the non-adhesion of the sac, and the consequent escape of its contents into the peritoneal cavity. I remember seeing a physician adopt the ingenious plan of inking the outline of the tumour, and then carefully noting if it shifted at all from any change of position, in order to see if it was adherent; but in one case which fell under my notice, where there was adhesion, and consequently no shifting of the tumour could take place, the *post mortem* examination showed this adhesion to be only partial. An opening was actually made in this case: unfortunately, the patient, an old woman, died worn out by protracted suppuration; but the inspection after death showed that, had the incision been carried a line or two further in the downward direction, it would have gone beyond the adherent portion of the tumour. To obviate this, the opening is sometimes gradually effected by caustic potash: this, however, I have never seen done.

Lately, another mode of treatment, combining both these

methods of cure, has been adopted; namely, the puncture of the tumour by a capillary trochar, and the injection of tincture of iodine. Two cases have been recorded by Dr. Aran, where this plan was tried with success: it seems to promise well, and, in a fitting case, I should be inclined to recommend its adoption; but it must be remembered that, in many cases which come under our care, the death of the hydatids has happened, but not by the favourable process of degeneration before alluded to; the condensed cyst in which the acephalocyst is contained has supplicated, and the cavity is virtually an abscess. In such a case, the injection of tincture of iodine can only do harm.

Hydatids in the kidney can only be diagnosed by the escape of the cysts either through the ureter, or by abscess externally, or into the intestines; those in the lungs can only be known to exist when expectorated. In the spleen, a tumour might be formed which would be at least suggestive of an hydatid nature; but when in this viscus, they are generally in the liver also. I have nothing to say about the treatment of these cases.

Of the origin of the echinococcus, or to what particular cestoid it owes its birth, I can also offer no clue; but, as even an hypothesis may lead to good, I would suggest that the cestoid may be one of those which infest ruminants. The number of tripe-houses, and the number of hydatids in this locality, have struck me as perhaps standing in the relation of cause and effect.

The *cysticercus cellulosa* is the next of the entozoa which we shall notice; it is far from rare, as we said before, in the hog, and also met with in the human subject occasionally. The *cysticerci* differ much from the acephalocysts in appearance; they have a double circlet of hooks, and below these a series of suckers; and to this head follows a more or less elongated neck, sometimes fasciolated; and this is terminated by a vesicular dilatation. This is in some species very small. The want of generative segments is the only distinction between these and the cestoid worms, except that of habit. In *cysticercus cellulosa*, there is a distinct vesicular dilatation, and an elongated neck; it sometimes grows to an inch in length. Its usual nidus is the cellular tissue, between the muscles; but it has also been found in the heart, the liver, the parietes of the intestines, the brain, etc. In the eye, it generally occurs singly, and seems to indicate from this some extraneous source or origin. It has been noticed many times in this locality—first, I believe, by Sömmering. You will find many published cases. Figures are given in the little *Manual of Ophthalmic Surgery*, by Wharton Jones. The best treatment is removal. This is the only situation in which the occurrence of this parasite can be diagnosed.

I have hazarded the opinion that this is the origin of the *tænia solium*: before long, I hope to make some more decisive experiments on this interesting point; if any of you anticipate me, I shall be more gratified than by any success of my own. The mode of experiment is easy. The segments of *tæniæ*, containing ova, must be freely given to young pigs, and these must be afterwards carefully examined for *cysticerci*; but frequent repetition is the only method of guarding against fallacy.

The *cænurus cerebralis* merits a short notice from us, as being a frequent parasite in the sheep, and also from its belonging to a perfectly distinct group of the cystic parasites. The *cænurus* consists of a large sac, from the middle membrane of which heads sprout, so that you have many heads to one cyst. These heads are much like echinococci, and are crowned with a circlet of hooks, below which are acetabula or suckers, and below these a short neck. These parasites produce in sheep the disease known as staggers, which is curiously enough endemic, pointing apparently to some local source of origin. It has been stated by Van Beneden, on the authority of experiments made by M.M. Kuchenmeister, Eschricht, and Leuckart, that these *cænuri*, given to dogs, produce *tæniæ*; and if the segments of these *tæniæ* be administered to lambs, that *cænuri* are developed in their brains.

Such is a short summary of our knowledge of the cystic worms.

3. We must now pass to the cestoid group; and of these we shall only consider the two parasitic on man, namely, *tænia solium*, and *bothriocephalus latus*.

*Tænia solium*, the common tapeworm, inhabits the intestines of man; it is generally, though not always, solitary; the head is either in the duodenum, or the jejunum, but the segments may extend even into the rectum; its length is sometimes very great. It seems more distributed in some places than others, but it exists in all parts of the globe. I have examined specimens from the Cape, in every respect the same as those of England; indeed, throughout Africa it is very common, and this seems to me to militate rather against water as its source of origin. It is very easily distinguished; the head is small, about the size of that of a middle-sized pin, hemispherical, rather flattened at its upper aspect, on which are placed the four suckers or discs; in the centre is a single series of very small hooklets; to this head follows a neck, consisting of numerous almost capillary segments, which gradually increase in size until they are the well known joints of the tapeworm, described by old authors as cucurbitary worms.

The four suckers have no relation to what is usually called the alimentary canal of the *tænia*. This is more aptly termed a "water vascular" system; it consists of two lateral trunks on each side, connected in every segment by a transverse branch, and probably also connected with a finer system of vessels which Blanchard has described as forming a network in each segment. This water vascular system is lined with cilia.

Blanchard has also described a nervous system consisting of a single ganglion in the centre of the head, sending off branches to the suckers.

The greatest part of the segments is, however, occupied by the generative organs, each segment having both male and female organs of its own; these last or the ovaria consist of a central canal, nearly as long as the segment, and having ramifying branches; from this passes a duct, which, near its termination, bifurcates, the upper division alone opening externally, the other forming a kind of uterus, in which the ova accumulate until the whole segment is obscured by its dilatation. The male apparatus is a long convoluted tube, whose aperture is close to that of the female organs, but yet distinct from it.

The segments at first increase by transverse fission; but as they are further removed from the head, they seem only to grow, and not multiply; all increase in number takes place, therefore, at the upper part. The likeness between each single segment, and the perfect distoma, or fluke, is one merely of analogy, not of homology; the segments afford only another example of what we have often seen before in the lower animals, generative organs, endowed with a separate vitality, budded off from the individual, in order to insure the propagation of the species. I have seen one of the segments of a *tænia* crawl several times round the edge of a saucer of water in which it was placed.

The symptoms that these pests produce in man are various; amongst the most usual are a general feeling of malaise, a capriciousness of appetite, especially in the morning, drowsiness in the day time, and sometimes even more important effects, as epilepsy; but none of these can be looked upon as diagnostic, unless the patent is passing segments of the worm. Of course, the best remedy is the removal of the parasite, and there are several modes of doing this. Amongst the most usual remedies are spirits of turpentine, pomegranate bark, ethereal extract of male fern, and kousso. The turpentine, is, I think, to be avoided if the same effect can be produced by other remedies, as even in these large doses it sometimes acts upon the kidneys: the bark of the pomegranate root must also be struck out of the list, as its efficacy is not to be depended on except when fresh, in which state we cannot procure it in England. As far as my experience goes, ethereal extract of male fern, if properly prepared, rarely fails in destroying the *tænia*. Kousso is also very efficacious; but in order to insure success with

either of these remedies, we must be careful to attend to the common sense of the question. We said that the head of the worm was in the duodenum, or upper portion of the jejunum; now, of course, it is necessary that the head should be left as far as possible unprotected by food, in order to allow the medicine to act more freely on it. The patient must, therefore, fast for at least twenty-four hours before taking the remedy. Again, as neither the fern nor the kousoo are in themselves purgatives, a brisk dose of castor oil must be given a little while after the remedy itself has been administered. In Africa, another fern is given, the *aspidium athamanticum*, and lately two other remedies have been added to our list, both natives of Africa, and both myrsinaceous plants; these are, *myrsine Africana*, and *mæssa picta*. It would be curious to examine if there is any common chemical property in plants so widely different in botanical character as the pomegranate (*myrtacææ*), *brayera anthelmintica* (*rosacææ*), the two plants above mentioned, and the *aspidia*, which should make them alike poisonous to these parasites.

*Bothriocephalus latus* may be distinguished from *tænia solium* with the greatest ease. The head is elongated, and instead of the four suckers, is provided with two sulci; the genital pores are also in the middle of each of the segments, and not at the sides, as in *tænia*. The segments are also proportionably broader and shorter. This tapeworm is not found in England; it is, however, common in Switzerland and Russia; this local distribution of the parasite may perhaps help us to discover its origin, and it would be of interest to inquire if there be any peculiarity in the food of the inhabitants of those districts in which it occurs. It is a subject well worth attention, since if the clue to the cause of these pests be once known, it will be easy to prevent their occurrence.

We shall leave the consideration of the trematoid worms, or flukes, and the nematodea, for another day.

Birmingham, August 1855.

### A CASE OF ILEUS, FROM FIBROUS CANCER AT THE ENTRANCE OF THE CÆCUM.

By THOMAS SANDWICH, M.D.

On the 11th of June, I attended, in consultation with my friend Dr. Boulton, Mr. Wynn, an iron-founder, aged 42 years. He was of a meagre and emaciated habit, but was a man of considerable mental power. For some months, he had some difficulty in keeping his bowels regular.

The symptoms were at first those of a mild form of gastro-enteritis, and no fears were entertained of his speedy recovery. Defæcation was daily effected by mild aperients and an injection, which brought away a few dark green coloured scybala. A slight ptalism being in a few days produced by alterative doses of *hydrargyrum cum cretâ* with Dover's powder, the medicine was discontinued.

Soon afterwards the costiveness became insuperable; nothing returned but the enemata. He complained of nausea, tormina, and spasmodic contractions of the abdominal muscles; and began to vomit matter which had a stercoraceous appearance and a fæculent odour. The true character of the disease was now apparent, and the usual means were adopted to procure fæcal evacuations. He was bled to relaxation; tobacco enemata were administered at short intervals; full doses of opium were given; and generally speaking the plan of treatment recommended by the late Dr. Abercrombie of Edinburgh, in his excellent work on *Diseases of the Abdominal Viscera*, was adopted.

The patient was now seen by Sir Henry Cooper, of Hull, who approved of our proceedings.

On the failure of these measures, the long tube of the stomach-pump was carried up the colon; and the bowel being distended with warm water, the action of the instrument was reversed, so as to empty it completely. Bleeding *ad deliquium*, in the erect posture, was then tried, followed

by a drachm of croton oil in an enema. Galvanism was employed for several days, cold affusion of the legs and belly, ice to the abdomen, and finally crude mercury, but all without effect.

The case was now left to nature, and our efforts were limited to means calculated to relieve pain and keep up the strength of the patient. He was fed with chicken-broth, beef-tea, and jellies, in small quantities at a time. A mild injection was given every morning; and twice a day beef-tea and laudanum were administered *per anum*. These measures were approved of by Mr. Hewson, an eminent surgeon from Lincoln, who met us in consultation.

By this plan of treatment, he was rendered tolerably comfortable; the spasms and stercoraceous vomitings were less frequent; the latter occurring only once in two days; but there was a daily increase of emaciation. At length, at 1 o'clock, A.M., on the 22nd of July, six weeks from the date of the attack, having occasion to get up to the night table, he felt something give way, and became alarmingly ill. I found him moribund, the wrists cold, the jaw fallen, the pupils of the eyes dilated, and the face hippocratic. Being put to bed, cordials were administered; but he only partially rallied, and expired at half-past 11 o'clock, A.M.

All his medical attendants were agreed that the cause of obstruction was seated at the junction of the ileum and cæcum; but whether it was an intussusception, or the pressure of a tumour in that situation, was uncertain. As, however, the disease advanced, most of them were inclined to the latter supposition; the comparative mildness of the symptoms, and the duration of the complaint, being adverse to the notion of there being a volvulus. It has been observed, that what he vomited had a stercoraceous appearance and odour; but it was never supposed that the contents of the colon were ejected. We had indeed every reason to believe that it was perfectly empty. On this point, Morgagni has some pertinent remarks. "*the ingesta*", he observes, "which are conveyed downwards with the *succus intestinalis*, the *succus pancreaticus*, and the bile, and are delayed in the small intestines, especially if the parietes of the canal are inflamed, acquire the peculiar odour of stercoraceous matter, and may be called excrement without impropriety."\* But, to return to the narrative, a *post mortem* examination revealed the following particulars.

The small intestines were immensely enlarged, while the cæcum was contracted, and the colon reduced to the normal dimensions of the small intestines. At the junction of the ileum and cæcum, the intestine was converted into a hard annular scirrhus tumour, resembling the gizzard of a fowl, which adhered to the sacro-iliac juncture of the pelvis. It was thinner on the sacral aspect than on the upper; and the canal was so much narrowed as only to admit the passage of a large dissecting needle. There were several ulcers towards the termination of the ileum, from the largest of which issued the quicksilver that had been taken.

The alimentary canal, from the mouth to the anus, is the seat of fibro-cancer, or scirrhus, as it is commonly called. The ordinary situations of that disease are the lips, tongue, œsophagus, the cardiac and pyloric orifices of the stomach, and the rectum. I have, however, seen a cancerous tumour, about the size of a small orange, in the larger curvature of the stomach, and also in the sigmoid flexure of the colon, which was ulcerated and adherent to the bladder; so that ultimately fæces were voided with the urine. Two cases are on record of scirrhus of the cæcum;† and Nicholas Piso, as well as Rokitsky, mentions scirrhus as an occasional cause of ileus; but I have only met with one recorded case of this disease produced by a scirrhus of the entrance of the cæcum. The case occurred to the great Boerhaave, and is related at length by Von Swieten, in his *Commentaries*.‡ The difference between cancer of the cæcum and its entrance is remarkable. In the former the

\* Cook's Morgagni, vol. i. p. 55.

† Copland's Dictionary, p. 280.

‡ Comment, vol. iv, p. 229.