Thesis
Composed by
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Perforation of the Appendix
Verniformis

Kirkcudbright. April 26th 1890
Cases of Perforation of the Appendix vermiformis

Case I. causing Peritonitis, and Fecal Abscess.
Evacuation of the Abscess by operation: Complete Recovery.

Case II. causing Sluice Fecal Abscess of long duration; Spontaneous Evacuation in the right buttock; Death from Exhaustion.

Case I. A. C., female, aged 16 years.
I was called in early part of the year 1888 to see a young girl who was suffering from severe pain in the abdomen; also vomiting badly, the vomit consisting of bile and acids of food. She said that on the previous night she felt something giving way—giving a crack—in the lower part of the right side of the abdomen. Soon after this the severe pain began in the same place and radiated towards the middle line. Her previous health was very good. Her family history excellent. Her teeth were always regular, with no pain or disturbance. She had ceased "altering" for some days before she took ill with this complaint. The bowels were regular.
There was no history of any injury.

On examination, the temperature was 103°F. in the axilla. Pulse, 120; respirations regular, small, thirsty. Respiration a little suppressed and shallow, not much accelerated. Skin rather moist and clammy. Tongue slightly furrowed. She was not in a state of collapse, although she was weak. She was lying in bed on her back with her knees drawn up, to relax the abdominal muscles and fasciae. On examining the abdomen, it was found to be distended and tympanitic; tenderness considerable over the right iliac region, elicited by pressure; some also in the left iliac region, and in the hypogastric and umbilical regions. Fullness, most marked in the right iliac region, but no distinct tumour could be felt and no dulness anywhere over the abdomen.

Eth. Spirit in Jill was ordered to be taken every four hours to alleviate pain, and to keep the bowels quiet, light infusates of linseed meal were applied over the abdomen; diet of liquid food only, such as beef tea, chicken soup, and plenty of milk. The pain and tenderness gradually subsided from the abdomen. The temperature fell. But all the while she became weaker, and there still remained a pain and tenderness in the right iliac region.
together with fulness, but no well-defined tumour could be made out, and no dulness on percussion, no feeling of fluctuation either superficial or deep-seated could be made out. There were no rigor. At the end of five days from the onset an enema of tepid water was given which moved the bowels without much pain. The tongue was now dry and covered with a whitish-brown fur. Afterwards, Rochelle salts were given in divided doses every second or third morning to move the bowels. At the end of two weeks after the onset the complainant complained of severe pain in the pelvis, especially when the bowels moved, accompanied with tenesmus and throbbing, although the pain over the abdomen proper was rather less. The pain was remittent, being very severe at times and lull'd in the intervals, but never quite gone. She was taking opium ever since the attack came on, but not quite so often latterly as at first.

On rectal examination, a considerable quantity of mucus was observed to come away at frequent intervals from the rectum. Around it a fluctuating swelling, tender on pressure, was felt in front of the rectum about three inches up from the anus, resembling an enlarged and inflamed prostate in
the male, but softer. On vaginal examination, the same soft, tender, fluctuating tumour was felt through the upper part of the posterior vaginal wall bulging down the posterior fornix. There was no 'pointing' in the right iliac region.

A large hypodermic syringe armed with a long needle was inserted into the rectum, guided by the forefinger, and passed through the anterior wall of the rectum into the substance of the tumour. On withdrawal, it was found to be full of very foetid pus. Immediately after this, aspiration was performed in the very same place, and over a pint of very foetid pus was withdrawn. The patient felt relieved and rested well afterwards, but she said she felt matter collecting again. By the way, there was no thinning from disease, as yet, of either the rectal or vaginal walls. Two days after aspiration, a long large needle-cannula was passed into the swelling at the old place of puncture in the rectum, and the cavity allowed to drain freely; fully a pint of the same kind of pus came away. The cavity was then syringed out freely through the cannula with a potash, and a third wash (a teaspoonful to the tumblerful) until the lotion regurgitated in almost the same condition as it
entered. The canula was then withdrawn, and the opening it made in the rectum enlarged by means of an ordinary pair of dressing-forcps intro-
duced closed into the wound and opened up in it.

The opening enlarged by the forcps was enlarged
still more by introducing the forefinger into the
wound. The object of this was to allow any more
jus which might collect, to come away freely. No
chloroform was used. The Patient did not feel very
exhausted after the operation. The enlargement of the
wound in the anterior rectal wall was the most pain-
ful part of it. I left orders to have the rectum syringed
out with diluted b.iq. Potassii ber.Cryptography. every three
or four hours, to take still, ext. Qii. pot. every six
hours, and to take milk and soups. She rested well
the following night— and very little jus came away.

Next morning an instrument like a metallic female
Cat liver, but with the opening at the very end instead of
at the side, was introduced through the wound
and the cavity syringed out with diluted b.iq.
Potassii berかかり. of lukewarm temperature—very little
jus came away still. The swelling had subsided
so had the tenderness over the right iliac region.

The vagina was examined and its walls found
tobe healthy. An enema of tepid water was or-
dered, with injunctions to point the nozzle of the syringe towards the posterior wall of the rectum so as not to injure the wound more. This moved the bowels and with almost no pain. The metallic instrument like a catheter was passed a few morning yet through the wound in the rectal wall, and the cavity syringed out, but very little pus came away. The diarrhea was no longer given, and the bowels moved freely without any pain. The wound in the rectal wall soon healed up, and the patient was soon free from pain anywhere. The temperature always prevailing above the normal became normal. The pulse which was quick at first remained quick and weak throughout the whole course of the illness, but became stronger and slower as the approached convalescence. She now made a good and speedy recovery, and in a month from the onset, was going about the house, almost as well as ever she was. She was ordered to avoid indigestible diet such as cheese, and was warned not to strain herself by lifting heavy weights or such like. When she first got out of bed she felt a weakness over the right iliac region, but even thus passed
away in a few weeks more, and now, two years afterwards, she is quite well, and has remained quite well ever since her severe illness.
Case II
J. B., aged 18 years. Stable-boy.
I was called in the last stages of a severe illness to see the patient who had been previously ill for three months before I saw him.
Before that, he had always enjoyed very good health. He had been under other medical advice during the three months of his illness, and not improving but getting worse, the patient wished me to see him. When I saw him, he complained of severe pain in the groin, shooting down the thigh to the knee, and even down the leg to the toes. He was confined to bed when I saw him, shortly before that, he tried to walk but was that lame, and had so much pain and weakness that he had great difficulty in getting along. He was very weak when I saw him first. Pulse feeble and diastolic and quick. Temperature elevated especially in the evenings. He had night sweats and fright sweats. He was hectic looking. Had occasional diarrhoea with very frothy stools, no vomiting. There was a swelling over the right iliac region. No fluctuation could be distinctly felt in it. The percussion note was tympanic.
all over the abdomen, even in the right iliac region, except perhaps in the latter region, a mere line of dullness may have been thought to have been present, close beside the iliac bone. There was no pulsation on palpation in the right iliac region, but there was tenderness. There was no pain over the general surface of the abdomen. No enlargement of the liver. The skin over the right iliac region and over the very upper part of the thigh presented a somewhat blanched appearance. It was, unfortunately, neglected to perform a rectal examination, but the patient complained of no measliness in the rectum. His chest was examined, and under percussion, a flatness of sound was elicited all over the right lung, but no absolute dullness. Numerous rales were heard all over the right lung; a few were heard over the left lung too; there was also flatness of percussion note over the base of the left lung, but nowhere else over the left lung. There was a kind of moist, hoarse, tickling cough. There was very little of expectoration, but what was was mucous and purulent. There never was any lameness. The family history was good. His brother and
Sisters were pictures of health. His father, a very healthy man. His mother died before him (the Patient), the cause of death being, the father said, consumption; but on interrogating him more fully afterwards, he said that his wife had no cough and no putting up of blood from the chest, only general wasting, and that evidently from some obscure illness. Besides, the old family physician of his wife (when she was a girl) said it was very unlikely that it was consumption. Taking the cause of the death of the Patient's mother unequivocally, granted for consumption, and considering the present condition of the Patient—the state of his chest, the cough, the hectic fever, the night sweats, and the general wasting, I diagnosed his illness as subacute general tuberculosis, and the condition of the right iliac region as being the local manifestation of it—afflicting the Genitourinary and glands in that region. I thought the case hopeless and only ordered Yellow's Syrup of the Hypophosphates and Paterson's Extract of Malt. He continued to get steadily worse. He lay on his right side with the right thigh drawn up.
A bed-sore formed over the greater trochanter of the right side, and soon afterwards a large quantity of very foetid pus, over a joint, leaving a florid ulcer, made its escape. The cavity was syringed with antiseptic lotion—sublimate solution. The Patient rallied a little the first day after the pus came away, but ultimately sank from sheer exhaustion in two days more.

By consent of the Father of the Patient, I was allowed a post-mortem examination.

On opening up the abdomen, I soon reached a large abscess-cavity which had recently contained the foetid pus, but was now empty. It lay in the right iliac fossa between the iliac fascia and the iliacus muscle, surrounded by thick adhesions. It was prolonged backwards towards the sacrum, but not upwards towards the rectum. It did not descend below the brim of the Pelvis. A search was made for the oesophagus and its appendix, and it struck me that it lay higher up than I expected to find it with the appendix behind it and hanging downwards. Properly speaking it could not be said to lie in the right iliac region.
Caud inwards and immediately below the right kidney, but rather higher up, and it lay well back. It lay upon the Psoas muscle so that this case confirmed Treves' account, viz. 'that the cæcum is most frequently situated not in the right iliac fossa, but on the Psoas muscle or rather on its fascia'. The lower part of the appendix was, however, in the right iliac fossa and adherent to the iliac fascia by its tip. In the Anatomical Text-Books of my student days, the cæcum with its appendix was placed in the right iliac region. A goose-quill could have been easily passed from the abscess cavity into the cavity of the appendix, but not onwards into the cæcum for there was no communication between the cæcum and its appendix. There was complete stenosis of the valve or fold of mucus membrane that lies between the cæcum and its appendix. One part of the limiting membrane between the two was thinner than what it was elsewhere, and here complete closure had taken place. The appendix itself presented a gangrenous appearance at its distal extremity. Its cavity was empty. In the cavity of the cæcum
itself was a little force. Its walls showed signs of inflammation. There was no tubercle in the walls of the cæcum or its appen-
dix; no tubercle was found anywhere in the abdomen, or in the whole body. No adhe-
ssions of lymph between the coils of intestines and no jin amongst them. No foreign
body could be found anywhere in, or about, the appendix, or in the abscess cavity. The ab-
sscess-cavity communicated with a similar one in the pleural region through the great sacc-
sciatic foramen. The Pyriformis muscle pas-
ses through this same foramen on its way
from the Pelvis as it goes to be inserted into
the inner part of the posterior aspect of
the great trochanter, so the jin had burrow-
ed along the course this muscle takes. The
great and small sciatic nerves also pass
through this foramen as they make their exit
from the Pelvis. They are in very close proximity
to the Pyriformis muscle; sometimes the great
sciatic nerve passes through the fibres of the
Pyriformis muscle. This would explain why
the patient had such severe pain shooting
down the whole length of the right lower
extremity to the toes. The patient was very lame before he was finally obliged to keep his bed; while in bed he could scarcely move the right thigh and leg. This I am certain was due, in a great measure, as any rate, to the involvement of the Psoas and Iliacus muscles, along with their respective fasciae.

Regard the cause was tubercle was found and no foreign body so that in all probability it would be a little mass of hardened pieces that would make its way into the cavity of the appendix, remain there and form a nucleus to the mucus fluid of the appendix which would collect around it, get inspissated and form a larger mass, setting inflammation of the appendix cause occlusion of the opening between it and the colon, so that this hardened mass would get imprisoned quite more inflammation and cause the appendix to throw out lymph which would become formed into adhesions uniting the tip of the appendix to the iliac fascia. By and by, the inflammation would spread and affect the blood-vessels of the appendix, causing thrombosis of them, and so interfere with
the blood-supply of the parts beyond, the
distal end notably would suffer, for it has
got no mesenteric (with blood-vessels of it)
of its own but is dependent altogether on
the blood-vessels of the proximal part of the
appendix, and on those of the cæcum. For its
blood supply so that congrene of the tip of
the appendix would ensue rupture of the
wall and discharge of its contents into
the abdomen, in the iliae fossa.
A good deal has been written of late about perforation of the Appendix vermiformis, more than usual to be, and since laparotomy has been robbed of a great many of its terrors, the disease can be better understood and more rationally treated.

Perforation of the appendix is a rare disease. It is also a very fatal one, on account of the great danger of acute peritonitis of a virulent type coming on suddenly, or at any time in the course of the disease; or, on account of fistula coming on and causing death after some months from the establishment of a so-called permanent jejunal fistula; or from some other complication.

Case II was a lingering one, extending from first to last, for three months. In all probability, if steps had been taken early to evacuate the abscess properly and provide for effective drainage the patient's life would have been saved. Pepper in the Philadelphia Medical News, Jan. 27th, 1888, speaks of the frequency with which these cases assume a chronic form, running
over months, until the patient is relieved by operation or spontaneous rupture of the abscess, or dies from general peritonitis. In this case there was no general peritonitis. It was only local and confined to the region of the cæcum. In the Medical News, Ap. 27th 1889, Dr. Weir of New York says, under the heading, Perityphlitic Abscess—"That all such abscesses originate in the peritoneal cavity and there develop to an appreciable size before invading the peritoneal structures or visceræ," General Peritonitis may come on at any stage of the disease, owing to the contents of the bowel, or from an abscess invading the general peritoneal cavity.

Rupture of the appendix, if left to pursue its course is often fatal, but under careful examination and proper treatment this fatal issue can be often averted. Fortunately, the rectum should be examined in every case, and the vagina too in women. This perhaps the most important physical aid we possess, it ought to be done early and often repeated. If, under this
examination a fulness is detected on the
right side of the roof of the pelvis, we may
be sure that there is a mass of exudation
present which will not resolve, and is,
therefore, a certain indication for opera-
tion. On the other hand, if there is no
fulness, we may delay a while, and
watch carefully. If, moreover, we have
reason to suspect the presence of pus,
through elevation of temperature or in-
crease of symptoms in the course of the
disease, rigors occurring, and a sensa-
tion of throbbing felt by the Patient,
and fluctuation being felt by the medi-
cal attendant, no delay should be made
to evacuate the Jus, for fear of periton-
itis, or other dangerous complication
coming on. Try aspiration with a long
fine needle, or insert a long needle of a hy-
dropneumatic syringe. Pass the needle well into
the part affected or supposed to be affec-
ted, say into the right iliac region, and
also, if thought necessary, into the hypo-
gastric region, the bladder being first.
emptied. Indeed, if general suppurative peritonitis be suspected, the needle may be inserted into various places over the abdomen. If pus be detected, we ought to make a free opening. The needle is a very useful diagnostic aid. It is also a useful therapeutic aid, in part at any rate. Probably the best operative procedure is to make an incision over the tumour, or if no tumour be present over the place where the pus is detected or even over the place where pus is strongly suspected, and provide for effective drainage, ligature the perforated appendix at its base and remove it. If the peritoneal cavity should, unfortunately, be opened into, it must be carefully irrigated by weak antiseptic lotion and effectively drained. Sir Dyce Duckworth and Mr. John Longton, in a paper read before the Royal Medical and Chirurgical Society, June 11th, 1889, on secondary laparotomy for suppurative peritonitis consequent on gangrenous Appendix Vermini, was advocated the value of making the incision in the right semilunar line as
being more directly placed over the seat of the lesion than are made in the middle line, this is what is to be expected. Exception, however, has to be made in cases where the suppurative peritonitis has extended considerably beyond the seat of the lesion. They also laid stress on the importance of early operation when suppurative in the neighbourhood of the caecum was supposed to exist.

Dr. Weir of New York (Med. News, April 27, 1887) also advocates the lateral incision as soon as symptoms constitutional or local indicate the formation of abscess, and that if these symptoms continue for forty-eight hours, there is greater danger in leaving matters alone than in the proposed lateral or median laparotomy which should then be immediately resorted to.

In the operation of laparotomy for this disease we need not expect to find the various layers of the abdominal wall as they exist in health, but they will be altered by disease—by inflammatory exudation, and will present a bruised appearance and
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Hardness. For instance, Wernig of New York, in the Medical Record of April 27th, 1889, says that in one case of this disease in which he operated, "the peritoneum was recognized only as a mass of greyish fibrous structure, more like fibro-sarcoma."

"Fitz, in the International Medical Society's Journal of Oct. 1886, shows that in eleven per cent of the cases of perforative appendicitis the patient is subject to relapse. Mr. James proposes in cases of relapsing "pyphilitis" to perform laparotomy and remove the vermiform appendix in the period of quiescence following an attack. In one case in a man aged thirty-four, he did this successfully, and the patient has since been free from relapses. One would think this a justifiable operation especially under the present comparatively safe antiseptic methods, seeing that rupture of the appendix is such a fatal malady. "Pyphilitis is often the precursor of inflammation of the appendix whether"
Perforative or not, and in inflammation or perforation of the appendix there is some typhilitis as well for the caecum and its appendix are very intimately connected anatomically. Fenwick in the Lancet of Dec. 6th 1884, says that in four cases out of forty-three, of perforation of the appendix—"there was a history of a previous attack of typhilitis from which they all recovered, but they all died from peritonitis, or from peritonitis and abscess after rupture of the appendix came on."

Dr. Michel Gangolphi of Lyons has in the Revue de Chirurgie, an article, of late date, on the operation of trephining the Pelvis for supplicative Peritonitis. Now the appendix lies well back in the abdomen and upon the Diaphragm muscle. I think me therefore, that in perforation of the appendix with subsequent suppuration, we have in Dr. Gangolphi's operation a legitimate one and a good effectual and safe one. The Peritoneal cavity has not the appendiceal opened. The operation is free from danger. It can be rapidly perform-
med, and what is very important ef-
fec tual drainage is provided for. If pus
be not found at once, search might be
made for it by means of a blind probe,
or the finger inserted amongst the loose tis-
ues in the immediate neighbourhood,
taking care not to injure any important
structure. This operation if it had been
done in case it would have suited ad-
mirably, I am confident and would,
in all probability have saved the Pat-
ients life, if it had been performed suf-
ficiently early. The situation that is
Gang of the grefers is a joint nearly
three finger breadths below the crest
of the ilium, and three finger breadths
behind the anterior superior spine.
In case it the pus had burrowed into the
lowest part of the peritoneal cavity, or
into the recto-vaginal pouch, and it
naturally occurred to me to open the ab-
cess there, after fluctuation was detected,
and the presence of pus determined. I knew
that drainage could be effectually provid-
ed for. The abscess, if left to itself, might
have burst into the rectum or vagina. If it
into the latter disagreeable complications,
possibly, would have arisen. If it had
burst into the general peritoneal cavity,
death would have been certain, speedily.
so I thought it best to anticipate mat-
ters, and make an opening through the
anterior wall of the rectum. A good result
with a speedy recovery. Fortunately, fol-
lowed. The patient has, moreover, contin-
ued well for over two years now, with
not a single relapse, so that evidently the
value of Gerlach or fold of mucous mem-
brane between the cecum and its ap-
pendix has become completely closed up,
or stenosed, and has prevented any irritat-
ing matter going into the appendix. The
appendix too has almost certainly be-
come adherent to the pelvic wall, or to some
neighbouring part. Very probably also, it has
become shrivelled into a fibrous band.
I have since that operation seen a case un-
der the charge of another medical practit-
ioner, in which I was informed that a
perityphlitic abscess formed as the re-
Swell of perforation of the appendix, the medical adviser suspected the abscess to burst in the right iliac region. It did not however, but burst into the bowel somewhere, and the patient recovered. There is a swelling or mass of induration in the right iliac region still but no induration can be felt in the right side of the roof of the pelvis on rectal examination. When the patient first got up out of bed he had to walk bent forwards and to the right side, on account of the tightness of formed adhesions.

Case II was rather a baffling one. When called in first, I gave greater prominence to the lung-symptoms than to any other. A low form of Pneumonia was present evidently hydrostatic Pneumonia for it was principally basal and was most marked on the side on which the patient lay viz. on the right side; but then the patient was very prostrate when I saw him so the lung affection must have been in all probability an after-complication besides be very likely
got a chill from the rigors and perspiration which often came on, and the window of the room where I was frequently open. The lung affection could scarcely be septic pneumonia for pyaemia rarely occurs after focal abscess. Strange to say, the course of temperature was too regular to suppose pyaemia to exist, and there was no enlargement of the liver, and no tenderness over it. Also, the illness was too prolonged to suppose acute pyaemia to exist. Kernick in the Lancet of Dec. 6, 1884 says that pyaemia sometimes but rarely occurs after perforation of the appendix. The reason seems to be that the thickened adhesions prevent the absorption of fluid into the system. A case is mentioned in the Lancet of Feb. 21st, 1885 where pyaemia occurred after perforation of the appendix and on post-mortem examination the liver was found studded with abscesses.

Considering the cause of perforation of the appendix, it seems to be more frequent in males than in females. There is no anatomical difference of the structure in the two sexes.
to account for this disparity. The cause seems to be, that, as a rule, a greater quantity of indigestible food is consumed by males than females, setting up cataract of the intestines, notably typhilitis, and subsequent cataract in the appendix, leading to the formation of aconcretion and increase of that from the accumulation of catarhal products from the inflamed mucous membrane around the originally formed cecum, or around some other nucleus such as a mass of hardened feces or a seed; inspissation is going on all the while, and so a hard body or concretion is formed, which very often causes ulceration and perforation of the appendix. Yerwick in the Lancet of Dec. 6th 1884 estimates the frequency in females about eighteen to twenty-three percent of all cases, and in feminine cases the female proportion is doubled. As regards age, it seems to be most frequent in adolescents who consume food in the greatest quantity. Leblé, writing in Lienèse's Cyclopedia of Medicine, says,
"that in Gerlach's experience the dup- 
lification of mucusous membrane (called 
Gerlach's valve) which, more or less, blocks 
up the opening between the cæcum and 
its appendix becomes rudimentary with 
advance of years thus explaining the 
diminished frequency of focal infec-
tion and perforation of the appendix as 
people get older."

We used to be taught that cherry stones and such 
like foreign bodies were the principal causes of per-
foration of the appendix, but that was subsequently 
found to be greatly exaggerated. Now, concretion 
of some kind in the canal of the appendix seems 
to be rightly considered as the main cause 
of perforation. Catarrh is in all probability the 
real initial cause in most cases being, as 
before said, the result of too much indigestible 
food being consumed and lodging in the cæ-
al mucus, the catarrh extends to the appendix 
concretion follows and this causes perforation. 
The perforating ulcers in the stomach were attribut-
ed by Kochitschki to haemorrhagic erosion of the 
mucusous membrane, the result of catarrh; this 
theory derives some support from the fact that
Perforations of the Stomach are most common in
those situations where catarrh is most frequent,
viz., at the pyloric end of it. In catarrhal affections
of the Cæcum and its appendix, we naturally expect
the catarrhal secretions of the mucous membrane
to gravitate to the lowest part of the canal
of the appendix and there by their irritation
produce ulceration and perforation of its walls,
and this process will be greatly aided because it is in
the neighbourhood of, and in free communication
with, the Cæcum, where decomposing and irritat-
ing materials lie; thus the process will end not in
mere inflammation or abrasion as it would otherwise
have done, but in perforation. Perforation of the ap-
pendix often comes on after attacks of typhilitis. Dr.
Weg's above-quoted mentions four cases of such,
out of forty-three of perforation of the appendix.
The healthy appendix is a hollow structure depending
from the cæcum and in free communication with
it; it must therefore be common for fluid to en-
ter in and pass out of it without injury, and
it is common to find in post mortem examination
seeds, flint and even worms occupying its
 cavity, without any apparent ill results; but
when typhilitis comes on and causes stricture of
the little valve between the cæcum and its appendi-
dix then the danger begins for feces, secretion and
other contents cannot return into the cæcum,
but set up ulceration and perforation of the appendi-
dix. As people get older there is less danger of these
untoward results for the valve aholplies with ad-
nance of years.

Over-distension of the appendix may be a cause
of its rupture, as over-distension of the cæcum many
hollow viscus may be a cause of its rupture. Hill
in his Clinical Manual p. 275 says that “accor-
ding to Virchow the canal of the vermiform
appendix may be distended into a round sac
the size of a large fist.”

Diverging a little, an abscess may form behind the
cæcum and its appendix as the result of tension
of renal gasas empyema or helicis abscess or of ab-
cess the result of caries of the vertebrae. No such ab-
cess was suspected however in either case I or case II
In case II the autopsy cleared up the cause and
as to Case I the kidneys were normal there was no
blood or albumen in the urine and the Patient
is now in perfect health. There was no disease of the
vertebrae, no spinal curvature or caries of the
vertebral, no lameness, no swelling in the lumber
region or thigh, a chest disease, or uterine disease. She was in perfect health before she took badly and soon regained good health. Such an abscess, as one forming behind the cæcum might burrow into the cæcum causing a discharge of pus from the bowel along with diarrhœa, for the presence of pus in the bowel would set up diarrhœa. An abscess, too, might become focal subsequently through the escape of focal matters into it and the lesion in the bowel might become healed up so that what was previously an ordinary abscess might become a focal abscess; again a focal abscess might, if the communication with the bowel get closed, become an ordinary abscess and no focal odour be present when it is opened. Mr. Bristow in Reynolds System of Medicine Vol III. p. 127 says:—It must, however, be remembered that not infrequently, the communication with the bowel has been cut off before the abscess goes external and that the absence of odour, or of gas does not necessarily show that the abscess has not commenced on perforation of the bowel." Dr. Allchin writing in Dr. Amis's dictionary of medicine on Perityphlitis i.e. Perityphlitis proper or inflammation of the loose connective tissue behind the cæcum. For
in some books there is a good deal of careness displayed with regard to the uses of the term.
Typhilitis and Perityphilitis, Typhilitis Proper or Typhilitis means inflammation of the Cecum itself. Well, Dr. Allein says: "Exceptional cases of Perityphilitis occur where no cause can be assigned beyond cold." Perityphilitis like cellulitis elsewhere e.g. Pelvic Cellulitis may end in resolution or suppurate and form an abscess.

In Tubercular Peritonitis an abscess may form in this region without any well marked symptoms, as I have myself observed in at least three cases of General Tuberculosis. In all the temperature was generally slightly subnormal, and in none did it ever rise above 100° F. as I observed it. In one of the cases the abscess the abscess burst externally, and besides the huge large caseous masses could be seen coming away, the bowels were matted together by adhesions and studded over with caseous tubercular nodules and masses; in one place moreover the small intestines had given way and its contents made its way through the abdominal wall at the place where the abscess burst.
An American writer Dr. Ransdoff of Cincinnati, in the Journal of the American Medical Association, July 14th, 1888 p 44, argues that in a fair proportion of cases perforation is brought of the appendix is brought about by displacement of the appendix and consequent torsion of its vessels, with primary involvement of the distal end and that the exciting cause is often a violence such as might result from blows on the abdomen, excessive exercise, lifting a weight, or vomiting.

Typhoid fever is sometimes a cause of perforation of the appendix. Liebermeister, in Lieuksen's Cyclopaedia Vol I, p. 151, says that, in perforation of the bowel from typhoid fever, the opening is found most frequently in the lower portion of the ileum though it may take place at a point higher up in the small intestine or in the colon especially at the vermiform appendix.

Flannelson in the Pathological Transactions, Vol. XVII, p. 127, records "a case of perforation of the appendix in the course of typhoid fever, but there was no escape of fecal matter in this case! This was rather anomalous, seeing the stools were so liquid in typhoid fever, probably adhesions formed
before the perforation was complete and so prevented extravasation; and even if no adhesions had had time to form, if the perforation was small (which it would be in that particular place) the mucous membrane which would be everted into the wound would prevent the extravasation of bowel contents. Besides, although Surgeons and Physicians talk of the peritoneal cavity, there is really no such space in the living healthy human body outside the bowels and inside the abdominal walls lined by peritoneal membrane; for, by the equal pressure of the abdominal muscles and diaphragm, every part of available space is accurately filled up, thus preventing extravasation of fluids. But if force is used to propel the contents of the bowel onwards—a frequent thing, for example, the state of affairs is altered and there would be very great danger of extravasation. Similarly, in the case of lesions of abdominal arteries as from wounds the heart would propel the blood into the peritoneal cavity; and there would be no difficulty about this, seeing blood is very liquid in consistence.

We cannot be too much on our guard in mild cases of typhoid fever for perforation of the bowel might occur at any time, and an error in diagnosis might be easily made.
Pathologists tell us that perforation of the caecum is very rare except in phthisical cases. Henle in the Lancet of Dec 13th 1864 says that "ulceration of the caecum is very rare except in phthisical cases," so, of course perforation must be rarer. Flint in his clinical manual, p. 282 says: "In some of the cases of acute caecitis which have fallen under the author's observation there is perforation of the intestine taken place and the termination has in every instance been favourable." Wein of New York (Medical News, April 27th 1869) says: "That as sterile accumulations or caecal perforation are so rarely met with as causes of peritonitis, abscess, or abscess, they should not be considered from a clinical view in any given case.

Cases have been mentioned by authors where, after a local abscess resulting from perforation of the appendix, a permanent local fistula formed, discharging its contents into the vagina or bladder, or on to the skin surface somewhere. Mistletoe in Reynolds's system of medicine, vol. III, p. 127, on writing on the subject of abscess forming in the neighbourhood of the caecum, and mentioning that besides those that burst internally or into a neighbouring hollow viscus and heal up, says also that "in other cases it [the abscess] remains as a permanently open fistula or as an artificial anus."
And from which the Lancet of Dec. 6th, 1884, p. 988 mentions
the case of a boy in which an abscess in the neigh-
bhourhood of the cæcum formed and burrowed itself
through the ligament presenting itself in the thigh. The
boy perfectly recovered after pus and feces had been
discharged from the wound.

Such cases, more readily and logically explained, it is
my opinion, by supposing rupture of the cæcum itself
to have taken place instead of rupture of the appendix,
and such, sometimes, does take place although rarely.
It seems that in perforation of the appendix, the little
value between it and the cæcum gets closed up, as
was seen in Case II and that any concretion or
other body in the cavity of the appendix cannot get
back into the cavity of the appendix. Indeed,
the imprisonment of the concretion or other foreign
body is the cause of the perforation, by acting as an
irritant against the walls of the appendix, setting
up inflammation, ulceration and perforation. Now,
seeing this little value is sealed up in perforation
of the appendix, how can we logically claim that
in a permanently discharging fistula in this
region, the perforation is in the appendix and not
in the cæcum itself? In such cases, it is more
rational to assume that the perforation is in the
cadaver itself and not in the appendix. This point would be useful in the differential diagnosis of perforation of the cadaver itself from that of its appendix. It may possibly happen that, in perforation of the appendix there is a permanently discharging fecal fistula owing to the little valve between the cadaver and its appendix not being completely closed up, but it seems that this idea would obtain but seldom, for medical men observe that, in perforation of the appendix itself, the little valve between it and the cadaver is generally closed up; moreover, this idea would work counter to the causal relationship. The sealing up of the little valve is Nature's safeguard in cases of recovery from perforation of the appendix as a safeguard provided by Nature against further attacks of the same; but cases of relapse have been observed by Fitz and Yeres, and the latter has successfully removed the appendix in such like more-relapse occurring afterwards. No ill effects seem to follow the successful removal of the appendix, for we know of no function proper belonging to the appendix, but good might follow in directly in more ways than one; for if the adhesions were to give way under a blow or training, or such like, a fatal relapse might follow, then again, supposing the distal end of the appen-
aix to become adherent to the pelvic wall or to some other structure, which is the case generally it would form a trap for a herniole of bowel. The small intestine or some other part to get incarcerated forming an internal hernia and this would very likely become strangulated and cause a fatal ending. Again it goes without saying that when the proximal end of the appendix is ligatured properly and the appendix successfully removed, there can be no more attacks of perforation.

In Case 1 the pain radiated from the point of the laceration towards the middle line. Dr. Peppe has observed in these cases that the pain is apt to radiate towards the middle line and sometimes into the genitals.

Sir Dyce Duckworth in the Lancet of Dec 6th 1889 calls attention emphatically to the increased resistance of the right oblique, the transversalis, and the rectus abdominis muscles which are called into action to protect the subjacent tender parts, and this contrast with the muscles on the left side of the abdomen.

We may, I think, diagnose perforation of the appendix vermiformis, if we have present:—a sudden attack of severe pain in the right iliac region and often a feeling of something having given way there, together with or immediately followed by more or less severe and
sudden peritonitis; tenderness and a feeling of resistance when pressure is applied over the part; elevation of temperature and increased pulse rate—the pulse small and wiry. All these characteristics occurring in a person previously in good health must be borne in mind. Later on, a distinct tumour or fulness with flatness on percussion can be elicited; fluctuation deep down may be felt; on rectal examination which should always be performed, a fluctuating tumour may be felt or at least an induration on the right side of the pelvis. There may be gurgling on palpating over the abdomen giving us the impression of liquid and gas being together under the band.

Syphilis is unlike this is a mild complaint and of short duration, and if any tumour is present, it is from foetal impaction and will therefore be detected at the beginning of the illness.

There may be phlegmonous inflammation in this neighbourhood, the result of cold or from pelvic cellulitis after labour or abortion, as in a case I had in which after labour, pelvic cellulitis came on, an abscess formed and burst in the right iliac region discharging pus for two years and then healing up. I have also a case just now of induration of the parts in the
right side region with a fistula in the same region, that has been discharging pus for several years. The cause is caries of the sacral vertebrae.

The majority of cases of intussusception occur in this region. Here the onset is sudden, the surface of the body cold, the pains colicky and intermittent, discharge of bloody mucus from the anus, an elongated, well-defined tumor extends in the course of the colon, and not so tender on pressure or dull on percussion as after perforation of the appendix, and the intussusception may be seen or felt or both through the anus.

Some cases of acute tubercular peritonitis may be mistaken for perforation of the appendix, especially in those cases of the latter in which the onset is insidious and the course gradual and prolonged, and of a low type as in case II in which I made a mistake of diagnosis at first. Both affections occur in this region, but in the former there is generally urgent diarrhea, loss of fever and less pain, and consolidation of the spines of one or both lungs, or other signs of the tubercular disease each time.

Perforation of the vermiform appendix is one of the most common causes of Peritonitis.
Levée writes in Lenzseni's Cyclopaedia says that "according to Bamberger, it is the seat of the ulceration in about four-fifths of the cases of fatal Peritonitis starting in the caecal region."

In cases of Peritonitis whether tuberculous or not, the course of the temperature is uncertain and the thermometer is no safe guide. I myself have had a case of Peritonitis of non-tuberculous origin apparently for the chest was perfectly sound and there was no persistent diarhœa. In this case there was no rise of temperature whatever, but there were present all the other symptoms of Peritonitis, and the Patient had, twice before, within eighteen months, an attack of Peritonitis in which the temperature was raised. She was, however, weaker when this, the third attack came on, than what she was previously, and we know that inflammation to settle with a rise of temperature are not so readily lighted up after an exhausting illness, or after haemorrhage than at any other time. In Peritonitis the temperature may be high or moderate or normal or subnormal. In Wunderlich's classical work on Medical Thermometry p. 391 is mentioned: - They (Pleurisy, Endocarditis, Pericarditis, and Peritonitis) may run their
Course without any elevation of temperature, for if they are occasionally found with high temperature, at another time we find them quite free from fever.

Again, "they may depress the temperature to subnormal degrees, or even collapse-temperatures." Also, "subnormal temperatures are especially common in peritonitis, and are always highly suspicious."

In the same work, p. 164 the author says that "Jacobson and Bernhardt have also pointed out that the temperature in inflamed serous cavities (pleura and peritoneum) may be lower than the heat of the same parts when healthy or than the temperature of the heart."

This is, however, different from what usually takes place. John Hunter was the first observer to remark local elevation of temperature in inflammation. He observed this after an operation for hydrocele. He did not think the temperature was produced by the circulation of the blood (through the lymph). He says in his works Edin. 1837 vol III p. 338, that, "It is very evident that warmth depends on a different principle..."
which is intimately connected with life itself, and is a power which maintains and regulates the machinery independent alike of the circulation of the blood and of sensation.

We are in ignorance still, as to what determines the varieties of temperature, and of the regulators which, even in sickness as well as in health, keep the temperature within certain limits; also, we do not know why some disturbances which affect the whole system do not alter the temperature while others do. So we must be satisfied for the present with empirical rules drawn from multitudes of careful practical observations of temperature under all conditions and circumstances of health and disease.

With regard to the peritoneum itself, Foster in his Text-book of Physiology, third edition p. 744, after remarking on the results of experiments on the abdomen—laid bare—of a frog comes to the conclusion that “in general the alimentary tract seems in closer connection with the cardio-inhibitory centre than the roots of the body”.

Wundt concludes, p. 152, says that “Fischer believes that he has met with cases which justify him in concluding that there is a centre in the cen-
Note: - Repetition of small writing in case it is not sufficiently legible.

But we know that in this or Vagus-Induction of the Heart, the surface of the body is cold and blanched, while the abdominal vessels are engorged with blood.

Note further: - So perhaps those cases of Peritonitis in which the temperature is depressed may be accounted for by the lesion which induces Peritonitis also inducing shock more or less continued, with all the attendant phenomena of shock, and that any different nerve will convey the impression to the &c. &c. &c. while the Autonomic nerves are the efficient ones; after paroxysms of these latter is induced and dilatation of the abdominal blood vessels ensues. Moreover, the veins the inhibitory vessels of the heart are connected with the &c. &c.
vical portion of the cord for limiting the temperature by irritating which we get a decrease of temperature, by analysing it there is increased heat obtained, and that this centre is to be looked for in the anterior fibres of the cervical portion of the spinal cord. Yeschelbelin in 'Von der Schilderung der Neurose', § 157 - places centre of control in the brain and these regulate the activity of the spinal cord and so indirectly have an influence over temperature to keep it within limits, similar to reflex action, respiration and cardiac action.

But then, if there is a temperature centre in the nervous system we do not know the relationship between it and the cardio-inhibitory centre, so we are no further forward than before. Perhaps there is no relationship at all between the two, and more is required, such as our ignorance upon the subject. Something to dispel that ignorance and clear up the mystery would be a great consideration in practical medicine. Curiously enough, the temperature has been often observed to increase in height even after death, for a while, in some cases where it has been rising before death. The chemical changes in the muscles and those of decomposition together with no cold air being inhaled seem to have something to do with this.
Lapissier said the cause of animal heat was due to the oxidation of Carbon and Hydrogen in respiration. Sir Benjamin Brodie contradicted this theory and said that the source of heat must be sought for in the nervous system. He deduced this conclusion after ligaturing the cervical blood-vessels in animals, decapitating them, and performing artificial respiration for a time; in spite of the conversion of venous into arterial blood, the temperature of the body sank more rapidly than in those cases in which (after decapitation) artificial respiration was not tried. After this, numerous discussions ensued between the partisans of either theory. Probably the truth lies somewhere between the two, the nervous system acting as controller, as it does with so many other functions. But as to arriving at a definite solution of the problem, it seems to me that we are no further forward than what John Hunter left us, with all our vaunted progress. It is true, however, that when a muscle or any organ partial tissue does work contracts, and a fluid the like, e.g. secretion, heat is evolved.

Remarking on removal of the appendix vermiformis by ligaturing it or where it is destroyed by disease—where it gets shrivelled into a fibrous band for instance,
no ill-effects seem to follow its removal or destruction. It has no function that we know of. It seems to be merely a morphological structure representing in a rudimentary form an organ which had a definite function to perform in some prototype of man in a long by-gone age, probably when that prototype consumed more vegetable food—roots and such like—than what man does now. It is drawn an analogy in herbivorous animals. The cecal portion of the large intestine is very voluminous and it is known that in them a good deal of cellulose enters the large intestine and is digested. The function of the large intestine, however, seems to be mainly absorptive. Cellulose is acted upon by the salivary secretion in man, so probably this function is left to the large intestine including the cecum and the appendix is very closely related anatomically to the cecum.

The appendix is peculiar to those animals that are closely allied to man anatomically, viz. the higher apes and the wombats, so far as is known. The above idea about the appendix being in some prototype of man, a fully-developed organ doing work by itself or in conjunction with the cecum, when it was relatively large compared to the cecum, and not a mere
rudiment as it is now; well, this idea seems to get support from embryological and developmental grounds, and it is the case in all biological questions with respect to evolution that these grounds enable one to trace the descent of particular organisms from ancestral forms or prototypes more readily than any other way. After the embryos in its process of development through the different stages in order representing successively the different prototypes from which it sprung, beginning with the oldest and simplest first and ending with, or even going beyond in development, the immediate parent from which it sprung, that is getting more differentiated and being suited for a greater division of labour as we go onwards and upwards. In short, the developmental history of organs as well as of living beings seems to be a repetition of the history of the descent of these same organs or of living beings from their own primitive types long ages ago. Or, in other words natural history repeating itself.

In Linnæus' Anatomy 7th Ed. in the part on the development of the alimentary Canal is said: - "This part (the caecum) of the bowel grows gradually out from the rest and in the first instance forms a tube of uniform calibre, without any appearance of the vermiform appendix, subsequently,
The lower part of the tube ceases to grow in the same proportion and becomes the appendix, whilst the upper portion continues to be developed with the rest of the intestine." The appendix therefore in the adult is a rudimentary structure, whereas at one time in the life-history of the embryo itself it is of the same calibre as the cæcum. It could not therefore be called a rudimentary structure at that time. In the adult the cæcum is the widest part of the whole intestine and its appendix the narrowest.