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To

The Faculty of Medicine,

University of Edinburgh.

Report of Results of Investigations

in the

University Clinical Medicine Wards

from May 1885 to May 1886.

By

John Stevens, M.A., M.B., B.Ch.

First Scholar in Clinical Medicine.
In presenting the Report of my Investigations as Stark Scholar in Clinical Medicine, I beg to thank the Professors in that Department for the facilities afforded me for carrying on the work.

John Stevens.

University Clinical Medicine Ward,
May 5th, 1887.
On the Renal Elimination of the Bile-bilirubins.

Notwithstanding the clinical testing for bile in the
urine has been confined generally to the detection of
bilirubin pigment by the color reactions which they give
with certain reagents. These methods are purely
qualitative, the intensity of the color reaction being
the only rough guide we have as to the quantity present.
These pigments are, to a greater or less extent, chemically
changed within the body, and it is only the unaltered
or slightly changed residuum which appears in the urine
in jaundice. As we cannot estimate the extent to
which they are so changed, one factor is wanting in
the absence of which a quantitative test would not be
of great value.

It is different, however, with the bile acids.
They are not much changed within the body, and the change
which they undergo are mainly at least such as do not
injure or hinder their characteristic reactions. The
conjugated acids are split up, but cholic acid, united with
phosphates, as its base, remains.

While there is no doubt as to the bile
pigment in relation to jaundice, there have been, and
still are, great differences of opinion as to the presence of
the bile salts in the urine. The best authorities have
differed widely, not only as to the methods for their detection,
but even as to whether they were seen to be found in the
urine at all. Thus Freichs held that, being destroyed
(1) as Canon vol 1. 1875, pp 133-140.
in the blood they were never to be detected in the urine, even in severe jaundice. Abraham admitted that traces of them had sometimes been found. Others again have made their presence or absence a ground for different diagnoses as to the nature of the jaundice, their presence indicating that the jaundice is due to obstruction to the outflow of bile, whereas their absence indicates that it is due to suppression of the biliary function of the liver. This view is represented at present by Dr. George Harley who strongly advocates it in his able work on Diseases of the Liver. Others again, such as Kühne, hold that the bile salts are to be detected in all forms of jaundice, whatever its duration. Recent investigations have however shown that by delicate chemical analysis they may even in health be detected in the urine in minute quantities. The change which we are to expect in jaundice is therefore, not the presence of a new and morbid ingredient in the urine, but merely a difference in the quantity of one of its ordinary, though minor constituents. While they have not yet been detected in normal blood, Næmper and Wagendroff have actually separated them from non-jaundiced urines. Another step in the same direction has been the detection of taurin in small quantity in the casual excretion. Leprinx and Guérin have lately proved that the reabsorption of taurine and acid is due the greater part of the proximal tubules in the kidneys.

The wide differences of opinion to which I have referred and also the various modifications
(1) Brandt's examination of Union 2 91

(2) Located in 64.

(3) Nature of the land in 424.

(4) Dreams of the past in 737.
which have been made in the method of detecting the
lith salts. Indeed, I think, we have no good evidence
that there is some persons difficulty in that method,
or something unsatisfactory in the result obtained.

The test is really a difficult one. Regarding it Lyson
says that "such detection by the direct application of
Peltner's test to the urine or to any other animal
fluid is practically impossible, even if the lith acids
are present in considerable amount." Simple modifi-
cations have been tried, but none have been
satisfactory. Dr. George Harley introduced a modification
by which the method might be applied directly to the urine
by adding to two dropkinds of the urine in a test tube
a small fragment of loaf sugar and then pouring about
a dram of strong sulphuric acid, — a deep
purple line at the line of juncture indicating the presence
of lith acids. But any one may easily discover for himself
the fallacy of this method. It is easy, as Churchman points
out, to apply the method to these urines, one from a case
of jaundice, and the other two from patients with no
jaundice and with no sign of liver disease, and to get
a deep purple reaction with all three. Some of the
primary regiments give the same reaction, and albumin
gives a reaction not much different. Indeed Harley has
admitted the failure of his method. To detect the lith
calls in the method by Peltner's method (except in
osseously rare cases when they are present in very large
amounts) it is necessary to go through a complicated
chemical process to extract them from the urine, and


(b) Dr. Alice's articles to which frequent reference is made appeared in the Journal vol 1, 1885 ff. 740, 741, 742, 739, 740, 733, 734, 746, 770, and 1078-1079.
This, as Murchison says, is "too tedious and difficult a process for the ordinary purposes of diagnosis." However, satisfactory experience chemists may have found this test, it is practically unavailable for ordinary clinical investigation.

Dr. Olivier of Harrogate has recently introduced a test for the bile salts which gives quantitative data, and which is sufficiently simple to be available for clinical work. It depends on the property of the bile salts to precipitate albumin or leucocytes in a fluid of胃肠 acidity. The urine, which must be clear, is first diluted to the specific gravity 1000 and then added in measured quantities to 60 minutes of a standard solution of leucocytes until the specific gravity is equal to or a little greater than that of the standard. In this way the proportion of bile salts present is calculated, 100 per cent representing the normal amount. After an extensive trial of Dr. Olivier's method, I can fully confirm what he says as to its delicacy and reliability. The physiological and clinical data obtained have been strong, and, so to say, strong evidence in favour of the value of the test. We have therefore in this method a means of gauging in any case from day to day the condition of the liver function of the liver.

The method has been very carefully worked out by Dr. Olivier. There is only one point to which I desire to direct attention, namely, a modification required when sugar is present in the urine. This I observed when investigating the case of obstructive jaundice.
complicated with glycosuria. The presence of sugar increases the specific gravity above what it would be were the normal constituents alone present, and besides the quantity of urine is usually increased. Consequently, when the urine is diluted to the specific gravity 1.025, the amount of normal urinary solids presented in a given quantity of urine, will be less than the amount in undiluted urine diluted to the same patient. To obviate this fallacy which this method makes, the urine must be diluted not to the specific gravity 1.025, but to that specific gravity plus the increase of specific gravity due to the sugar. Each grain of sugar per ounce increases the specific gravity roughly by about 0.001. Thus, a urine which contains, say, 11.5 grains of sugar per ounce should be diluted till it has the specific gravity of 1.029 (plus 0.0015—that is 1.0195. The difference which this makes on the result is obvious.

Delicate and valuable, however, as this method is, there are serious difficulties in the way of its introduction as a test to be regularly used in the course of ordinary clinical work or medical practice. One, and perhaps the chief of these, is the difficulty of obtaining and keeping always at hand a reliable sugar solution. The solution is difficult to prepare and can only be properly prepared by a good chemist. Unless properly prepared it is of course useless for quantitative results. Further, such a solution is much costlier to be expensive. Special, though comparatively simple apparatus is required and the test requires rather more time than these inclusions.
practice could as a rule afford to give. Besides, the
value of having definite quantitative results is to some
extent my apparent, for there is a fairly wide
difference in the amount of bile salts excreted in
health by different persons, and this difference must
influence the amount present in different cases in
disease as well. A prommier test, though not giving
qualitative result, is therefore still required.

Since my tenure of this relationship ended
I have devised a prommier method of applying the same
property of the bile salts as a test, and an account has
also appeared of the discovery of Professor W. G. Abden
that the bile salts have a remarkable power of lowering
the surface tension of fluids and that this property can
be used as a test of their presence.

I shall now give the results which I have
obtained by the use of Dr. Oleis test, classifying them
according to the systems to which they belong.

I. Biliary System.

1. Cases with Jaundice.
   (1) Catarhhal Jaundice (recovering). Bile salts slightly
       increased - 16.6 per cent, but became normal before the
       bile pigment disappeared.
   (2) Alkaline Catarhhal Jaundice (recovering). Some hepatic
       tenderness; gall bladder distended. Bile salts slightly
       in excess; no bile pigment.
   (3) Catarhhal jaundice 22- of recorded cases. Bile salts
increased to 200 per cent, became normal before the bile pigment disappeared.

(4) Case of obstructive jaundice with pain in abdomen from liver, 3rd of recorded cases. Bile salts increased to from 200 to 300 per cent. Bile pigment present.

(5) Bilharziasis with jaundice, 4th of recorded cases. Bile salts increased when bile pigment present to from 200 to 300 per cent.

(6) Attacks of jaundice, occasional fevers like ague attacks, enlarged liver, Colour of skin a little jaundiced. Bile salts slightly if at all increased, slight trace of bile pigment.

(7) Gall stones, abscess in gall bladder, jaundice, malignant disease of kidney and ducts. 5th recorded case. Bile salts increased, usually 200 or 300 per cent; great increase before death, over 600 per cent. Bile pigment in large quantity.

(8) Malignant disease of liver and peritonitis with jaundice. 6th of recorded cases. Bile salts decidedly increased. Bile pigment in large quantity.

(9) Cancer of stomach and pancreas of liver. The patient left the suffering and died shortly after the observation was made. Skin colored with bile, after 1026, acid, no albumen nor sugar. Bile salts increased to 240 per cent. Bile pigment in considerable quantity, chloroformly, a few small casts with granules, bile plates, urine acid crystals etc.

(10) Cancer of head of pancreas with jaundice & dyspepsia.
4 12 of recorded cases. Blood loss increased to 200 per cent. Bile pigment 50 considerable quantity.

(1) Cancer of head of pancreas with jaundice, 5th of recorded cases. Blood loss very largely increased—up to 600 per cent. Bile pigment in large quantity no sugar.

(2) Cancer of pancreas with jaundice, of ten months duration. Early in the illness bimanous jaundice is said to have disappeared for a time. No history of gall-stones. When examined there was marked jaundice and considerable emaciation. Abdomen not distended. Liver considerably enlarged, with no irregularity but with slight tenderness at the margins. Gall bladder felt below it about 3 inches to the right of the umbilicus, about the size of a small orange. To the left of the gall bladder, commencing about an inch to the right of the umbilicus was a hard body which could be traced across the abdomen a little above the umbilicus for several inches to the left, with some inclination upward; not tender; pulsation communicated through it from the heart. It seemed to be connected with the under surface of the liver. The heart was almost quite dull over it. The case was thus one of prolonged obstructive jaundice due to all probability to cancer of the pancreas. The urine was clear and contained no albumen nor sugar. Bile salts normal or only very slightly increased. Bile pigment present, but reaction not very deep.

2. (3) Acute Bileymenores, of two days duration.

No jaundice. Urine half colored, with large deposit of protein,
As pp. 1030. No albumen nor sugar. Bile salts increased to 300 per cent. No bile pigment.

3. Cases of Malignant Disease in which there was no jaundice:

(14) Malignant Disease of Liver, Hepatitis and Peri-
hepatitis. The hepatitis not in acute stage. 9th of recorded cases. Bile salts diminished. No bile pigment.

(15) Carcinoma of Liver which extended from liver to level of umbilicus, with nodulated surface and irregular margins. Urine turbid from urates which form a large deposit, yellowish amber. Pp. 1034, acid. No albumen nor sugar. Bile salts increased to 150 per cent. No bile pigment.

(16) Carcinoma of Liver which is enlarged, reaching nearly to the level of the umbilicus. No jaundice. Urine - p. 1036, large deposit of urates. Albumen in considerable quantity. Bile salts, normal maximum, or slightly less. No bile pigment.

(17) Malignant Disease, probably in the gallbladder and hepatic. 10th of recorded cases. Bile salts, normal maximum, but no distinct murines (3.50 grain the standard dose). Bile pigment in small quantity.

(18) Carcinoma of Pylorus with intense anemia, a few nodules of cancer in liver. 11th of recorded cases. Bile salts nor murines except once slightly 166 per cent nearly a month before death. They again diminished to the normal or a little below it. No bile pigment.


(21) Cancer of liver due to peritonitis and of liver. 12\(^{th}\) of recorded cases. Bile salts generally increase, sometimes up to 300 per cent, sometimes without a trace of bile pigment.


(22) Cirrhosis of liver with ascites. 14\(^{th}\) of recorded cases. Bile salts not increased. No bile pigment.

(23) Congestion of liver with ascites. 13\(^{th}\) of recorded cases. Bile salts normal or slight increase. No bile pigment.

(24) Limited peritoneal effusion, probably partly at least hepatic, also cardiac valvular disease. 15\(^{th}\) of recorded cases. Bile salts not distinctly increased except perhaps once. No bile pigment.

(25) Syphilitic Cirrhosis of Liver, enlarged spleen, Cardiac valvular disease. 16\(^{th}\) of recorded cases. Bile salts distinct increase on admission; only once slight increase after that (1.66 per cent). Bile pigment — a trace on admission; did not disappear quite so soon as the presence of bile salts. When the bile salts were increased again the presence of a trace of bile pigment was doubtful.

(26) Cirrhosis of liver. Bile salts distinctly diminished; Bile pigment — none.

5. Enlarged Liver from other Causes than the above.

(27) Ascaris in liver with enlarged liver. Bile salts normal.
28) Agyne, enlarged liver with some tenderness, often slightly enlarged. Oedema of legs and slight ascites. Bronchitis tonsils in chest, dulled systolic murmur. The mixed urine passed before and after rigor with increased temperature showed no perceptible increase in the quantity of bile salts.

29) Enlarged liver (2 fatty), weak heart. 14th of recorded cases. Bilirubin normal. No bile pigment.

6. Biliary Colic and Distended Gall Bladder, etc.

30) Recurrent Attacks of Biliary Colic, no attack while in the Fermining. 19th of recorded cases. Bilirubin - no increase. No bile pigment.

31) (?) Attacks of Biliary Colic. - Done when in Fermining. Bilirubin normal. No bile pigment.

32) (?) Distended Gall Bladder. 19th of recorded cases.

Bilirubin normal or slightly diminished.

33) Gastric Disorder: Attacks of chilliness. - Bilirubin normal or slightly diminished - if 60 giving up one half of the plan for 30.

8. Peritonitis and Fever.

34) Chronic Peritonitis with obstruction of large intestine and paralytic distension of small intestines. Bilirubin normal or slightly diminished.

35) Umbilical Fistula (? Chronic Peritonitis). Bilirubin normal maximum. Bilirubin - mono from but reaction probably due to locale of perforation.

36) Chronic Peritonitis with nausea to left of umbilicus. Urine deposits water, acid. No albumen. Bilirubin -
increased to 183 per cent. With & chloride of bismuth, green layer, probably due to & which is in large quantity.

II Hæmopoetic System.

40) Advanced Anaemia. Bilirubino diminished to half the standard.
41) Pernicious Anaemia (far advanced). Bilirubino increased to 183 or 200 per cent. Urine very thick, coloured, op. gr. 1013. Albumen in small quantity. No chlor.

42) Jaundice. Bilirubino normal.
43) Intercalary Disease of Bile. Bilirubino normal at first, became doubled (200 per cent). No bile pigment.
44) Leucocytosis. Bilirubino normal or only slightly increased. No bile pigment.

III Circulatory System.

45) Cardiac, Enlarged Liver; slight jaundice on admission, albuminuria. 25th of recorded cases. Bilirubino not tested for till the jaundice and albuminuria had disappeared. They were then found to be diminished, no bile pigment.
46) Cardiac, Enlarged Liver, 23rd of recorded cases. Not tested till he had made some improvement. Bilirubino then diminished.
47) Cardiac, Enlarged Liver, 24th of recorded cases. The
Lad vena and ascites, for which she was baffled. She had improved greatly before the bile salts were tested for, the ascites having been absent for some time. Urine contained no albumen. Bile salts normal. No bile pigment.
(48) Cardiac, Enlarged Liver, 25th of recorded cases. Bile salts sometimes some increase up to 200 per cent, sometimes normal. No bile pigment.
(49) Cardiac, Enlarged Liver, ascites. A little albumen in urine. Bile salts increased to 166 per cent.

IV. Respiration System.
(50) Phthisis Pulmonalis with enlarged, fatty liver. 25th of recorded cases. Urine—albumen in small quantity. Bile salts normal. No bile pigment.
(51) Phthisis, Liver slightly enlarged. Large quantity of indigo in urine. Bile salts increased to 166 per cent.
(52) Phthisis with Fatty Liver. Urine greenish yellow, turbid, of 8716, acid. No albumen nor pigment. Bile salts increased to 166 per cent. Bile pigment in small quantity.
(54) Pneumonia of left base with slight albumen and slight jaundice 28th of recorded cases. Bile salts increased to 240 per cent. The bile pigment disappeared before the decrease of bile salts disappeared.
(55) Pneumonia of right base with albumen and a
trace of sugar in urine. 29.5% of recorded cases.

Bile salts largely increased - up to 500 or 600 per cent.

Bile pigment in small quantity at first, soon diminished to a trace and disappeared several days before the bile salts had ceased to be in excess. Absent red pigment reaction with nitric acid.

V. Urinary System.

(59) Diabetes Mellitus (2.2 g of sugar per ounce).

Urine dilute to 59.10 30 (1008 + 0.22). Only slight turbidity present with the fifteen solution.

(57) Cystitis. Dilated stomach, 34th of recorded cases.

Bile salts distinctly diminished. No bile pigment.

VI. Locomotory System.

(60) Sera. Rheumatism. 3rd of recorded cases. Bile salts in large excess 600 per cent. Absent red pigment which disappeared before there ceased to be excess of bile salts.
VII. General Diseases.

(61) Hæmophilia. In hemorrhages at the time the
urine was examined, but nothing abnormal. Urine
contained no albumen nor sugar. Bile salts much
diminished. No bile pigment.

(62) Hemorrhages (under treatment) Bile salts —
normal maximum.

(63) Many hem, spleen and kidneys. 32 of recorded
cases. Bile salts normal or diminished. No bile
pigment.

(64) Disthenea, inflamatory Bright, enlarged and
afterwards slighty diminished liver. Bile in forcing urine
(owing to indies) 38.2 per cent. Bile
salts normal at first, gradually increased to 240 per cent.
Neither acid nor green or greenish bile mixture, but it is doubtful if it contains any bile pigment as there was a large amount of indies present.

(65) Inflammation Bright, Tablehips of Head, back and
Bedem of Leg. Urine contains albumen. Bile salts
markedly diminished, not giving more than a fourth
of the standard quantity.

(66) Cardiac, Brights Disease, slightly enlarged liver,
enlarged spleen, ascites, Bedem of Leg, arms and hands.
Slight yellowish of conjunctivae. Epistaxis on Leg. Temperature
elevated. Urine reddish amber, pH 7.4. 201 to acid,
albumen = 1/2. No albumen nor sugar. Bile salts
in excess, from 240 to 600 per cent. Trace of

At the post mortem, vegetations were seen on the
Boston. The lungs were in a state of brown induration, hypertonic congestion and oedema. Post. 3 lbs 2 oz. - Malady of fatty, sullen condition, enlarged, from chronic venous congestion. Kidneys in state of congestion with interstitial inflammation. Hardening in the skin of the body flaps. Right leg much swollen and discoloured. Blood in body very fluid.

(47) Paraplegia - from malignant disease which was widely spread throughout the body, affecting the vertebrae. There was complete loss of power in both lower limbs and loss of sensibility from the fourth rib downward. Right much smaller than left. Right return of consciousness.

(47) Visceral: Gastric. Vomiting of easily digested.

(48) Headache. Indigestion and constipation.

VIII

(48) Healthy individual. 1/4 hour after dinner.

Mile talks distinctly diminished.

These results, as well as others which I have obtained with the urine of healthy individuals, support the conclusion of Sturzyn and Frejuffer that the bile salts are normal constituents of the urine. The change which we are to expect in jaundice and in other diseases is, therefore, not the presence of a new and morbid product in the urine but merely a difference in the quantity of one of its constants, or at least normal, constituents.
A special importance necessarily attaches to the observations in cases of Jaundice, as the presence or absence of the bile salts has been made by Parry and others the basis for differential diagnosis between obstructive Jaundice and what has been called Jaundice from Inflammation. The discovery of their normal presence from the non-jaundiced persons, however, shows that no obstruction to the outflow of bile is required to lead to their presence in the urine. Dr. Oliver, in his observations states that he invariably found an increase, and generally a very decided increase of the bile salts in all forms and stages of jaundice; this even in cases of from one to four years' duration.

Of the twelve cases which I have recorded, nine only show a distinct excess, varying from 166 per cent to 600 per cent. Of the three others in one there was only a slight trace of bile pigment, and it was doubtful if the bile salts were at all increased. The other was a case of marked obstructive jaundice of long duration, and in the urine, while there was a considerable, though not very great, quantity of bile pigment, the bile salts could not be said to be distinctly increased. Thus in a case of jaundice from obstruction, probably almost complete, there may be no excess of bile salts in the urine. Further, Dr. Oliver has found the excess of bile salts to persist for a time after the discharge of bile pigment had ceased. This was so in some of my cases, particularly in the cases of pneumonia and acute
phosphatemia, in which there was only a small quantity of bile pigment with a large elimination of bile salts. It was not the case in all persons. Thus in the first and third case - cases of cutaneous jaundice - the discharge of bile salts had returned to the normal quantity before the bile pigment disappeared from the urine. Towards the end of these cases also, therefore, there was jaundice with a normal excretion of bile salts. There is thus far from being a correspondence between the amount of bile pigment and of bile salts discharged in cases of jaundice, and this want of correspondence becomes more marked when we include in our study those cases due to dry biliary fever, jaundice, etc., in which the presence of bile pigment is slight or variable, while the discharge of bile salts may be very large. Some explanation may, I think, be offered in regard to the variability in the relative quantity of these two ingredients of the bile discharged. While rejecting the view that the presence or absence of the bile salts is the ground for differentiating two forms of jaundice, we must recognize the wide variability in the relative quantities of the two substances in jaundice due to different conditions. To explain these differences we must consider the conditions which influence the amount of the ingredients of bile in the blood. These may be classed under three heads: - First, an increase in the amount of bile, or of one or other of
its constituents, secreted; second, an increased absorption into the blood, due to alterations in the pressure on the liver vessels and bile ducts; third, a diminished 
or increased motility of the blood. It is the 
fragment which undergoes change, while the bile salts are little affected. The first point in the explanation is, I think, the fact that the urinary excretion of the 
bile salts in health differs vastly in different people, some normal persons containing a quantily in which 
gives a reaction equal to the standard of purity, while in others the quantity produced with the test is much less than that. This difference will necessarily affect the amount discharged in urine also. The second 
place the composition of the bile may be altered. It is 
now well known that certain hemolytic agents produce 
jaundice. The most interesting substances in this respect 
are bilirubin and bile pigments which have a powerful influence in 
liberating the haemoglobin from the red blood corpuscles. 
The result is that the liver is supplied with an enormously 
large amount of free blood pigment, from which to form 
bile pigments. Consequently the bile secreted, contains a 
much larger proportion of bile pigment than is normal 
and becomes so thick that it stagnates within and 
obstructs the ducts. The absorption of the liver pigment 
is thus increased and jaundice results. The bile pigments 
being increased out of proportion to the bile salts, we 
cannot expect that the latter will appear in the urine 
in a degree proportional to the jaundiced color. Again, 
in jaundice from disease, while the marked conditions
(1) Heading: Details of the River L. 730
lead to the presence of an excess of bile in the system and in the urine, the functional activity of the liver comes to be more or less interfered with. According to Budd and Harley, the bile salts are in greatest quantity at the commencement of the obstruction and gradually diminish as the functional activity of the liver becomes more and more interfered with. This may be accepted as the explanation of the fact that in the long standing case of obstructive jaundice (probably complete) there was no distinct increase in the elimination of the bile salts. Further, not only may there be an increased production and absorption of the bile salts, but the rapidity of the chemical changes which it undergoes may be altered, becoming more or less active under different medical conditions. It is mainly the pigment which undergoes change, and so in the former case the amount of it discharged in the urine will be diminished in proportion to the amount of bile salts, while in the latter case it will be proportionately increased.

We can thus understand how it is possible that it is not uncommon to find a slight jaundice with only a small amount of bile pigment in the urine, but with a large quantity of bile salts. The bile formed may be increased in quantity and it is probably rendered more viscid (just as the urine becomes concentrated) while the hepatic congestion which occurs also leads to an increased absorption, even if no important change has taken place in the bile itself. On account, however, if
the more rapid metamorphosis, the bile pigment is changed in the blood, so that little, or, it may be, none of it is eliminated at all by the urine, whereas the bile salts are eliminated in large amount. We may therefore rightly regard this excess of bile salts in the blood and urine in form as a colorless jaundice not differing so widely as might at first be supposed, from some of the ordinary forms of jaundice, such as those which result from congestion and oedema.

What has been said also suggests an explanation why some observers have detected the bile salts in the urine in jaundice from obstruction only. Not only is the jaundice as acute greater when it is due to obstruction than when independent of obstruction, but there is in many cases of the latter class a serious blood change which may affect the composition of the bile in a manner similar to that familiar. Cases of jaundice from obstruction probably therefore in their early stage have a much greater amount of bile salts in the urine than in the pure, in cases of jaundice independent of obstruction, although these substances are eliminated in excess in both classes of cases.

While therefore the bile salts are very commonly present in excess in the urine in jaundice, I cannot agree with Dr. Piers that they are in every case present at all stages. Further, if, as is possible, there may be a purely haematogenous jaundice, in which the haemoglobin is transformed into bile pigment in the blood and tissues without the action of the liver, in such
cases we should expect to find bile pigment in the urine with a normal discharge of bile salts. I have however no facts bearing on this point. In all the cases the jaundice can be explained by the re-absorption of bile secreted by the liver.

In the case of Acute Cholecystitis there was a marked excess of bile salts without any bile pigment, but with a very large amount of urinary pigment. In the cases of Cancer of the Liver, the results were variable, two showing an excess, one a diminution and two a normal amount, one of the latter having a small quantity of bile pigment. In one case in which the main disease was jaundice showed a normal amount except once when there was a slight increase. In other cases there was marked jaundice of the liver there might be only a normal amount of bile salt discharge.

In the two cases of Cancer of the Stomach, one showed a normal quantity and one a diminution.

In the cases of Congestion and Cirrhosis of the Liver, there was little in the way of increase. As a rule the amount was normal, and the increase when it occurred was not great. In one there was distinct diminution. The case of Congestion was not in the acute stage when the urine was examined.

In the three cases of enlarged liver from hypeleps, the quantity was normal—in one case in spite of the occurrence of a rigor.

In the two cases of Biliary Colic (neither of them having attacks at the time), and in the case of distended gall bladder the quantity was normal.
In the case of gastric disorder with attacks of cholelithiasis the quantity was diminished.

Of three cases of chronic Peritonitis, two had a normal quantity, and the third there was some increase.

In simple Anaemia I have not found any increase as Dr. Crockford in some cases, but this I suspect is due to the fact that in none of the cases had I the opportunity of examining the urine while the disease was progressing. In all, the complaint was either fully developed or in process of cure. In some the quantity was normal, in others diminished, sometimes very greatly. Another did I find any distinct success in lessening in labors menstruations.

Dr. Crockford had an opportunity for observations in Hemorrhagic Anaemia. In a far advanced case of this disease, rapidly progressing to a fatal issue, I found a decided increase. This fact, I think, lends support to the view that the essential morbid process in this disease is an increased hemolysis, the red corpuscles being more rapidly destroyed than in normal urine, perhaps to disturbed actions of the glands rendered by the excess of bile salts in the urine. Hence the frequent inutility of Sen and the value of Arsenic in some cases.

In the case of tubercular Disease of Bladder the increase which occurred is probably to be accounted for at least to the elevation of temperature.
which there was marked embarrassment of circulation
showed an increase, one in pretty fair condition showed
a normal amount, while two who had made considerable
improvement showed a diminution. I now was taking
any bile pigment. This variable condition of the
excretion of the bile salts in best disease may I think,
be readily explained.owing to the interference with
the circulation through the liver and the changes in its
nutrition and structure consequent upon this there
must result a deficient and altered secretion of bile,
just as a deficient and altered secretion of urine
occurs under similar circumstances. This then
will explain the diminution in the amount of bile salts in
the urine. Now, though the patient had been restored to a
pretty comfortable condition, there is a marked change in
the liver but no interference to the flow of bile in the
ducts. When however the backward pressure increases
and interferes with the flow of bile in the ducts owing
to venous congestion and consequent pressure upon them
the bile salts, though probably not found in so large
quantity as in health, are reabsorbed in larger amount
into the blood.

Out of four cases of phthisis there was an
increase in three, in two of which some bile pigment
was also present. Excess of bile salts in the urine is
therefore, so far as these results show, of common
occurrence in advanced phthisis, and this may be
ascertained partly to the high temperature and partly to the
waste changes in the liver which occurs in phthisis.

2. This: £ 466.
The four cases of Pneumonia all show a marked excess, one of them nearly so much as the most severe case of Jaundice from obstruction to the common bile duct, and I have already pointed out that this occurs along with only a small amount of bile pigment or even with none, and that the bile pigment disappears before the excess of bile salts. The high temperature in whatever way it acts, is doubtless partly the cause of this excess of bile salts, but jaundice still differs as to the explanation of jaundice in Pneumonia. There appears to be a rapid destruction of the blood corpuscles with liberation of pigment of which only a small part is excreted as bile pigment, the remainder passing into another form, either through bile pigment or without ever becoming bile pigment at all. This is shown by the marked red colour which the urine frequently has, and by the marked reddish pigmentation given with uric acid. The bile salts, however, being less liable to be transformed in the system are excreted in large quantity. In spite of the presence of jaundice the reaction for bile pigment may be quite absent, and this is regarded as an unfavourable symptom, indicating apparently a greater alteration in the ordinary chemical change in the body. The jaundice has been ascribed by many to deficient oxygenation, by others to congestion due to reflex irritation from the vagus in the lung, and by others to some poison—perhaps a micro-organism—in the blood, the Pneumonia in such cases being accompanied by typical symptoms. It is more than
likely that not one but several conditions must be taken into account in the explanation— the chief temperature being accompanied by congestion of the liver, cloudy swelling and possibly some of the other organs in the body. The high temperature and congestion probably leading at first to increased formation and then to resorption of the bile and consequently to greater absorption. The deficient resorption may also be an element in the case, but if so, one would expect jaundice to be more frequent in cases with jaundice than it is. Albuminuricous in the blood are doubtless also a cause in cases with typhoid symptoms. Indeed, albuminuria in the blood are well known causes of jaundice, and some chemical processes taking place in the jaundiced partly by their action on the blood.

The slight reaction given by diabetics in the urine may be explained by the large quantity of sugar passed.

In the case of Cystinuria the bile salts were distinctly diminished, but this condition is so little understood that we are unable to draw any conclusion from it. It is to be noted, however, that there was some diminution in the size of the liver and possibly the occurrence of the hopeful containing cystine may be connected with a deficient formation of tartrate which becomes conjugated with tartrate and iron.

The case of acute rheumatism resembles those of acute pneumonia in the large excess of bile salts with the trace of bile pigment which disappears before
the process of bile salts ceases. The conditions as to high temperature, congestion, destruction of red blood corpuscles and the consequent excessive formation of bile pigment and precipitation of bile are in all probability here also the factors in the explanation, but we have no ground for assigning the condition to deferent action. The question as to the action of micro-organisms here also suggests itself.

The well known theory which the bile salts process of producing haemosphares suggests a possible relation to haemosphares. In the case examined there was a distinct diminution, but there were no haemosphares occurring at the time.

Dr. Olivi found a distinct excess in steatorrhoea. There was no excess in the case examined but this may have been because the patient had been undergoing treatment.

In the case of any disease there was no increase.

In the case of constant diarrhoea with inflammatory Bright's disease, in which there was at first a normal quantity which became gradually increased, there was nothing in the temperature sufficient to explain the increase; there was no jaundice, and it is doubtful whether there was any bile pigment in the urine in addition to the indican. The most probable hypothesis is, I think, that the diarrhoea, at first simply due to enteritis, led to the formation of steatorrhoea or other poison in the intestine, and that these, being absorbed, set up the defeca-
and by their action on the circulation led to retention, to
degeneration, and to a subsidence of all the vital
interferences to the flow of bile, so that the bile
salts were absorbed in excess. Unfortunately a
post mortem examination was not obtained.

The case of Cirrhosis of the liver and lympho-
atic Bright's disease with ascites and edema
showed a marked diminution. The Cirrhosis, as we
have seen might or might not of itself lead to
an excess, while the renal disease would interfere
with elimination and so sufficiently account for
the diminution.

The case of Cardiac disease with enlarged
liver and spleen and with ascites and edema showed
a pretty large excess which was sufficiently accounted
for by the high temperature (due to ergotism) and
by the vomiting and fatty condition of the liver found
of the post mortem. This patient, like many
others in whom the liver is diseased, had toward
the end hemorrhages in the plate of the body and legs
and the blood in the body was very fluid.

In the case of Paraplegia the malignant
disease was very extensive throughout the body;
there was slight jaundice and the bile salts were
present in slight excess.

The diminution in the secretion of bile
pools after food in the healthy individual corresponds
with Plaxis statement.

These observations confirm the statement.
f. I believe that the bile salts are frequently in excess in the urine when there is no bile pigment in it. It is evident from them that in addition to actual liver disease, with or without jaundice, one of the most important factors in producing that excess is high temperature, as is evidenced particularly by the cases of pneumonia and acute pneumonia. What usually characterizes the case with high temperature in relation to the present subject is the fact that the bile salts are found in the urine in large amounts with only a comparatively small quantity of bile pigment or with none at all. Another condition which has a marked influence in leading to an excess of bile salts is the presence, with or without bile pigment, of the absence of backward pressure in the circulation, producing venous congestion of the liver, as is seen particularly in cases of heart disease. In such cases, the results of course vary with the extent of the backward pressure. An excess may also be found in some blood diseases. If this be true, we have one or several examples of such blood diseases which I cannot, the former showed a normal or diminished amount. It would, however, be very important in relation to the question to test for the bile salts in a case of pneumonia immediately before, during and after the occurrence of jaundice. As I have not yet had an opportunity of doing, I furnishing examples, however, an excess may be found and I have already spoken of the conditions favoring which this fact has in the pathology of the condition and in the question of treatment.
1. Disease of the heart, pp. 314 - 315.
2. Inflammation of the liver and their sequelae, pp. 317.
On the Occurrence of Haemorrhages in Liver Disease.

An interesting question in regard to diseases of the liver is, what is the cause of the haemorrhages which are so common in some such diseases? The question is of much interest as some of the diseases, such as pyogenic and septicemia, and anaemia, and perhaps others, appear to be related to or dependent upon some morbid condition of the liver.

Excluding haemorrhages which are really traumatic, such as those which result from perforation by a gall stone, and those which are obviously due to venous engorgement from impeded circulation in the liver, such as haemorrhages from haemorrhoids and the profuse or even fatal haemorrhage which occurs from the disturbed vessels at the cardiac end of the stomach and lower part of the esophagus in cases of advanced cirrhosis, there remains a class of haemorrhage into the blood, mucous surfaces and other parts which are characteristic of liver disease, and in account of which some diseases of the liver may be said to be accompanied by a haemorrhagic diathesis. Various explanations of such haemorrhages have been given. Some ascribed them to some altered condition of the blood. O. H. 1856 applies to this as to the other forms, a mechanical explanation, ascribing them all to the obstruction to the circulation through the liver, resulting back in the arteries and raising the blood pressure. This explanation, though it accounts for some haemorrhages, appears to me quite inadequate to explain them all, especially as the occurrence
(1) Bills Jamieson and Robert Drummond.

(2) Writings on Landet 31st May 1853.

- £ 315.
and the amount of such hemorrhages appears to have little relation to the amount of vascular obstruction. If the obstruction to the venous circulation were the cause we should expect them to be most common if all in heart disease. Neither will an altered state of the blood by itself explain their occurrence. As it is particularly in heart disease with jaundice that hemorrhages are apt to occur and as the bile salts are known to have the power both of destroying the red blood corpuscles and of causing hemorrhages when injected into animals, the hemorrhages which occur in jaundice have been ascribed to them also. Dr. Wedderburn Laidlaw quoted Layden as having shown that the bile salts cause degeneration of the corpuscles as well as of the glands, and he suggests that the cause of the hemorrhages may be found in degeneration of the middle coat of the arteries. Dr. Elliot gives a similar explanation, pointing out at the same time the fluidity of the blood in jaundice which die after the injection of the bile salts.

In the cases which I have observed, in addition to those in which there were hemorrhages from mechanical or accidental causes, there were four which had hemorrhages of the kind under discussion. These were the case of cancer of the pancreas with jaundice and glycemia (case 7), the case of gall stones (with suppuration) and cancer (case 3), the case of the other cases of cancer of the pancreas (case 8), the case of persistent diarrhoea with inflammatory bright stools (case 33), the case of Bright's and Bright's disease (case 66 among the bilirubin statistics) and the case of cirrhosis of the liver (case 16). Of these, four had
jaundice more or less distinctly, named the first time, and the fifth, while all had constantly an excess of bile salts in the urine except the last in which there was only a slight excess twice during several months. Yet this last was the most marked case of haemorrhage of them all. One could scarcely see a more marked case of jaundice, and the patient presented the typical jaundice symptoms (in hepatic disease) of haemorrhage from the primary duct, the mucous membrane of the pelvis of the kidney having evidently been its source. In this case, as the kidneys were acting fairly well, there is no reason to believe that bile salts were present in excess in the blood owing to their being insufficiently eliminated by the kidneys. While, therefore, both experimnet and clinical observation favors the view that an excess of bile salts in the blood (cholemic) is to be regarded as an important cause of haemorrhage in hepatic disease, it is probably not the sole cause. The bile salts may cause or predispose to the haemorrhages in three ways,—by altering causing degeneration of the walls of the vessels, by altering the blood corpuscles and by rendering the blood less coagulable, as was observed in some of my cases, thereby making it more difficult to stop the haemorrhage when it has commenced. In these latter forms of disease the presence in the blood in large quantity is probably an important cause of haemorrhage. Other causes however, markedly alter the blood and vessels; this is some forms of poisoning (e.g., phthisis) there is degeneration of the walls of the vessels as well as of other parts and the condition of the blood is markedly altered.
forms, such as cirrhosis, we have the action of constant or intermittent, of the slighter degree of excess of the bile salts, but we have also to take into account the fact that the deficiency of the digestive action of the liver must also produce a morbid state of the blood and consequently of the vessel walls.

Some of the other biliary symptoms which occur in jaundice are due to the bile salts, such as the slowing and at weakening of the heart action, and they may be a cause (though not the only one) of the other common symptoms which seem to occur in jaundice. The explanation for these symptoms is that serious symptoms are not more common appears to be that in jaundice the leading function of the liver is generally to a large extent in abeyance. Thus Lehwander found that very little bile pigment can be secreted by the liver in jaundice compared with the amount normally secreted by the liver; and the same is true regarding the bile salts. It is rare to find more than 600 per cent (and then only the traces present in health) or even as much as that; we should expect the quantity to be much greater, at least in jaundice from complete obstruction of the liver were to continue to secrete as in health.

It will be found that in the case of gall stones, with puffiness, and cancer (case 3) the amount of bile salts rapidly increased the day before suppression of urine occurred and that this was followed by suppression of urine, drooping, stupor, delirium, and death.
Observations on the Excretion of Indican in the Urine.

I made a series of observations on the discharge of indican in the urine in order to determine under what conditions it is present in excess and what diagnostic or other import it possesses.

The observations are as follows:

I. Diabetes Mellitus.

1. Urine J of 1835, containing nearly 22 grains of sugar per ounce. -- No indican.

2. Complicated with phthisis pulmonalis and pericarditis, passing 180 or 200 ounces of highly saccharine urine daily. Being treated with salicylate of soda. Only a slight trace of indican -- no excess.

3. As treatment being given -- little or no indican.


5. Complicated with albuminuria. Indican slightly increased.

II. Cancer of Pylorus.


16th. little or none

30th. none

7. 18th of recorded cases. No antiphthisic given -- indican always increased, generally largely.

8. Doubtful case -- indican a trace or none.
III. Cancer of Liver, Pancreas &c.

(1) 9th of recorded cases. Malignant disease of liver, hepatitis and peritonitis. Indurated always or almost always increased.

(10) 18th of recorded cases. Malignant disease, probably both gastric and hepatic. Liver - large increase. Right segment in small quantity.

(11) 7th of recorded cases. Cancer of head of pancreas with jaundice and glycosuria. Indurated - distinct increase, but doubtfully owing to bile segment which was not removed.

(12) 12th of recorded cases. Cancer of lesser toe of pancreas with some nodules in liver. Increased largely increased.

(13) 5th of recorded cases. Gall-stones, suppuration in gall bladder and bile ducts, jaundice, cancer of bile ducts and liver. Indurated - distinct increase before operation, less some time after, but still increased.

IV. Peritonitis and Neus.

(14) Chronic peritonitis with a nodule to the left of the umbilicus. Indurated in very large quantity.

(15) A persistent, not well defined, mass was felt in the right side of the abdomen below the liver, with percutaneous much impaired, but without much tenderness. Bone's every few days. Bonda very constipated, much emaciated, cheeks sunken; no jaundice. Urine contained no albumen, sugar or bile pigment. Indurated in very large quantity. At the post mortem it was found that there had been chronic peritonitis with blood. The large intestine was obstructed and the small intestine...
was distended, but with no constipation.

16. Umbilical fistula; & chronic perihepatitis.

17. Pigment in small quantity. Little or no induration.

18. Obstruction (? malignant) in large intestine.

Indians not increased.

V. Cardiac Disease with signs of backward pressure (enlarged liver, etc).

19. 25% of recorded cases. Indians considerably increased.

20. 23% of recorded cases. Indians increased.

22. 22% of recorded cases. Indians in slight excess.

23. In some also - Urine contained a small quantity of albumen. Indians - moderate or considerable increase.

21. 21% of recorded cases, complicated with foot-patella.

Indians normal.

24. 24% of recorded cases. No Indians.

VI. Congestion and Cirrhosis of Liver.

25. Cirrhosis of Liver. Urine contains no albumen or bile pigment.

26. - 19% of recorded cases. Cardiac disease limited peritoneal effusion.

27. -11% of recorded cases. Cardiac disease, limited peritoneal effusion; (2 Cirrhosis of liver). Indians - 12% times no increase, only once some increase.

28. Cirrhosis of Liver with ascites. 14% of recorded cases.

Indians - no increase.

29. 13% of recorded cases - Congestion of liver with ascites. Indians - no increase.

30. 16% of recorded cases - Syphilitic cirrhosis of liver. Indians no increase. (To phosphorus)
VII. Jaundice and Biliary Derangement.

(29) Attacks of jaundice, decannal region like acute attacks, liver enlarged, but with no irregularity. Pain occasionally below umbilicus. — Possibly a case of gall stone. Possibly commencing carcinoma of cæcum or transverse colon, liver slightly enlarged, tests of bile pigment positive. Jaundice distinctly present.

(30) 3° of recorded cases. Obstructive jaundice, large cyst in or abdomen. Jaundice in distinct, though not great excess.


(32) Acute Lillomarism — Ill for two days. — (See Table I.)

(33) 14° of recorded cases. Weak heart and enlarged liver (3 fatty). — No jaundice. Red colour of urine. 

IX. Gall stones and Distended Gall Bladder.

(34) 19° of recorded cases. Distended gall bladder.

(35) 4° of recorded cases. Attacks of biliary colic. Jaundice generally moderate increase.

(36) 18° of recorded cases. Recurrent attacks of biliary colic and jaundice. No attacks when examined. Jaundice no excess.
X. Wing Disease.

(37) Wing Lucid, Ellen and Rodina. 52 of recorded cases. Disease slight most of time, became much
increased towards the end. Decreased when causes detected.

XI. Diphtheria and Bright Disease.

(38) 33 of recorded cases. Persistent diarrhea;
Inflammatory Bright disease. In, Lachrym in large quantity;
giving the urine a brownish colour.

XII. Anemia and Hemorrhage.

(39) Lachrym in large quantity.

XIII. Diseases of the Hemorrhagic System.

(40) 28 of recorded cases. Tubercular disease of
lymphatic glands. Lachrym not increased.
(41) Tubercular disease. Lachrym little or none.
(42) 23 of recorded cases. Laryngitis. Lachrym
not increased.

XIV. Diseases of the Respiratory System.

(43) 20 of recorded cases. Pneumonia with traces of
sick pigment. In urine, Lachrym in considerable
quantity.
(44) 21 of recorded cases. Pneumonia with salty urine.
Lachrym not increased.
(45) Pneumonia. Urine contains no albumen nor sick
pigment. Lachrym in large quantity.
(46) Pneumonia. Urine colored by stool. No albumen
nor sick pigment. Lachrym moderately or slightly increased.

XV. Urinary Disturbances.

(47) 38 of recorded cases. Ectasia. Lachrym in
large quantity.
(a) Phenirin. (Atebrin, in urine) Glucin not increased.

XVI. Reality Individual.

(b) Glucin slightly increased.

The test used in these observations was that with hydrochloric acid, hydrochlorate of lime and chloroform. Except in one or two of the earlier cases the blue pigment were, when necessary, first removed by acetate of lead.

The results of these observations may be summarized as follows:

1. That in uncomplicated Diabetes the urine is not or not
   tending to form of pyelium. (Two of the cases, however, were
   taking sulphate of soda, the one case in which there was some
   increase was complicated with albuminuria.)

2. That two cases of undoubted cancer of the stygma
   showed a very large quantity. (In one, however, it disappeared
   while the patient was taking sulphate of soda.)

3. That in these cases of abdominal cancer an
   increase is pretty constant.

4. That there is a large quantity in chronic peritonitis.

5. That in obstruction of the large intestine
   there may be none, but that the presence
   or absence of faeces cannot be used as a
   means of diagnosing the site of obstruction
   unless other causes, (e.g. peritonitis and cancer)
   which produce faeces can be excluded, and
   unless there is evidence that the obstruction
   has not looked back on the small intestine
   so much as to produce paralytic
   distension of it, that is, to produce

(Continued on next page)
Secondary obstruction of the small intestine.

6. That in heart disease with symptoms of both visceral
pressure, both a enlarged liver, the results are variable;
out of 50 cases, 4 were with success, one normal and 
one with none.

7. That in congestion and tuberculosis of the liver the
results are variable, if one cases two had an increase,
out of 50, however, showing no increase only once in
five examinations on different days, while three had no
increase.

8. That in cases where there is a distinct interference
with the liver function of the liver, as in jaundice from
various causes and from obstructions, there is a
frequent constancy of fever.

9. That in cases of gall stones, when there is no
jaundice there and the patient is free from colic, there
may be no fever, but that an increase was generally present
in a case having attacks and in another with distended
gall bladder.

10. That in a case of many diseases of the liver often
and cirrhosis in a patient who had been suffering several
years ago and who then had jaundice the jaundice was only
much increased toward the end.

11. That in a case of persistent diarrhea, with inflammation
of the liver, the condition being probably due
primarily to decomposition products absorbed from the intestines,
the quantity was very large.

12. That in ascites and edema the quantity may be large.
This, also, being the results of previous discases that may be due either to
the anatomy of the root producing the symptoms.

13. That in ulcers of the skin, glands over the latter regions, there may be no increase.

14. That in the sciatic nerve, the quantity may be considerably less in the case. In some this may be explained by the fact that the sciatic is a large nerve. In this case, the quantity may be explained by the fact that the sciatic is a large nerve.

15. That in patients with fever or advanced pregnancy, there may or may not be an increase.

16. That in conditions of the spine, depending on derangement of the cord, there may or may not be an increase. This is explained, there is a large quantity of fluid probably resulting from the general condition of the digestive system as indicated by the dyspeptic symptoms, the debility, and the general state of the system, and the diminished secretion of the glands. In reality, again, there is no question.

17. That even in health the quantity may sometimes be distinctly over the normal.

In regard to Jeff's conclusion that in cases when there's obstruction in the small intestine but not in the large intestine, the fourth case of group IV supports the statement in reference to the large intestine. As regards the present case of the same group, the fact that there was chronic induration is sufficient to account for the pains of induration, apart from obstruction altogether; and further, the small intestine had become secondarily obstructed owing to the gradual accumulation of intestinal contents above the point of obstruction. Such a case, therefore shows how limited application to diagnosis Jeff's observations on this point are, because they can be applied to cases in which there is no other cause of pain if induration should exist in which the obstruction has not told back on the
small intestine so as to lead to its distension. Further, some of the chief causes of obstruction are among the most important factors in producing excess of mucus.

With the observations of Senator, mine in large measure correspond, though I found no increase in a case of Tabes dorsalis, in one of paresis, phthisis nor in one of leucorrhoea.

With the results of the extensive investigation of Heine, mine correspond closely, as is shown by the results in statorrhoea, phthisis, delirium of the stomach, diarrhoea, proctitis, abscess of the liver, &c.

What I wish, however, particularly to draw attention to is that regard to my own observations is the relation of the discharge of indigo to the condition of the biliary secretion and discharge of bile into the intestine. Hitherto, there has been no clinical method by which we could gauge the condition of the biliary function, but this has recently been supplied by Dr. Oliver's suprinate test for the bile salts, of which I have already spoken. What I am concerned with, here is the relation which this biliary function, as shown by the renal elimination of the bile salts, has to the formation of indigo in the intestine and the consequent presence of indigo in the faeces in an amount, at least, roughly corresponding. To bring this out clearly, I shall give in a tabular form the results of the examination for these two substances
In all the cases in which lots have been tested for they are arranged in groups as before and the numbers correspond with the numbers in the statement of the observations on Indies so that they cannot can in that way be identified.

Table showing the relation between the renal elimination of Indians and of Belo Salts.  

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Disease</th>
<th>Belo Salts</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1</td>
<td>Diabetes</td>
<td>0</td>
</tr>
<tr>
<td>II</td>
<td>6</td>
<td>Cancer of pylorus</td>
<td>much increased</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>normal</td>
</tr>
<tr>
<td>III</td>
<td>9</td>
<td>Melanotic urine</td>
<td>H. always or almost always</td>
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<tr>
<td></td>
<td>10</td>
<td>Melanotic deposits</td>
<td>large increase</td>
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<tr>
<td></td>
<td>11</td>
<td>Cancer of pancreas</td>
<td>decreased</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Cancer of liver</td>
<td>large increase</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Gallstones</td>
<td>increased</td>
</tr>
<tr>
<td>IV</td>
<td>14</td>
<td>Cho. Microtubular</td>
<td>very large increase</td>
</tr>
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<td></td>
<td>15</td>
<td>Cho. Microtubular</td>
<td>normal</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Cho. Microtubular</td>
<td>none</td>
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<tr>
<td>V</td>
<td>19</td>
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<td>considerable decrease</td>
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<td>21</td>
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<td>22</td>
<td>Cho. Microtubular</td>
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<td>VI</td>
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<td>24</td>
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<td>26</td>
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<td>normal or slight increase</td>
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<td>VII</td>
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<td>Distinct increase</td>
<td>Slight fluid in all tubes.</td>
</tr>
<tr>
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<td>30</td>
<td>Distinct increase</td>
<td>Leucocytes moderate in number.</td>
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<td>31</td>
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<td>Leucocytes moderate in number.</td>
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<td>Leucocytes moderate in number.</td>
</tr>
<tr>
<td>VIII</td>
<td>33</td>
<td>Endogenous, male</td>
<td>None</td>
</tr>
<tr>
<td></td>
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<td>Distinct increase</td>
<td>General increase, normal or slightly diminished.</td>
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<td>35</td>
<td>Distinct increase</td>
<td>Leucocytes moderate in number.</td>
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</tr>
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<td>XVI</td>
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<td>51</td>
<td>Distinct increase</td>
<td>Leucocytes moderate in number.</td>
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It will be observed from this table that there is a marked correspondence between the occurrence of a normal quantity of a normal quantity or a total absence of indican and a normal amount of bile salts, and on the other hand, between the occurrence of an excess of indican and a change in the elimination of the bile salts, either in the way of...
increase or of diminution. In the whole series of cases except two, or perhaps three, there was no such a correspondence or the want of correspondence can be explained on other grounds. Thus the apparent diminution of bile salts in the case of diabetes, with no indies, is to be explained by the large quantity of urine voided causing a great dilution in the proportion of bile salts in a given quantity of fluid. In three cases of cancer there is a want of correspondence, but cancer is itself an important cause of an excess of indies. The same remark applies to the case of chronic peritonitis and ulcers in which there is a probable want of correspondence. In the cases of waxy livid, pale, and hidalgos and of persistent diarrhoea and Bright's disease, of anaemia and leucocytes, and of cystic with related stomach, etc., there is enough to explain the excess of indies without reference to the lithoalts, though in only one of these, the case of anaemia and leucocytes, is there a want of correspondence. Of the remaining twenty cases, in which no important factor apart from the fact of the case of diabetes, diabetes in itself is no cause, liver function to present only two or perhaps three, as before stated, show a want of correspondence, and there even must be put down as somewhat doubtful as to their want of correspondence. Of the remaining twenty-three cases, ten show a normal or nearly normal amount of indies, nine show an increase of indies, while four show an increase of indies with a distinct diminution of bile salts. Those showing
the diminution of bile salts may be regarded as having less weight of evidence than those showing excess; still I think they also may be accepted as being cases in which the formation of bile salts is less than in healthy individuals, this deficient formation resulting in a diminished quantity in the intestine as well as in the urine. Again, all the cases with excess of bile salts in the urine, with the possible exception of the jaundiced, may fairly be regarded as secreting a normal or more probably a diminished (but certainly not an increased) quantity of bile, perhaps inferior in quality, which, owing to obstruction in the ducts or to changes in the substance of the liver, is made to diffuse in larger quantity than is normal into the blood and to pass in abnormal small quantity into the intestine. Even in the case of jaundice the same were probably also the case, the bile being caused to diffuse more into the blood owing to congestion of the liver or to atrophy of the ducts, and this result would probably be aided by the pressure within the ducts being increased owing to the engorgement of the bile, the result of the jaundiced process.

The view which I have suggested renders all the more probable when we further compare the different groups of cases. Thus in the group of jaundice and Biliary Distension, all the four cases have an excess of mucus, and so also have the other cases of jaundice not placed in this category. This seems therefore to be a constant or nearly constant excess of mucus when there is a marked interference with the
biliary function. Of the four cases in the group of
Congestion and Cirrhosis of the liver, only one showed
an excess constantly, while another showed an excess
only once in four examinations on different days, and the
other showed no excess at all. The results in
these diseases were somewhat similar, and they show
the correspondence too which I have referred to in a very
marked manner. In the latter two conditions the
bile flowing into the intestine is less diminished
than in cases of jaundice, hence the difference as
to the frequency of an excess of indigo.

We are therefore, I hold, justified in
concluding that in all or almost all these cases
with excess of indigo in the urine, not otherwise
explained, there was a diminution (and in some
cases a total absence) of bile in the intestine whether
the quantity of bile salts in the urinary was increased
or diminished, while in the cases in which there was
a normal or nearly normal amount of bile salts present
in the urine the quantity of bile discharged into the
intestine was as a rule not far removed from the
normal ratio. A complete correspondence in every case
would hardly be expected, for on the one hand the liver
might in some be secreting more actively than is normal,
or that, while a sufficient amount passed into the
intestine, an excessive amount might diffuse into the
peritoneum and appear in the urine, and on the other hand
in a decomposed liver, secreting much less than the normal
amount, the conditions may be such as to favor absorption,
so that the quantity present in the urine might in that way reach the normal maximum but no higher, while the amount passing into the intestine would therefore be all the less. This then I am inclined to give as the explanation of the presence or absence of an excess of indigo in the urine in cases of heart, liver or kidney diseases in which the biliary function or the discharge of bile into the intestine is liable to be interfered with and in which no other obvious cause of an excess of indigo is present.

Can any explanation be given of how the bile should have this influence? I think two explanations may be given. It is well known on the one hand that indol is a product not of digestion, but of putrefaction, and that it is produced only when the contents of the alimentary tract become alkaline, as they normally do in the small intestine when the biliary and pancreatic secretions are mixed with them. The formation of indol and allied products is not due to the digestive ferments but to the putrefactive micro-organisms which are constantly present in the intestine, conditions which increase the putrefactive process or which interfere with the absorption of the ferments from the bowel, such as paralytic distensions of the small intestine, lead to an increase in the formation of indol and similar products. It might therefore be inferred that the bile salts which have some antiseptic power would interfere with the formation of indol and such a view is supported by the fact that reduction in the urine may diminish or even disappear.
during the administration of antiseptics as it did in one of the cases of cancer of the pylorus while sulphuric acid was being given. This then is the first explanation, but there is I think another of greater interest and regard to digestion. When the bile comes into contact with the acid chyme from the stomach it precipitates the pepsin in it so that they form a layer on the surface of the mucous membrane. This appears to be an important process in digestion. The pepsines so precipitated are prevented from passing any further down the intestine as they would have done had they remained in solution, so that they are less exposed to the processes of decomposition which are going on more actively lower down. They are in large part absorbed high up in the intestine by the mucous membrane with which they are in contact and which is adapted to more active absorption by the influence of the bile. This then I take to be the second explanation of the effect of the bile salts in preventing the progressive formation of indol, and it is probably the more important of the two, if they are deficient or absent in the intestine it follows that not only is this antiseptic action diminished or lost, but the pepsines are insufficiently precipitated or are not precipitated at all, and consequently they are under less favorable circumstances for absorption, are carried further down the intestine and there in an abnormal degree undergo the processes of fermentation which lead to the formation of indol and such bodies, the products of which are
more or less absorbed and appear in the urine.

I shall now add a few general conclusions regarding the presence of bilirubin in the urine. These are:

1. That both in health and disease, decomposition of albuminous substances in the intestines must be regarded as its chief, if not its only source.

2. That the frequency of an excess of bilirubin in affections of the liver, particularly in those in which the biliary function or the discharge of bile is markedly interfered with, affords to show that one factor at least in the occurrence of such excess is the derangement or absence of the physiological action of the bile in the intestine.

3. That, in the absence of other causes, an excess of bilirubin in the urine is usually accompanied by an excess, or, less commonly, by a diminution of the bile salts discharged, so that we have a direct evidence of biliary derangement apart altogether from the symptoms.

4. That the above observations and those of others show bilirubin to be in excess in a large number of diseases of very diverse nature, some acute, some chronic.

5. That the diseases in which it is most commonly present in excess are those in which the digestive organs are in some way markedly affected, particularly those which are chronic and are accompanied with wasting and cachexia.

6. That as many diseases an excess may be present in some and absent in others, and that in the same case
(1) Medical Times and Gazette vol 1, 1885 to 761.
there may be an excess at one time and not at another in the same case.

7. That in many diseases in which it is found increased, the excess is not in any way pathognomonic of the disease but is due to concomitant and subsidiary conditions such as derangements of the stomach, bowels or liver.

8. That owing to the large number of diseases in which it is found in excess, it cannot be regarded as of much value in diagnosis.

9. That in regard to the diagnosis of the seat of intestinal obstruction its applicability is very limited.

10. That a negative result—that it is not increased—is the only evidence of much value in diagnosis, for there is then a strong probability of the absence of those diseases in which it is characteristically present in excess, such as cancer, peritonitis, and according to Dr. Groshick (1), fracture of bone.
1) 2% vol. 24/6.

2) Ibid. 19th November 1873 vol IX 24/6.

On the Occurrence of Sugar in the Urine in three of the Recorded Cases.

Three of the cases which I have related present this symptom, namely, a case of cancer of the head of the pancreas with jaundice and glycosuria (case 7), a case of malignant disease probably affecting the stomach and liver (case 10), and a case of jaundice of the liver of the right lung with bile in the urine (case 29).

The first case, that of cancer of the head of the pancreas with jaundice and glycosuria, I regard as one of very considerable interest, especially as it exhibits symptoms which are extremely rare in cases of jaundice and particularly so in those which are, like this one, due to complete obstruction of the common bile duct.

In case 7 it is that I can find no reference to it among the cases of obstructive jaundice related by Almquist, and Dr. Maclean has referred to it in his work on "Bile, Jaundice and Bilious Diseases." Indeed, though I have carefully looked for it in nearly all the cases which I have examined, I have never met with it." Dr. Legg explains the absence of glycosuria in jaundice by the fact that he found that when jaundice was artificially produced by ligature of the common bile duct in animals "glycogen disappears in the liver and that when the fourth ventricle is irritated under the same circumstances, no sugar appears in the urine." On the other hand he states that Golowin found that when milk was given to a dog artificially jaundiced.
(1) London Medical Record July 15th 1886. £ 2 9s. 4d.
Monte May 1886. £ 9 18s. (original papers)


(3) Diseases of the head p. 749.
sugar appeared in the urine. Lely's supports his conclusion by a case of diabetes recorded by Dr. Bright in the Medico-Chirurgical Trans. 1833 vol. XVIII. p. 3 in which diabetes occurred and in which the sugar disappeared from the urine nearly three months after the occurrence of the jaundice. At the first motion there was found to be complete obstruction of the common bile duct, and he explains the disappearance of the sugar by the cessation of the hepatic function of the liver. Dr. Hyatt has recorded an interesting case of diabetes which appears to support Dr. Lely's conclusion. The patient became jaundiced, evidently owing to some obstruction, the stools being destitute of bile, and with the occurrence of the jaundice the sugar, which had previously amounted to ten or twelve grains per ounce, diminished to a hardly perceptible trace. On the disappearance of the jaundice the sugar reappeared again returned to its former amount. On the other hand, Freih. has recorded a case in which there was complete obstruction by pancreatic disease and in which sugar was found in small quantity in the urine about two or three months after the commencement of the jaundice and disappeared again three days before death. Dr. George Harky recorded a case of jaundice from complete obstruction due to a duodenal perforation in which sugar appeared in the urine in small quantity when the case was near its fatal termination, associated with a diminution of pene, of urine acid and of urinary acids and with the appearance of leucin and tyrosin. He remarks on this subject, that the appearance
(1) British Medical Journal, March 6th, 1854. - "An Address on some of the Rarer Symptoms produced by Gall Stones."
of premonitory matter in the urine in the course of a chronic and exhausting disease, is generally the fore-runner of a fatal termination." Dr. Odl, again, in an address on some of the common symptoms produced by gall stones, states that they may produce obstruction jaundice and glycosuria. He relates a case in which in an old man jaundice with complete obstruction occurred after an attack of laboratory, and in which soon after the jaundice commenced, glycosuria began, with thirst and loss of flesh. The liver was greatly enlarged, but not painful or tender. The specific gravity of the urine was 1020, and its content is sugar and some albumen. "Surely here," he says, "we have evidence of the reflection upon the lens of an irritation arising in its own domain — to all appearance an irritation started by gall stone?"

These statements show that, whatever may be the correct conclusions to be drawn from physiological experiments, there is a marked variety in the clinical evidence.

There is every reason to believe that, as in Dr. Odl's case, the glycosuria in this case I have recorded commenced after the jaundice and was related to it. Probably the polyuria and glycosuria were commencing at or shortly before the time of the patient's admission to the infirmary, or perhaps shortly after the onset of the jaundice. For some time before his death the polyuria diminished and the fever also diminished greatly till shortly before death the urine seems to have been quite...
free from sugar. This disappearance of sugar before death is, I believe, characteristic of such cases as regression to diminution of the sugar in ordinary diabetes. Of the three cases of cancer of the pancreas which I have examined, this is the only one which showed sugar in the urine.

This case is apparently quite at variance with the results of Legg's experiments, and the fact that these experiments have been performed with great care and have yielded a perfectly definite conclusion, which has been supported by clinical evidence renders the interest of the present case and the difficulty of finding an explanation of it all the greater. The patient's diet was restricted as to carbohydrates, and though the sugar underwent a diminution it remained in considerable quantity till shortly before death, while in the two other cases of cancer of the pancreas with obstructed jaundice, with a diet not restricted in any way there was no glycosuria at all.

The case recorded by Herick is in many respects similar to the one I have described. There were jaundice from complete obstruction of the bile duct by cancer of the head of the pancreas, constipation, except near the end when there was some diarrhoea in both. The jaundice diminished owing to the glycosuria as did also the amount of bile pigment discharged in the urine. Diarrhoea of blood from the bowel was a more marked symptom in Herick's case, though it occurred in the other also. There were glycosuria and glycosuria but while the urine
Robert states that "under a variety of diseased and unnatural conditions it quickly disappears" and "the circumstances preceding death from disease are such that the liver parenchyma contains a trace of amylol substance when examined post mortem. Apart therefore from any interference with the liver's function, the same condition as Dr. Beez found after the rupture of the bile duct is found when death occurs from other causes.

(1) Op. cit. 1871


(3) London and Edinburgh Medicine, p. 281.
diminished in Trousseau’s case it remained above the normal till the end. In both, however, the sugar entirely disappeared. In relation to this case Trousseau remarks that “observations of this nature prove how little the formation of sugar in the liver is interfered with by a stoppage in the flow of bile. The frequency with which diabetes is accompanied by disease of the pancreas has appeared to me remarkable; out of nine cases I have seen atrophy or fatty degeneration of this gland in five. It is still undeterminable whether these lesions are to be regarded as the producing causes of diabetes and, if so, in what manner they operate.” These two cases afford strong clinical evidence against the conclusion which Ehrlich draws from his experiments, that of “in jaundice, if the obstruction be complete, no sugar from the liver should appear in the urine.” In relation to this it is of interest that not only does glycogen disappear from the liver when the bile duct in animals is ligatured, but in advanced diabetes in man Ehrlich has found that the glycogenic function of the liver is almost abolished, no glycogen being found in a portion of the liver removed by biopsy. The condition which Legg based his conclusion as to sugar from the liver being necessarily absent from the urine in jaundice from complete obstruction is therefore found to be present in advanced diabetes. The theory of Pavy, supported by experiment, that the diabetes may be due to a hyperemic state of the liver, naturally suggests...
(1) British Medical Journal Vol 2. 1885, p. 133-3.

2 London Medical Record. 1891, p. 150 - from Proceedings
2 Bulletin de Med. Paris 1874, 2nd série, vi, 1215 - 1240,
itself in explanation, as an irritative condition of the liver with enlargement and congestion is induced when obstructive jaundice occurs. This, however, is a common result and yet glycosuria is extremely rare in connection with it, and it was not particularly marked in the case which showed the symptom. From the glycosuria we are led simply to intestinal absorption of sugar which, owing to the loss of the glycogenic function of the liver, passed into the general circulation, we should expect the symptoms to be more common in jaundice. In several cases hemorrhages into the Porus Varoli were observed. In the case here described it is stated that the convolutions on the surface of the brain seemed somewhat atrophied but that there were no marked appearances of disease. It seems very unlikely that the origin of the diabetes in such cases has any relation to the brain, evidently springing directly as it does from local changes in the abdomen. Whether does the muscular theory of diabetes introduced by Mr. Pottier (1) fit in well with the facts, especially as the amount of sugar was distinctly affected by diet. More therefore confined to the liver and adjacent organs for an explanation. Herein lies, I think, rightly emphasized the importance of this pancreas interrelation to diabetes, and pancreas- and Belfiore's case does not a special form of diabetes with sudden onset and rapid course due to pancreatic disease with complete abolition of the function of the gland. This form, called "emaciating diabetes," ordinarily commences with

"grave intestinal manifestations, vertigo, vomiting and jaundice." There is habitual diarrhea with greasy or creamy stools, sugar in present in great abundance and there are polyphagia, polydipsia, polyuria and autophagia. The two cases I have spoken of do not correspond to this group of symptoms, as the sugar was not nearly so abundant, and in place of diarrhea there was constipation. In these particulars there are differences. I shall probably, however, though I am not yet thoroughly certain that it is a disease of the stomach, and in one way in which the pancreas may produce diabetes is through the colonic flora. It is interesting that in the case I have related the right sublumbar ganglion appeared to be abnormally hard. Probably therefore the pancreatic disease produces the glyceruria not by itself, but in conjunction with the kidney, as would be the action of the function of glycerin being part of the process.

Although the precise explanation of the glyceruria is doubtful, the description of such cases may do something to the clinical aids towards clearing up the pathology of glyceruria and diabetes.

In relation to the occasional association of jaundice with glyceruria it is interesting that Van Wettich has found that fresh human bile has the property of transforming starch into sugar, while Penfield found that the fresh bile of oxen and sheep transformed glycerin into glycerol. This action was not due to other like pigment or bile salts.
Whether this action may have anything to do with the occurrence of albuminuria is uncertain, it is however very doubtful owing to the rarity of the combination of the two symptoms. It is indeed remarkable that there is so frequently grave derangement of one or the others important hepatic functions and symptoms, whereas there is so very rarely any evidence of a derangement of both together.

There are some other features of interest in this case to which I will briefly refer—

1. The liver was considerably enlarged at first, but gradually diminished, and before death had come within the normal limits. With this diminution there was found after death to be a commencing cirrhotic change, the result of the biliary obstruction.

2. No haemorhage occurred, but this was not a marked symptom.

3. It will be observed from the tabulated statement at the end of the case that the diminution in the daily quantity of urine towards the termination of the illness was accompanied by a diminution in the specific gravity.

4. During this diminution in quantity there was little change in the excretion of urea per ounce, but there necessary was a marked diminution in its daily amount. The daily discharge of urea gradually fell from 467 grains on 10th July to 100 grains on 26th August. Whether it fell still—
further towards the end, I do not know. This steady fall in the discharge of urine in such a case is I think a very grave point in prognosis. During the earlier part of the time occupied by this fall the patient's general condition did not markedly change for the worse, but this diminution of urine made me suspect that he was beginning rapidly to lose ground, and the subsequent progress showed that it was so.

The sugar little diminished for ounces and, still more markedly, for the urine in the twenty-four hours. When the quantity of urine fell below the normal there was a corresponding fall in the amount of sugar and a very great fall and ultimate disappearance of the sugar.

The fall in the urinal excretions and perhaps also the diminution and disappearance of the sugar may be taken to indicate the increasing failure in the functional activity of the liver, and this is supported by the fact that there was some proportion diminution in the amount of bile pigment, and that, notwithstanding this great diminution in the amount of sugar the proportion of bile salts present in it remained about the same as when the quantity of urine was large. Whether there occurred any increase in the urinary elements before death, as in some other cases, I do not know.
The second case, that of malignant disease, probably affecting stomach and liver, was admitted only nine days before death, and sugar was detected in small quantity at least four or five days before he died. It was still present in small quantity three days before death, the last time the urine was tested. Jaundice in this case was absent or slight and bile was passing freely into the intestine. The case, as far as the sugar is concerned, may be compared with that recorded by Dr. George Harley, and his remarks regarding the prognostic value of the symptoms may fairly be applied to it. In none of the other cases of malignant disease was sugar found, though its occasional presence, apart from jaundice, is well enough known in such conditions.

The third case, one of pneumonia, showed only a trace of sugar, and that disappeared along with the bile pigment soon after the crisis. The pneumonia affected the base of the right lung and was accompanied by a small amount of bile pigment in the urine with a large amount of bile salts.

I think, reasonably, ascribes the occurrence of the sugar to the changes in the liver or adjacent organs. In this case the apparent interplay with brain centres of brain might be suggested as an explanation of the rapid disappearance of the sugar. The sugar found in the urine of persons suffering from diabetes, when a sickle condition is set up, that sugar in the urine commonly diminishes or may actually disappear. It may with great probability be ascribed to the can
British Medical Journal, vol 2, 1855, p. 1052.
irritative condition of the head and possibly of the pancreas, with hyperaemia, set up by reflex influence from the pleura of the lungs adjacent to the inflamed lung. It may possibly be related to the fact that glycosuria is present in the consolidated lung of pneumonic in larger quantity than in normal lung.

Glycosuria in febrile conditions rare. Dr. B. Marshall G. Sherwood related a case before the meeting of the British Medical Association at Cardiff in which the patient had a febrile attack of about eleven days duration, possessing no special features, with a condition of acute glycosuria, in which the characteristic symptoms of diabetes—thirst and the generation of a large amount of sugar-laden urine—were prominent features. As sometimes occurs in intermittent fever, the glycosuria was here evidently induced by the febrile state and it disappeared when the fever ceased. The fever rapidly subsided under treatment with salicylic acid. The marked influence of this drug suggests a muscular origin of this glycosuria in this case.
Remarks on other Cases.

Case 26. Cardiac, with Pericarditis.

The chief feature of interest in this case is, I think, the occurrence of Pericarditis apparently as a complication of the second attack of pneumonia. During the first attack the patient had had induration and probably Pericarditis as well. During the second attack there appears to have been an exacerbation of the cardiac mischief, and it is interesting to observe that the pericarditis appears to have commenced over this part of the liver next the heart, and to have extended from thence, whether it was set up by a direct extension of the inflammation or not, it is difficult to say. The more chronic congestion of the liver is not a likely cause, and I think we must either regard it as a direct extension of the inflammation which had probably been lighted up in the pericardium or as an independent chronic inflammation occurring as a complication of the pneumonia. Whichever view may be taken of it, the case is interesting on account of the fact of this symptom under such conditions.

In some of the other peculiar cases pericarditis also occurred, but in them it was more superficial. Thus in the case of cancer of the lungs (case 11), it occurred over the tumor. In the case of lung disease (case 32), pericarditis occurred and was speedily fatal. In this writer's case (a case of malignant diathesis of this kind), pericarditis was present.
In the case of Gallstone with suppuration in the gallbladder and bile ducts, and with cancer in the ducts and head (case 8), there was general swelling of the parts around about the affected area.

A more unusual (in fact, very rare) complication was the occurrence of Perichondritis in the course of a case of Diabetic Mallory. The pain was worst close to the Xiphisternum, and it extended from there to four fingers to the right over an area of about ten square inches' breadth in the line of the costal margins.

There was tenderness on palpation and percussion, and distinct friction was heard. The heart was not markedly enlarged. There was no jaundice nor ascites. The heart was normal, but there were well marked signs of Phthisis and Bronchitis, the expectoration being especially numerous over the front of the chest on the right side.

The occurrence of Perichondritis in Diabetics is certainly rare, and in the works which I have consulted it has not been mentioned. A possible explanation is that the inflammation may have extended through the trachea from the pleura as a result of the pulmonary affection.

It may be that there have been connected with an embolus through the trachea, sometimes present in the chest in diabetes.
Case 3.

Case of Obstructive Jaundice with large dense Creation in the front of the Abdomen.

The patient gives a history which would seem to point to the case being one of Biliary Jaundice following upon Gastritis-duodenitis, but the severity and persistence of the jaundice are against the view of its being due merely to jaundice. The fact that she had a very severe form on the abdomen five years previous suggests two explanations of the jaundice: one, the more probable, that a duodenal polyp had formed as the result of the form, and that the biliarial changes following upon this have led to the occlusion of the common bile duct; the other, that the irritation from the polyp gave rise to a satellite stone extending inward by the downward elongation of the gallbladder, so that the bile ducts have thereby been involved in a peculiar process and so occluded.

Case 4.

Case of Gall Stones, Obstruction in the Gall Bladder and Bile Ducts. Cancer of Ducts and Liver.

This case is interesting in regard to the question of operative treatment. The question of ligature was residually made out before the operation as found the indication for it, but there was no evidence of any condition being present which would necessarily make the operation a failure. Considerable relief was obtained by the operation though the jaundice persisted. At the post-
The frequent association of gall stones and cancer is well known, and the relation between the two appears to differ in different cases; in some, notably the great majority, the gall stones being the primary condition and the cancer being produced by the irritation caused by them, in others the cancer being primary condition. A case of the most frequent development of cancer as the result of the irritation of gall stones, it is advisable to in some requiring function, to have the function done as soon as possible in order to diminish the risk. The present case also illustrates the uncertainty which must often persist on the prognosis in such cases.

Case 87.

Case of Cancer of the Pancreas with Jaundice.

In previous cases, this case contains at first an unusually large amount of bile salts, as much as 600 per cent. A steady fall occurs in their elimination till a few days before death, the excretion present was only 300 per cent. This fall may be taken to indicate the gradually increasing failure of the functional activity of the liver, and it substantiates the opinion of Dr. George Hardy that the bile salts are present in greatest amount at the beginning of a case of jaundice, or jaundiced condition, and that they diminish as the case advances.
Case 15.

Case of Limited Peritoneal Effusion with Cardiac Disease and Carcinos of the Liver.

The interest of this case lies in the manner in which the ascites was limited in the abdomen, the right lumbar and right iliac regions remaining clear on inspection, and this clear area not being affected by change of position. Further, while the fluid was being drawn off, this clear area extended more to the left by three inches, while the upper limit of dulness descended only very slightly. Then, when the tapping was stopped, a considerable area of dulness remained on the left side of the abdomen. There was nothing in the cause of the ascites to account for such a peculiar limitation, it being due probably partly to the heart and partly to the liver. Peritoneal adhesions from old inflammation or some peculiar dilatation of the peritoneum seem the most probable explanation.

Case 16.

Case of Hepatitis Cirrhosis of the Liver.

A marked feature of this case was that, though the obstructed circulation led to great enlargement of the liver, there was no ascites. This absence of ascites meets its explanation in the vascularity of the new connective tissue in the liver, so that it is probable that the spleen should have enlarged so much.

Towards the end, this patient presented characteristic...
As characteristic of advanced cirrhosis. Of this I have already spoken.

Case 33.

Case of Persistent Diarrhoea with Inflammatory Bright's Disease.

I have already stated briefly the view I take as to the nature of this case. The illness apparently commenced with ordinary diarrhoea, the result of cold. This, however, proved intractable. The exacerbations of the subsequent symptoms is, I think, that in the abnormal condition of the intestine, decomposition went on to an unusual extent and that the poisonous products of this generation, perhaps intestinal — but of acute nephritis, and if their irritation produced, led to the enlargement of the liver with caustic and afterwards to degeneration and subacute atrophy. We have evidence of the great amount of decomposition going on both in the fluid of the stools and in the large amounts of indigest in the urine. In spite of the blood colour of the juice and the bluish green reaction given with nitric acid there was no jaundice and these characters of the urine are evidently to be explained by the excess of indigest from the occurrence of tubercular disease of the intestine is a possible explanation of the persistence of the diarrhoea.
Report of Clinical Cases.
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Case 1.

Case of Catarhal Jaundice with some Congestion and Enlargement of the Liver.

James McGovern, age 21; Labourer. Admitted on 10th Feb. 1886, suffering from Jaundice of about nine days duration.

History: He used to be the worse of drink as a rule every Saturday and he has been in the habit of eating Butcher meat to excess, taking ¾ to 1 lb of it twice or three times a day. His work was hard and constant. While at work he was exposed to an atmosphere filled with steam; he never had any serious illness before, and never had any hepatic disorder.

Present Illness: He became jaundiced about nine days before admission. The illness began with frontal headache and sickness, but with no pain, shivering or vomiting. The skin became itchy, and he had a bad taste in the mouth. He had diarrhoea for the first four or five days, with pain and flatulence. He also vomited some sour greenish fluid. After the diarrhoea ceased he had a feeling of heaviness in the umbilical region. This disappeared when he lies on his right side, and is worst when he lies on his left side.

State on Admission: Well developed; marked jaundice of skin and mucous surfaces. No chills, nor cyanosis. Temperature 98.8°F.

Alimentary System: Gums slightly anaemic. Tongue furred towards the back and clean at the tip.
The buccal secretion are deficient and a bitter taste is constantly present in his mouth. Appetite poor.
The feeling of weight in the umbilical region becomes worse about three hours after food. He suffers from flatulence. Bowels constipated. Stools white.
Abdomen: Lower border of liver indistinctly felt. No irregularity detected. Gall bladder indistinctly felt. On percussion the note is clear except over the liver. The stomach is considerably dilated and splashing sounds are obtained by succession. The gall bladder gives an ini-
spired note for fully an inch below the margin of the
liver, and for fully an inch transversely between the
right parasternal and middle lines, extending a little
beyond parasternal line. In the middle line the he-
patie dulness extends from 4 inches above the
umbilicus upwards for 3-4 inches. In the right mam-
mary line it extends from the 4 th rib downwards to
about half an inch below the costal margin a distance
of fully 6 inches. The superficial dulness begins
at the 6 th rib. In the right mid-axillary line the
dulness extends from the 6 th intercostal space downwards
for 6-7 inches. The superficial dulness begins at the 6 th rib.
In the left parasternal line the deep cardiac
dulness begins at the 8 th rib. Transversely it extends
from nearly an inch to the right of the sternum
to the left mammary line. The apex beat is in the 5 th
intercostal space in the left mammary line. In all the
Cardiac areas the first sound is followed by a soft
diastolic murmur, and the second sound is slightly
accentuated. Pulse 70 per minute, regular, of moderate volume, rather collapsing, soft, and easily compressible. Except for the jaundice the other systems are normal. Treatment: - 21st Feb: Saffron powder.
23rd Feb: Rhubarb, Bismuth, and Soda powders, one thimble daily. A blue pill was also given.
On 12th Feb: his condition had not markedly changed. The gall bladder was palpated. Succession produced a splashing in the stomach, whose root extended to an inch below the umbilicus. Spleen not enlarged.
On 20th Feb: the skin was becoming a little clearer, but there was still a deep yellow colour of the conjunctivae. Some pain below the liver. Still a better taste in mouth. No tenderness on palpation of abdomen. Tongue covered with yellowish-white fur.
On 24th Feb: the liver dulness in the middle line extended from 3 inches above the umbilicus upwards for 5 inches. In the right mammary line it extended from the 4th interspace to an inch below the ribs, a distance of 6½ inches. The superficial dulness commenced at the 5th interspace. In the mid-axillary line the dulness extended from the 6th rib downwards for 6 inches. Superficial dulness at 7½ rib.
There was slight tenderness in the epigastric in the middle line. No tenderness on palpation of the liver. He complains of pain in the left side in the region of the lower true ribs. Slight systolic mitral murmur.
Skin still slightly yellow, but jaundice less marked in conjunctivae. Still some itchiness of skin, but not so much. Feels heaviness in stomach after food.

He was discharged on the 1st of May, only a slight icteric tint remaining in the conjunctivae. He had almost quite recovered from the jaundice, but the liver still remained large.

**Examination of Urine.**

*10th Feb.* Clear, distinctly bile stained; Deposit of mucus; S. Specific gravity 1021, acid. No albumen nor sugar. Bile pigment in considerable quantity. Bile salts slightly increased. 3740 required = 166 per cent.

*12th Feb.* Bile pigment in considerable quantity. Bile salts not perceptibly increased.

*15th Feb.* Bile pigment much less.

*17th Feb.* Bile pigment almost absent. Bile salts about normal.

Case 2
Case of Catarhal Jaundice.

John Henderson; age 34; Engineer.
Admitted on 5th March, 1886, suffering from Jaundice, of about seven weeks duration. The history and symptoms all pointed to its being an ordinary Case of Catarhal Jaundice.

On admission he was distinctly jaundiced and the liver was distinctly enlarged.

A point of interest in the history is that his mother aged 60 was at the time of his admission suffering from her third attack of jaundice. Her second attack lasted three months. She also had heart disease. His father died from heart disease.

On 9th March he was not quite so deeply jaundiced. The cardiac impulse was felt as far out as the anterior axillary line. There was a soft systolic metallic murmur, and a faint diastolic murmur is also heard. The cardiac condition has not, however, given him any trouble. The hepatic dulness in the right mammary line extended from the 4th interspace downwards for 7/4 inches, ending 1 3/4 inches below the costal margin. In the middle line it extended from 2 3/4 inches above the umbilicus upwards for 6 inches.
In the mid axillary line it measured 7 inches. No pain or tenderness. Pulse 60, regular, small, easily compressible.

The patient gradually improved, the jaundice becoming less and the stools becoming darker. No marked change occurred in the size of the liver, but it became less firm. On 13th March the sputum, which had for some days been yellowish, was found to give the reaction of bile pigment. It was distinctly acid. On the right forearm and some other places there were patches like urticaria. Spleen not enlarged. Better taste in mouth.

On 18th March the jaundice had become much less, but was not quite away from the skin, or from the conjunctivae. There was still slight itchiness of the skin. Tongue slightly furry. Stools a little coloured. Pulse 76, moderate volume, collapsing. No pain. The patient left the infirmary that day much improved.

Treatment:—6 grains of Calomel was given on 5th March at bedtime, and 31st Mnt. Somae Co. next morning. The Calomel was repeated on 7th, 9th and 11th March. A dose of Henry's solution was given on 11th, 12th and 13th March.

Diet:—Milk, porridge, light puddings and soup.

Examination of Urine.
The quantity during the first few days was
small, but afterwards it was normal or nearly so. The specific gravity at first was high, after- wards normal. The reaction was acid. There was no albumen or sugar. The urea varied from 149.9 to 378.46 grains.

Microscopically there were at first amorphous urates, hyaline casts containing granules and highly granular cells, deeply bile stained, and cells probably from the kidney also bile-stained. Latterly there were, besides the usual vesical epithelium, which was a little bile stained, deeply pigmented granules, some obviously epithelial.

6th March, Quantity 20 ounces, specific gravity 10.28; Bile pigment in pretty large quantity; Bile salts my 30 required, or 200 per cent.

8th March, Quantity 40 ounces, turbid from urates; Bile pigment in pretty large quantity; Bile salts my 35 required, or 183 per cent; Urea 499.928 grains.

12th March, Quantity 48 ounces; specific gravity 10.21; Bile pigment in smaller amount; Bile salts not perceptibly increased. Urea 378.46 grains.

17th March, Quantity 48 ounces; specific gravity 10.22; Bile pigment in small quantity, much less than before; Bile salts normal; Urea 421.35 grains.
Case 3.

Case of Obstructive Jaundice with large tense, localized on the front of the abdomen.

Elizabeth Allen: Age 25.
Out door farm servant: Admitted, 23 Sept. 1885, on account of Jaundice of nine weeks' duration.

History: - There is nothing of importance in the family history. She has had good food, a comfortable home, not too much work, and has been temperate. She has had no previous illnesses. Five years ago she accidentally set fire to her night dress, and the skin of the abdomen was very severely burned. There was not much pain, but a considerable amount of skin was destroyed, and there has resulted a large and very dense cicatrix at and around the umbilicus. The wound was healed within six months. There is no history of haemorrhage or other symptom of gastric or intestinal following this burn.

Present Illness: - Nine weeks before admission, when suffering from toothache, she took a smoke from a neighbour's pipe - she had never smoked before - and almost immediately she became sick and vomited. The vomited matter consisted simply of altered food. The sickness and vomiting continued for about four weeks. About a week after these symptoms commenced, the urine became dark, and after this the skin became yellow, and it has been itchy ever since.
though not so much since her admission. There has been a bitter taste in the mouth. The stools have been generally white, sometimes a little coloured. They continue much the same. There has been no pain in the stomach, no headache, nor drowsiness.
When examined on 2nd Oct: there was marked jaundice of the skin and mucous surfaces. The tongue was covered with a yellowish white fur, and is sore owing to the Calomel pills which have produced salivation. The saliva is greenish in colour from the presence of bile in it. Appetite good. No thirst. Complains of flatulence. No vomiting now. Bowels regular. Feces continue pale.
There is a cicatrix as before mentioned occupying the epigastric region and umbilical regions, and extending to the upper part of the hypogastric region and the two hypochondric regions. The cicatrical contraction has caused a restriction of the abdominal wall laterally. The central part of the cicatrix round the umbilicus and for 2 or 3 inches above it, is very hard, and the skin is puckered all round it. There is no tenderness, and there is nothing abnormal to be felt in the abdomen. There is no dulness except over the liver. In the middle line the liver dulness extends from half an inch above the base of the Xiphoid-sternum downwards for 3½ inches. In the right upper
iminary line, it extends from the 4th, interface to about half an inch above the costal arch, a distance of 5½ inches. In the right mid-axillary line it extends from the 6th interface downwards for 5 inches.
Circulatory System: Normal except that the first
sound is feeble. Pulse 70 per minute, regular, of medium size easily compressible.

Respiratory System: - Normal.
Integumentary System: - The cuticle is the jaundice.

The patient was treated for about a week after admission with Calomel, Coniummin & Extract of Gentian in pills. This had to be stopped owing to the great readiness with which salivation was produced. On 1st Oct she was ordered bicarbonate of soda, and infusion of Gentian. On 7th Oct. pills were ordered containing Podophyllum, Rhubarb, Coniummin, and Gentian.

The patient remained in the Infirmary till 13th Nov. During the time she was in the Infirmary her condition underwent little change. Though she said she felt stronger. It is doubtful whether the Jaundice ever contained any bile. They were carefully examined on 16th Nov. by Dr. Robertson & myself. They were of pretty-like consistence and colour, with no evidence of bile either to the eye or by tests. There was a large quantity of fat present, but very little albumen. The jaundice varied somewhat in intensity from time to time. The gums sometimes bled owing to the dryness produced by the Calomel.

The temperature was normal or subnormal at all times.

The Urine was generally about normal in quantity: It varied from 24 to 64 ounces per diem.
It was always deeply bile-stained. There was as a rule only a slight mucous deposit which on microscopic examination showed mucous corpuscles, bile-stained epithelial cells, and sometimes a little granular matter. The specific gravity varied from 1.011 to 1.018 except on 12th Nov. when it fell to 1.006. There was never any albumen or sugar. Bile pigment was always present in large quantity. The bile salts were always present in distinct, though sometimes not great excess — the largest amount being 300 percent (normal = 100 percent) and the smallest about 180 percent.

Indican was several times carefully tested for, the bile and the pigments being first removed by precipitation with acetate of lead. It was found to be always in excess sometimes considerably.

Microscopically there were bile stained squamous epithelial cells, some mucous and pus corpuscles, granules of bile pigment, uric acid crystals, urate of soda, hyaline casts with bile stained granules & cells, granular casts, and casts partly epithelial.

The urea varied from 1.68 to 3.36 grains per diem, generally near or under 2.00 grains.
Case 4.

Case of Bilious Colic.

Martin Welsh, age 45, Coalminer.
Admitted on 15th September 1885, complaining of pain in the right side extending across the front of the abdomen; pain in the back and edema of skin.
Duration about a year.

History: Two brothers suffered from jaundice, but it was not of long duration. Food has been good. He has for twenty years been in the habit of drinking to excess on Saturday nights. As a miner he has been exposed to wet and to alternations of temperature, and has had to work in a damp and foul atmosphere. Previous health good. About eight years ago his back was bad half below the right shoulder. No history of syphilis. He had haemorrhoids which sometimes bled in 1870. They got better and did not trouble him again till the present illness commenced. Since then they have returned and bled occasionally.

Present Illness: The first attack came on gradually in the end of last year with pain in the right side in the region of the lower ribs. This was accompanied by yellowness and edema of skin, jaundiced urine, and pulp but not quite white stools. He got a chill a few nights afterwards which made the pain worse. Caused him to stop work. The pain then shot across the epigastrium and through to the back. The attacks of pain
came on gradually and went away gradually. Between
the attacks of severe pain he was relieved for a variable
time up to a fortnight, but still some dull pain remained.
During these remissions the skin became less jaundiced.
In February last, while suffering severe pain in the right
side of the abdomen, he vomited "black blood." He thinks
this occurred twice once about a pint of blood was
vomited. He started work again in June, when he
was a good deal better, had no pain, but still had ithe-
ness of the skin. The colour of the skin did not quite
clear up. He had to stop work on 8th Sept. as the pain
recurred owing this having got a chill when heated at work.
The pain began first in the right side then extended across
the epigastrium and then to the back which was so painful
that he could not lie on it. After admission the first
attack occurred on 13th Oct. Up to this time he had been
improving. At 5 p.m., he was seized with a severe
sharp pain in the same situation as before, shooting
to the back and down the right side, but not to the
epigastrium. A rigor soon followed the pain. There
was also some sickness but no vomiting. Tempera-
ture in evening 104° F. 30 grs. of sulphate of quinin
was given. Pulse 88 at 8 p.m. Pain not so severe. He
lay on his back with both legs extended, moaning a little.
There was slight fulness in the epigastrium to the right
of the middle line, at which part there is also some
tenderness. The liver dulness in right mammary line
extended to about half an inch below the costal arch. From
this point to the middle line, the line of dulness passes
slightly downwards, being distinctly lower than normal in the middle line. Opiate perforations were applied over the epigastrium. At 9.15 p.m. the temperature was 103.6, the pain was less, and he was feeling better. On the morning of 15th Oct: he was again in his usual condition, the rigor and severe pain having passed off.

He vomited frequently before admission when he had the pain, but he has not vomited since admission. Except on the occasion above mentioned, the vomit consisted of altered food and mucus. The bowels have been constipated since admission. The colour of the stools has varied, being sometimes pale.

On 3rd Nov: his condition was as follows: He has lost about 40lbs weight since the illness commenced. He is pale and thin. Conjunctiva have a distinct, though not very deep, jaundiced colour. Skin dry and harsh.

**Alimentary System:** Tongue clean, slight jaundice on under surface. Appetite good. Pain between meals, especially directly after food, with sometimes a feeling of weight, distension, and heartburn; also acidity, flatulence, and water-brash. Pain in right side when at stool. The evacuations were chalky after the attacks of pain, but are now going normal in colour.

**Abdomen:** The skin has a slightly yellowish tinge. There is a slightly tender nodule about the size of a pea in the epigastrium about 3 inches above the umbilicus. It does not move with respiration, but is symmetrical in size when he has the severe pains. The abdominal walls are of moderate thickness and tension. There is some
Tenderness in the right lumbar region. It is doubtful whether there is some irregularity of the surface of the liver. The margin does not feel irregular, but it is not very distinctly felt. There is no dulness except over the liver and spleen.

In the right mammaeary line the hepatic dulness extends from the 5th rib to a little below the costal margin, a distance of 5½ inches. The superficial dulness begins at the 6th rib. In the middle line the lower margin is 2 inches above the umbilicus, and the hepatic dulness extends upwards for 5½ inches. In the right mid-acillary line the hepatic dulness extends from the 6th rib downwards for 5¼ inches. The superficial dulness begins at the 7th rib. The lower border meets the costal margin on the left side three inches to the left of the middle line.

Haemopoietic System:—The splenic dulness is continuous with the liver dulness in front. Its limit is not well defined behind. In the left mid-acillary line it extends from the 7th rib downwards for 4 inches. There is enlargement & induration of the inguinal glands, but not of any of others.

Circulatory System:—The apex beat is displaced outwards to some extent. In the mitral area the first sound is impure, and the second sound is slightly accentuated. Otherwise, the system is normal.

Respiratory System—normal.

Integumentary System—normal except for the itchiness and slight jaundice.

Urinary System:—He had pain in the region of the bladder, and itching along the urethra when micturating.
He requires to urinate once or twice during the night.

Nervous System: - A burning sensation is sometimes felt all over the body, especially in the right side and back. The complaints considerably of sleeplessness. The system is otherwise normal.

Locomotor System: - normal.

Treatment: - He was first ordered Dilute Nitrohydrochloric Acid. On 11th Nov. pills were ordered containing Iridin, Ergomine, Podophyllin & Pte. Hydrarg. One at bedtime: Dose of Carlsbad Salts in the morning.

5th Nov. The pain has been worse to day. The tender part is below the ribs about 2 or 3 inches to the right of the middle line.

6th Nov. The pain has again become very severe twice he got up. Skin and conjunctivae more jaundiced than usual. Great boarding of Abdominal wall. Pulse 82, regular, moderate. Volume, tension good, easily compressible. Mid day temperature 103° F. In the evening temperature 97°.

7th Nov. Some pain again this morning.


11th Nov. Evening. - Very little pain. He feels tenderness over the prominence below the Xiphisternum, which, as well as one lower down, appears to be in the abdominal wall. The surface of the liver is felt to be nodulated, the nodules being small, and the lower margin is rounded, hard and irregular like the anterior surface... Abdominal walls lax. Slight fulness in epigastrium especially on the right side. The percussion of the liver is nearly the same as on 3rd Nov. -
13th Nov. Morning. — Jaundice more marked today. He has not had a severe attack of pain during the last twenty-four hours. 2:20 p.m., he took an attack of pain with rigor between 11 and 12 a.m. Pain not so bad now. Lying with knees drawn up to relieve the pain. Pulse 85, of moderate volume and compressibility.

14th Nov. Much more jaundiced to-day. No oedema.

15th Nov. — Pretty free from pain since yesterday. Jaundice much less.

24th Nov. — Very severe pain last two days.

The nurse has several times searched for gallstones, but none have ever been found. The stools have sometimes been like putty, sometimes a little darker. To day there is marked jaundice of the skin, &c.

Not complaining of pain.

He left the Infirmary to-day by his own desire, his condition not having undergone much change.
The urine always contained a considerable quantity of urinary pigments. It never contained sugar, and only once was a small quantity of albumen present on 13th November, on which day he had a severe attack of pain.

Microscopically it showed only mucous corpuscles and squamous epithelial cells.

25th October, some days after an attack. Specific gravity 1012; acid; bile pigment in small quantity. Bile salts, my 30 required, double the normal, or 200 percent. Indican in small quantity; no increase. Urea per ounce 9.596 grains.

3rd November. (No attack for some time.) Specific gravity 1021; no bile pigment; bile salts normal; indican, moderate increase; Urea per ounce, 9.8384 grains.

6th November. (Attack of pain both yesterday and to-day.) Specific gravity 1021; acid; bile pigment, in considerable quantity; bile salts, my 20 required, i.e., treble the normal, 200 percent. Indican, some increase. (The other pigments were first removed by Acetas plumbi.)

13th November. (Attack of pain at 2 p.m.) Specific gravity 1021; acid; albumen = 1/2; bile pigment, in large quantity; bile salts, my 25 or 30 required, i.e., 250 or 200 percent; indican, considerable quantity. (Other pigments first removed by Acetas of lead.) Urea per ounce 8.9185 grains.

15th November. (Relief free from pain since
yesterday, and jaundice much less.) Specific gravity 1023; Acid; Bile pigment, only a trace; Bile salts, normal, or only slightly increased. Indigéum, moderate increase. (Other pigments removed as before.) Urea per ounce, 10.0972 grains.

23rd November. (Severe pain) Specific gravity 1022; Acid; Bile pigment in small quantity; Bile salts not tested for.
Case 5

Case of Gall-Stones, Suppuration in Gall-Bladder and Both Ducts, Cancer of Ducts and Liver.

George Robertson: age 49; Dick Porter:
Admitted 8th Dec. 1855, complaining of dull pain in the epigastrium, and a more acute pain which darted through the upper part of the abdomen from left to right.

Duration—about nine weeks.

The patient was in good health until nine weeks before admission, except that he had long suffered from piles for which he was operated upon seven years ago. They have bled slightly ever since when he is constipated.

He has long been subject to "bilious attacks," during which his skin becomes yellower. Once about nine years ago, he had an attack of jaundice.

He had pain in the stomach afterwards owing to the retching.

Nine weeks before admission he began to suffer from diarrhoea. He continued at work, however, for six weeks, when he took a chill, with pain in the epigastrium. This pain has been constant, but he has had acute attacks of pain which commenced in the left of the epigastrium, and extended round the right side in the region of the liver, rendered worse by breathing, relieved by fomentations. He felt hot at nights. He did not take a rigor again till the night before admission. There have been head...
 ache, sleeplessness, and a constant feeling of nausea.

There has been frequent vomiting, at first simply altered food, afterwards bilious. After a time some yellowness of the conjunctivae was noticed.

On Admission there was some internus of the conjunctivae, and the skin had a sallow colour, but was not distinctly jaundiced. There was some diffuse fulness in the epigastrium, and extending to the right of it. The abdominal wall was of moderate thickness and tension. There was tenderness over the liver below the ribs, most marked in the epigastrium just below the Xiphisternum. The lower margin of the liver was felt extending across an inch and half above the umbilicus. It was palpable for some distance to the left, and could be traced to the right beyond the mammary line. There was no tenderness except over the liver. No friction. In the middle line the liver dulness extended from 1/2 inch above the umbilicus upwards for 6½ inches. In the right mammary line the dulness extended from the 5th rib to 1/2 inch below the costal margin, a distance of 6½ inches. In the mid-axillary line it extended from the 5th rib downwards for 6½ inches.

Spleen considerably enlarged.

Circulatory System: Normal except perhaps for a slight mitral systolic murmur. Pulse 80 per minute.

Respiratory System: Normal.

Integumentary System: Some old perspiration along with new.
Urinary System: - He has a constant desire to pass urine, and there is a burning sensation in the urethra during micturition. (Report on urine at end of case.)

Nervous System: - Nothing in addition to what has been already stated.

Locomotory System: - Normal.

On the evening of 8th Dec: he took another rigor. Temperature was 101.6°. Pulse 104, regular, of moderate size, tension good; artery well filled between the beats.

From 8th to 20th Dec: he had intense deep-seated pain in the upper part of the abdomen and in the back with exacerbations. Marked jaundice came on & persisted. The stools were pale, but, as a rule, not absolutely bloodless. Once or twice the contained a little blood. The temperature was normal in the morning, but was several times elevated at nights - once (14th Dec) as high as 103°. The bowels were kept open by Epsom Salts. Senna was applied on 16th Dec: to the anus and over the liver, and after that the pain was diminished. Lead & Opium fomentations were applied over the liver. On 19th Dec: the pain was again severe, and had to be relieved by Laudanum.

On 20th Dec: the patient was operated upon by Dr. Lawson Tait. An incision was made a little below the right costal arch. Thirty-nine gall stones and a quantity of pus were removed from the gall bladder. After the operation the pulse rate was 80 per minute, and the temperature was 98°. The intense pain disappeared, but some dull pain remained. The jaundice
also persisted. On the following day the morning temperature was 100.2 and the evening temperature 101. From this time till 14th Jan., the temperature was normal or subnormal in the morning, except on 8th Jan., when it was 101.4, with sometimes a rise in the evening. On 30th Dec. he had a rigor with a temperature of 102.4, and several rigors occurred after this during the progress of the case. There was some bile in the motions after the operation, but after some days the bile entirely disappeared from them. During the rest of his progress they contained generally a little bile, sometimes none. On 24th Jan., his nose bled a little. From 14th Jan. till the end of Feb., the temperature was frequently elevated, often in the morning than in the evening, the highest being 102.4 on the morning of 22nd Feb. During March there was not much elevation of temperature. On 28th Feb., the skin and conjunctivae were still deeply jaundiced. There was no itchingness of the skin; indeed, he never had had any. Tongue pretty clean, but flabby. The abdominal examination on 28th Feb. was as follows:—There was general fulness and tenderness in the epigastrium from the middle to a little to the left of the middle line. No distinct fluctuation. Margin of liver to the right also tender. In the right mammary line the liver dulness extended from the 5th rib downwards for 6 inches. The dulness in the epigastrium began fully 2 inches above the umbilicus and the tenderness was greatest at the point where the dulness begins. There was some dulness below the liver in the right mammary line.
After the operation a drainage tube was inserted into the cavity, and the fistula remained open ever afterwards. The cavity contracted somewhat, and an effort was made to get the wound to close up, the tube being gradually shortened; but this did not succeed. The discharge till near the end of March gave a slight reaction for bile pigment. After this it gave no reaction for bile pigment.

After the wound had cicatrized he was able to get up, and his general condition did not undergo much change till after the middle of March. During this time he was generally up for part of the day. On 24th Feb. the epigastric trunnum was observed to show more prominence than before, but this after a time went down. The jaundice varied, becoming more marked after the rigors, which were not accompanied by pain. After the rigors the stools sometimes became absolutely bileless. The nurse stated that even during the rigors the skin became visibly more jaundiced. After the 10th of March he complained a little of itchiness of the skin and of a bad taste in the mouth. The tongue after January was large and flabby, and covered with a whitish or yellowish white film.

On 22nd March, a quantity of blood, partly clotted, was discharged when the cavity was washed out. He had a good deal of pain round the wound which caused him to return to bed. There had for some time been tenderness of the skin of the back, and at the lower part there had been a slight bed sore, which, however, healed up. After this there was more or less haemorrhage from the wound. The tenderness round it increased, and a considerable amount
of swelling and induration occurred at its lower border. This was relieved on 22nd April by a small incision from which nothing but blood escaped. On 23rd March the hepatic dulness in the middle line commenced 1½ inches above the umbilicus, and the lower border extended from this upwards and to the left, and met the costal margin near the left mammary line. Below the falciform there was dulness for about 1½ inches. A day or two after this oedema of the feet commenced and this caused him to keep his bed. He had for some time felt breathless on walking, and this had been getting much worse.

28th March. — Harsh breathing with prolonged expiration, & a few rhonchi over the front of the chest. He has had a cough for some time with much purulent sputum. Pulse 84, regular, moderate volume, collapsing easily compressed. Appetite sometimes good.

31st March. — The discharge, which for a time was rather fetid, has become more sweet, twice carbolic lotion was used instead of boracic. Some oedema of feet from being up a little, and after this the oedema occurred very readily.

14th April. — Has been getting gradually weaker, with more oedema of the legs. For several days his urine has contained considerably more bile than recently. On 13th April he had severe pain in the left side of the abdomen with a good deal of fulness and tenderness all over. The pain was relieved by a mustard poultice. Yesterday evening he had a severe attack of pain in the abdomen with friction, later he had a rigor, and at 12.30 a.m. his temperature was 104°. At 1 a.m., 30 gms.
of Antipyrin given. Pulse 150. Respiration 56. Two Codlins pills were given. At 1:30 a.m., Temperature 103.2; at 7:30 a.m. 98.8. The wound was found to be jacket last night, and was washed out with Corrosive Sublimate lotion. Today there is haemorrhage from it, the discharge is still jacket, and the wound itself is looking bad. There is considerable abdominal distension. Bowels have been loose for some time and are so still. Faces very jaundiced. Had a faintish attack at stool last night, was in a dressing condition. Cough as before. Has to hold the top of the bed to assist his breathing. Pulse 92, regular, soft, weak. Tongue thickly covered with dirty whitish fur, wanted to be dry. Speaks in a low weak voice: seems a little deaf. Pain now gone. There are haemorrhages in the skin on both legs a little above the ankles. Oedema of feet and legs in spite of his lying in bed. 15th April. Worse to-day. Taking chiefly brandy. Has become drowsy and stupid. Pulse 66, regular, small, soft and feeble. Vomited this morning. Stools loose, bilious or almost so. No pain but considerable abdominal distension. Considerable amount of ascites. Percussion of liver the same as before. No friction. Skin dry. He has passed only about 4 ounces of urine since yesterday, 2 of which were drawn off by the Catheter this morning. At 2 p.m., he was wet-capped over the loins and afterwards hot bottles were put round him to cause perspiration. He perspired freely. In the evening he was very weak. Pulse 79 - weaker but fairly regular. Bowels moved freely by aperients, brandy and spirit of juniper being given. evening pulse 100. Respiration 44. 16th April. Very weak.
but says he feels well. Drowsy; mild wander a good deal. Skin has been gradually getting darker. Some puff of Capillaries distension on face. "Pupils somewhat contracted. Still vomiting at times, bringing up tough mucus. Abdomen much distended. More tympany. Discharge from wound very foetid. Supuration burrowing in tissues round it. An ulceration above the cretinae gave way to about to about an ounce of pus. About 2 draughts of wine were drawn off at 1.30 p.m. Highly albuminous. In the evening the pulse rate was 82. Respiration 32. Full and irregular. Breathing stertorous. Semi-comatose. "Pupils contracted. Skin very dark. Petechiae much the same as a few days ago. A little wine passed in bed. A good deal of haemorrhage from cavity opened to-day. Tissue breaking down round the wound. Discharge foetid. Abdomen tense and distended. Considerable tympany. Deluere in both flanks, and for some distance above pubis. At 8.30 p.m. he was becoming more comatose. Breathing 28. Stertorous and irregular.

About 11 p.m. he had seven abdominal pain dilatation. This was relieved by 1/8 gr. Chlorophorin for a time. He answered sensibly when roused up but remained drowsy.

17th April. At 3.45 a.m., a hypodermic of one eighth grain of morphine was injected, and after this he became quiet. He died this morning at 10.30 a.m. after being comatose for some hours. Respiration 21 to 14.

From 5th to 13th April there was some rise of temperature in the evening, reaching as high as 101.4 on the 12th. During the last three days of his life the temperature was abnormal
The patient was treated with Mist. Agromelum Co., Chloride of Ammonium, and with Nitric Hydrochloric Acid, and Tarzecum, but none of them had any marked effect either on the jaundice or on his general condition.

The patient's weight was formerly 144 lb. On 3rd Feb. it was 131 lb. On 2nd April it was 133 lb. Between these dates it had only varied a few pounds.

Post Mortem Examination: 19th April.

Intense yellow discoloration of skin. Conjunctivae also markedly discoloured. Left pupil firmly contracted. Right moderately dilated. A peculiar dark brown colour of face, and especially round the eyes. Petechiae on legs. Post mortem rigidity passed off in upper limbs and neck; still slightly marked in lower limbs. On the right side about half an inch below ribs are two openings. The upper one leading into a sinus connected with the muscles immediately below the ribs. The lower one apparently the original opening by which the access was evacuated. Below the lower opening is a granulating surface, evidently opening into the abdominal cavity.

On cutting into the muscles of the abdominal wall, one or two small haemorrhages into them are seen. There is adhesion of the peritoneum over the liver to that lining the abdominal wall round the wound. External more thickening of the peritoneum round the wound, and suppuration below that. A good deal of burrowing of the pus. Adhesion of the transverse colon to the under-surface of the liver. All the tissues around the gall bladder
are bound together by adhesions in considerable standing. On the upper surface the liver is bound down to the peritoneum in front and also to the diaphragm. Very considerable thickening of peritoneum in front of liver. Liver has a quantity of soft fibrinous lymph on anterior surface. Some injection of vessels of omentum and serous coat of intestine. A considerable quantity of bile-stained fluid in peritoneum.
The peritonitis is comparatively localized, and is especially marked in the immediate neighborhood of the liver itself.

The bile ducts are enormously distended and contain a large quantity of pus, comparatively unstrained. Around the gall bladder also there is suppuration which appears to communicate with the interior of the gall bladder from which bile-stained pus can be expressed out. In the wall of the gall bladder and in the immediate neighborhood of these adhesions are one or two nodules very like cancer. On the upper and under surfaces of the right lobe of the liver are a number of nodules which on incision are seen to be well defined cancer nodules. In some there is depression of the central portion which appears to be somewhat gelatinous. On section of liver peripheral zone of lobules somewhat yellow, and running through the liver are minute nodules. These vary in size from a shilling to a large pea head. One or two nodules in left lobe.

whole substance firm.

Left Kidney: 9 1/2 oz. extremely flabby, firm, bound down to surrounding tissues. No distinct congestion of surface. Capsule at some parts does not strip off readily. Tubules very well marked. Periphery of tubule pale, and centre congested. On section, cortex thickened ex-

 tremely mottled, showing marked fatty degeneration. Malpighian bodies very indistinctly seen. No woody change. Vessels in Cortex don't contain much blood. Those in pyramids contain more. Tubules full. Interior bile staining of whole organ. The condition is one of pro-

 longed bile staining with intense nephritis shortly before death.

Right Kidney: 11 oz. In a very similar condition. Capsule not so adherent: No cysts.

The gall bladder appears cut off from the dilated ducts - a hard cancerous mass separating them. The Colon and Pancreas are adherent to the cicatricial mass.

Heart: Evidence of comparatively recent peri-
carditis at the base. Both Ventriles contained bile-

stained clots. Aortic and pulmonary valves competent. Slight thickening of cusps of mitral valve and of chordae tendineae, but not very marked. Slight

 also in tricuspid, but not so marked as in mitral. Muscular substance not very friable. No mottling of muscular papillaris.

Slight adhesion of anterior and posterior margins and base of right lung, the posterior adhesion,
extending up to the apex. One or two small adhesions on outer and anterior surface. Slight adhesion at posterior border of left lung. Small quantity of bile-stained fluid in both these cavities.

Left Lung weighs 3 lbs. 5 ozs. Internally congested and oedematous throughout. Bile stained. Small fibrous cicatrix, and a minute cavity with perfectly smooth fibrous walls, evidently of long standing at apex near this cicatrix.

Right Lung: congested and oedematous. Some emphysema at anterior margins. A firm fibrous cicatrix also at posterior border of lung and evidently a considerable amount of cicatricial tissue at its root.
The lobes are firmly bound together. Very marked congestion of mucous membrane of bronchi of both lungs.

The contents of the intestine were like blue clay in colour. (He had had some Blane's pills shortly before death.)

The liver was not cut up and the cause of the obstruction between the ducts and gall bladder was not examined at the time.

The fluid in the peritoneal cavity was of a dirty yellowish brown colour, turbid, depositing a considerable quantity of greenish-yellow pus on standing about one-fifth of its bulk. Decidedly acid reaction. Albumen in large quantity. Distinct reaction for bile pigment. Blood present. The albumen was removed and the clear fluid diluted to sp gr. 1008. The bile
Sulphuric acid by Dr. Oliver's method were then found to be in large quantity, 10 minutes giving with 60 minutes of the
peptone solution an opalescence equal to that of the standard.

Microscopically, there were seen pus corpuscles in large
number, red blood corpuscles, and epithelial cells from
the peritoneal surface. Some large, rounded, granular
cells probably swollen up cells from the peritoneum,
were also present.

The fluid from the gall bladder was of a dark
brownish red colour, very viscid, consisting chiefly of
blood, partly clotted. Slight reaction for bile pigment,
marked reaction for blood. Microscopically it
contained red and white blood corpuscles, mucus
corpuscles, pus corpuscles, columnar epithelial
cells, some of them in opposition, much granular
matter, a few crystals of cholesterol, and numerous
flat globules.

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Examination of Urine.

From 9th to 14th December the quantity varied
from 60 to 74 ounces daily. On 15th Dec. 44 ounces;
16th Dec. 56 ounces; 22nd 50 ounces; 23rd 52 ounces;
24th 44 ounces; 25th 42 ounces. From 26th December
till 13th April inclusive the quantity almost always
was between 60 and 100 ounces. Except at first
it was always deep, dark stained. Specific gravity
varied from 1012 to 1020; Reaction acid; Never any
sugar, and until 15th April never any albumen.
Except when admitted the bile salts were always in
excess. The area varied from 613 to 310 grains daily. Microscopically, there generally were hyaline casts, containing granules and granular cells, bile stained, casts of bile stained granules, epithelial cells from kidney, very granular and deeply bile stained, bile stained squamous epithelial cells, and granules of bile pigment. Spermatozoa were sometimes present. 8th Dec. Clear amber coloured, sp. gr. 1020. No bile pigment. Bile salts about normal. Urine distinct in colour. Urea about 493.731 grains.

Urine just after operation. Bile pigment in considerable quantity. Bile salts (my 30 required) about 200 per cent. 24th Dec. Urea, quantity 12 ounces; sp. gr. 1016; bile salts my 25 required = 240 per cent; Urea, 613.2444 grains. 28th Dec. Urea, quantity 100 ounces; sp. gr. 1016; bile salts my 20 or 25 required = 300 or 240 per cent; Indican quantity small.

9th Feb. Urea, 1452.2 grains. 19th Feb. Bile salts, my 25 to 30 required = 240 or 200 per cent. 21st Feb. Urea, sp. gr. 1016; Bile salts, my 25 required = 240 per cent. 3rd March. Urea, quantity 14 ounces; sp. gr. 1016; Bile salts, my 20 required = 300 per cent; Urea, 431.6 grains. 9th March. Urea, quantity 64 ounces; sp. gr. 1012; Bile salts, my 25 required = 240 per cent. 18th March. Urea, quantity 64 ounces; sp. gr. 1018; Bile salts, my 25 required = 240 per cent; Urea, 310.5 grains. 29th March. Bile salts, between my 20 and 25 required = between 300 and 240 per cent. Urea, 433.2744 grains. 2nd April, (the day before suspension) quantity 72 ounces.
13th April. [The day before suppression] Quantity 80 ounces; more deeply bile-stained than recently; sp. gr. 1015.
No albumen; Bile pigment in larger quantity than recent; it has been increasing for some days; Bile salts, 1/45 or 1/48 required = about, or near, 400 percent.
Urea, 338; 2 grains; Microscopically, much the same as before.

14th and morning of 15th April; Only 4 ounces passed since yesterday 14th; 2 ounces of which were drawn off by the catheter this morning. Turbid, brown colored; Greenish yellow when shaken up. Deposit of casts and cells. Acid. Albumen in large quantity; Bile salts, about 1/8 required, over 400 per cent; Urea, per ounce, 3; 333 grains.

16th April. — Urine drawn off by catheter; Same physical characteristics as the previous; Albumen in large quantity; No blood; Bile pigment in consider.
abl quantity; Bile salts in as large, if not larger quantity, than previous; but exact quantitative es-
Veration not obtained on account of the smallness of the quantity of urine.

Microscope: — Large hyaline casts, deeply bile stained, some with catarhal cells on sur-
face. Epithelial and granular casts. Numerous large cells deeply bile stained and very granular,
many with two, three, or four nuclei. Many of these cells appear vacuolated. Numerous spermatogonia.

Nas and mucous corpuscles. Granular Matter. Large quantity of bacteria, some of them in threads.
Case 6

Case of Malignant Disease of the Liver and Peritoneum with Jaundice.

Mrs. Fox: Age 53 – Housewife.
Admitted 1st June, 1885.
Examined 2nd June, "

Complaint: Pain in region of stomach and liver, increasing weakness, jaundice, and itchiness of skin.

Duration: The pain in the stomach has lasted about a year, the jaundice and hepatic pain about two weeks, and the itchiness three or four weeks.

History: Family history unimportant. She has been twice married, and has had ten children. Food, habits, and home surroundings good. Work not too heavy. Previous health good, except for occasional bilious attacks.

The present illness commenced about a year ago, with pain in the stomach, often very severe, not much affected by food, but relieved by vomiting. The vomit consisted simply of altered food. She gradually became weaker. About two weeks ago she suddenly became jaundiced, and the colour of the skin was at first – the eyes, darker than it is now. Shortly after this she began to suffer from a dull pain in the region of the liver, both
over and below the ribs. The other symptoms continued. She noticed that when the colour of her skin first changed, she saw green and yellow stripes before her eyes, but she sees things in their proper colours now. She has had no dimness of sight. For the last month she has been troubled with itching of the skin, and sometimes of the eyes also. A slight eruption, congestive and papular, has come out, with slight haemorrhage on the surface apparently due to scratching. She has had no headache, but has felt drowsy. The bowels were constipated at first, but have been rather loose during the last month. The stools natural before became very white when jaundice commenced. They are not so white now. The urine has been deeply jaundiced. There has been no ascites or oedema.

Present Condition:

She is a small woman with wasted flabby muscles. Marked jaundice of skin, conjunctivae, and other mucous surfaces. She has a cachectic anaemic expression. She cannot lie on the left side, owing to the pain produced over the liver. Temperature normal.

Digestive System:

Tongue covered with yellowish-white fur. Under surface and mucous membrane of the mouth deeply bile-stained.
Appetite fairly good. Better taste in mouth. Swelling feeling in stomach during fasting. Various dyspeptic symptoms from time to time, as weight, heart-burn, acidity, flatulence, etc. Was not vomited for the last few days. Bowels now pretty regular. Stools pale, but not quite bileless.

Abdomen: A few congestive papules on the skin, as before mentioned. Examination of the abdomen reveals extensive malignant disease of the liver and peritoneum, the liver being greatly enlarged and nodulated. Some of the nodules cause prominences on the external surface of the abdomen, and they can be felt with great distinctness owing to the laxity and thinness of the abdominal walls. They are chiefly if not entirely confined to the right lobe. The superficial veins are not distended, and there is no ascites.

Liver Delimitation:

Middle line, from the level of the 4th intercostal space to the umbilicus — 6½ inches;

Right mammary line, from 6th intercostal down for 8½ inches;

Mid-axillary line, from 6th intercostal to iliac crest, 9 inches;

Right scapular line, from 7th intercostal to iliac crest.

Haemopoietic System:

Enlargement and induration of
glands in both groins and in left axilla.

Spleen: dulness normal.

Examination of Blood: 4th June.

Red corpuscles: 4,810,000 per cubic millimetre.

Leucocytes: 37,000. —

Corpuscles fairly well formed, and pretty equal in size.

Circulatory & Respiratory Systems: Normal.

Pulse: 76 per minute.

 integumentary System: —

Skin dry, deeply jaundiced; itching

ness and eruption as before described: Marked tinea.

urinary System: —

No subjective phenomena. (Report

on Urine at end of case.)

nervous System: —

The mental functions seem some-

what dulled: her memory is defective, and she

is often slow in answering: Otherwise this System

is normal.

Treatment:

Pelcarpin, Nitro-hydrochloric Acid,

and Succus Taraxaci.

6th June: — Bile pigment detected in saliva

by Nitric Acid, and bile acids by Dr. Oliver's

method.

8th June: — The patient was discharged to-day,
at her own desire.
Result: No change.

The Urine:

Several examinations were made, e.g., 6th June. Quantity in 24 hours 26 ounces.

Microscope: Granular casts. Hyaline casts with cells and granules. Red corpuscles in masses. Other cells - some squamous, some of other forms, varying in size and shape, with large nuclei, and highly granular; one-tailed cells; some granular matter, probably amorphous urates.

The quantity of urine passed in 24 hours varied from 24 to 64 ounces, and the urea varied from 230 to 425 grains. Not therefore outside the limits of health.

The urine was twice carefully examined for leucin and triguscin, but though plates and crystals somewhat resembling these substances (as well as other crystals) were obtained, chemical tests did not give the confirmatory reactions.
The presence of these substances cannot therefore be asserted.
Case of Cancer of the Head of the Pancreas with Jaundice and Glycosuria.

Adam Fowler, - age 59; Station Agent. Admitted, 9th April, 1885. Examined, 6th to 8th July, 1885.

Complaint. - Pain in abdomen, yellowness of skin, and constipation.

Duration. - About eight weeks before admission.

History. - The patient's parents were both healthy and both died at the age of 80, but he does not know the cause of death. He is married and has one son, aged 14, alive and healthy. There is no history of malignant disease in the family. His food has been good, and he has been temperate, though not an abstainer. When a young man he worked on a farm. For the last 40 years he has been a railway servant, and though during the last 8 years he has had long hours, he has not had much anxiety or heavy work. He has a comfortable home, and has not been exposed to damp or cold.

The only previous illness he remembers about is an attack of small pox which he had when about 25 years of age. There is no history of venereal disease.

Present Illness. - Eight weeks before admission, one night when going to bed, he felt a sharp pain
in the epigastrium almost in the middle line. The
pain was constant, and he does not remember of it
shooting to the umbilicus, or in any other direction. There
was with it some swelling in the epigastrium, and
he was troubled with flatulence and gaseous evac-
uation. With the accumulation of the 'wind', there was
an increase of the pain. He did not become sick or
jaundice, nor did he vomit. He scarcely rested any
all that night, but walked about or tossed in bed.
The next day he was backwards and forwards to try, as he
says, to get clear of the 'wind', which continued to
come up all night. He was weak the next few
days, but the pain abated, though it did not leave
him, and the flatulence did not trouble him so
much. The pain was like that of colic. Taking
food did not affect it. Defaecation did not make
it worse, but he sometimes had pain across the lower
part of the abdomen during micturition and de-
faecation. He continued at work for the first few
days and then gave it up, and remained in bed most
of the time till shortly before he came to the Infirmary
where he sometime got up a little. The pain con-
tinued till the day after his admission. Since
then has been very little pain till the last
few days when it has become rather worse, though
it is still slight compared to what it was at first.
The cannot tell whether or not the pain was relieved
by pressure. Soon after the pain occurred he noticed
that the motions became pale, the urine became
dark coloured, and the skin became yellow. Soon after this the skin became very itchy, and it has continued so ever since. worst at night when he gets warm. Before the present illness his bowels were regular. Since the present illness commenced, they have been constipated, but this has been regulated since he came to the Infirmary. They have acted pretty regularly for some time without purgatives. At first the motions had a worse smell than before, but that is not so bad now. He has had no appetite since he turned ill till the last eight days, when it has improved somewhat. When at home he simply took water, potash water, and milk, with scarcely any solid food. There is not so much flatulence now. He did notice the urine to be increased in quantity till shortly after his admission here. For nearly the whole time during which he has been here it has been considerably increased, and Dr. Love, who had charge of him for a week or two after his admission, told me, that at that time he had detected sugar in it in small quantity. The patient was not much troubled with thirst before the beginning of the present illness, but after it commenced, during the eight weeks he was at home, he was considerably troubled with thirst and drank a good deal of potash water. The thirst has become still worse since he came in here. The skin, besides being jaundiced, has been dry since this illness commenced; only
during the last night or two there has been some
purification. These facts suggest the possibility
of the polyuria and glycosuria having commenced
before admission, soon after, or coincidently with the
onset of the disease. The first day on which poly-
uria was observed, was the fourth after his ad-
mission, when the quantity passed was 70 ounces.
The daily quantity kept near, or a little above this
amount for a week, after which it became larger,
and was then generally 100 ounces or more.
This state of matters continued when my attention
was drawn to the case in July. The amount of
sugar had for some time been considerable. In all
probability there was a gradual increase in the
amount of sugar passed in April during the
time that the quantity of urine was increasing and
after that the amount of sugar, as well as the
polyuria, kept up.

The patient has been very drowsy and inactive
since he turned ill. He has had no headache,
and there has been no xanthopsia. He has not
slept well, has often wakened up, and has then
felt a heaviness as if there were something op-
pressive at the same place as he had the pain.
He has lost flesh considerably.

On his admission on the 9th of April, the liver
dullness was found to extend in the right mam-
mary line from the 5th rib to 1½ inches below
the costal margin, a distance of 6 inches.
Palpation revealed some enlargement downwards in the middle line. No inequalities were felt on its surface. Palpation caused some pain in the middle line. There was marked jaundice, over the irides showing some yellow tinct. On 6th May his weight was 10 st 14 lb, his height being 5 ft 8 in. There was tenderness on pressure below the costal margin in the right hypochondrium. The lower margin of the liver was distinctly felt, and appeared to be thickened and somewhat irregular. In the middle line, just under the costal margin, a somewhat rounded, semi-elastic body, having the character of a distended gall bladder, was felt. The liver dulness in the right mammary line, extended from the lower margin of the 6th costal arch below the costal margin, a distance of 6½ inches. In the middle line the dulness extended downwards to a point about one inch above the umbilicus. The spleen was not enlarged. There was some impurity of the first sound of the heart, but no murmur. The pulse was sometimes regularly intermittent.

Respiratory System - fairly normal.

The patient was at this time passing 100 ounces or more of urine daily. Its colour was greenish brown: Sp. gr. 1030, acid; no albumen, bile present. It is said that no sugar was at this time detected by the analyst, but, considering the quantity of wine, the high specific gravity, and the
fact that sugar was present both before and after without any important change in the condition of the patient, we must, I think, conclude, that the sudden dejection of sugar, was simply an error in observation.

On the 6th June it is stated that the patient's general condition was decidedly improved; the bowels were quite regular without laxatives; the motions were very small. The skin was rather less dark in colour, and the urine was less bile-tinged. The anterior margin of the liver was less prominent.

On the 6th, 7th and 8th July, I examined the patient and found his condition to be as follows:—There is a fatty tumour in the subcutaneous tissue in the right infra-axillary region. This has existed for many years. Development good. No dropsy or cyanosis. The skin of the whole body, especially that of the abdomen, has a yellowish-green, somewhat olive colour. On the arms there are a few papules, some with haemorrhage on the surface, due to scratching on account of the itchiness. On the legs the papules are larger, and more numerous, some of them tending to form small furunculi. There are no petechiae. The skin is harsh and dry. The face is slightly pitted with smallpox. The face is expressive of sadness and anxiety. The temperament is not marked. Attitude not unusual. When up he feels some distaste, like a weight at the upper part of the abdomen. The temperature normal or sub-normal.
Alimentary System: The lips and gums are anaemic, and the mucous surfaces as well as the skin are deeply tinge stained. Teeth nearly all out. Tongue pale, flatly, slightly furred, covered with a yellowish fur posteriorly. Secretions of the mouth normal in quantity. Ritter taste in mouth. (This was worst at the beginning of the illness) Deglutition normal. He has had little or no appetite till the last week or so, when it has improved. Not inclined for solid food. Does not care for fat substances. Complains of thirst. Has a feeling of want in the epigastrium in the morning before food. No unpleasant sensations after food except flatulence. No sickness, vomiting. J. Bowels regular. Stools normal in consistence, but quite pale from absence of bile. No gall stones or biliary concretions have been detected in the stools though careful examination has been made.

Abdomen: The skin has an olive green colour. Considerable development of hair over abdomen. A few maculae in the skin. Superficial veins not distended. On palpation the abdominal walls are of moderate thickness and are very lax. Slight pain is complained of in the epigastrium a little to the right of the middle line, and two inches above the level of the umbilicus. No feeling of resistance except over the liver. In the right mammary line the margin of the liver is distinctly felt to more
up and down with respiration a little below the
costal margin. The border is here felt to be of mo-
cerate thickness and consistence. The margin can
be traced inward and slightly downwards to
within 1½ inches of the middle line, where it passes
obliquely upwards and to the left till it meets the
costal margin. In the epigastrium the margin is
felt more rounded than in the mammary line.
There is slight tenderness where the border in the
mammary line passes under the finger during
deep inspiration. The liver so far as can be felt
is quite smooth and regular. Below the liver
between the right mammary line and the middle
line, the distended gall bladder is indistinctly felt.

Percussion: In the middle line the hepatic dul-
ness begins three inches above the umbilicus and
extends upwards for a distance of 6 inches. In the
right mammary line the deep dulness extends
from the 4th rib to 1½ inches below the costal margin,
a distance of 7½ inches. In the right mid-axillary
line the dulness extends from the 5th rib down-
wards for about 6½ inches. Over the rest of the ab-
domen the note is good. There is no dulness in
the flanks.

Haemopoietic System: Thyroid normal.
Lymphatic glands slightly enlarged. Spleen
not enlarged.

Circulatory System: Heart normal in size
and position. Sounds very feeble but otherwise
normal: No murmur; Pulse regular, rather small, easily compressible: Rate varies from 68 to 70.
Respiratory System: — Normal.
Integumentary System: — Nothing in addition to what has been stated.
Urinary System: — No subjective phenomena.
During the day he micturates every three or four hours; during the night from two to eight times.
[Urine report at end of case.]
Nervous System: — Nothing further.
Locomotory System: — Normal.
Treatment: — The patient was put upon a modified anti-diabetic diet sometime after his admission. On admission Cascara Sagrada was ordered for the constipation. Various medicines were given including Sulphuric Ether, Tar: pentane, Capsules, Nux Vomica, Bicarbonate of Soda and aromatics, but no medicine had any effect on the progress of the illness.

Progress: — On 10th July he was feeling rather better, but still had the uneasiness in the epigastrium where the pain had been.
18th July: — During the last few days he has had attacks of pain in the epigastric region in the same place as before. The pain sometimes darts to the back. Yesterday and the day before he thinks there was a little reddish blood found with the stools which were otherwise the same as before.
This afternoon he passed two solid masses, which were found on examination to consist of curdled milk. The motion was, he says, darker than before, but he does not know whether there was any blood in it.

**Abdomen:** There is some tenderness in the epigastrium on deep pressure, and also over a small area about an inch to the right of the middle line, and a little above the level of the umbilicus. In the right mammary line, or a little internal to it, the lower border of the liver is felt during deep inspiration passing a little below the costal margin. Otherwise the palpation is much the same as before.

**percussion of the liver:** In the middle line the lower border of the liver dulness is 3½ inches above the umbilicus, and the hepatic dulness extends upwards for the distance of 5½ inches. In the right mammary line the dulness extends from the 4th rib to about an inch above the costal margin, a distance of 5 inches. In the mid axillary line the dulness extends from the 5th rib downwards for 4½ inches. The inferior border curves downwards internal to the mammary line, so as to lie lower in the epigastrium than in the mammary line. In the epigastrium it makes a curve with the convexity downwards. It then curves upwards again towards the left. Slight hepatic dulness is got for 3½ inches to the left of the middle line. The abdominal examination is otherwise as before, and the condition as to jaundice, &c. remains unchanged.

22nd July:—He has had some colicky pain in the...
lower part of the abdomen. From one to two inches above the level of the umbilicus almost in the middle line and extending a little to the left of it, there is an indistinct feeling of resistance with some tenderness.

25th July:—He has not had much pain during the last few days. The condition as to jaundice is much the same as before. There is some blood extravasation round a pinprick in the conjunctiva of the right eye. There are no petechiae on the back, shoulders, or abdomen. The abdominal examination is almost the same as when last reported on. The distended gall bladder is felt. The stools are much the same as before but are more coloured owing to the use of bran bread whose use was commenced a short time ago. The cheeks appear rather better coloured.

28th July:—A good deal of pain yesterday both in the epigastrium and below the umbilicus, worse today. Since the diet was restricted—the sugar being cut down and bran bread and skimmed milk given—the thirst has been less, and there has been a considerable diminution in the amount of urine. Some resistance is felt below the liver about two inches to the right of the middle line. There has for the last few days been some oedema of the feet and ankles.

3rd Aug.:—He is at present confined to bed on account of the oedema of the feet and ankles, worse on the right foot. The jaundiced tint of the skin is not quite so deep as at first. Tongue flabby and covered with a thick dirty white fur. Complaints of distention
good and pain in the bowels. In the epigastrium—especially in the right half of it—the border of the liver is felt round, thickened, and slightly irregular, with some tenderness on palpation. He has not been much troubled with thirst lately, till yesterday, when the urine was again considerably increased in quantity. He was also constipated, and he says the thirst was relieved after the bowels were moved. He has not felt any weaker lately.

12th Aug.: Feels very weak. Gaundies rather more marked than recently. Tongue covered with a whitish creamy fur. Oedema of feet and ankles slight. Not getting up much. Stools still clay-coloured. He has complained of several days of a good deal of pain and swelling in the epigastrium.

Abdomen:—There is diffuse prominence in the epigastric area, and extending to the right and left of it. There is tenderness on palpation and percussion over the prominent area, especially about the position where he has complained of pain all along. The lower margin of the liver can be felt in the mammary line passing slightly below the ribs during deep inspiration. The margin here feels normal. In the epigastric area the margin of the liver can now be only indistinctly felt. No irregularities are felt. The gall bladder is not felt. There is no dulness in the flanks. Splenic dulness normal.

The Liver:—In the middle line the hepatic dulness extends from half an inch above the tip of the Xiphoid process upwards for 2 1/2 inches. From the middle line the
lower border passes upwards and to the left, and downward and to the right, passing under the costal margin about 1 1/2 inch to the left of the right mammary line. In the right mammary line the hepatic dullness extends from the 5th rib to a little above the costal margin, a distance of 4 inches. In the right mid-axillary line the dulness begins at the 7th rib and measures 4 3/4 inches.

29th Aug, He has continued in much the same condition as to jaundice, &c., but has been gradually becoming weaker. The urine has much diminished in quantity, having for weeks been considerably under 50 ounces daily. It contains much less sugar. He has once or twice passed solid masses by the bowel, but they have consisted simply of curdled milk. The motions are still white. The tongue & oedema are much as before. The oedema is extending slightly up the leg.

The Abdomen is generally prominent with its walls somewhat tense. No distention of a spontaneous vein. No thrill. Tenderness as before in epigastrium—now extending to each side of it. The lower margin of the liver cannot now be palpated.

Measurements:

At level of Xiphisternum 39 inches;
Midway between Xiphisternum & Umbilicus 38 1/2"
At level of Umbilicus 38 "

There is dulness in the flanks from the presence of some fluid in the peritoneum. Percussion of the Liver
gives a slightly larger area of dulness than when it was last noted.

18th Sept. - He took a rigor this morning - possibly due to the mind being disturbed by the death of another patient. The temperature was 99° - at 11 a.m. it was 102° - at 12.30 p.m. pulse 124. Crepitations at bases of lungs, but no other marked change in the physical signs. Abdomen still distended, with dulness in the flanks and slight thrill. He is very weak and depressed. Much smaller amount of urine today.

21st Sept. - He is better today and the temperature has fallen to normal.

As I left town on the 1st of September I did not see the further progress of the case. He gradually became weaker. The fluid in the abdomen and the oedema increased. Stephanothus was given to remove the dropsy, but it had very little effect either in diminishing the dropsy or in increasing the urine. The sugar in the urine continued to diminish, and for at least a day before death Dr. Brunswell did not detect any at all by Seibling's solution. It continued to be deeply bile-stained.

The patient died somewhat suddenly on the 9th. Sept. His temperature during most of the time he was in the Infirmary was either normal or sub-normal. During the last month or so, there was an occasional slight rise in the evening, and this became more frequent towards the end.
Post Mortem Examination.

Length 67 inches: Circumference round shoulder 36 inch.

Much emaciated: Deeply jaundiced: Pulps equal and contracted: Rectum slight: Bowel habit: Test, legs and abdomen considerably distended with fluid:

Craniun: Scalp, skull cap, dura, and other membranes natural: Weight of brain 3lbs. Convolution on the surface seemed somewhat atrophied; no naked-eye appearance of disease.

Thorax: Pericardium uniformly attached by old adhesions which, however, could be broken down by the hand. Heart weighs 14 oz. No valvular lesion: Deeply bile stained: Not a slightly atheromatous.


Kidneys: Left weighed 5 oz: Capsule strips off easily: surface smooth: Organ deeply bile stained: Cortex pale & bile stained: Right weighed 5 oz: a cyst on its surface: Otherwise in the same as the left: Right seminal ganglion seems hard: A large quantity of fat at the back of the abdomen: Right ureter: Renal capsule very soft: Left somewhat enlarged.

Liver weighs 31b. 6 oz: Bile ducts widely dilated: Organ deeply bile stained & in a condition of early cirrhosis: Gall bladder & duct much dilated: Pancreas: Head much enlarged, but of stone hardness, adherent to liver: Cancer: Some of the
pancreatic ducts enlarged.

Stomach, Duodenum, & Intestines normal.

Examination of the Urine. During the whole of his present illness the urine has been deeply coloured with bile. It is not known what quantity was being passed before his admission. For the first three days after admission the quantity was about 400 cc. Next day it rose to 700 cc. For about a week after this (12th to 19th April) it ranged from 60 to 80 cc. Then it rose rapidly to 112 ounces on 22nd April, and from this time to 5th June, it was generally 100 ounces or more, reaching once as high as 130 ounces. On 6th June it rose to 188 ounces, and from this time to near the end of June it kept rather higher than before - sometimes reaching 150 ounces. After this there was again a steady fall, but till 17th July it kept generally between 100 and 140 ounces. After this there was a considerable fall in the quantity, there being only occasionally 100 ounces or more. From 18th to 27th July it varied from 84 to 92 ounces. From this till 8th Aug it was rather lower. On the 11th Aug. it rose again to 98 ounces. From this till 22nd Aug. it varied from 66 to 40 ounces. From this till 31st Aug. it varied from 88 to 30 ounces.

On 9th Sept., the day on which he had the rigor it fell to 16 ounces. It again rose to 32 ounces on 5th Sept. On the three days preceding his death the quantity was 13, 16, & 24 ounces respectively. For some time the fluid drunk was measured; this varied from 3 to 4 pints daily, and on the whole a distinct correspondence was observed between the amount drunk & the quantity of urine passed.

While speaking of the quantity of urine I may briefly refer to the weight of the patient during the course of his illness. On 6th May his weight was 108. 4 lbs. On 24th July (just about the time when the edema of the feet first appeared) it was 106. 6 lbs. He had therefore lost no ground so far as weight was concerned. From this time
his weight steadily increased, coincidently with a diminished excretion of urine and the development of edema, and falling of ascites. On the 5th Sept., 4 days before his death, his weight was 12 st. 17 lb. so that, since 24th July, it had increased 1st 9½ lbs, a stone of which was gained between 22nd July and 5th Sept.

There was merely a slight trace of albumen present. Bile pigment was present in large quantity all his time, but there was a distinct diminution in its quantity as the case went on. The bile cells were present in distinct excess, and usually about doubled. I refer elsewhere to the manner in which the presence of sugar affects the quantitative estimation by Dr. Glover's method, and the modification in the method necessary to avoid the fallacy to which it would lead.

Indican was several times tested for, and towards the termination of the case, a marked blue was got by hydrosulphuric acid, hypochlorite of lime, & chloroform, but there is some doubt as to the result in this case, as it was one of the earliest cases in which this substance was tested for, and the bile pigment was not first removed.

Microscopically: Bile stained granules and cells, and once a few stellar phosphates were observed.
Table of Results of Examination of Urine.

<table>
<thead>
<tr>
<th>Date</th>
<th>Quantity in Ounces</th>
<th>Sp. Gravy.</th>
<th>Urea.</th>
<th>Sugar.</th>
</tr>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Grains per oz.</td>
<td>Grains per diem</td>
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<td>May 5</td>
<td>100</td>
<td>10.36</td>
<td>...</td>
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</tr>
<tr>
<td>July 3</td>
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<td>10.27</td>
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<tr>
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Summarize these results for conclusions.

Six and one half months have been passed.
Case 8

Case of Cancer of Head of Pancreas with Jaundice; some cancer in Liver.

Margaret Noble, aged 70, Housewife.
Admitted on 1st March, 1886, suffering from Jaundice of six weeks' duration.
3rd March. History: - Her father died when over 60 years, of "Black Bile", one of the symptoms having been vomiting. Her mother died, aged 69, of heart disease. One of the patient's brothers died of Phthisis. She has had no family.

Previous Illnesses: - Forty-one years ago she had an attack of Jaundice which lasted a good while, but from which she got quite better. Both before and since that time she has frequently had attacks of "bile" when the skin frequently became yellow. These attacks lasted only a few days.
She had Typhus Fever three years after the attack of jaundice.

She has had a comfortable home, easy work, and good wholesome food. She has been temperate, but took a glass of ale every night, and sometimes a glass of whiskey. It was afterwards learned that she had been intemperate.

Present Illness: - For several months she has not been feeling as well as usual. She lost her food, was troubled with wind, but did not vomit. Some
time before the jaundice came on she was exposed to cold and wet, and she got a fright. About six weeks ago the jaundice came on and became gradually more intense. She felt some stiffness at first, but this has diminished. She has had a sour taste in the mouth, and has been troubled with wind, but these symptoms are not so bad now. She has also had some thirst, but this has passed off. Both before and since the jaundice came on she frequently had a feeling of "growing" through her body. This feeling was worse at the time when the jaundice came on. At present she feels a tension in various parts, but apart from this she has been free from pain.

Present Condition: Well nourished and well developed skin and conjunctivae deeply jaundiced. No dyspepsy nor cyanosis. Nothing unusual in attitude. There is some fulness of the abdomen. The wall is pretty thick, with a large quantity of fat, which gives a feeling of totulation, interfering much with the palpation of the abdominal organs. There is some tenderness over the liver below the ribs, especially at the lower border which is felt to be firm, hard and somewhat rounded. (Slightly irregular?) The lower margin is felt about 1½ or 2 inches below the costal margin in the right mammary line, and it crosses the middle line about 2½ inches above the umbilicus. The surface of the liver below the ribs feels hard, rounded
and somewhat lobulated, but the lobulation may possibly be all explained by the fat in the abdominal wall. The spleen is somewhat enlarged. There is a slight systolic murmur in both the mitral and aortic areas. The second sound is slightly accentuated. Pulse 66 per minute, regular, weak, small, easily compressible.

Treatment: The patient was put upon fluid diet and half an ounce of Mkt. Agrimoniae Co. was given three daily. Except for the first day or two, a bleu and a colocynth pill were given every night till 17th March, after which they were given every other night till 20th March, when they were stopped, as the bowels were acting fairly. The Mkt. Agrimonia Co. was continued. On 23rd March, Fort & Sherwood were given, as the patient seemed sinking; and then 8 cholophorm were given for breathlessness. On 26th March, pills were ordered containing Sepia, Cinia, and Tell Bovine one thrice daily.

The patient gradually became weaker. Considerable salivation was caused by the bleu pills, and the saliva gave some reaction for bile pigment. The jaundice diminished slightly up to 23rd March, after which it increased. On 13th March the condition of the abdomen was as follows. The lower border of the liver was felt from the right mammary to the middle line, firm and somewhat thick. It arched downwards somewhat in passing from the right mammary to the middle line. No pain or tenderness. In the middle line the hepatic dulness extended from 1 1/2 inches above the umbilicus upwards for 4 3/4 inches. In the right mammary line...
It extended from the 5th rib downwards for 6 inches, ending half an inch below the costal margin. Spleen slightly enlarged. Superficial veins at sides a little distended.

On 14th March there was said to be some bile in the stools for the first time. After this it again diminished and after the 22nd March the stools were again almost or quite destitute of bile.

On 23rd March the patient was very weak and the pulse was slow, small, weak and irregular. Tongue covered with yellowish-white fur. The liver extends rather lower than before. Still some rhonchi in chest and breathing short.

27th March. - Weaker. There has been some yellow bile in the stools for a week. No oedema.

30th March. - Evening. Much weaker. Talking very short breath. Sandier deeper. Tongue furred and cracked, brownish and dry. No headache, but pain in back of right shoulder. He complains of soreness in the region of the liver, but there is no tenderness on palpation of the liver. These is about the same as when last examined. No bile in stools. No oedema of feet. Not so much rhonchi. Pulse 70, regular, weak, small, and easily compressible.

2nd April. - Very weak and prostrate. There has been considerable froth of the breath for some days. Haemorrhage from the bowels consisting of bright blood. This had also occurred some days previously. Lips very bloodless. Skin of deep lemon yellow colour.
Some capillary dilatation on face. Pulse 60, fairly regular, almost thready.

Evening - 7.30 p.m. - She has been lying in a drowsy condition all afternoon. No haemorrhage from the mouth as well as from the rectum occurred both last night and to-day. A few petechiae on skin of abdomen. Skin of face has a more dusky appearance. Pulse at most almost imperceptible.

3rd April: The patient died at 5.15 a.m. She showed no further symptoms except that she gradually became more cyanotic. No more haemorrhages.

The fluid from a blister was examined on one occasion. After removal of the albumen the reaction for bile pigment was still obtained and Dr. Oliver's hypothe new solution revealed the presence of bile salts in a very large quantity, in much larger quantity than they occur in normal urine. The observation was repeated with similar results.

The temperature was normal or sub-normal except occasionally in the evening up to 20th March when it was slightly elevated. For about nine days before death it was sub-normal.

*Post Mortem Examination: 5th April*

Body deeply jaundiced. Scurfiness slight. Rigor moderate. Some petechiae on legs. About an inch and a half of subcutaneous fat over thorax and abdomen, deeply bile stained. There was a quantity of bile stained fluid in the peritoneal cavity.
Gall bladder fully distended and projecting as a globular mass about 1½ inches below the lower border of the liver. The common bile duct was dilated so as to resemble in size the transverse colon, and a hard irregular mass, about the size of a hen's egg could be felt at its duodenal extremity. It was found on section to consist of a scirrhous deposit in the head of the pancreas undergoing colloid degeneration. The common bile duct occluded by it.

Two dark brown faceted gall stones were found in the gall bladder from the inner surface of which the sugar had almost quite disappeared owing to the distension.

The surface and section of the liver were deeply bile-stained and of a greenish-yellow colour. Throughout its substance there were numerous colloid gelatinous looking bodies, dark green in colour from the size of a pea's head to that of a pea. There were also pale yellow nodules of cancer, some of them as large as a hazel nut.

The stomach was in a state of catarrh. The mesentery and omentum were extremely fatty, and the appendix epiploica very large. The vermiform appendix was healthy.

Spleen weighed 17 ounces, bile-stained and of thin flabby consistence: section greasy.

Left Kidney: 6 ounces. Numerous cysts containing dark greenish-brown fluid. Capsule slightly adherent, leaving on stripping, a slightly

Right kidney: 5 1/2 ounces. One yellowish nodule the size of a pea. Otherwise similar to the left.

The lungs were in a state of congestion and oedema, and there was yellow mucous purulent fluid in the bronchi. On the surface and on section there were numerous yellow points the size of a pin's head. There were some fibrous adhesions to the chest wall on both sides.

The pericardial sac was empty. There was an excessive deposit of deep bile stained fat under the epicardium. The aortic cusps were somewhat thickened and in a state of early atheroma. There were two vegetations on one of the cusps.

On the aorta above the sinuses of the Valsalva there were two large firm calcaneous plates which had partially ulcerated through its wall. Above this there were traces of early atheroma. The cusps of the mitral valve were somewhat thickened. Weight of heart 11 1/2 ounces.

The bile in the gall bladder was somewhat thin, brownish coloured and gave a deposit of bile pigment and cells. Reaction acid. Mucin in large quantity. No pus. Only a trace of albumen.
Bile pigment present. After being cleared by boiling and filtration, 5 minutes of it with a drachm of Dr. Smith's test solution, gave an opacity equal to that of the standard, showing that the bile salts were present in large quantity. By filtration through a double layer of filtration paper the fluid came through clear, showing that it is a true precipitate which is produced. The presence of bile salts was also revealed by Pettenkopf's reaction with sugar and sulphuric acid.

Microscopically there were a few plates of cholesterol, masses of bile pigment, columnar epithelial cells - many of them in apposition, masses of rounded cells, and mucous corpuscles.

Examination of Urine.

From the time of admission till 21st March the quantity was normal or a little over the normal. After this it could not be collected. It was always deeply bile stained. Specific gravity low. Reaction acid. From her admission to 21st March, inclusive, there was no albumen nor sugar. On 31st March there was albumen, due to the presence of blood which probably came from haemorrhoids, but no sugar. Bile salts were present in very large quantity at first, but somewhat diminished as the case progressed. The Urea on 2nd March was 317.7 grains per diem. Always after this it was distinctly diminished, varying from 228 to 280 grains.
Microscopically there were cells from the renal epithelium, hyaline casts containing highly granular cells and granules, and granular casts, all deeply bile-stained, squamous epithelial cells containing granules of bile pigment, sometimes granules of bile pigment, some of them crystalline, sometimes bile colored ureate of sodium crystals.

On 22nd March there were masses of dark brownish-black pigment (? Bilirubin or Haemosiderin). On 21st March there were red and white blood corpuscles.

To determine whether the opacity produced by the bile salts with the peptone solution was a true precipitate, the fluid was filtered with the result that, as in the same observation with the bile, the filtrate was quite clear. It is therefore a true precipitate which was produced. This was done on 2nd March when the bile salts were present in very large quantity 600 per cent. Pettitkof's reaction was obtained with the same specimen.

Tabular Statement of Urine over.
### Tabular Statement as to Urine.

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Though there was some diminution in the amount of bile pigment while the jaundice diminished, there did not appear to be a decrease corresponding to the decrease in the amount of bile salts, and it increased again towards the end, when the jaundice increased.
right side of the epigastrium, extending a little into the right hypochondriac region below the ribs. The abdomen is otherwise normal in appearance. The abdominal walls are of moderate thickness and tension. There is no tenderness at present. Friction fremitus is felt over the liver below the ribs, especially over the prominent part, which is rounded, like the section of an orange in size, with slight linear depressions on its surface. The margin of the liver is distinctly felt from a little behind the mammary line to the middle line. While it passes upwards it also descends, so as to lie lower in the middle line and for some way to the right of it, than in the mammary line. The percussion note is clear except over the liver. In the middle line the hepatic dulness extends from 1/4 inch above the umbilicus upwards for 53 inches. In the right mammary line the hepatic dulness extends from the 5th rib to an inch below the costal margin, a distance of 53 inches. The superficial dulness begins at the 6th rib. In the right mid-axillary line the dulness extends from the 6th rib downwards for 42 inches. The superficial dulness begins at the 7th rib.

On Auscultation friction is heard over a large area of the liver, especially distinct over the prominent part.

Haemopoietic System. Spleen not enlarged. There is considerable enlargement and induration of the
Case 9

Case of Malignant Disease of the Liver with Pericholangitis.

John Wright, age 59, cooper.

History: There is no history of malignant disease in the family. The patient's wife first conception ended in a miscarriage at the third or fourth month, due, he says, to a fall. After that she had five children, all born at full time. One died from the effects of a burn. The others are alive and healthy. He has for a long time been in the habit of drinking a good deal of whisky— frequently going to excess. He did not, as a rule, take much beer or ale. His work was not heavy, but he was sometimes exposed to cold while at work. He had inflammation in the chest when only a few months old. About thirty years ago he had a Tonomorra, but there is no history of any other venereal disease. Apart from this he has had no illness except a cold occasionally since he was a child. He was once laid up for a fortnight owing to a "wreck" in the right side of the chest. Besides these illnesses he has been troubled with haemorrhoids for the last thirty years.
induced first, he says, by sleeping in the cold.

Present Illness: Three weeks ago fully, when
done with his work at night he was seized with
a sharp pain in the right side over the liver. For
four weeks before this he had had some difficulty in
swallowing, the food appearing to stick near the
level of the lower end of the sternum. For the pain
two powders were given, and mustard poultices were
applied to the side. He also got a mixture for the
cough which accompanied it. The pain was soon
relieved, but tenderness remained in the part for
ten days or so. It was very sharp, and was intensi-
fied by respiration. It returned last Tuesday morning.
It shot through to the back between the ribs and half of
there was some change in the colour of the skin.
The urine has been high colourless. The bowels have
been regular. He has not noticed the character of
the stools.

State on Admission: — Well developed. No
Jaundice, Droopy, or Cyanosis. Face somewhat
flushed.

Alimentary System: — Tongue moist, flabby,
risied, tremulous, covered with a Whitish-
yellow fur. Secretions of mouth normal.
Not now any difficulty with deglutition: Appetite
good. Seldom any thirst: Troubled with flatu-
ence. One morning after he had the pain he
vomited some clear fluid. Bowels regular.

There is a rounded prominence in the
glands in both groins, and slight enlargement of those on the right side of the neck.

The heart's action is slightly irregular. The first sound is impure and the second sound is accentuated, especially in the mitral area.

The breathing is slightly harsh. There are medium crepitations posteriorly, especially at the bases. There is nothing further abnormal in the Respiratory System.

There is some varicos dilatation of the veins of the legs. There is no evidence of any syphilitic affection of the skin.

Nervous and Locomotor Systems normal.

Urinary System: No subjective phenomena.

Report on Urine at end of case.

The patient was treated for about a month with Chloride of Ammonium, and after that with dilute Hydrochloric Acid, mixture of Mur窗口 and Glycerine.

Progress: The malignant disease still progressed, the liver becoming larger as a whole and the prominence in the epigastrium increasing.

On 29th Oct. the perihepatic fat was much less marked, and on deep pressure to the right of the right mammary line, a large module was felt extending down to about an inch above the level of the anterior superior spine of the ilium. It was rounded in shape and was like a small apple, a large plum or egg. It moved with respiration. This module also steadily increased in size. Apart from this there was moderation
of the under surface of the liver.
On 2nd Nov. The liver dulness in the middle line extended from \( \frac{3}{8} \) inch above the umbilicus upwards for 6 inches. In the right mammmary line it extended from the upper border of the 5th rib to 2 inches almost below the costal margin, a distance of 9 inches. The superficial dulness began in the 5th intercostal space. In the mid-axillary line the dulness extends from the upper border of the 7th rib downwards for \( 6\frac{3}{4} \) inches. The superficial dulness begins at the upper border of the 8th rib. On 9th Nov. friction frremitus was felt extending over the liver below the ribs. Friction was heard below the ribs and over the lower ribs, most marked between the mammmary and anterior axillary lines. It was absent or almost absent on 14th Nov.

Soon after this the friction increased, was accompanied with considerable pain, and became more extensive.

On 14th Nov. there was a slight but quite distinct icteric tint of the conjunctivae and under surface of the tongue. This was present for some time subsequently, but passed off. On 23rd Nov. the abdomen was more prominent, and there was considerable pain and tenderness over the liver. Friction frremitus was felt, and friction was heard, not only over the liver, but below it on the right side. The lower margin of the liver was thickened and indurated. There was no ascites. On 24th Nov. the friction frremitus was very marked, and the pain was very severe. There was no jaundice. From this time opium had frequently to be
given and hot fomentations applied. He was sick and vomited on 6th Dec. On 7th Dec. the pain extended right across the abdomen and was very severe. He looked thinner, paler, and more cachectic. On 8th Dec. friction from his was distinctly felt over the intestines, very marked on the right side, slight on the left side. Auscultation corresponded. The abdomen was more distended, and there was some dullness in the left flank. The hepatic tumour had increased in size.

The pain in the stomach has been pretty constant since admission, especially after food. The difficulty of swallowing has not been great. He sometimes has heartburn, and often bad-smelling gaseous excretions. He can't take food now, has no appetite for it.

The patient went out by his own desire on 22nd Dec.

He had been gradually losing ground, and he died not long after leaving the infirmary.

The temperature has been normal or subnormal all the time.

The urine varied in quantity from 20 to 48 ounces, was normal in appearance, except for deposit of urea acid in large quantity. It contained no albumen, bile pigment, nor sugar. The bile salts were always distinctly under the normal maximum. The uric acid varied, sometimes some increase, sometimes no distinct increase.

Urea, 335.508 grains.

Microscope: Ureic acid crystals.

Specific Grav. 1012 to 1019, acid.
Case 10
Malignant Disease, probably both Gastric and Hepatic; Small quantity of Chlor in urine.

John Traynor, age 52. Had charge of miners' houses. Admitted on 7th Oct. 1885, complaining of pain in left hypochondrium and in stomach after food for two months; also of gradual loss of flesh and increasing weakness; also of great and constant thirst for the last five or six weeks.

The pain was so severe that morphia had sometimes to be injected.

Examined on 14th October

History: Nothing of any importance can be ascertained regarding hereditary tendencies. His food has been fairly good, but he has drunk a good deal of whiskey, but very little during the last year. He worked was light but he was a good deal exposed to the weather. He had an illness a long time ago which, he says, was pleurisy and Bronchitis.

Present Illness: Fully a year ago he began to complain of pain of an 'eating' character in the upper part of the abdomen to the left of the middle line, worst after food. After a time he noticed a hard swelling in this region. He has not noticed any change in the colour of the skin; he has simply become more and more emaciated. He has had very little
appetite during the illness and has been unable to take any solid food worth speaking of. He has had some sickness during the last three weeks, but has not vomited any. He has been constipated. He has not noticed any change in the appearance of the stools. He has had a good deal of thirst. The urine has been diminished in quantity. He has not complained of any sensations in connection with, or apart from, food except the pain before mentioned.

The patient was too weak to be much examined. I felt the tumour in the left hypochondrium and extend- ing slightly into the epigastrium region. It was hard, not quite regular on the surface, and of the size of an orange if not larger. It moved very distinctly with respiration, and did not feel as if it were very deeply situated. The note was impaired over it, but not quite dull. There was an area of quite clear percussion between it and the spleen.

From the history of the case and the situation of the tumour it appears most probably to have commenced in the wall of the stomach and to have secondarily involved the left lobe of the liver.

On 7th Oct., a mixture was ordered containing Bismuthi Salicylici Acid; Hydrocyanic Acid; Strychnine and Infus. Columbae. On 11th Oct., 6 gr. morphia hypodermic was ordered to be given every night. On 16th Oct., he was ordered pills containing Ext. Opii; Ext. Hyoscyami; and Ext. Gentianae, one every night repeated if necessary. The temperature was normal or sub-normal until
The evening of the 15th of October, when it rose to 102.4. 
On the morning of the 16th it was 101.2, and in the 
evening it was 103.4. The patient grew rapidly worse 
and died that evening.

Post Mortem Examination was refused.

The Urine:— The quantity has been small, varying 
from 12 to 28 ounces per day.

13th. Oct. — Quantity 18 ounces, orange-yellow, turbid 
from the presence of urates. Large deposits of urates. 
Specific Gravity 1032, acid. Slight trace of albumen 
detected by several tests, cold nitric acid included. 
Bile pigment in small quantity. Bile salts about 
0.50 give the standard opacity, therefore not 
distinctly over normal maximum.

Sugar present in small quantity. (This is known 
to have been so for a day or two.) Fehling's Solution 
gives the reaction for sugar only with a considerable 
quantity of urine. Frommer's test also gives it. 
Not detected by indigo carmine. After complete 
precipitation with acetate of lead the reaction with 
Fehling's Solution was still obtained, showing that 
the reaction was not due to urates.

Indican present in large quantity.

Urea, 263.8512 grains.

Microscope:— Amorphous urates, uric acid 
crystals, mucous corpuscles.
Case 11.

Cose of Cancer of the Pylorus with some secondary Carcinous growth in the liver; Intensive Anaemia.

Thomas Keusted, age 43.
Admitted 1st March, 1885.

Complaint: Pain in the region of the stomach and liver.

Duration: Since August, 1884.

History: Family history unimportant except that one brother died, possibly of cancer, at the age of forty-nine. Patient's meals have been irregular and hurried. He took tea largely, and ate a good deal of cheese. Comfortable home. Temperate. Work heavy and working hours long. A good deal exposed to cold and wet at work. 

Previous Illnesses: Measles and Scarlet Fever when a child. About twelve months ago an affection of the knee—probably acute Bursitis. He has had haemorrhoids for six years. Two years ago they "came down" and became inflamed. No history of syphilis or other venereal disease.

Accidents: Besides some slight accidents, which have left scars on the forehead and scalp, he sustained a fall sixteen years ago, while carrying coals, and this caused a right inguinal hernia, for which he has had to wear a truss.

Present Illness: This began one day in August
1884, when after taking food very hastily he felt
pain and distension in the stomach to such an
extent that he was scarcely able to continue at work.
After that the pain recurred regularly after meals,
coming on about an hour and a half after the
meal, and lasting about half an hour. In four
weeks the pain had become more severe, and
commenced about half an hour after food. Vomiti-
ing then commenced and that relieved the pain.
From the very beginning the vomited matter had
a dark colour—rather darker than a cinnamon-
brown. In December, 1884, he was treated as an
out patient at Ward 22, where some stomachic
medicine was ordered. As he did not improve he
was admitted by me to Ward 22 on the 14th of
January, 1885. He had at this time a sharp
attacks of Bronchitis which more urgently required
Treatment than the gastric symptoms. In a
fortnight this gave way to treatment, and he was
discharged on the 19th of January. He had
not vomited at all during his stay in the In-
nnmary. No abnormal physical signs were, at
this time, detected in connection with the stomach
or liver. There was considerable anaemia as was
shown by the pallor of the face and lips. After
this he received treatment (Kisnath, 8c) at Foun-
dtainbridge Dispensary. Near the end of Febru-
ary the pain came back very severely all over
the stomach, and next day it extended to the
right side also. He was admitted to the Infirmary (Ward 2D) for the second time on the 1st of March. He had not vomited more than twice since he left it - the vomit having been again brownish. He had been constipated during his illness. Not known whether any blood ever passed by the bowel - probably it had.

On admission he appeared to be in a state of extreme cachexia, and was scarcely able to walk. There was great pallor of the face and lips, and his face had, besides, a yellowish waxy appearance. The vomited almost immediately after admission, the vomit consisting simply of altered food.

On the 6th of March, the dulness in the middle line was found to extend to about an inch above the umbilicus. The hepatic dulness measured 5½ inches in the right mammary line, extending to one inch below the costal margin. Over the dull area below the ribs there was severe pain, most severe a little external to the right mammary line, and that passing through to the back. A nodule was indistinctly felt on the surface of the liver.

Red Sodicide of Mercury was applied.

8th March. - Severe pain in middle line about an inch above umbilicus. At this spot a nodule, apparently connected with the under surface of the liver, was felt. Severe frontal
and verticle headache.

21st March. Diarrhoea and pain in bowels, with a burning sensation in epigastrium. Note clear over the module above described. The pain continued, but varied in severity. It was sometimes absent. He sometimes complained of severe headache. Near the end of April he began to have oedema of the legs. The pain remained, most severe about an inch above the umbilicus; but he now vomited very seldom, only three from his admission to near the end of April. His appetite was fairly good, but he had various dyspeptic symptoms besides the pain. He continued to have numerous rhonchi and coarse crepitations over the chest though the acute attack of bronchitis had subsided.

When examined on the 25th May there was marked palor of the skin and mucous surfaces. There was oedema of both legs, most in the right. There was slight varicosity of the superficial veins of the legs. Expression of face anxious. General appearance that of cachexia with extreme anaemia. Temperature, 98 to 99.6 Feh.

**Alimentary System:**

Tongue pale and furry posteriorly.

Appetite good. Some thirst especially at night. The dyspeptic symptoms had considerably subsided. Vomiting rarely occurred, and the bowels were regular.

**Abdomen:** Inspection normal except for
slight prominence below level of umbilicus. Superficial veins not distended.

Palpation: Abdominal walls moderately thick and tense. No tenderness except in epigastrium immediately below xiphisternum. Some slight irregularity of the surface of the liver felt near the xiphisternum. In the right of the middle line a rounded mass was felt connected with the under surface of the liver, and extending to about the right mammary line, and the right border of which could be felt by pressing deeply on the outer side of the right Rectus muscle. It could be distinctly got between the fingers and thumb, and it appeared to be slightly irregular on the surface. Its size was like the section of a large orange. It moved with respiration, was not tender, and extended for about 1'-2' or two inches below the ribs.

Percussion: Note good over the whole abdomen except over the liver and the tumour above described. At the right border of the sternum the hepatic dulness begins at the fourth inter-space. In the right mammary line the liver dulness begins at the upper border of the 5th rib, and the dulness extends for two inches below the costal margin, a distance of 7 inches. In the right mid-axillary line the hepatic dulness extends from the 6th rib almost to the costal margin - a distance of 6'-7' inches. No hepatic dulness can be distinctly obtained.
to the left of the middle line. On percussing transversely from left to right, below the cardiac dulness, the note is found to become impaired almost exactly in the middle line. The line of impairment extends downwards and very slightly to the left, so as to pass slightly to the left of the middle line. Then it takes a curved course to the right and crosses the middle line about 1 1/2 inches above the umbilicus. It then becomes more transverse, and, nearly 3 inches to the right of the middle line, it curves slightly upwards, then passes nearly straight backwards, and meets the costal margin a little behind the anterior axillary line. The lower part of the line is between one and three inches to the right of the middle line, where it is about 1 1/2 inch above the level of the umbilicus. At the level of the Xiphisternum the dulness becomes absolute, 1 1/2 inch to the right of the line of impairment. The line of absolute dulness takes a curved direction downwards and to the right, becoming further from the line of impairment until there is 2 1/2 inches between them. It then becomes transverse, and meets the costal margin a little to the right of the right mammary line, and a little beyond this, it becomes continuous with the line of impairment already described.

Haemopoietic System:

Normal, except for the Anaemia.
On 27th May examination of the blood showed:
Red corpuscles, 2,670,000 per cubic Millimetre;
White    , 30,000
Haemoglobin     20 per cent.
The red corpuscles varied considerably in size, and some of them were irregular in shape.

Circulatory System:
Heart feeble, but otherwise normal.

Respiratory System:
Chest well formed. No dulness, but harsh breathing and a few rhonchi.

Urinary System:
No subjective phenomena.

On 28th May the urine was clear, pale, sp. gr. 1018, slightly acid, and contained neither albumen, sugar, nor bile pigment.

Nervous System:
Normal except the eyes. There is congenital cataract in both eyes, worst in the left eye. The looks entirely with the right eye, the left being turned outwards. There is also congenital myasthenia. He can see large print with difficulty. He sees near objects best. He can tell the number of fingers correctly if they are near, but often gives double the number, or more, if they are further away. He can see best in a subdued light. Pupils equal, of medium size, react normally.

Sensory System: Normal.
Various medicines for the stomach, liver, &c. were administered, and the diet regulated. Some improvement was obtained. The pain became slight, but the physical signs did not change much. She was discharged on the 6th June improved.

Early in July she suffered from diarrhoea and haemorrhoids. The diarrhoea yielded to treatment.

20th July: The tumour in the epigastrium is much the same as before—perhaps rather smaller. The liver has undergone some diminution in size. It now extends in the right mammary line from the 5th rib to slightly below the costal margin, a distance of 5½ inches. In the right para-sternal line the vertical dulness over the liver tumour is 6½ inches; in the right sternal line it is 5½ inches.

On the 6th August he was re-admitted, having become worse about a week previously, with pain after food, sickness, eructations, &c., but no vomiting. His face was very pale as before, but with a more haggard appearance. No jaundice, dropsy, or cyanosis. The tenderness is more extensive than before. The lower part of the tumour is now tender. The tumour is found to be somewhat larger than before, but no general enlargement of the liver can be made out.

Examination of Blood on the 8th August:
Red Corpuscles, 2,930,000 per cubic millimetre;
White " 4,000 "
Haemoglobin, a little under 30 per cent.
The red corpuscles have the same appearance
as before.
16th August. - A slight haemie murmur is heard
over the heart.
14th September. - Has been gradually becoming worse.
The pain has been severe, tumour larger, has
for some time caused bulging of the right
costal cartilages. No oesitis or oedema of feet.
29th September. - Cachexia increasing, some
oedema of left foot and leg. Traction from the
tumour, a little external to the right mammary line. Rough and grating fricitive heard
over the tumour first noticed about a fortnight
ago.
9th October. - Considerable oedema of abdominal
walls with tympanitis.
19th October. - Pain in the lower part of abdomen,
with distension of legs oedematoso.
29th October. - Rigor yesterday with great pain in
abdomen, sickness and purging. Temperature
in the evening 100° F. Opium given internally
and hypodermically, opiate fomentations applied.
This morning a good deal of pain, especially in the
right side of the abdomen. Difficult to get
anything to remain on the stomach; even
milk and potash water makes him sick.

Face extremely pallid. Features more pinched than usual. Tongue extremely pale.

28th October. Southey's tube inserted into right leg yesterday and 4 ounces of fluid removed.

23rd November. For some days after the rigor there was diarrhea. He gradually became more cachectic, and the emaciation became more and more extreme. Great oedema of lower limbs and considerable swelling of abdomen owing to presence of fluid. For some days the right hand and forearm have been much swollen and oedematous. He gradually sank and died about 2 o'clock this afternoon. Previous to death he vomited some dark greenish fluid. In the last there was no jaundice though the skin had a yellow-greenish colour owing to the anaemia and cachexia. During the last fortnight of his life there was frequent vomiting, the vomited matter being greenish. For some time before death it was difficult or impossible to feel the tumour owing to the abdominal pain and distention.

The urine never contained any albumin, nor pigment or sugar. The bile salts were only once found to be slightly increased, (20th October) when \( \frac{1}{4} \) oz. gave the standard opacity instead of \( \frac{3}{4} \) oz. In all the other examinations they were found to be either normal, or slightly diminished in amount. The area \( \frac{1}{4} \), was several times estimated, and the largest
quantity found in 24 hours was 24.6 grains. Indican was almost always found in large quantity, while the urine was distinctly diminished in amount. In all the other estimations it was under 200 grains. E.g. Urine of 8th Oct. quantity in 24 hours 30 oz., deep straw coloured. No deposit; sp. gr. 1016, acid. No albumen, bile pigments or sugar. Bile salts not increased. About normal. Indican very deep blue, much increased. Urea per \( \frac{3}{1} \) = 0.665 gr. In 24 hours 199.97 gr.

Post Mortem Examination. 24th November.

Thorax. - In left pleural cavity there was a large quantity of turbid fluid, similar to that in the abdomen. In this fluid there was a considerable quantity of fibrinous lymph adhering to the chest wall and also to the surface of the lung. Pleura considerably injected.

Left Lung. - Fibrinous lymph on anterior surface, base and posteriorly. Marked Collapse at base. Also firm patches due to haemorrhages and interstitial pneumonia. Above the collapsed part, congestion and oedema. Small bronchiectatic cavity near open with tubercular nodules in its walls. At anterior margin of upper lobe, a firm yellowish mass. - Weight 1 lb. 3 oz.

Right Lung. - Firmly adherent all round to chest walls. Very marked congestion & oedema. Remains of fibrinous adhesions. Towards the
area some emphysema and some pigmentation.

Weight 1 lb. 9 oz.

Tissues in front of pericardium somewhat oedematous.

In the pericardial sac there was an ounce and a half of fluid.

Heart. - Subserous tissue somewhat oedematous.

Nothing important.

Abdomen. - Cavity contained 94 ounces of clear straw-coloured fluid with a few flakes of lymph. Omentum considerably retracted.

Liver drawn up under ribs and, at its lower margin, is a firm nodular mass connected with the duodenum and transverse mesocolon, passing back to the spine, and pressing on the inferior Vena Cava.


Kidneys. - Weight of each 5½ ounces. Right kidney - tissues in pelvis very oedematous. Capsule does not readily slip off at some parts. Cortex somewhat smaller than normal, and slightly irregular. Somewhat mottled; pale streaks passing in between the vessels.

Stomach. - There is a direct communication with the duodenum. The pyloric end is involved in the cancer mass, which is apparently scirrhous. The scirrhous growth extends over a considerable portion of the stomach to the left, - the growing margin thickened and,
indurated, overlapping the healthy mucous membrane beyond. The cancer mass is entirely adherent to, and ulcerating into, the under surface of the liver.

Duodenum. - The mucous membrane is all invaded by the tumour. Bile duct quite patent. Bile very dark. There is a small cancerous nodule in the liver at the anterior margin in the right lobe close to the middle line.

Liver. - With the exception of the nodule just mentioned, and also that there is some cancerous infiltration on the under surface in the region of the quadrate lobe, the rest of the liver is free from malignant deposit. There is a small thrombus in the hepatic artery. There is also a thrombus in the inferior Vena Cava where the tumour rested on it.

Diaphragm. - There is severe inflammation on the pleural surface of the diaphragm, but the other surface is quite healthy. No nodules in diaphragm.

The tumour involves the stomach, duodenum, pancreas, omentum, and transverse mesocolon, and is adherent to, and invades, the under surface of the liver.

Pancreas. - Some cancerous material in it, studded with cancerous nodules. The whole is firm and hard in consistence.

The small Intestines is involved in the malignant growth.
The mucosa is thickened.

Large Intestine. - Fibroid thickening in wall due to dyspepsy.

Abdominal Aorta. - A considerable number of thrombi in the renal arteries.

 Inferior Vena Cava. - The whole tumour rests on it, but does not invade it. Thrombus in it as before stated.
Case 12.

Case of Malignant Disease of Liver and of Lesser Sac of Peritoneum.

Mrs. Montefush, age 53; Housewife.
Admitted on 27th January, 1886, complaining of looseness in abdomen, griping, loss of appetite, and pain after food, the symptoms being of two years' duration.

The patient gives a history of severe headache, vomiting, giddiness, and dull pain in the epigastrium. A year past last October she had an attack of what she calls inflammation of the bowels. The pain has been worst after food. She has not vomited for some months, but has often felt sick. The vomit never resembled coffee grounds. She has had various dyspeptic symptoms. She has not had any jaundice, though her face became more yellow when she had the attacks of vomiting. Bowels have been constipated, and pain is worse when they are so. Previous health good except that she had had rheumatic pains in the fingers and wrists.


Abdomen:—Some univexal prominence with slight bulging of the flanks. Very slight comparative fulness in region of, and below, right costal arch in region of mammary line. No dilated veins.

Respiratory movements natural. Walks placid with
considerable amount of adipose tissue. Below right costal arch a rounded swelling is felt, extending from beneath costal margin downwards to about half-an-inch below umbilicus. Its inner edge is very distinctly felt immediately above the umbilicus in the middle line. Above this, it is in relation to the enlarged liver. The lower limit of this swelling has a rounded smooth curved border which can be traced to the right for a distance of four inches. The surface feels smooth and firm, and gives no definite sense of fluctuation or elasticity. It moves distinctly with respiration. The inner edge immediately above the umbilicus is very distinct and sharper than either the lower or outer limits, and it joins at an angle, into which the tip of the finger can be passed, with the lower part of the liver immediately to the left of the middle line. On palpation to the right it seems again to join at a distinct angle the lower border of the right lobe of the liver, which can be felt about a finger breadth or so below the right costal margin as a somewhat rounded and uneven edge.

The surface of this part of the liver below the right costal arch and to the right of the periumbilical swelling, is firm, uneven, and distinctly nodular.

On percussion the dulness over the swelling is continuous with the liver dulness.

The relative liver dulness begins in the right mamma-
mary line at the upper border of the 6th rib, and in the mid-axillary line at the upper border of the 5th rib. The absolute dulness in these lines begins at
the 5th and 6th ribs respectively. The lower limit of the liver dulness in the middle line is an inch above the umbilicus. A line of impalpable is continued upwards from this, and to the left to reach the costal margin in the mammary line. The lower margin of the splenic dulness is a continuation of this line, and corresponds to the lower border of the 8th rib. The upper border is at the upper border of the 6th rib. The stomach note — much obscured — can be obtained through the liver. Towards the right the lower border of the liver crosses the swelling below it at a level a little above the umbilicus — reaching its right border in the mammary line where a distinct angle of junction is felt. From this the lower margin of the liver continues outwards and very slightly upwards to reach the costal margin in the anterior axillary line. The most tender part is at the lowest part of the swelling, and over the liver to the rights of this.

3rd Feb: Soft systolic murmur with first sound, heard all over praecordia. Some accentuation of second sound in pulmonary area. Pulse 72, rather high tension.

5th Feb: The liver was explored just below the costal arch immediately to the right of the swelling, but no fluid was found. Next day she had a slight rigor and vomited.
After this the patient made some improvement. The pain and tenderness diminished and his general condition became better.

25th Feb: Very slight, scarcely perceptibleicteric tint of conjunctivae. Tongue pale and flabby. Abdomen very much as before, but the lower margin of the livers is near an inch further down. The swelling below it is larger considerably. No much tenderness.

The patient left the Infirmary on 6th March, her condition being on the whole not much changed.

The temperature at night varied from 99 to 101.4. In the morning it varied from 98.5 to 99.8.

She was re-admitted on 24th March, much weaker, complaining of a "burning heat in the abdomen and great indigestion." The abdomen was more prominent, and the swelling was rather larger. It was doubtful whether fluctuation was present.

On 26th March a fine needle was introduced one inch below the right costal margin, and an inch and a half from the middle line, and about 1/2 inches above the level of the umbilicus. The needle was passed deeply and in a downward direction. Six ounces of a somewhat thick brownish yellow fluid were withdrawn. The fluid contained a large amount of albumen and a trace of bile pigment.

Microscopically: No cholesterin or other crystals. Besides numerous pus corpuscles there were very many cells large and brightly granular, some with two or more nuclei, some rounded, but most of very irregular
and various shapes, some evidently dividing, some with long processes, some spindle-shaped, most at least epithelial in type, evidently of carcinomatous origin.

The tapping reduced the size of the swelling and it was not followed by any bad symptoms.

She had also begun to suffer before her readmission from a very severe pain in her left hip joint, extending down to the knee. This caused her great pain during the rest of her life. She was a nervous woman apparently with some hysteria. The pain was said by her to be relieved by salicylate of soda which was given for it, but a small dose was found to be as efficacious as a large one.

31st March. She has had no jaundice since readmission; more relish for food now. No gastric symptoms of importance. Pulse 90; regular, weak, easily compressible, rather small. Tongue somewhat dry and cracked, coated with brownish white fur. The abdomen is flaccid and there is tenderness over the tumour, especially in the middle line and a little to the left of it. No irregularity of the liver felt.

10th April. Tumour extends to 1½ inches to the left of the middle line, and downwards for three inches below the level of the umbilicus. Very tense and painful on pressure, especially on the inferior border. It extends into the
Cells in fluid removed from abdomen.
right lumbar region. It appears continuous with the liver on its upper and right border. Note over the upper third of the swelling is almost completely dull; over lower two-thirds, partially dull on light percussion.

12:45 p.m. — The tumour was again aspirated and eleven ounces of thick, slightly viscid brownish-grey, coloured fluid were removed. It deposited a copious sediment.

19th April. — Tumour again increasing. No fluctuation made out, but the whole tumour can be moved from side to side.

22nd April. — Tumour larger than ever. It was again aspirated and twenty ounces of fluid — fairly clear at first; towards the end a thick creamy sort of fluid escaped. Under the microscope cells of various shapes were seen as before.

On 26th April, several ounces of fluid were again drawn off. On standing it deposited three-fifths of its bulk. Supernatant fluid turbid and of greenish-yellow colour; deposit brownish-yellow. Albumen in large quantity. Pigment also present: Pus and blood present.

Microscopic character much the same as before — cells of varying shapes and sizes, all very granular and fatty, some very large, some with more than one nucleus. Pus corpuscles. Numerous fat globules.

The patient gradually became weaker, more
and more emaciated and cachectic, suffered greatly from pain in the left hip joint. The tumour became larger than ever, reaching near to the right anterior superior iliac spine, but it was not thought of any use to repeat the tapping.

Towards the end of May she began to pass urine in bed; a bed-sore formed over the sacrum; and the feet and legs began to swell. A nodule appeared on the liver under the right costal arch; and another mass was felt in connection with the liver in the right flank. Some friction was felt over the larger tumour, between the upper part of which and the liver there was sometimes some resonance. There was little or no jaundice. Towards the end she slept a good deal; and she died on the 2nd or 3rd June.

During the second period of her residence in the Infirmary, the morning temperature was often slightly elevated—99° to 99.6°; and the evening temperature was generally elevated—usually from 100° to 101.6°.

Post Mortem Examination.

4th June:—Pupils equal and moderately dilated. Subject emaciated. Large bed- sore in lower sacral region, sloping at one side, healing at the other. Post mortem rigidity completely absent. Sodicity absent. Some oedema of lower limbs. There
commencing gangrene on the inner side of the left acetabulum. In the right hypogastric region and extending into the epigastric, there is a marked swelling 5\% by 6 inches in diameter. The left femur is fractured.

On opening the abdomen there was seen a hard nodule at the base of the tumor with a little omentum attached. The colon was displaced by the tumor. The gall bladder was completely filled with gall stones, and the new growth has taken place posteriorly. The cancerous cyst was found to be the lesser sac of the peritoneum. The liver was enlarged an cancerous. It contained some deep old cicatrical contractions due apparently to cancer of long duration.

The spleen was firm and slightly enlarged. There were cancerous infarctions at its anterior margin.

Right Kidney pale, surface roughened. Capsule strips off readily. Slight congestion. A large quantity of yellow material scattered through it. A few cysts. In the cortex were a few patches of granular yellow material. The cortex was atrophied. The Malpighian bodies and the pyramids were waxy.

Left Kidney, 5 ounces. Capsule stripped off readily. Slight congestion. In a similar condition to the right.

Heart: Some clots in both ventricles, also in the left auricle. The right auricle was empty.
No Antheroma of Aorta. Vegetations in the mitral valve. Tricuspid valve normal.

Left Lung, somewhat emphysematous anteriorly and at the apex; somewhat congested and edematous.

Right Lung. Completely collapsed at base. Firm hard cancerous nodule in the lower part of the lower lobe.

There was a cancerous growth in the Femur and also in the Humerus. The fracture of the femur - the result of the cancer - was intracapsular.

Examination of Urine.

The urine was always small in quantity, the largest quantity per diem being 32 ounces on 14th February. Generally 20 ounces or less. Specific gravity usually high. Reaction acid. If generally deposited urates or uric acid, and frequently oxalates also. There was no albumen nor sugar till 12th May, when albumen appeared. Nitric acid, except at first, gave a slight reaction like that for bile pigment, but this may have been due to the indican which was always present in large quantity. The bile salts were in normal quantity at first, but on 3rd March, and always afterwards, they were in excess. The Urea varied from 397 to 146 grains. Microscopically there were amorphous urates, uric acid, and sometimes oxalates. Also Mucus and pus leucocytes, and squamous epithelial cells.
On 12th May, in addition to albumen there were present a few cells from the renal epithelium, one or two epithelial casts, and hyaline casts containing cells and granules.

The bile salts on and after 3rd March were generally present in double or nearly double the normal maximum amount 200 per cent. On 2nd May their quantity was as large as 300 per cent; but after that it fell again to a little under 200 per cent.

The urine was not tested after 12th May.
Case 13.

Case of Congestion of the Liver (chronic) with Ascites.

Horatius Bonnar Symington, age 50, Labourer in Iron Works. Admitted 1st Feb., 1886, complaining of pain in the right side, with swelling of the abdomen. Duration of illness about a month.

History:—He used to take a good deal of alcohol, but not since he had pleurisy in the left side two years ago. He has had good food, and his home has been comfortable. He had Scarlet and other fevers when a child. About a year ago he had a slight attack of Lumbago, and he has had several attacks since then. About six months ago he had a severe attack which confined him to bed for fourteen weeks. Ever since he had the pleurisy he has had pain in the left side region on lifting a heavy weight.

Present Illness:—About a fortnight before the New Year he began to suffer from pain in the region of the liver. This at first affected his breathing, but it is not so bad now. About the New Year, or shortly after it, the abdomen began to swell, and it continued to swell until he was admitted. There has been no jaundice nor swelling of the legs.

The patient's condition a week after admission.
was as follows:—The tongue was flabby, tremulous, and slightly furrowed. There was no jaundice. The abdomen was prominent, and there was slight bulging in the flanks, but there was no localized prominence. The superficial veins were somewhat distended. The abdominal was moderately tense. There was no tenderness except over the point of the liver below the ribs. Between the middle and right mammary lines the lower margin of the liver was obviously felt. There was no irregularity. The percussion note was clear in front. On the left side the note became dull six inches to the left of the umbilicus. In the middle the dulness commenced about two inches above the pubes. On the right side there was impalpable percussion in the flanks, but the tympanitic note of the ascending colon was heard through it.

In the middle line the hepatic dulness extended from 4 ½ inches above the umbilicus upwards for about 4 ½ inches. In the right mammary line it extended from the 4th rib to fully half-an-inch below the costal margin, a distance of 5½ inches. In the right mid-axillary line it extended from the 6th rib downwards for 6½ inches.

The cardiac, hepatic, and splenic dulnesses were continuous with one another.

The spleen was slight enlarged, the dulness reaching to the anterior axillary line in front.

Friction was heard over the liver in the region of
the lower ribs, chiefly in front of the mammary line due to perichepatitis.

The cardiac sounds were feeble and the first sound was air-pine. There was no murmur.

There was no dulness over the lungs. The expansion was better at the right than at the left base. There were crepitations with deep inspiration above and below the clavicle on the right side, and also at the left base. The expiration was a little prolonged at some parts. There was no pleuritic friction.

On 2d Feb., a mixture was ordered containing ipecac, Digitalis, &c.


This was discontinued on 13th Feb. On 18th Feb., a wineglass full of Potash Imperial three times a day was ordered. He sometimes had to get an abscessed pill on account of typhoid fever.

After the 7th Feb., he steadily improved. The friction had disappeared by 25th Feb. The pain also ceased. The ascites diminished, &c. He left the Infirmary on 13th March, it was very slight. The liver gradually diminished in size, till when he went out, it was within the normal limits, measuring 2½ inches in the mammary line. The spleen became normal in size. The superior jejunal veins for a time, when the liver began to diminish, were more distended, but after a time they also diminished in size.

He left the Infirmary on 13th March much improved as regards the abdomen, but the pulmonary condition was a little suspicious. There was found on the previous day slight dulness at the right apex posterior. The breathing was harsh at the left apex in front, with occasional rhonchus. At the right apex in front and behind, the breathing was harsh, and approached the
bronchial in type, and it was accompanied with expectoration. The second sound of the heart was slightly accentuated in the aortic and pulmonary areas. The first sound was in, June. There was no murmur, and the cardiac dullness was within the normal limits.

There was a slight rise of temperature in the evening during most of the time he was in the infirmary, but this had ceased about a week before his discharge.

Examination of urine.

The quantity of urine was about normal from the time of his admission till 14th Feb. After this there was some diminution till 27th Feb., from which time the quantity was increased—varying from 54 to 86 ounces.

The urine was examined on 7th & 24th Feb. & again on 10th March. It was normal in appearance, and there was only a mucous deposit. It contained no albumen, bile pigment, nor sugar, and the bile salts were present only in normal quantity on 7th Feb. and 10th March, but were possibly slightly increased on 24th Feb. On 7th Feb. the quantity was 46 ounces. Indiuretin was found to be not increased.

24th Feb.: Quantity 38 ounces, Specific gravity 1029;
Slightly acid.
Bile salts normal, or slightly increased.
16th March.: Quantity 64 ounces, Specific gravity 1021;
Slightly acid. Urea 399.9 grains.
Case 14.

Case of Cirrhosis of the Liver with Ascites.

William Roden: age 40: "Publican."
Admitted: 12th June, 1855.
Examined: 14th.

Complaint: Dropsey. Duration: Four Months.
History: The only thing of importance in the family history is that one of his brothers died of Dropsey at the age of 29 after two years' illness. He was frequently tapped. He had been temperate. Patient was a coachman till a year ago; enjoyed good health and was temperate, but took on an average three pints of light table beer daily, with occasionally a glass of whiskey. About a year ago he became a publican, and then he took about six "nips" a day. The work was not heavy but the hours were long, and he was a great deal on his feet, and was very little out of the house, taking no exercise out of doors. After he had followed this sort of life for six months or more the present illness commenced. About three weeks after the new year his abdomen began to swell. His breathing became very difficult, and shortly after his legs began to swell. On 4th Feb. he consulted a Doctor who treated him for congestion of the liver, "with a slight tendency to Dropsey." He was ordered
Carlsted, Salts every morning, and a mixture was also given him. This treatment he continued till three weeks ago, when the medicine was altered to Acetate of Potash, Sweet Spirit of Nitre, and Decoction of Scoparium. Since then he has got worse—the swelling of the abdomen increasing rapidly. The legs became more swollen, and the scrotum and penis also began to swell. He was not confined to bed during the day while he remained at home.

For a few months before the new year, he had felt out of health, and was treated for stomach disorders. He used to be ruddy, but became pale. Since last summer his skin has had a more yellowish colour than before—almost like jaundice. This has now greatly left him. About 1st Feb when he consulted the Doctor, he noticed that his urine was smaller in quantity and high coloured, and that it became turbid on standing. He has had a cough for some months, and it became worse three weeks ago, when he got into a state of orthopnoea.

State on Admission:

Height 5 feet 8 inches. Marked Dropsey of the Peritoneum and lower limbs. Some scaly eczema over the front of the legs. Most com-fortable when propped up, but can now sleep where lying down.
Alimentary System:

Tongue somewhat flabby and slightly furled: sometimes troubled with flatulence.

Abdomen: Marked prominence with bulging in flanks and other signs of ascites. The dulness in the middle line reaching to two inches above the umbilicus. The deep liver dulness begins at the lower border of the 4th rib in the right mammary line, and extends down to within an inch and a half of the costal margin, a distance of 4½ inches.

Measurements of Abdomen:

At level of tip of Xiphisteroneum.

At midway between Xiphisteroneum & Umbilicus.

At level of Umbilicus.

4½ inches.

Circulatory System:

Heart somewhat pushed upwards.

No murmurs. Pulse 104, regular, somewhat small; arteries healthy.

Respiratory System:

Breathing 24 per minute, entirely thoracic. Cough troublesome at night. Sputum frothy, bluish white. The percussion note is good in front—impaired at the bases posteriorly—hard breathing in front. "Posteriorly over the bases numerous medium expirations, especially with inspiration. Breath sounds heard; resonance faint."
Integumentary System:

Great oedema of lower limbs; some oedema of Scrotum and Penis, and also of Chest wall. Erotic oil eruption over chest. Dry eczema over front of legs.

Urinary System:

Urine, Sp. gr. 1028, acid; considerable deposit of urates; Colour reddish-pink; turbid from presence of urates. No albumen, blood, bile, or sugar. Microscope: Amorphous urates.

(As I was unable owing to illness to be at the Infirmary when the patient was admitted, I am indebted to the Clinical Report for the facts as to the State on Admission.)

1st July. – The cough has now almost gone, and he can lie on his back comfortably. The oedema of the legs has gradually diminished, and is now slight. The abdomen is still considerably distended with fluid. No jaundice or cyanosis.

Tongue covered with whitish fur, especially posteriorly. Appetite has been good all the time of his illness. Since admission he has felt a fulness in the epigastrium after food, and has had sour eructations, which he attributes to the sweet milk.

Troubled with watery and gaseous eructations. Bowels regular: Character of motions, natural.

2nd July. – Abdomen: Nearly globular in shape. Superficial veins distended. Distinct signs of Ascites
When lying on his back the note becomes dull about an inch or an inch and a half below the umbilicus, and laterally about four inches from the middle line. The deep liver dulness in the right mammary line extends from the 5th rib to the costal margin, a distance of four inches.

**Circulatory System:** Much the same as before, but slight roughening of first sound in the Mitral area, and slight accentuation of the second sound in all the areas. Pulse, 92 per minute, regular, small, easily compressible. Veins of Abdomen distended. Capillaries normal.

On his admission he was put upon convalescent diet with milk at night, and was ordered a diuretic containing Acastal and Bicarbonate of Potash, and Tincture and Infusion of Digitalis. This treatment, combined with strong purgatives was continued till 30th June, with very little influence on the ascites. On 30th June the abdomen was aspirated and 270 ounces of a milky yellow fluid were removed. From this time he made a steady improvement, interrupted only by a slight bilious attack with a very slight icteric tint of the conjunctiva. The size of the abdomen, as shown by the measurements, gradually diminished. The edema of the Scrotum and legs soon diminished and disappeared. On 6th July the ascites was still considerable
and the liver dulness on the right mammary line extended from the 5th rib downwards for 3½ inches, the lower border being above the costal margin. On the 20th July he was much improved. No jaundice—still some ascites. His face has a better colour now. The complaint of sickness and a tendency to vomit in the morning, but he does not vomit much. He got out for a little about the 10th July.

23rd July:—The ascites has now almost gone.

In the right mammary line the deep hepatic dulness extends from the 5th rib to 1½ inch above the costal margin, a distance of 3½ inches.

In the right mid-axillary line the hepatic dulness extends from the 7th rib downwards for 3¼ inches. In the middle line anteriorly the vertical hepatic dulness is 2 inches in extent, ending below about ½ inch below the base of the uniform cartilage. There is very little hepatic dulness to the left of the middle line. The size of the liver has thus undergone a steady diminution, while he has been in the Infirmary, and it is now distinctly, though only slightly diminished in size.

The patient's general condition is now much improved, and he is able to go about quite well.

24th July:—The patient was discharged to day, the ascites having almost disappeared.

The temperature was normal or subnormal.
while he was in the Infirmary.

The Urine was diminished — 12 to 14 ounces on admission — but soon increased to near the normal amount, and for a time after the tapping it somewhat exceeded the normal amount. It contained no albumen, bile pigment or sugar. There was no increase in the bile salts. The Indican was not increased.

On one occasion a little skatoxygul sulphate of potash was present as well. The urine was a little diminished, (324 to 335 grains) except at the time of the bilious attack. An estimation made at this time gave 651/49 grains in 24 hours.
Case of Limited Peritoneal Effusion in a Patient with Cardiac Disease, but in whom the Effusion is probably in part at least due to Cirrhosis of the Liver.

Andrew Sykes, Age 32. Coal miner for the last 5 years; previously an agricultural labourer. Admitted on 2nd July, 1865. Complaint: Swelling and heaviness in abdomen. Duration: Three weeks.

History: There is little of importance in the previous history. He has been in the habit of taking beer, but not to excess. As a miner he has been much exposed to damp and wet. He has never had rheumatism and there is no history of syphilis. He has never suffered from shortness of breath.

Present Illness: Three weeks before admission he began to feel ill, was unable to take food, but could not say that there was anything in particular the matter with him. He continued in this condition for a fortnight, and then he observed that his abdomen began rapidly to swell, and this has rapidly increased. He is not aware of his legs or ankles having been swollen until he came to the infirmary. There has sometimes been a very severe pain in the small of his back, extending round to the front of the abdomen.

On admission he was found to be a well developed man, with no jaundice or cyanosis, but with considerable oedema of the feet & ankles. He could only lie on his
back, lying on the side producing severe pains in the back.

Temperature, 99.8°.

Adermal System: Tongue indented at the edges, covered with a thick white fur. Mouth dry, constant thirst during his illness. Discomfort in stomach after food. For last fortnight he has had diarrhea.

Abdomen: Marked distension especially at lower part, umbilicus projects. No bulging in the flanks. On palpation the walls are tense. At the lower part of the abdomen a distinct thrill is elicited. On percussion there is dulness below a line drawn from Poupart's ligament on the right side an inch below the anterior superior iliac spine to an inch above the umbilicus, from that point transversely to the left for 4 inches, thence curving up wards and backwards along the lower border of the 8th rib. Over the stomach there is a highly sympathetic note, extending up to the 4th rib on the left mammary line. In the right lateral sternal lines the clear percussion extends up as far as the junction of the 4th costal cartilage with the sternum. The liver dulness in the right mammary line extends from the 6th rib to the 7th intercpace. The left lobe cannot be percussed. There is an area of dulness in the right hypochondrium 12 inches external to the mammary line, continuous with the liver dulness and extending down to the level of the umbilicus. This area is 2 inches broad. Measurement of abdomen at level of iliac crest 36 inches; at lower extremity of Xiphisternum 39 inches.

Haemopoietic System: Slight enlargement of
axillary and inguinal glands: otherwise normal.

Circulatory System: Cardiac impulse at the interface in anterior axillary line. No murmur but some impurity of first sound.

Treatment: He was put upon a milk and soup diet and was ordered a Digitalis & Iron Mixture. This was stopped in two days. Nesapecta pills were also given. On 9th July he was ordered a subnitrate of Bismuth powder, and on 10th July a diuretic mixture containing Tincture and infusion of Digitalis, and acetic acid of potash was ordered.

Progress: 5th July: Complains of dyspnoea, and of pain in the right mammary region.

7th July: The abdomen projected so much anteriorly that a catheter was passed under the suspicion that the fluid might be due to retention of urine, but without any urine being drawn off.

9th July: This morning he had a severe attack of dyspnoea, with imperfect pulse, cyanosis, and dilatation of veins. On examination after this attack had passed off, the cyanosis had disappeared; there was no jaundice, but some oedema of the legs and ankles. He was pale and emaciated, and in a state of orthopnoea. There was a slight murmur in the mitral area. The abdomen was uniformly distended, prominent anteriorly, but with no bulging in the flanks. The abdominal veins were not distended. The walls were tense, and there was a distinct thrill. When sitting up the dulness in the middle line begins about 2½ inches above the umbilicus, and
the line of dulness extends to both sides on a level with this. Below this line there is dulness over the whole abdomen except in the right lumbar and right iliac regions where there is a clear note which becomes gradually impaired in passing forwards till the line of absolute dulness is got running vertically about 13 inches anterior to the anterior superior iliac spine. This clear area to the rights is not affected by change of position. The abdomen was aspirated, the trocar being inserted about 2 inches below the umbilicus, a little to the right of the middle line. 128 ounces of serum were drawn off. The patient was greatly relieved by this. While the fluid was being drawn off it was observed that the vertical line of absolute dulness in front of the right anterior superior iliac spine gradually passed forwards till it was at least 3 inches in front of its previous position, while the level of dulness in the middle line had only become lower by about half an inch. As the fluid was further drawn off the dulness diminished in much the same way, becoming however, considerably lower in the middle line. When the aspiration stopped, the note was clear immediately above where the needle of the aspirator was inserted. A considerable area of dulness remained on the left side of the abdomen.

Evening: Much better. The liver dulness is now found to begin at the 4th rib in the mammary line, and to be considerably increased in extent. In the middle line, the lower border of the liver dulness
is at the tip of the euneiform cartilage.

16th July: Some Oedema of Peri to day.

13th July: Oedema of feet gone.

20th July: He has steadily improved since the tapping. Abdomen generally prominent; slight bulging in the left flank. Umbilicus level with the skin. Superficial veins not enlarged. Walls tense. No tenderness. No feeling of resistance. No fluctuation.

Measurements:

At level of euneiform cartilage: 3 7/8 inches.

Midway between euneiform and umbilicus: 3 5/8 inches.

At level of umbilicus: 3 4/8 inches.

There is still the clear area on the right side, even when the patient is lying on that side. In front of this however, a narrow band of dulness extends right up to the liver. In the middle line the liver dulness is not more than an inch or an inch and quarter. In the right sternal line it is 1 3/4 inches; in the right parasternal line, 3 4/8 inches; in the mammary line 4 3/8 inches (from 4 7/8 rib to about an inch above costal margin); in the mid axillary line, 6 3/4 inches. The spleen is normal in size, or but slightly increased. The heart is slightly pushed upwards and to the left. There is a somewhat rough systolic murmum, and the second sound is accentuated, especially in the pulmonic area.

30th July: Abdomen less prominent than before. Still some bulging in the left flank.
Measurements

At level of tip of Xiphisternum 39 inches
Midway between Xiphisternum & Umbilicus 34 ½ inches
At level of Umbilicus 33 inches
At level of antero-superior iliac spines 34 ½ inches

The outline of dulness is now as follows: It commences below 1/2 inch to the right of the middle line, passes almost vertically with a slight inclination to the left, and crosses the middle line near half an inch above the umbilicus. It then passes to the left with a slight curve downwards, then curves upwards to its former level and then passes almost transversely backwards. The note is clear above and to the right of this line. The liver dulness in the right mammary and mid-axillary lines is rather less than when last described.

6th August. The abdominal measurements are diminished on the whole by nearly an inch. The vertical line of dulness has now passed to 1/4 inches to the left of the middle line. There is a considerable area of clear percussion to the left iliac fossa. When the patient was changed onto the right side, there was some resonance in the left flanks, but the area of dulness, both on the right and left sides of the abdomen, remained very much the same as when the patient was lying on his back.

There is now no hepatic dulness to be made out in the middle line, nor for ½ inch to the right of it.
The upper border in the right mammary line is at the 5th rib, and the lower border is fully an inch above the ribs. The measurements are as follow:

Right Mammary Line 3 1/4 inches
Right Mid-Axillary Line 4 1/4 inches
Midway between Mammary and Middle Line 2 1/2 inches

9th Aug.: The patient left the Infirmary today much improved. The physical signs of fluid in the abdomen are slight. During his stay in the Infirmary, the liver has undergone gradual diminution in size, so that instead of being increased in size, it is now rather diminished.

The morning temperature was slightly elevated for the first fortnight; after that it was normal or sub-normal. The evening temperature was rather higher; several times 100° once 101° (the day after the tapping.) Latterly it also was normal.

The urine was very scanty at first 10 to 20 ounces, but it increased after the tapping to 30 ounces, and a week afterwards, it became normal. It was very concentrated at first 56 gr. 1032, and showed a large deposit of urates as a rule. A trace of Albumen was only once detected (16th July). There was no sugar nor bile pigment. The bile salts were not distinctly increased except perhaps on one occasion. The indigo was tested for five times, and only once shortly before he went out, did it show any increase.
On the 8th July the area was 461.8 grains.
On the 9th it was 594.8.

It varied from 240 to 594.8 grains; the figures being: 461.8; 594.8; 240.8; 583; 364.8; 289.8; and 343.2 grains.
Case 16

Case of Syphilitic Cirrhosis of the Liver with Valvular Disease of the Heart and Enlargement of the Spleen; Extensive Hemorrhages before death.

William Miller, age 45; Inhabitant for 20 years; Previous in the spirit trade.

Admitted: 3rd August, 1885; Examined 4th Aug. Subsequently.

Complaint: Feeling of heaviness and slight pain in epigastrium; Weakness; Sickness; Yellowness of skin; Inability for work.

Duration: 8 or 10 weeks.

History: Family history, unimportant. He has been a habitual drunkard. Home, not very comfortable; unmarried. When about 23 years old he contracted a chancre. There were no secondary symptoms following it, but he has for the last two years had ulcers, evidently syphilitic, on the legs. When 28 years old he fell from the trapeze, but was not seriously hurt.

Present Illness: About ten weeks ago he began to suffer from sickness and a feeling of heaviness in the epigastrium, without much pain, but with some tenderness on pressure. He became gradually weaker, but was able to continue at work till ten days ago. For the last four days before admission he was confined to the house. He has suffered a good deal from sickness, and there has been vomiting occasionally. He has had very little appetite, but he drank a good deal owing
to his thirst. He felt cold, and had cold sweats at times. He has had some shivering several times—relieved by taking a little warm spirits and going to bed. The skin became of a yellowish colour about the time he turned ill, and the stools became lighter in colour, being yellowish but not quite white. The urine also became more yellowish. It is darker now than it was at first. It has been diminished in quantity all the time of the illness. The bowels have been pretty regular till last week, when he had an attack of diarrhoea for two days. For the last few days they have been somewhat constipated. He has felt giddy when standing since he turned ill. He has been uneasy at times. He has slept well.

State on Admission:—Height 5 ft. 4 in. Well developed. Slighticterus of skin, and mucous surfaces. There are two syphilitic ulcers on the right leg, and there are also two cutaneous, one white, and the other copper coloured.


Abdomen:—Slight diffused prominence in right epigastrium. A few petechiae especially on the left side of the abdomen below the level of the umbilicus. There is tenderness on palpation over this part of the liver below the ribs. The lower margin of the liver in the right mammary line can be felt during deep inspiration to pass below the ribs, and the margin here feels normal. From about an inch internal to the right
mammary line to slightly beyond the middle line there is a prominence felt of the anterior surface & margin of the liver, which is here tender. The margin between the points noted is lower than in the mammary line. It is felt to be distinctly thickened & indurated. No irregularity of the surface or margin can be distinctly felt. The gall bladder is not felt. The percussion note is clear except over the liver and spleen. The liver dulness extends, in the mid-axillary line, from the 6th rib downward for 4 3/4 inches; in the right mammary line, from the 5th rib to 3/4 inch above the costal margin, a distance of 5 inches. An inch & a half to the right of the middle line, the lower border is 3/4 inch lower than in the mammary line, and here the vertical dulness measures 5 1/2 inches. Slightly to the left of the middle line, it is 3 1/4 inches. To the left the hepatic dulness meets the splenic dulness 3 3/4 inches from the middle line.

Haemopoietic System: - Distinct enlargement and induration of Lymphatic glands in the groins, and to a less extent in the axillae and neck.

The Spleen: - In the left mid-axillary line the splenic dulness extends from the upper border of the 6th rib to the 10th rib, a distance of 6 1/2 inches. Posteriorly it extends to 3 1/2 inches from the spine. Anteriorly it extends to about 1 1/2 inches in front of the left mammary line. With deep inspiration the border of the spleen inferior & anterior can be distinctly felt passing below the ribs. A nodules is felt at the anterior and lower part of it. There is no tenderness.
Thyroid gland not enlarged.

Examination of Blood. (6th August.)
Red corpuscles . . . . 3,900,000 per cubic millimetre.
White . . . . . . . . . . . . 9,000 . . . . . . . . . . . . . . . . . . . . . . . . .
Hæmoglobin . . . . . . . . . . . . 60 percent.

Circulatory System.:—Dyspnoea on exertion.

Gastric trouble, probably gastric ulcer, has had pain in epigastria but not marked. The heart is not markedly enlarged, but there is both aortic and mitral incompetence, and the pulmonary second sound is accentuated.

Pulse 81 per minute, regular, rather small, tension rather poor, easily compressible, arterial wall distinctly thickened.

Respiratory System.:—Distension of veins over upper part of chest. Lungs fairly healthy.

Integumentary System.:—A few pustules and congestive patches on the back and shoulders.

Urinary System.:—No subjective phenomena.

Report on urine at end of case.

Nervous System.:—Normal.

Locomotor System.:—Normal.

The patient was put upon convalescent diet, with milk at night, and a mixture was ordered containing Perchloride of Mercury, Iodide of Potassium and Quassia.

Progress.
The patient remained in the Infirmary until the end of September, and during this time he made
some improvement; the yellowness of the skin and conjunctivae diminishing, and the tenderness and prominence in the epigastrium becoming less. The stools were somewhat pale, and he had two or three attacks of diarrhoea. The ulcers improved. The urine contained no albumen. On admission it contained a trace of bile pigment and an excess of bile salts, but after his discharge there was no bile pigment detected, and the quantity of bile salts was not in excess. The twelve-hour was 318 grains at first; on the 9th Aug. it was 384 grains. There was no excess of Indican, but the reaction for the Skatolyl sulphate of Potash was very distinctly obtained. In the end of September the patient went to the convalescent home, and remained there for three weeks. While he was there the only important change which occurred was that he commenced to have haemorrhage from the gums. He also complained of a feeling of weight and sinking in the stomach after food. Previously to 28th Oct., his temperature has been normal or subnormal, but on the evening of 28th Oct. it rose to 102°, and after this, during the rest of the progress of the case, there was frequently a greater or less evening rise of temperature, and the morning temperature was also sometimes somewhat elevated. He frequently after this time had slight rigors or chilliness, and he often complained of severe headache. On 29th Oct., the prominence in the epigastrium had become much less, but some irregularity of the surface of the liver at this part was made out. About an inch internal
to the mammary line a notch was felt in the anterior margin of the liver. His breath was fast and became more so as the case progressed. The intensity of the yellowish sallow colour of the skin, varied from time to time; but it never disappeared, nor did it ever pass into what could be called a distinct jaundice. The amount of tenderness and prominence in the right half of the epigastrium also varied from time to time. The liver, which had been enlarged at first, remained for a time not much changed in size; then it underwent a gradual diminution, and by the end of January, 1887, had come within the normal limits, except in the middle line in which it remained increased. The spleen on the other hand steadily increased in size. The blood underwent a steady deterioration. On the 12th Nov. examination of the blood showed its condition to be as follows:

Red corpuscles: 3,390,000 per cubic millimetre
White: 8,000

Haemoglobin: 30 per cent.

There was a slight tendency to tailing of the red corpuscles, and the varying considerably in size. There was not much to the formation of rouleaux.

On the 27th Jan., again the condition was this:

Red corpuscles: 2,320,000 per cubic millimetre
White: 2,000

Haemoglobin: 38 per cent.

The condition of the corpuscles was much the same as before. No later estimation was made, but the deterioration continued to the end of the case.
In January, 1889, the ulcers on the leg had healed, but some subcutaneous haemorrhages occurred in the legs, and he began to have slight haematuria occasionally. The subcutaneous ecchymosis first appeared about the middle of January on the thighs a few inches above the patellae. There were now signs of pulmonary consolidation at both apices, especially at the right apex. The factor of the breath continued, and the tongue—found before had now a dirty-brown colour owing to the haemorrhage from the gums.

On 1st Feb., there was some dilatation of the superficial veins, both on the body and legs, and there was observed a series of punctate capillary dilatations arranged in a transverse line a little below the xiphisternum, extending across the epigastrium and into both hypochondriac regions. This line had been observed before, but was now more marked. There was a blue discolouration from a subcutaneous haemorrhage of some standing in the upper part of the chest in front, and there were some patches of recent haemorrhage on the abdomen. There was a patch of capillary dilatation on the left thigh, with a slight recent haemorrhage in the centre.

On 1st Feb., his temperature went up to 102° in the evening, and his nose bled three times. He had a severe verticil headache. There were some patches of capillary dilatation on the cheeks and nose.

On 8th Feb., jugular pulsation was noticed, the
vessel when emptied filling from below. The cough and signs of consolidation at the axillae were by his time more distinct. The abdomen was more prominent, but there was no dulness in the flanks. Some oedema of the feet and ankles and of the lower part of the legs appeared, but this disappeared again by 13th Feb. On 28th Feb., he was distinctly worse. His gums were swollen, sore, and spongy, and lips were thickly supported. He frequently complained of pain in the stomach.

In the end of Feb., he became very weak, lethargic, and was unable to stand. On 1st March, his breath was very foul, rendering antiseptics necessary round his bed. He had no inclination for food, but took milk readily. He slept a good deal. There was a good deal of haemorrhage from the mouth and the back of the nose. The liver was more tender, and the spleen had extended (by percussion) to half an inch to the left of the middle line. The tongue was tumescent, dry, and cracked, and covered with a dirty white fur. Subcutaneous tenderness was present last night. Stools brown and light colored. Pulse 84, regular, of moderate volume, easily compressible. A corrosive sublimate lotion was used for the mouth and nose.

On 23rd March he was worse and lay asleep with his eyelids half closed. A good deal of blood pressed in the motion, partly bright, partly dark.

On 3rd March the lips were dry, parched & thickened, the conjunctivae were rather more yellow. He lay in a listless apathetic state, and spoke in a low husky
tense. The motions contained some blood again.

On 14th March he was in a drowsy semi-comatose state. There was sometimes low delirium, and he complained of slight verticil headache. There was a good deal of bleeding from the mouth - none from the nostril. He had eminence odour.

On 5th March he first vomited his food and then a solution painfoul of bright blood. Numerous haemorrhages some bright red, others blue, appeared over the shoulders, back, and limbs just like an attack of purpura. There was also haemorrhage into the conjunctiva. An ice bag was ordered to be applied to the abdomen of the haemorrhage returned, and he was fed on milk and beef tea.

After 3 p.m. on 3rd March he became somnious and continued so till he died at 11:35 p.m. Profuse haemorrhage occurred from the stomach and bowel that from the bowel being mostly dark. A little haemorrhage occurred from the nose; and several fresh haemorrhages came out in the skin. Oedema glottidis came on before death.

Besides the treatment already mentioned. The patient took Pepsine, Quinine, Iron, Sulphate of Soda, Phosphates, Perchloride of Mercury, and Lime Juice. Astringents were used for the mouth. No treatment, however, had any marked effect on the progress of the disease. Perchloride of Mercury, which was ordered on 5th Feb., had to be stopped in a few days owing to the gastric irritation produced.
Post Mortem Examination.

Externally nothing remarkable except some petechial spots scattered over the skin surface, and a darkened patch on right leg, the seat of the old ulcer.

Some haemorrhagic spots on pericardium. Fluid in small quantity, somewhat blood stained, in the pericardial and pleural sacs. in the pericardial sac 1 1/4 ounces of orange coloured fluid.

Spleen - 1 lb 14 oz. Capsule smooth; a few thickenings on the anterior surface. On section, substance firm, and in some parts mottled and deeper in colour. Trabeculae prominent. Malphigian bodies in some cases enlarged.

No watery reaction with Iodine.


Right Kidney - 8 ounces. Surface like that of the left. On section more congested; otherwise the appearance much the same. The substance not so flabby. Capsule more adherent.

Liver - Weight 3 lbs 4 oz. A portion of the left lobe almost detached from the rest of the organ, the intervening liver tissue having been almost entirely
replaced by fibrous tissue, due to a cicatricial process of long standing. Surface roughened. A series of orange yellow patches surrounded by more translucent effused, corresponding to bands of fibrous tissue, congested tissue. Some depressed atreticous on upper surface. On section, bile-stained masses of liver cells with a large amount of fibrous tissue between, the fibrous tissue being very vascular, (this explaining the absence of ascites,) Liver tissue in small quantity and bile stained. Masses of cells of small size, bile-stained and probably fatty. The condition is thus a diffuse cirrhosis. Immediately under the cicatricus on the upper surface, there is a large area of fibrous tissue, and in it are a number of blood vessels. No trace of any caseous material. The small partially detached portion of the left lobe is in the same state as the right,—a dense fibrous mass separating the two portions.

No caseous reaction.

Heart: Weight 16 oz. Slight incompetency of aortic valves. Some thickening at the margin of the mitral valves. Slight thickening of the margins of cusps of aortic valve. The other two valves healthy. Atheroma of Aorta immediately above the cusps.

Left Lung: 2 lb. 10 oz. Congestion and oedema. No haemorrhages on serous surface. At the apex the remains of an old cavity. Calcareous particles embedded in a firm fibrous cicatrix.

Right Lung: 2 lb. 1 oz. Congestion and oedema. A very similar condition at the apex to that in left lung. A slight pneumonic condition in upper

Pancreas: Somewhat enlarged, firm & fibrous. The fibrous tissue slightly congested. Otherwise normal.

Stomach: Mucous membrane somewhat congested along the larger curvature. Numerous minute haemorrhages into mucous membrane, confined almost entirely to greater curvature, most marked in the folds, and most of all at their apices. The veins at the lower part of the oesophagus where it joins the cardiac end of the stomach were dilated for the distance of an inch and half or so. The surface of this part was ulcerated and slightly sloping.

Intestine: Somewhat oedematous with a few oedemata, but not well marked; but on surface of mucous membrane, especially in upper part, there was a good deal of lary material, evidently blood acted upon by the digestive secretions.

Microscopic Examination of the liver showed bands of fibrous tissue separating the secreting tissue into small masses of partially atrophied cells.

Examination of the Urine.
The quantity of urine was generally normal, even to the last, the extreme limits being 30 and 60 ounces per diem. The specific gravity during most of the time, was normal. During the last month or so, it fell rather below the normal being
1014 to 1014. Reaction, acid; sometimes neutral. There was no albumen in it until the haematuria commenced. Bile pigment was present in small quantity on his admission, but it soon disappeared and was never again detected. Sugar was never present. The bile salts were slightly increased on his admission, but they came within the normal range before the bile pigment had quite disappeared. The only other time when there was a slight excess was when he returned from the convalescent house in the end of October, and at this time the presence of bile pigment was doubtful. At all other times their quantity was either normal, or slightly diminished. The indican was also frequently tested for. At first there was no blue colour got by the hydrochloric acid, hypochlorite of lime, and chloroform, but instead the chloroform took up a deep pruple or mauve colour (due to the presence of hydroxyl sulphate of polash). After he had been in the infirmary for some time, however, a slight blue colour was obtained as well, and after a time, the red or mauve colour ceased to be obtained. Only once, however, out of a considerable series of testings, could it be said that the indican was present in excess, and that time (15th Nov.) the excess was slight.

The Urea per diem has ranged from 262 to 384 grains - usually over 300 grains. There was no great fall in the excretion of urea towards the end, the quantity discharged on 20th March (two days before death)
having been 310.97 grains. In three estimations during the previous month, however, it had ranged between 261 and 287 grains. There was therefore apparently some, though not great, diminution of in the excretion of urea during the latter part of the illness.

During most of the time all that was found microscopically were crystals of oxalate of lime, sterical and triple phosphate, muscosus corpuscular and epithelial ceals. After the blood appeared there were found red and white blood corpuscles, hyaline casts with ceals, blood corpuscles and granule, granular casts and renal epithelium.
Case 17.

Case of Weak Heart and Enlargement of the Liver.

David Jamies, an old man, was admitted on 27th April, 1866, suffering from breathlessness which he had had for a long time. Some weeks before the new year his legs began to swell, and they were considerably swollen when he was admitted. By 5th Feb. the oedema had disappeared.

On 8th Feb. his condition was as follows:-- Face full and florid. Doubtful icteric tint of conjunctivae. Tongue flabby, covered with yellowish-white fur.

The abdomen was full, but without localized prominence. There was slight dilatation of superficial veins. No tenderness. No ascites. The liver was considerably enlarged, uniformly so, the dulness measuring 6 inches in the middle line, and 1½ inches in the mammary line in which it extends for 3½ inches below the costal margin.

The spleen was not enlarged. The first sound of the heart was impure, presystolic murmur doubtful. Second sound accentuated. Pulse 82, regular, small, easily compressible. There was some emphysema of the lungs. There was some dilatation of the superficial veins of the upper part of the chest and in the neck, but no pulsation.

He was treated with Perchloride of mercury and Sodide of Potassium.

The patient made decided improvement and the liver gradually diminished in size. On 24th Feb.
the hepatic dulness vis the middle line measured 4.5 inches and in the mammary 5.5 inches, where it extends 2 inches below the costal margin. The first sound of the heart was impure, and the second sound was slightly accentuated in the pulmonic area. Pulse 110, slightly irregular, small, and easily compressible. There was slight dulness over the upper part of the sternum, and over a small area over the roots of the lungs posteriorly. The breathing was harsh, and there were a few rhonchi and crepitations. Some oedema of the legs had returned owing to his going about, but a day's rest in bed put it away.

He was discharged on 3rd March.

Examination of Urine. The urine was about normal in quantity, contained no albumen nor sugar. With Nitric Acid it gave a brownish line at the junction of the fluids, and above this a yellowish green tinge. Whether this indicated a trace of bile pigment seems doubtful. It may have been due to the Salicylate of Potassium which he was taking.

2nd Feb: Specific gravity 1018, acid, Bile salts about normal.
3rd Feb: Quantity 62 ounces, yellowish straw colour, slightly turbid. Specific gravity 1016, acid. Bile salts slightly diminished. Indigo - With Hydrochloric Acid - a faint colour. With Hydrosalicylic Acid & hypochlorite of lime, after precipitation of other pigments by alcohol & lead, the chloriform comes down with a beautiful rose penta colour. (? due to Salicylate of Potassium)

Urca 228 lbs. 12th Feb: Specific gravity 1016, bile salts distinctly diminished. There was thus gradual diminution of bile salts from the normal as the case progressed.
Case 12

Case of Recurrent Attacks of Bilious Colic with Jaundice.

Catherine Dockerty: age 55.
Admitted, 29th August 1885. Complaining of attacks of severe pain in the epigastrum, shooting through to the back and down both sides of the abdomen, but worst on the right side, occurring about once a fortnight, more frequent of late, accompanied by yellowness of skin, dark greenish-coloured urine, and pale facies. These attacks last about two days at a time. She has been subject to them for six months, but the yellowness of the skin was first noticed about two months ago. The attacks have become more severe, more frequent, and of longer duration. The pain is severe and constant during the attack; it first increases in severity and then passes away gradually. There was rigor at the beginning of the attacks, and lately there has been vomiting also, and itchiness of the skin. She has felt some swelling in the epigastrum during the attacks, but cannot distinctly localise it. She becomes very drowsy when the attacks occur. She had hard work for fifteen years as a Greengrocer in Australia, but has done no work for
the last year. She takes tea a good deal; otherwise her food has been good. Temperate. She has been subject to bilious attacks for fifteen years or more. She had pleurisy on the left side seven years ago. She never had any rheumatism.

State on Admission:—There is no jaundice or other obvious morbid appearance. There is tenderness on palpation and percussion in the epigastrium and on each side of it. The abdominal walls are somewhat lax. The margin of the liver is not distinctly felt. There is tenderness on percussion of the upper border of the liver, and indeed of the whole front of the chest. The abdominal percussion is clear except over the liver. In the middle line the liver dulness extends from two inches above the umbilicus upwards for 5½ inches. In the right mammary line it extends from the 5th rib downwards to a little below the costal margin, a distance of 5 inches. In the mid-clavicular line it extends from the 7th rib downwards for 4½ inches. Below the lower border in the epigastrium and a little to the right of it, extends about half an inch downwards there is an area of impaired percussion which varies somewhat from time to time.

The spleen is not enlarged.

There is a slight systolic mitral murmur, and the second sound is slightly accentuated, especially in the pulmonary area. She has of
present an attack of Bronchitis, with harsh breath ing rhonchi, and some crepitations. Otherwise the systems are normal.

The last attack the patient had occurred a few days before admission. She remained in the Infirmary till some time in September, but took no attacks at all the time. Her condition underwent no important change while she was in the Infirmary.

The urine was normal in appearance, S.F. gravity 1015, acid, contained no albumen, bile pigment, nor sugar. The bile salts were not increased. There was no excess of Indican. The proportion of urea was 48.426 grains per ounce.
Case 19.
Case probably of Distended Gall Bladder.

James Kelly. Age 27. Labourer.
Admitted on 24th Oct. 1855, complaining of pain in the upper part of the abdomen and loss of appetite. He had a severe attack of Scarlet Fever when a child. He had Gonorrhoea and Abubo about eight years ago, and was ill about five months, having pains in the small of the back and throughout the whole body. There is no history of Syphilis nor of any other disease than those mentioned. He has been intemperate.

Present Illness: He has had attacks of severe pain in the upper part of the abdomen on the right side which, in their situation and symptoms, point strongly to biliary colic, commencing with rigor, sickness and vomiting as a rule. The present attack began about a week ago. He has never noticed the colour of the urine to change.

Present Condition: Well developed jaundice. He finds the pain easier when he sits up, and also when he draws up the legs.

Alimentary System: Tongue slightly fur. Appetite good. The pain is not relieved when he fasts. Sometimes it is worse after eating. Has flatulence and eructations. No vomiting since admission. Stools light, yellow in colour.
Abdomen:—A very firm smooth resistance is felt about 2 inches below the right costal arch. The note over it is slightly impaired. It does not move with respiration. It is tender to palpation. No resistance in epigastrium. Note sympathetic top of Xiphisternum. Pressure here causes winced. The lower margin of the liver in the right mammary line is half an inch below the costal margin. Upper border at 5th intercostal.

On 27th Oct:—A firm resistent body is felt extending from the right costal margin towards the umbilicus for 3 inches. It is 3 inches wide at its base at the costal margin, and 2 inches wide at its smaller end towards the umbilicus. Note high pitched over it. This area of dulness is continuous with the liver dulness.

These notes of the condition of the abdomen are taken from the clinical report of the case, as I did not see the patient at first. They correspond to what I found on subsequent examination.

The Haemopoietic, Circulatory, Nervous and Locomotory Systems were normal, and the Respiratory System was also fairly normal.

In regard to the Urinary System, urination became more frequent when the pain was severe.

Treatment:—The Battry was applied over the affected part. On 30th Oct: Opium were ordered for the pain. On 6th Nov: Pills containing Colombo and Compound Rhubarb were ordered.
containing Sice. Tartaric and dilute nitric hydrochloric acid were ordered. On 10th Nov; a mixture containing
Tincture of Mycostamus and Liquor Potassae was ordered on account of difficult of micturition.

9th Nov. - For some time the attacks have been coming
on every night about 2 A.M. The pain is now greatest
over an area 1/2 inch, or a little more in diameter imme-
diate to the right of the umbilicus and extending a
little below its level. This is distinctly lower than
before. There is slight fulness in this area and a
little below it. It is tender on palpation and percus-
sion. There is some indistinct fulness and re-
sistance in this region, but no body can be dis-
ственные palpated. The liver dulness in the mam-
mary line reaches to the costal margin. The
dulness below the liver has distinctly diminished in
extent while it has extended further down. There
is now between it and the liver a some resonant
area of about an inch in breadth below which
distinct dulness begins. The outline of the dulness
can be ascertained fairly distinctly to the right and
left, not so distinctly below. In the right parasternal
line it extends to 3/4 inches below the ribs, ending
about half an inch below the level of the umbilicus.
Transversely it extends from about half an inch
to the right of the middle line for 2/3 inches to the
right, the boundary on the right being an almost
vertical line situated between the right mammary
and parasternal lines.
24th Nov: The symptoms have improved considerably. The resistant and dull area now extends rather further down still, but is not so well defined as before.

1st Dec.: Not much pain now, but still work at night; worse about an inch below and to the right of the umbilicus. Some tenderness on palpation at this point and also a little below the liver, about 2 or 3 inches to the right of the middle line. Below the liver in the right half of the epigastrum, a rounded, semi-elastic body can be felt. Peristaltic waves vary from time to time. In perceiving upward waves about an inch to the right of the middle line the note becomes gradually impaired, the impairement beginning about an inch below the level of the umbilicus, and the note becoming almost quite dull slightly above the level of the umbilicus. Between the upper limit above mentioned and the liver dulness, the note is much impaired and has a high pitched tympanitic character. The area of dulness extends laterally from a little to the right of the middle line for two or three inches to the right. The rest of the abdomen is resonant.

The liver dulness in the right mammary line extends from the 5th rib to half an inch below the costal margin, a distance of 4 3/4 inches.
The patient was discharged on the 16th December much improved.

The temperature was normal or sub-normal all the time he was in the Infirmary.

The urine varied in quantity from 24 to 82 ounces, was usually near the normal. Normal in appearance. Specific gravity varied from 1102 to 1017. Reaction acid. It never contained any albumen, bile pigment or sugar. The bile salts were normal or slightly under the normal maximum. There was a moderate increase in the amount of uric acid. The urea varied 310.02 to 415.545 grams juriérem. There was nothing seen microscopically.
Case 20

Case of Tuberculosis of Lymphatic Glands.

Mr. Donald Hall, age 15, Apprentice Engineer.
Admitted on 21st April, 1886, suffering from Tuberculosis of the Lymphatic glands.

The lymphatic glands of the neck first became enlarged after an attack of Scarlet Fever which he had when 9 or 10 years old. They again diminished and remained small till the following year when some enlargement occurred. In February, 1885, they began to enlarge rapidly. The lungs became smaller and his health improved during a voyage in the following summer. After that, however, they again steadily enlarged.

When admitted the glands of the neck, thorax and abdomen were much enlarged, and there were some signs of consolidation at the bases of the lungs. The liver was slightly enlarged, and so also was the spleen.

While he was in the Infirmary he became gradually weaker. He had usually an irregular febrile temperature with occasional exacerbations of feverishness. The glands at times became swollen and inflamed, and one at least became soft and gave some evidence of fluctuation. He was much troubled with irritability of the stomach, and latterly head symptoms supervened, accompanied with delirium. There became more severe, and he died on 5th July. There was no jaundice.

At the Post Mortem Examination the lymphatic glands...
were found to be tubercular, and many of them were in various stages of caseation. There was also some tubercular deposit in the lungs, kidneys, & spleen, but none in the liver. The liver weighed 3 lbs. 3 oz. It was much engorged, and the peripheral zone was very pale. The gall bladder was much distended with very dark green bile.

**Examination of Urine.**

No examinations of the urine were made after 16th May, except for shape once. It contained no albumen or sugar, and no bile pigment except perhaps once. It was normal in appearance except on 16th May, when there was a large deposit of urates. With this once exception nothing was found microscopically.

A day or two after admission, Sp. gr. 1012, Bile salts reaction a little less than normal maximum: Indican not excessive.

(Temperature about 100°.)

2nd May, Sp. gr. 1014, acid, Bile salts - my 50 or 60 give specificity equal to the standard normal maximum. Temperature 100°.

12th May, Quan. 50 oz. Sp. gr. 1014; Acid; Bile salts - normal maximum. Urea, 2.5. (Temperature Morning 101°; evening 103°, both 1° higher than previous day. Temperature had been so high before)

13th May, Sp. gr. 1010, Bile pigment, very slight trace. Bile salts - my 35 required, 183 per cent. (Temp, morn. 102°; even. 106°)

16th May, Orange coloured, large precipitate of urates, Acid; No bile pigment. Bile salts - my 20 required or 200 per cent. (Temperature has been keeping up. Sp. gr. 16th May, Morning, 102°; Evening, 103.6°.)
Case 21.

Case of Leucocythaemia (Splenie) with Enlargement of the Liver.

William McEllivray, age 52.
Admitted 29th June, 1885.
Examined 1st July.

Complaint, weakness, want of breath, and a swelling on the left side of the abdomen.
Duration of illness, at least nine months.

History: Family history unimportant. For the last 20 years he has been engaged for six months of the year as a boatman on Loch Leman, and during that time he usually drank half a pint of whisky and a quart of beer daily. During the rest of the year he wrought as a general labourer, and not take much alcohol. The only complaint he has had previously was a rheumatic pain in the left shoulder about six years ago; it lasted about a year though not constant. There is no history of Tuberculosis disease. He has not been abroad, and has not hadague.

Present Illness: He began to feel ill about the end of September last, and was unable to go on with his harvest work owing to...
weakness and want of breath. But for a few months previously, he had felt a hard swelling in the left side of his abdomen. This has increased considerably since then. There has been a tendency to diarrhœa during the illness; and for a time this was very severe and accompanied by blood. He was treated by Dr. Oswald, Kinnies. For about two months he was confined to bed. He however improved, and was able for his work on the Loch till shortly before admission, though not feeling strong. He has again become worse, becoming breathless on exertion. For some days before admission, there was oedema of the legs and ankles, appearing in the evening and being absent in the morning.

State on Admission:

No jaundice or cyanosis. Marked oedema of both lower limbs, below the knee.

He cannot lie comfortably on the right side owing to the weight of the tumour in the left side of the abdomen. Sometimes a slight evening rise in the temperature, but never above 99.4.

Alimentary System:

Tongue furred: Appetite poor: Slight dyspeptic symptoms. No vomiting except once lately, when he became sick after a hard day's rowing. Bowels at present regular. Feces natural.
The abdomen is generally prominent—especially to the left of the middle line and below the umbilicus. There is no ascites. The liver is considerably enlarged. In the right mid-axillary line the deep dulness extends from the 3rd intercostal space to the 10th rib—a distance of 7 inches. In the right mammary line it extends from the 4th rib to half an inch below the costal margin, a distance of 7 inches. In the middle line the hepatic dulness extends from 2½ inches above the umbilicus upwards for 6 inches. Beyond the middle line on the left side the liver dulness becomes continuous with the splenic dulness.

**Haemopoietic System:**

The spleen is enormously enlarged, reaching from the 6th rib on the left mid-axillary line down into the iliac fossa, and extending a little beyond the middle line.

The inguinal and femoral glands are considerably enlarged and indurated, as are also those of the axillae and neck to a less extent. Thyroid gland, not enlarged.

**Circulatory System:**

Dyspnoea on exertion. There is a systolic murmur, probably of haemie origin. Second sound reduplicated, slightly accentuated, especially in the pulmonary area. Pulse from 64 to 84 per minute, regular, of moderate volume.
Respiratory System: Normal.

Integumentary System: Perspires a good deal at night. Oedema of feet and legs.


Nervous System: Normal, except for sleeplessness.

Locomotor System: Normal.

He was treated with Arsenic and Ipecac and had ordinary diet. He also required treatment for diarrhoea from time to time.

He left the Infirmary on the 18th of July, little change having occurred in this condition.

The Blood was several times examined:
On 17th July its condition was as follows:
Red corpuscles 3,070,000 per cubic millimetre
White corpuscles 3,140,000

Proportion of White to Red 1 to 7.8.

The haemoglobin was not examined on this occasion, but had previously been from 40 to 45 per cent. The red corpuscles vary much in size and shape, and many of them are tailless. There is an apparent nucleation in some of them, and in a few the apparent nucleus is very distinct and well defined, the appearance being to the pigment having run to the centre of the corpuscles.
In one of these apparent nuclei, looks as if it were dividing in the centre thus: — 

One corpuscle is seen with a constriction in the centre thus: — ( ) The two halves of which are each as large as a single large sized red corpuscle. It shows no cupping in the centre of either half, and it looks like either a red corpuscle which has increased in size, and is beginning to divide in two, or like two red corpuscles which have partially fused into one. There is no appearance of a nucleus in it. There are several microcytes seen and some granular matter.

The white corpuscles show a very distinct dark outline, especially the large ones. Some have not this distinct outline, and are more irregular and less rounded in shape. Some are very large. The majority are at least as large as ordinary white blood corpuscles, but a considerable proportion are small, not much larger than red corpuscles. They are abnormally granular. By adding Liquor Potassae, the granules are brought out very distinctly. By adding Aetic Acid the nuclei are revealed. Many have a large single nucleus situated towards one side, crescentic in shape and highly granular. A few have two such nuclei on opposite sides. Some have two, three, or four small nuclei.
The Urine:—


Microscope:— Amorphous urates and crystals of uric acid.

14th July:— Albumen increased to one-twelfth.

16th July:— The quantity of urine was 30 oz. It contained no albumen, and the uric acid amounted to 268.4 grains.
Case 22

Case of Cardiac Disease (Mental) with Enlargement of the Liver, Slight Jaundice and Albuminuria.

Thomas Wilson, Age 26; Engineer.
Admitted: 3rd Oct. 1885; Suffering from Heart Disease with pain and dyspnoea. He first became ill nearly two years ago.

History: There is a history of Consumption in the family. The patient used to be intemperate, but is now an abstainer. His work has involved heavy lifts, and he has been exposed to considerable alternations of temperature. His previous health has been good. There is no history of Venereal disease. He has not had Rheumatism. No accidents.

Present Illness: Nearly two years ago he had an attack similar to the present but not so severe, brought on by heavy work and exposure to cold. He was eleven weeks in the Western Infirmary, Glasgow, where he got fairly well, and after three months convalescence became again able for work. He took a second attack in January, 1885, and from that he has never recovered. He made some improvement till shortly before his admission here, when he again got cold. Since then he has had a cough, has lost his appetite, and has been in a state of orthopnoea. He has been unable to sleep. His feet have never been swollen.

Alimentary System: Tongue covered with yellowish white fur. Appetite poor. Considerable thirst. Weight and distension after food. Flatulence. Nausea in morning. No vomiting. Bowels constipated. The stools have been pale owing to this having been on milk diet. The abdomen is generally prominent particularly in the epigastrium, and on either side of it, most on right side. Slight distention of superficial veins. Liver considerably enlarged, but with no irregularity of superior margin. No ascites
In the right mammary line the liver dulness extends from the 4th rib to 2 1/2 inches below the costal arch a distance of 9 inches. The superficial dulness begins at the 6th rib. In the middle line the dulness extends from 1 1/2 inches above the umbilicus upwards for 8 inches. In the mid axillary line the dulness begins at the 5th intercostal space, and extends downwards for 9 inches.

Haeuopoietic System: The spleen is enlarged and can be palpated. It feels rather soft. Its percussion dulness extends forward to the anterior axillary line.

Circular System: There is considerable hypertrophy and dilatation of the heart. There are presystolic and presystolic murmurs, and probably a tricuspid systolic, and an aortic systolic. Pulse, 89 per minute, regular, easily compressible, collapsing, somewhat small. Wall
of artery somewhat thickened.

Respiratory System:—There are slight signs of consolidation at the apex, especially the right. There are marked signs of congestion and oedema of the lungs, especially at the bases posteriorly.

There is nothing important in the other systems.

The patient was treated with Digitalis, Squills, and diffusible stimulants.

He remained in the Infirmary till 17th Nov. and made considerable improvement. After admission the jaundice diminished and by the 6th Oct. it had disappeared. After this, during the rest of the time, it was either absent or very slight. For a while at first he often took breathless attacks, but latterly these became infrequent. The liver distinctly diminished in size. On 7th Nov. the measurements of the hepatic dulness were:—In the middle line, from nearly an inch above the base of the Xiphisternum downwards for about 6 inches. In the right mammary line, from the 5th rib to 2½ inches below the costal margin, a distance of 9½ inches; absolute dulness at 6th rib; In the right mid-axillary line the dulness extends from the 7th rib downwards for about 9 inches.

The urine at first was much diminished in quantity, 16 or 20 ounces, and deposited urates copiously. After 5th October it generally varied from 30 to 50 ounces per diem. The specific gravity was at first high (1030) but soon became normal. Albumen was present in large quantities
at first, (one third of column in test tube,) but it rapidly diminished, and by 6th October had dis-
ppeared. There never was any bile pigment, sugar, or blood. The bile salts were not looked
for till 12th October, and they were found to be dis-
apparently under the normal maximum quantity,
both then and subsequently. Indican was several
times tested for, and a moderate increase was
found. The urea on 4th October was 270.6
grains, and on 6th October 172.87 grains. After
this it increased to 331.2 grains on 12th October;
306.4 grains on 19th October; and 208.08 grains
on 29th October. Microscopically there were
amorphous urates at first, and afterwards
Octahedral oxalates.
Case 23.

*Case of Cardiac Disease with Enlargement of the Liver.*


Admitted on 5th October, 1885, complaining of breathlessness of five months duration.

**History:** His sister had rheumatic fever; three of his seven children—the third, fourth & seventh—were still born. Three are alive and well. The patient has been temperate. He had dysentery in India in 1858. In 1865, while in India, he had an attack of rheumatic fever. He has never had it since. He had ague in 1868, and he has had another attack since he came home. Four years ago he had what is called "Rheured" due to working under pressure below the water. It affected his arms, sharp sore pains darting through them from time to time. The sensibility was not lost. He has had no venereal disease.

**Present Illness:** Five months ago he got cold while working as a diver. In the morning he was seized with a sharp pain in the front of the chest for which opium pills were given. There was no rigor. Two days afterwards cough commenced and he spat some blood. He had spat some blood also before the pain commenced. This stopped, but recurred if he exerted himself. He had pain
under the right nipple, and across the back. The temperature at first was 104°, next day, 103°, and on the third day 101.5. He lay in bed most of the time for three months. Since the illness commenced he has had breathlessness on exertion. He improved for a time, but again became worse. During the last three weeks he has been much troubled with cough and dyspnoea.

State on Admission:—Well developed. No jaundice, Alope, or Cyanosis. Temperament, rheumatic. Attitude not unusual, except at times when he requires to sit up on account of dyspnoea. Temperature 98.


Abdomen normal in appearance; slight tenderness in epigastrium. Lower margin of liver distinctly felt. No dulness except over liver.

The liver dulness in the middle line extends from an inch above the umbilicus upwards for 5 inches. In the right mammary line it extends from the 5th rib to an inch below the costal margin, a distance of 6 inches. The superficial dulness begins at the upper border of the 7th rib. In the right mid-axillary line
the dulness extends from the 1st rib downwards for 5½ inches.

The Spleen is not enlarged.

The heart is considerably hypertrophied. There are a systolic mitral murmur and systolic and diastolic aortic murmur. Pulmonary second sound accentuated. Pulse 108 per minute, collapsing, regular, full, moderately compressible. Arterial wall considerably thickened.

Respiratory System:—No dulness. Breathing harsh. Crepitations at bases posteriorly without inspiration. Some rhonchi at right base.

Other Systems normal. (Report of urine at end.)

The patient was treated with Digitalis and Iron. He improved steadily, and was discharged on the 16th October.

The Urine:

6th Oct.: Turbid from urates which also form a large brick-red deposit. Reddish amber coloured.

Specific gravity 1032, acid. No albumen, bile pigment nor sugar. Urca. per ounce 17.0455 grains.

Microscope:—Amorphous urates.

9th Oct.: Quantities 30 ounces, clear, amber coloured. Specific gravity 1025, acid; No Albumen, bile pigment nor sugar. Indican, considerable. Bile salts, under normal maximum.

Urca. 277.275 grains.
Case 24.

Case of Cardiac Disease with Enlargement of the Liver.

Mary Jane Prior; age 44; admitted on 31st August, 1855, complaining of shortness of breath.
Examined on 9th October.

Duration of illness doubtful: she says she has always felt breathless on going upstairs.

History: No history of rheumatism in family. She had measles when a child. She had influenza fever a year ago. The sight has been much impaired in the left eye for a long time owing to cataract, but she could see a little with it till she had the fever a year ago.

Present Illness: About eight days before admission her feet and legs were noticed to have become swollen. The swelling extended upwards to the abdomen. She became very breathless and could hardly speak. The swelling of the legs became so great that before admission serum was oozing from them. After admission she had a cough for a short time, but it soon left her. The abdomen was tapped on the 2nd September, and 70 ounces of serum were drawn off. Since that time she has gradually improved. There has been no oedema for some time.

Present Condition: Well developed. No jaundice,
dropsey or cyanosis. Attitude not unusual.

Alimentary System: Abdomen prominent.
Superficial veins distended: No tenderness. The lower border of the liver is felt indistinctly. The percussion note is clear except over the liver. In the middle line, the liver dulness begins midway between the umbilicus and the base of the xiphoid sternum. In the right mammary line, it extends from the upper border of the 5th rib to 2 inches below the costal margin, a distance of 4½ inches. The superficial dulness begins at the 6th rib. In the right mid axillary line, the dulness extends from the 7th rib downwards for 4½ inches. The superficial dulness begins at the 8th rib. The splenic dulness is not increased.

Circulatory System: A precordia bulging. Pulsation visible over a large area of the chest. The open beat is felt in the 7th intercostal space nearly in the mid axillary line. The impulse is diffuse in character and is felt over a wide area. Below the nipple there is a presystolic and systolic thrill. The veins at the upper part of the chest are distended. There is epigastric pulsation, and there is venous pulsation in the external jugular. In the left parasternal line, the deep cardiac dulness begins at the upper border of the third rib, and the superficial dulness begins at the fourth rib. Transversely at the level of the fourth rib, the deep dulness begins an inch to the right.
of the sternum and extends to the left for 0.2 inches, ending between the anterior and mid-axillary lines. In the mitral area there is a short pre-systolic murmur, and a loud rather rough systolic murmur, conducted to the aorta and inwards towards the sternum. The first sound is in distinctly heard between them. The second sound is faintly heard. Near the sternum the character of the murmur changes, becomes shorter and rougher, and is entirely systolic in time. Here the second sound is accentuated. In the aortic area there is a very short rough systolic murmur and the second sound is roughened and accentuated. There is no distinct diastolic murmur. The murmur is better heard and more prolonged in the pulmonary area and a little out from it. The second sound is loudly accentuated in the pulmonary area.

Pulse 112 per minute, regular in force and rhythm, not easily compressible. Wall not thickened; beat fairly well sustained.

Other systems normal. (Report on urine at end.)

For a few days at first the patient was treated with Tincture and Infusion of Digitalis and Bicarbonate Potash. On 16th September she was ordered Blund's Pills with Arsenic of Iron. On 9th October she was ordered pills of Quinina Sulph. Pulv. Scillae; Pulv. Digitalis and Extract Cannabis Indicae.
After the tapping the patient made great improvement, and was sent to the Convalescent House on 29th October.

The extent of the liver dulness on 28th October was slightly larger than it had been on the 9th October. The temperature was normal or subnormal all the time she was in the Infirmary.

The urine was at first diminished. The lowest quantity being 12 ounces on the 2nd and again on the 5th September. After this it increased rapidly:- 40 ounces on 5th September, and it then varied from 56 to 60 ounces.

On 7th October it was straw coloured, turbid, with slight deposit. No albumen, bile pigment or sugar. Bile salts normal. No Rife. Urea per ounce, 5.006 grains.

Microscope: Squamous epithelial cells.
Case of Cardiac Disease with Enlargement of the Liver.

Andrew M. Marnus, age 33. Admitted on 7th Oct. 1885, complaining of dyspnea and other symptoms of Cardiac Disease resulting from Rheumatic Fever. He had several attacks of ague when abroad, and one since he came home two years ago. The dyspnea first troubled him in March 1883. The Cardiac lesion is mitral regurgitation, and there is now failure of compensation. The liver is much enlarged—measuring 7 or 8 inches in the right mammary line. There is pleurisy with pulmonary congestion and oedema, and the lower limbs are oedematous. There was a slight icterus of the conjunctivae noticed on 5th Nov., 11th Nov., and at other times. After a time he improved under Strophanthin, but by the end of February 1886, he became worse again, and he died on 20th March.

The urine was high coloured, concentrated, and sometimes gave a copious deposit of urates. It was never found to contain albumen, bile pigment, or sugar.

5th Nov. Bile salts, double the normal—200 per cent.

Urea per ounce 9.703 grains, Indican considerable increase.

10th Nov. Quantity 40 ounces, Specific gravity 1016,
acid. Bile salts normal. Indican, distinct increase.

24th Nov. Specific gravity 1031. Bile salts about normal. Indican, moderate quantity, no marked increase. (Other pigments first removed.) Urca, per ounce, 16.6952 grains.

23rd February. Specific gravity, 1027; acid: Bile salts—my 40 or 45 required, that is, slight increase—1.66 or 1.50 per cent.

1st March. Bile salts—my 35 required—183 per cent.

He had made some improvement by 10th Nov.

By the 23rd February, when the bile salts were again in excess, he had begun to get worse.
Case 26.

Case of Heart Disease (mitral and aortic) with Enlargement of the Liver from Chronic Venous Congestion and with Pericarditis.

Alexander Campbell, age 25, Baker.
Admitted to Ward 22 on 20th April, 1885.
Examined on 22nd and 23rd May, 1885.

Complaint: Shortness of breath, Palpitation, Vomiting, and pain in the right hypochondriac region.

Duration of illness: He has suffered for eight or nine months, but the heart disease has probably existed since the first attack of Rheumatic Fever two years ago.

History: Family history unimportant. His food has been good, but he used to have long rough spells. He has been on the whole temperate, but has sometimes drank to excess. He has had hard work, involving heavy lifts, and has been much exposed to considerable changes of temperature.

Previous Illnesses: He had Scarlet Fever when young, and four or five years ago, he was laid up for a fortnight with what he calls "Rheumatic Fever," but the nature of this complaint is uncertain.

Two years ago he had an attack of Rheumatic Fever, and there is sufficient evidence from his statements that the heart disease from which he now suffers, dated from that illness. He has had some symptoms of heart disease earlier.
There is no history of Syphilis. He has, for long, had occasional epistaxis.

The patient's present troubles commenced about eight months ago, when he began distinctly to suffer from Cardiac dyspnoea, palpitation, sickness, vomiting, irregularity of the bowels, diminution and high-coloured urine, &c. About the 7th of January, he was laid up with another attack of Rheumatism, and he suffered at the same time from dyspnoea and palpitation. About the end of January he began to suffer from pain just below the ribs, a little internal to the left mammary line; and this pain gradually extended over the epigastrium, and beyond it, till he felt it over most of the region occupied by the liver. This pain was affected by respiration; and, he says, when lying on his right side, that he felt, with respiration, a sensation like rubbing, in the painful region. He had not been able to lie on his left side since the first attack of Rheumatic Fever, and now he felt easier when lying on his back. In February and March he felt well. About the beginning of April, however, he again suffered from loss of appetite and vomiting; the dyspnoea, cough, palpitation became worse, and the pain in the region of the liver, which had, for a time, been slight, became also worse. He had diarrhoea and the urine was diminished. With these...
Symptoms he was admitted to the Infirmary. He states that ever since the pain in the right side commenced, there has been swelling of the abdomen.

Since his admission the temperature has not been above 99° Fahr. and he has been constipated. The pain in the region of the liver was slight for a fortnight, but after that it became more severe, and was accompanied by some cough.

For a time friction ronmitis was distinctly felt over the lower part of the liver below the ribs, but this is now absent. A distinct double friction sound was heard, but this is now slight.

Oedema of the ankles appeared for the first time last week.

State on Examination:

Height, 5 ft. 9 in.; Weight (23rd May) 9 st. 8 & lb.; Well developed; Muscles soft and flabby.

Slight yellow tint of conjunctivae; No oedema.

Face and lips pale. Slight flush over malar bone.

Slight oedema of legs. Expression of face placid, with no sign of pain. Temperament phlegmatic.

The case sometimes lie quite well on his back, but is sometimes in a state of orthopnoea, and is generally in a state of semiorthopnoea. Since the pain in the region of the liver commenced, he has been able to lie on the right side only with a pillow under it for support.

Temperature 98.2° Fahr. Morning, 23rd May.
Alimentary System:

Tongue slightly tremulous, covered with a yellowish white fur; papillae prominent. Secretions of mouth deficient. Deglutition normal, except that at times he feels a choking sensation at the lower part of the neck as if food would not go down. This is equally so with solids and liquids. Appetite poor but improving. Some dyspeptic symptoms. Before admission he was frequently sick and vomited after food. He has only vomited twice since admission. Diarrhoea before admission; constipation since. Since January, if not sooner, the motions have been paler, and of a more yellowish colour than before.

Abdomen:

General prominence. Diffuse pulsation in epigastrium. Superficial veins not distended. Parities slightly tense and of moderate thickness. Tenderness on pressure over the liver below the ribs, extending from near the left mammary line across the epigastrium to the right hypochondrium, slight at other parts. No tenderness over the rest of the abdomen. No fluctuation. Friction fremitus is not now felt. The percussion note is good over the front of the abdomen to within 2 inches of the symphysis pubis at which point it becomes dull. Note dull in both flanks becomes clear when he turns on the other side. No distinct thrill. The deep liver dulness in the right mammary
line extends from the fourth rib to 2½ inches below the ribs, a distance of eight inches. In the middle line anteriorly the upper border cannot be differentiated from the cardiac dullness. The lower border is 4 inches below the base of the Xiphisternum, and 2½ inches above the umbilicus. In the right mid-axillary line the liver dullness begins in the 5th interspace, and extends to a little below the margins of the ribs, a distance of 7½ inches. The lower margin of the liver meets the costal margin on the left side of the left mammary line. On auscultation below the ribs, some friction is still heard, best in the mammary line. The liver is regular in outline with no nodulation on the surface.

Haemoipoietic System:

Normal as to spleen, thyroid, \\
Examination of Blood on 4th June.

Red corpuscles, 5,340,000 per cubic Millimetre;
White Not increased in number.

Haemoglobin about 60 per cent.

Red corpuscles well formed, but somewhat variable.

Circulatory System:


On percussion: Heart considerably enlarged; the
deep dulness extending transversely from 3/4 inch to right sternum to the left anterior axillary line - a distance of 7 inches.

**Auscultation:**

**Mitral area:** Loud musical diastolic murmur replacing first sound; joint diastolic murmur, both heard in the axilla.

**Aortic area:** Sounds replaced by systolic and diastolic murmurs which are also heard in the pulmonary and tricuspid areas. Outwards from the pulmonary area, the second sound is heard.

*Pulse 93 per minute; slightly irregular; volume considerable; easily compressible; typical Corromian in character. Veins normal.* Capillary pulsation is seen when a line of congestion is produced on the forehead.

**Respiratory System:**

Breathing 28 per minute, regular, costo-abdominal. No pain now. Not much expectoration now. Expectoration a week ago. Clear and frothy. Chest well formed; expands a little better on right than left side. Note slight inspiration at left apex both anteriorly and posteriorly. Breathing somewhat harsh. A few crepitations at the left apex, in the axillary regions and at the bases post.eriorly.

**Integumentary System:**

Slight edema of ankles and legs. Otherwise normal.
Urinary System:

No subjective phenomena.

21 st May: Urine contained some albumen.
22 nd : Quantity in 24 hours, 20 oz. highly coloured, somewhat turbid, considerable deposit of urates, sp. gr. 1026, acid. No albumen, bile pigment, sugar, or blood. Chlorides, sulphates, and earthy phosphates, normal. Indican normal. Urinary albumine present. Visc. in 24 hours, 286.42 grains.

Microscope: Amorphous urates and Con Agula of mucadese.

Reproductive System: Normal.

Nervous System: Normal.

Locomotory System: Muscles flabby and wasted: No joint affection at present.

Treatment: The patient was treated with Digitalis and Iron; Nux Vomica and Nitro hydrochloric Acid; also with Nitric Acid and Taraxacum. Hy- bisters were applied over the liver.

Diet: Convalescent, with milk at night.

25 th May, Birth at level of umbilicus, 34 inches.

 three inches higher, 33 "

The patient for some time suffered from considerable dyspnoea with some cyanosis. This was relieved by dry cupping the bases of the lungs on 29 th May. After this he improved and left
the Infirmary on the 7th of June, considerably in
proved. — The urine sometimes contained a
little albumen — sometimes more. The uric
varied from 233 to 350 grains in the 24 hours.
After leaving the Infirmary he became rapidly
worse and died in a few days.

Remarks: — The chief feature of interest in this case
is, I think, the rare occurrence of perihepatitis apparently
as a complication of the second attack of Rheumatism.
During his first attack he had had endocarditis and
probably pericarditis as well. During the second attack
there appears to have been an exacerbation of the
cardiac mischief, and it is interesting to observe
that the perihepatitis appears to have commenced
over the part of the liver next the heart, and to have
extended from there. Whether it was set up by a
direct extension of the inflammation or not it
is difficult to say. The mere chronic congestion
of the liver is not a likely cause, and I think
we must either regard it as a direct extension of
the inflammation which had probably been lighted
up in the pericardium, or as an independent
serous inflammation occurring as a complicat-
ion of the Rheumatism. Whatever view may
be taken of it, the case is interesting on account
of the rarity of this symptoms under such conditions.
Case of Phthisis Pulmonalis with Enlarged (Tuberculous) Liver.

Admitted: 18th June, 1885.
Examined: 19th "  "

Complaint: - Pain in the chest and cough, Breathlessness, Weakness in thighs.

Duration: - Eighteen months; Swelling of the abdomen was first noticed five months ago.

History: - The history is that of Phthisis Pulmonalis following a chill when he was heated. The appetite has been poor, but there has been no diarrhoea. Lately, there has been oedema of the legs and ankles. He has become much emaciated and the phthisis is now for advanced. Haemorrhoids for four months.

Alimentary System: -

Tongue a little dry and fissured, with a white fur posteriorly; some dyspeptic symptoms present: No vomiting: Bowels constipated.

The liver is much enlarged. In the right mammary line the deep dulness begins at the 14th rib and extends down for 8½ inches. The superficial dulness begins at the 6th rib. In the mid-axillary line the dulness begins.
at the 6th rib and extends downwards to within an inch of the iliac crest - a distance of 8½ inches. In the middle line the dulness extends to the umbilicus. - Palpation gives an outline corresponding to percussion. The surface and margin are smooth, and there is no increased firmness of the liver substance to be made out. There is slight tenderness in the epigastrium and at the lower border of the liver a little to the right of the middle line.

Spleen not enlarged.

Heart: - Systolic in mitral area heard at base.

Lungs: - The physical signs in both lungs are those of advanced phthisis. No night sweats, no cough for some time.

While in the Infirmary he had vomiting and diarrhoea and the liver became larger. He was removed from the Infirmary on the 6th July, and died soon after.

There had been, as a rule, a slight evening rise of temperature: once it rose as high as 104.2 Fah. - There was no jaundice.

Urine: - Micturition somewhat frequent - twice or thrice during night. Quantity of urine increased from 41 to 102 ounces. Several examinations made:

2nd July: Quantity in 24 hours, 69 ounces; straw-coloured, slightly turbid; deposit of mucous.
Specific gravity, 1011. Acid. Albumen present in small quantity. No sugar, bile pigments, or blood. Bile salts not increased. Indigo - no increase. Urea (estimated without removing the albumen) 379 grains.

Urea (after removing the albumen by boiling and filtration, and adding water to make the quantity the same as before) 362.9 grains.

[These two observations were made for the purpose of finding to what extent the presence of albumen affects the hypotonic process for estimation of urea, and the result is that it has little or no effect, so that, clinically, we can estimate the urea quite without well without the tedious process of removing the albumen.]

Microscope: Granular casts, becoming fatty. Hyaline casts, mostly containing granules and a few cells. Granular matter in considerable quantity, partly held together by strings of mucin. Mucus corpuscles. The urea varied from 302 to 379 grains.

Remarks: The state of the urine shows pretty conclusively that some waxy change had occurred in the kidneys. The occurrence of diarrhoea while he was in the Infirmary renders it probable that there was also some
commencing waxy disease of the intestine. As regards the liver, while the waxy disease would, in all probability, affect it too, the physical signs (especially the want of increased density) render it probable that it was, at the same time fatty, and this may have been the more marked change of the two.
Case 28

Case of Pneumonia with slight jaundice and with Bilie Regurgitation and Excess of Bilie Salts in the Urine.

Robert Cartwright, age 40, Ship's Carpenter. Admitted on 10th May, 1856, suffering from Pneumonia affecting the lower part of the left lung. It commenced on 6th May.

On the evening of the 10th May the temperature was 103.6.

On 11th May, the temperature varied from 103.2° at 2 a.m. to 101.2° at 10 a.m. and 12 noon. Morning pulse, 120; Respiration, 54; Evening pulse, 122; Respiration, 56.

On 12th May, the temperature varied from 100.4° at 10 a.m. to 102.6° at 8 p.m.: Morning pulse, 130; Respiration, 58; Evening pulse, 140; Respiration, 56.

On 13th May, the temperature varied from 102 at midnight to 99 at 8 p.m.: Morning pulse, 138; Respiration, 50; Evening pulse, 132; Respiration, 58. On this day it is first noticed that there was a yellow tinge of the conjunctivae. His condition in the morning was as follows: Pulse regular, collapsing. Slight Cyanosis. Slight reticent tint of conjunctivae and of surface of skin. Bulness up to third rib in anterior axillary line on left side. Note impaired in second interspace; hyper-resonant in first interspace in front. Abundant crepitations with both inspiration and expiration at the upper limit of the
dull area and a little above it. Some rhonchi in the first intercostal. Breathing tubular over the dull area. Sputum very rusty with a slight greenish tinge. In the right mammary line the lower border of the liver dulness is at the costal margin.

The crisis occurred during the night.

On 14th May the temperature fell from 101.2° at midnights to 99.2° at 8 a.m. After this the temperature continued normal except that it rose to 99.2° on the evening of 16th May, and to 99° on the evening of 17th May. On 14th May he was perspiring profusely. Dulness up to the second rib in front. In the evening there was still a slight everted tinge of the conjunctivae and of the vein of the upper part of the chest. Breathing easier. *Pulse 116, regular, collapsing.* Sputum still rusty with greenish tinge.

Temperature still coated, but more moist. Cyanosis less. Note clear at base posteriorly, dull higher up. Stimulants were required on 13th and 14th May. By 17th May the sputum had lost its rusty colour, the tongue was cleaner, the pulse slower and steadier, and the conjunctivae were natural in appearance. There was still a considerable amount of dulness.

The patient improved and was discharged cured on 29th May.

_ Examination of Urine._

The urine was about normal in quantity all...
the time. It had at first a marked reddish colour, which gradually diminished. There was very little deposit. The specific gravity was a little high at first. Reaction acid. Albumen was present in small quantity during the fever, and disappeared when the crisis occurred. Bile salts were present in excess, and they began to diminish the day of the crisis (13th May). Bile pigment was present in a mere trace at first; it increased up to the 12th, began to diminish on the 13th, and was absent on the 14th; the bile salts being still in excess. The bile pigment therefore evidently appeared later than the excess of bile salts, and it also disappeared sooner. The Urea was in marked excess during the fever. There was never any blood or sugar. Microscopically, there were numerous corpuscles; and on 10th May, there were also a few amorphous urates. Chlorides diminished during the fever.

10th May, - Specific gravity 1025; Albumen about 16; Bile pigment - faint trace; Bile salts, between Np 25 and 30 were required, or 240 and 200 per cent; Urea per ounce 14.74 grains.

11th May, - Quantity 50 ounces; Marked red colour; Specific gravity 1020; Albumen, about the same as yesterday; Bile pigment, more than yesterday; Bile salts - between Np 25 and 30 required, or between 240 and 200 per cent; Urea 67.89 grains.

12th May, - Quantity 58 ounces; Reddish coloured; Specific gravity 1021; Albumen in small quantity; Bile pigment, considerably more than yesterday, though still
in small quantity. Bile salts, M. 25 required, or 240 per cent. Urea, 855.97 grains.

13th May, Quantity 60 ounces, orange and coloured; specific gravity 1.019; Albumen, a trace; Bile pigment rather less than yesterday; Bile salts, M. 35 required or 183 per cent.

14th May, Quantity 58 ounces; reddish coloured; specific gravity 1.022; no Albumen nor Bile pigment. Bile salts, M. 30 more required or 200 per cent.

15th May, Quantity 60 ounces; reddish amber coloured; specific gravity 1.025; no Albumen nor Bile pigment. Bile salts; M. 35 required, or 183 per cent.
Case 29

Case of Pneumonia with albumen, trace of sugar, bile pigment and excess of bile salts in the urine.

James Crawford, age 16; Admitted on 28th April, 1856, suffering from Pneumonia of three days duration. The pneumonia was on the right side, and it extended over the greater part of the lung, a portion at the apex only remaining clear. There was some roughening of the first sound of the heart, which was followed by a soft systolic murmur. The case was a pretty severe one. Antipyrine, Derramine, Salicylate of Soda, Strophanthus, and diffusible stimulants were administered.

The temperature was 103° on the evening of 28th April. On 29th April, it varied from 101° to 103.2°; on 30th April, from 101.1 to 102.8°; on 1st May, from 100.2 to 101.8°; on 2nd May, from 98.5 to 100.4°; on 3rd May, from 98° to 100°; on 4th May, from 99.6 to 101.4°, and on 5th May, from 99.4° to 96.4°. On the night of 5th May the temperature fell very low, and the patient had to be wrapped round by hot bottles and brandy. After this the temperature was normal or subnormal. There was not much rusty colour in the sputum, Cyanosis was present, but slight. There was either no distinct icterus, or very little.

After 5th May he steadily improved, and by 10th May, the note over the right lung was resonant.
Examination of Urine.

The urine was diminished in quantity till the 9th May: After this the quantity was about normal. During the fever it was high coloured; it became less so afterwards. The specific gravity was high till 9th May, normal afterwards. Albumen was present in considerable quantity at first. After the 3rd May it diminished, and by 11th May it was absent.

Bile pigment was present in small quantity— the reaction being slight: After 3rd May it diminished. On 6th May there was only a trace; and after this it was entirely absent. The bile salts were present in large quantity. The increased up to 4th May, after which they diminished. There was constantly a distinct excess till 12th May. During the fever Nitric acid gave, in addition to the reaction for bile pigment, a marked blood red colour below it, showing that there was present a large quantity of pigment which was not in a condition to give the reaction for bile. A trace of sugar was present up to, and including 5th May. On 6th and 8th May its presence was doubtful, and after that there was none. Chlorides were diminished to a trace during the fever. Afterwards they were increased. Indican was tested for on 4th May, and was found to be present in considerable quantity. There was no blood.

On and after 3rd May the area was rather less than normal for a boy of fourteen—varying from 34.8 to 19.5 grains. Microscopically there were uric acid crystals and muscle corpuscles.
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On 3rd May the Alkali was removed from a portion of the urine by boiling and filtration and the urine was then concentrated. Pellencreif's coloress reaction with sugar and Sulphuric acid was then obtained, though the purple colour was faint.

(4 due to bile salts or to the pigment present)
Case 30

Case of Cystitis, with Symptoms of Renal Calculus; Liver somewhat swollen; Stomach dilated.


History:—When about fifteen years old he had an attack, he says, of Rheumatism, with pain in the shoulder and in the stomach. He has had good food, but has had to eat it hurriedly. He has been temperate though not an abstainer. It has been found since he came to the Infirmary that he has a tendency to over eating. His work has been heavy and he has been exposed to alternations of temperature.

Present Illness:—He has complained of pain in the stomach from time to time for eight or nine years, with headache, heartburn, and vomiting. He has only had three such attacks since the present illness commenced. An apothecary used to put him all right. Six weeks before admission he thinks he got a strain while at work. He began to suffer from head ache, dull pain in the stomach, especially after food, heartburn and flatulence. He vomited two or three times at the beginning of the illness, the vomited matter being like brownish dust he thinks. He had also pain in the left shoulder, and
an inflamed gland in the left axilla which was and by puncturing. He began also to suffer from a dull pain in the left loin, extending forwards to the left hypochondrium and to the pit of the stomach, upwards to the lower ribs and downwards to a little below the umbilicus on the left side. He has sometimes had sharp attacks of pain in addition, shooting from the left loin in the directions above indicated, but never down to the testicle. The pain is generally worst in the left loin.

15th Nov. Height 5ft. 4½in. Weight 10st. 16½lb. Well developed. No jaundice, some acne spots on back. Face pale without much expression. Temperament phlegmatic.

Digestive System: Tongue large, moist with creamy fur in middle, and crack in centre. Appetite good. Frequently thirst and dryness of mouth and throat. Some unpleasant feeling in stomach before food. After food, a dragging sensation and other symptoms as stated in history. Bowels regular; Stools normal.

26th Nov. Has not vomited since admission. Pain not so bad.

The Abdomen was several times examined. There was considerable dilatation of the stomach, interfering to some extent, with the percussion of the liver which appeared to be somewhat diminished in size. In the middle line, the liver dulness extended from half an inch above the base of the xiphisternum downwards for 1¾ inches. In the right mammary line it extended from the upper border of the 5th rib to 1½ inches above the costal margin.
a distance of 3½ inches. In the right mid-axillary line
the dulness extends from the 6th inter-space downwards
for 1½ inches.

Circulatory System: — Fairly normal. On 7th Dec:
second sound accentuated—occasionally reduplicat.ed.
Pulse 58 per minute, regular, rather small.
Other Systems normal.

The blood was examined on 2nd Dec. with the follow-
ing result:—

Red corpuscles 4,830,000 per cubic millimetre
White 20,000
Haemoglobin 85 percent.

He had severe pain in the left loin on the 3rd and
4th Dec., shooting round to the front and upwards to the
lower ribs, but not downwards, with severe headache.
On 7th Dec. there was tenderness on palpation in the
parts affected by the pain, worst about midway between
the last rib and the posterior part of the iliac crest.
He stated that the attack of pain was somewhat
relieved by pressure between the ribs and the iliac crest.
The treatment consisted mainly in the
administration of loschadie powders.
The patient was discharged relieved on
8th December.

The urine was normal in quantity, sometimes
slightly alkaline, sometimes slightly acid, deposited
crystals of cystine, gosrinol, and sometimes also
crystals of triple phosphates. It contained no albumen.
bile pigment or sugar. The bile salts were diminished in amount. The indican was markedly increased. The urine was about normal—467.6 grains; 427.4 grains; for example urine of 14th December; quantity 50 ounces, yellow with slight greenish tinge. Almost quite clear with some shining crystals suspended, which as well as mucus. Deposit contains shining silver crystals, some distinctly seen to be flat. Slightly acid. No albumen, bile pigment or sugar. Bile salts diminished; indican, none found on this occasion—possibly an error. (On other occasions on which it was tested for, it was present in large excess. The pigments were first removed by acetate of lead.) Urine, 427.4 grains.

Microscope—Crystals of cystine and triple phosphates.

The cystine generally formed a light eating layer on the top of the deposit of mucus.
Case 31

Case of Acute Rheumatism with Albumen, a trace of bile pigment and a large excess of bile salts in the urine.

Jessie Robertson, age 16; Admitted on 6th May 1886, suffering from Acute Rheumatism of four days' duration. There was a slight diastolic mitral murmur; the first sound was reduplicated, and the second sound was accentuated and occasionally reduplicated. On the evening of 6th May the temperature was 102.8. On 7th May it was 101 in the morning and 100.6 in the evening when the pulse rate was 112, and the respiration 30 per minute. On 8th May the highest temperature was 99.8 at 8 p.m. On 9th May the only rise was to 99 at 4 a.m.; and on 10th May the highest was 99.4 at 4 p.m. After this the temperature was always normal or subnormal.

She was treated with salicylate of soda; and during convalescence with Citrate of Iron & Ison. The urine contained a large excess of bile salts at first with a trace of bile pigment and a little albumen. The largest quantity passed was 52 oz. on 9th May, and 28 on each of 9th & 12th May.

Microscope: Urine acid and crystals, 9%. It only once contained a doublet trace of sugar: Morning of 7th May. High coloured, deposit of urates; strong acid; specific gravity 1030; albumen in small quantity. Bile pigment, a trace; Bile salts mg 10 required =
600 per cent. Heat diminished the opaquet produced by the
Keele's solution, and, on cooling, the opaquet again increased
but did not become so dense as before heating. Potter's test gave a slight reaction for bile salts.

14th May. (24 hours urine.) Quantity 32 ounces yellow,
bowel like amber, turbid, Aspect of Mucus, Viscid, Specific
gravity 1032, acid, albumen, a trace. Chlorides a mere
trace. Bile pigment a trace. Bile salts, 10 or 12 Mins.
required = 600 or 500 per cent. With cold nitric acid, a
copious formation of nitrate of Urca. Urca 800.7 grains.

19th May. Quantity 36 ounces. (Contains menstrual blood)
Specific gravity 1029, acid, bile salts. My 20 to 25 required
= 300 or 240 per cent. Chlorides still in very small quantity.

11th May. Quantity 28 ounces, Clear, Straw colored
Specific gravity 1024, acid, No albumen. Bile pigment
a trace. Bile Salts as 45 required = 150 per cent. Chlor-
: 400 in very large quantity. Urca, 291.85 grains.

12th May. Quantity 28 ounces, Specific gravity
1025, acid, No albumen. Bile pigment, doubtful, Bile
Salts, normal Maximum, or very slight increase.

13th May. Quantity 44 ounces, Specific gravity
1029. No albumen nor bile pigment. Bile Salts
My 40 required or 166 per cent.

16th May. No albumen nor bile pigment;
Bile Salts. My 45 required or 150 per cent.
Case 32.

Case of Mary, disease of the liver, spleen, and kidneys in a patient who had rheumatism disease nine years ago, and who is now suffering from phthisis.


Stokes in a steamer.

Admitted 9th March, 1885.

Examined on several occasions.

On admission he complained of a pain in chest, cough, shortness of breath, and swelling of the feet. The chest symptoms had lasted two months before admission. The dress for a week.

History. - Family history unimportant.

Good home. Good food. Exposed to great heat at his occupation. Has been at sea for nine years. Has been at the East Indies, in the Mediterranean, and up the Baltic.

Previous Illnesses. - Had measles and whooping cough when a child. Scarlet Fever doubtful. Nine years ago he was in the Old Infirmary under Prof. Seater, with disease of the left hip joint. He was laid up for the greater part of a year owing to suppuration. The canthoty was applied to the groove, and behind the great trochanter.

In July 1884, while at St. Petersburg, he had an attack of Haemophosis or Haematomesis which
accurred on three successive days—probably haemato-
•mesis. It left him weak, but he soon regained his
strength. No history of plague, or of venereal disease.
While in the East Indies, he and most of those on
board, suffered severely from diarrhea, due,
he says, to the butcher meat. He had not cholera.
When 18 months old he had a severe attack
of Bronchitis.

Present Illness—commenced in January
1865, with pain in front of chest, particularly
on the left side—continuous, and of a Sharp
shooting character—increased when he coughed
or took a long breath. He had a great deal
of cough, with some difficulty of breathing
—worst during the night and in the early morn-
ing. The sputum was at first frothy and
watery, but after a time it became thick
and yellowish. He became gradually worse
till his admission here. The bowels were
regular. For six weeks before admission
he was much troubled with vomiting which
occurred soon after food—sometimes during
the meal. The food came up unchanged.
Appetite good. No pain, but felt always very
tight across the stomach. His legs began
to swell about the beginning of March,
and this gradually became worse. The
swelling disappeared soon after admis-
sion, and remained away. There was
no swelling of the face. The vomiting ceased about a week after admission, and it has not troubled him since. The pain in the chest also diminished, and the cough improved. The urine began to increase in quantity about a fortnight after the new year. He has been getting thinner since his illness commenced. He has not had night sweats.


Abdomen prominent, liver much enlarged. No tenderness. In right mammary line, liver dullness from upper border of 6th rib to half an inch below the level of the umbilicus. A distance of 8 inches. In the middle line anteriorly it extends from the umbilicus upwards for a distance of 6½ inches. Percussion good over the rest of the abdomen.

Haemopoietic System:

Lymphatic glands normal.

The spleen in the mid-axillary line extends from the 8th to the 11th rib - a distance of 3½ inches.

over whole of chest. Coughing over lower part of chest in front and behind.

Circulatory System: Nothing important.

12th March. - Oedema of feet gone. Complains of soreness over epigastrium and right hypochondrium.

19th March. - Some friction below left clavicle. Impainment detected at both apices, chiefly behind, with increased vocal resonance & other signs as before.

24th and 28th May. - Much wasted and flabby, Considerable emaciation. No jaundice, dropsy or cyanosis. Crepitus behind left trochanter and over left groin, due to the Cantery. He has been unable to lie on the right side since he turned ill; but he can lie on the back and on the left side. Temperature has varied from 97.6 to 98.6.

Alimentary System:

Lips and gums somewhat pale. Tongue pale and slightly furred. Appetite good and no thirst. No dyspeptic symptoms except gaseous eructations and a bad taste in his mouth in the morning. No vomiting of late. Bowels regular.

Abdomen: - Slight prominence in epigastrium and right hypochondrium, extending to the upper parts of the umbilical and right lumbar regions. Abdominal walls...
of moderate thickness and tension. No tenter:
ness, except a little to the right of, and above,
the level of the umbilicus. [The pain used to be
more severe, and red iodide of Mercury oint-
ment was used for it. It has returned slightly,
and the same ointment is again being applied.]
The margin of the liver can be felt at the
level of the umbilicus. The liver appears to
be regular and smooth on the surface.
Percussion gives a clear note except over the
liver. The upper border of the liver cannot be
accurately determined owing to emphysema
of the lungs. Impairment is get in the right
mammary line at the level of the 6th rib.

Measurements of Liver Dulness:

Left Mammary Line, 5 3/4 inches;
Mid-anterior Line, 7 1/2 "
Right Mammary Line, 7 3/4 "
Right mid-axillary Line, 7 1/2 "
Right Scapula Line, 5 3/4 "

On the left side the dulness extends for 6 inches to
the left of the mid-anterior line.

Girth of Abdomen at level of umbilicus 29 1/2 in.
- 3 inches above - 31 "

Hematopoietic System:

Enlargement and induration
of glands in groins: Also some enlargement
of glands in axilla and neck. Hard above
ebrow not felt.
Spleen: In the mid-axillary line the splenic dullness extends from the 7th to the upper border of the 10th rib— a distance of 14 inches. In the line of the ribs it extends from about an inch behind the posterior axillary line, and merges anteriorly into the hepatic dullness. This gives a measurement of 5 inches in the line of the ribs.

Circulatory System:

Fairly normal. Often palpitation, chiefly on exertion. Slight accentuation of pulmonary second sound.

Pulse: 74 per minute, regular, moderately compressible, fairly well filled between the beats. Walls not thickened.

Respiratory System:

No pain now; cough not so bad. Sputum mucus and chiefly purulent, not so copious now.

The signs of consolidation have now become more marked and more extensive at both apices in front and behind. Otherwise the auscultatory signs are much the same as before. There is no evidence of cavity formation.

Integumentary System:

Skin dry, but he has been sweating at night for the last week or two. Over the knees and elbows, and to a less degree in some other parts, the skin is
affected with Ichthyosis. There is also a thick
and scaly condition of the soles of the feet.

Urinary System:

No subjective phenomena. Urine
of 28th May. Quantity, 30 ounces, pale, slightly
turbid, large deposit of mucus. Sp gr. 1020. Acid.
Albumen, between 3 and 4. Blue reaction
got with quinao and some ether, but he has
been taking syrup of the Iodide of Iron;
No sugar or bile pigment; Indigo, normal;
Urea, 1 75 grains.

Microscope: Mucous corpuscles.

Nervous System:

Headache in the morning of late.
Nothing further except what has been stated.

Locomotory System:

Nothing beyond what has been stated.
He can move the hip joint which was diseased,
free and without pain.

He was treated with Cod liver Oil, Syrup
of the Iodide of Iron, Expectorants, Digitalis,
and Citroce of Caffeine, &c.

He was discharged on the 21st of June
considerably improved, and he was read-
mitted on the 23rd of September.

The oedema of the legs returned a few weeks
before his re-admission, and this caused him
to stop work. He had also a pain in the left
side which was relieved by poulticing. There
was some puffiness of the face, and the urine became much diminished, high coloured and turbid.

1st Oct. - Legs and thighs very oedematous, the oedema extending to the hips and loins. Some puffiness of the face. No jaundice. Tongue coated with a yellowish white fur. The abdomen is more prominent than before in the regions occupied by the livers. The liver is rather larger than before. There is some dulness in the left flank, which disappears on change of posture. Measurements of the hepatic dulness:

Middle line - 42 inches
Right mammary line - 9 1/2
Mid-axillary line 10

Splanic dulness not much changed.
Cardiac action excited. In the initial area, the first sound has a thumpung character. The second sound is accentuated, most marked at the base.

Pulse 104 per minute, regular, of medium size, weak and easily compressible. Arterial wall not thickened.

Lungs: Condition much the same as when last described, but phthisical and bronchitis are both more marked. The oedema extends to the hips and loins, and as high as the dome over the lower ribs posteriorly.

3rd Oct. - Severe pain in epigastrium - tightening in abdomen. Opium and tonics in the bile gave relief.
Abdominal Measurements.
At level of xiphisternum \[34\frac{1}{2}\] inches;
Midway between xiphisternum and umbilicus, \[36\] " ;
At level of umbilicus \[35\] " ;
At level of iliac crests \[34\frac{1}{2}\] " ;
7th Oct: Oedema extending over abdominal wall. Little or no Ascites. Scrotum much distended by oedema. Souter's tube inserted into it.

From this time the steady loss ground, the oedema increasing, but being held in check to some extent by Souter's tube inserted into the leg, scrotum, and left flank. From time to time. The ascites remained slight. The condition of the liver did not much change, but there was considerable abdominal distension, due partly to the large size of the liver, which became more prominent anteriorly, and partly to some fluid in the peritoneum and to intestinal flatus. The liver was more difficult to examine owing to the abdominal distension, coils of intestine lying superficial to the lower part of it. On 29th Oct. and for some time subsequently he had an inflamed gland in the neck. He complained for a good while of pain in the left side of the abdomen some distance above the iliac crest.
On 7th Nov. the needle of the aspirator was inserted into the abdomen, but no fluid was got. Some time afterwards biting occurred, and there was pain and discomfort about the puncture for some days: but this came all right. The towels were loose for a time, and aphthae formed about the mouth.

14th Nov. Shortly before 4 p.m., he was seized with severe pain in the precordia, and pericardial friction fremitus and loud friction were then found to be present. The pain was relieved somewhat by a mustard leaf. At 8 p.m., the friction was heard very loudly over the whole precordia and beyond it. There was some enlargement of the cardiac dulness transversely. The lips became cyanotic, and the breathing more difficult. The pulse became weaker and more collapsing. One-sixth grain of Morphia was injected to relieve the pain. This gave relief, and he was drowsy and slept for a time. Then he woke up and spoke to his friends.

15th Nov. After 12.30 a.m., he passed into a drowsy condition, which gradually deepened till he died at 5 a.m. To the last there was no jaundice.

Post mortem examination refused.

The condition of the urine from May onwards was that of the third stage of
Waxy disease - the quantity being considerably diminished, falling before death as low as 15 or 20 ounces. The specific gravity varied from 1.013 to 1.024. Reaction acid. Albumen in large quantity - on one occasion (8th Oct.) as much as two-thirds of the column of urine in the test tube. There was no sugar, bile, or blood till near the end of the case (5th Nov.) when a trace of blood was found to be present. It again disappeared before death. There was no increase in the amount of bile salts. They were sometimes normal, sometimes diminished in amount. There was no excess of indican till near the termination of the case, when it became much increased. The quantity of urea varied from 24 to 365 grains - usually considerably below 300 grains.

On the day before death the quantity was 233 grains. Hyaline casts containing a few granules and cells were frequently found. Towards the end granular and fatty casts and red blood corpuscles were also present.
Case 53.

Case of Persistent Diarrhoea with Inflammatory Bright's Disease, recent Enlargement and Subsequent Diminution of the Size of the Liver.

Andrew Gilmore, age 20: Admitted on 21st April, 1856, complaining of Diarrhoea and general weakness of about fourteen months' duration. He is a farm servant and has never been out of this country.

History:—Family history unimportant except that a sister has just died of some wasting disease. Comfortable home; good wholesome food. He has had no previous illnesses.

Present Illness:—About the new year before last he thinks he got cold. He had to go to the sea frequently and got his feet wet. He had a bad cough with obstinate mucous expectoration. Shortly after, he had pain in the bowels and diarrhoea commenced. The diarrhoea has never ceased, but has varied in severity, sometimes only two motions daily, sometimes five or six, or even eight. He never noticed his face or his feet swollen. He did not notice any change in the urine except that it was bright-coloured till about five weeks ago, when he noticed that it was brownish and muddy. Since then it has been clear.

The face and lips sometimes became very blue, but he never noticed the skin or eyes yellow. He sometimes has pain in the left side in the region of the stomach. He vomited at first, but has not done so for a long time. The stools have, as a rule, been brownish-coloured, never pale. The cough got better and remained away, till for
some time last winter it again troubled him. He has very little cough now.

Present Condition: 27th April. Well developed. Muscles soft and flabby. No jaundice. Some oedema of feet, ankle and legs, most in the right. No cyanosis. Full expression of face. Cheeks flushed. This varying from time to time. Skin pale around the mouth and eyes.


Abdomen:—Normal in appearance. Walls of moderate thickness and tension. A line of resistance is felt about 2 ½ inches above the level of the umbilicus, between the right mammary and right paravertebra spaces, slightly tender, moving with respiration; some indefinite resistance below this. Peristalsis not good all over front and in right flank—impaired in left flank between ribs and crista ilei. Stomach dilated, the note extending to about 2 inches to the right of the middle line. In the middle line the liver dulness extends from a little below the middle of the umbiliform cartilage upwards for 3 inches. In the right mammary line it extends from the 12th rib—
to slightly within the costal margin, a distance of 5½ inches. The superficial dulness begins at the 5th rib. In the mid-axillary line the hepatic dulness extends from the 6th rib downwards for 6 inches. The superficial dulness begins at the 7th rib.

Haemopoeitic System: — In the left mid axillary line the splenic dulness extends from the 6th rib to the 9th inter-space, a distance of 5 inches. Its anterior end is in the anterior axillary line, and its posterior end is a little behind the posterior axillary line. The glands of the groins and axillae are not enlarged.

Circulatory System: — Sometimes palpitation; Some dyspnoea on exertion: Pneumonia normal: Cardiac dulness normal. There is distinct inequality of the first sound in the mitral area. The second sound is accentuated. There is no murmur.

Respiratory System: — Chest square shaped: flattened under both clavicles; slight on the left side, marked on the right side. Vocal fremitus perhaps slightly increased below right clavicle, where expansion is a little delayed. The percussion note is slightly impaired above the clavicles; most marked on the right side. Very slight impairment below right clavicle. Impaired at apices posteriorly. Clear over rest of chest. The breathing approaches the bronchial in type below the right clavicle; there are crepitations during inspiration and the vocal resonance is slightly increased. Below the left clavicle the breathing is harsh, with prolonged expiration; occasional crepitations with inspiration. Above the clavicles the breathing is harsh. Posteriorly
The vocal resonance is slightly increased at the right apex. The breathing is very harsh at the right apex, and inspiration is almost bronchial, and is accompanied by a few crepitations. At the left apex the breathing is harsh, but not so markedly; there are a few crepitations. Over the rest of the back the breathing is a little harsh with no accompaniment. Except for the condition of the urine there is nothing important in the other systems which has not been mentioned.

Treatment: The patient was put upon milk diet, and after a time, rice water was given along with it. Various medicines were given, including code & opium pills, subnitrate of bismuth, tincture of colo, ergotine, and morphia suppositories, muriate of silver enemata, & carbolic acid pills, but none of them had any marked effect.

Progress: The patient became gradually weaker; the diarrhoea continued. The liver underwent some diminution in size. On admission the urine was observed to be very slightly bile coloured, and it became more so and continued so till the end. Notwithstanding this, there never was any distinctly perceptible jaundice even of the conjunctivae.

16th May: Tongue dry; deficient in epithelium; papillae prominent; gums spongy; cheeks flushed. The liver dulness in the right lateral sternal line extends from the 13th rib down to 1 inch above the base of the xiphisternum, a distance of 2½ inches. In the right mammary line it extends from the 13th rib downwards to 2 inches above the costal margin, a distance of 3½ inches. In the mid-axillary line
It extends from the 5th rib downwards for 4½ inches.

17th May: The following is the condition of the blood.
Red corpuscles......5,180,000.
White.............16,000.
Hæmoglobin.........55 per cent.
Proportion of White to Red......1 to 324.
Hæmoglobin per corpuscle......53
 corpuscles well formed; considerable variation of size.

18th May: The serum from a blister was examined. It gave a distinct reaction for bile pigment. Very little coagulation was produced by the nitric acid, whereas with normal serum the coagulation was very copious.
Rapidly becoming weaker. Tongue dry and glazed. Gums thorny. The stools are almost watery, brownish-yellow, with some greenish-coloured material here and there. The reaction with nitric acid is doubtful. Some masses of curdled milk are present. Odour not very offensive. Temperature not elevated; Pulse 120, weak, compressible. Breathing 18 per minute, irregular and sighing.

19th May: He has been troubled with vomiting, and his nose has bled during the last few days.

21st May: Lips cyanotic. Measurements of liver dulness:
Right lateral sternal line......2½ inches.
Mammary line...........3½ + Mid axillary line.........4½
Pulse 96, almost thread-like. Vomited again to day, and some blood was discharged from the bowel.

22nd May: He was seized with acute pain in the lower part of the abdomen this morning. This was
relieved for a little by poultices and fermentations. Position of the legs does not affect the pain. Tongue dry.
Aphthous patches; cheeks sunken, some cyanosis. In the afternoon he became unable to pass water. In the evening he was very much sunken, but the pain was less severe. Breath foul. Pulse 120, regular, but small, and almost thready. Respiration 18 per minute, irregular, somewhat sighing, mainly costal.
Feels a burning sensation in the lower part of the abdomen. Pain on attempting to urinate.
No obvious dulness over bladder. Abdomen did not tend to a little, especially at lower part, less tender; some tympany. No dullness in flanks.

23rd May: "Patient sinking. Pulse imperceptible. Breathing 21 per minute: extremities cold. Lungs cyanotic. Abdomen very tender. Lying on back with legs drawn up: He died at 1:30 p.m.
Petchia had formed over legs some time before death.

From the time of his admission till 9th May, the temperature was frequently slightly elevated, most commonly in the evening. After this it was normal or subnormal until the last 36 hours or so of his life, when it was again slightly elevated.

A Post Mortem Examination was refused.

Examination of Urine.
When the patient was admitted the urine was a slight bilious colour, and this soon became more marked and persisted. The quantity was diminished to
from 38 to 14 ounces. The specific gravity was high or normal and the reaction acid. Albumen was always present in very large quantity. There was no blood, no sugar, nor ketones. The bile salts were at first normal in quantity, but soon began to be in excess, and continued so the excess commencing after bile pigment had appeared. Microscopically there were numerous casts, mostly hyaline with granules and fat globules; some with epithelial cells; also granular casts, cells from the renal epithelium, mucus and pus corpuscles. The urine was diminished—varying from 217 to 107 grains per diem.

A specimen of urine passed not long before death was tested for Indican, the other pigments having been first removed by acetate of lead, and it was found to be present in pretty large quantity.

25th April:—Deep amber coloured, greenish yellow when shaken up, forming a froth with a slight greenish tinge. Albumen = 1/2. After removal of albumen, slight reaction for bile pigment with nitric. Bile salts, on led, gave an opacity nearly equal to standard—no increase.

28th April:—Specific gravity 1022; Albumen = 1/2; Bile pigment, a small quantity; Bile salts—normal maximum.

2nd May:—Specific gravity 1019; Albumen = 1/2. Bile pigment a little increased; Bile salts—40 or 45 required, or 1 1/2 or 150 per cent.

4th May:—Quantity 28 ounces: Bile pigment in small quantity; Bile salts, on 30 required, or 200 per cent.
11th May. Quantity 20 ounces. Bile pigment inconsiderable quantity. Bile salts, between 140 and 45 required or between 1 and 150 per cent. Specific gravity 1025; Albumen $\frac{3}{5}$; Urea 217; 46 grains.

12th May. Quantity 18 ounces. Specific Gravity 1026; Albumen $\frac{3}{5}$; Bile pigment increased. Bile salts, 75 required or 200 per cent; Urea, 152; 145 grains.

14th May. Quantity 16 ounces; Bile salts, 97; 30 mg. or 200 per cent.

15th May. Quantity 17 ounces; Urea, 163; 132 grains.

19th May. Quantity 20 ounces; Specific Gravity, 1029; Bile pigment considerably increased; Bile salts, 95 required or 400 per cent.

20th May. Quantity 32 ounces; Less bile stained than it was yesterday; Specific Gravity, 1012; Albumen $\frac{2}{5}$; By Estach's tube, 10 grammes per litre; Bile pigment less, but still considerable; Bile salts, 75 required or 240 per cent; Urea, 107.616.

21st May. Quantity, 36 ounces; Specific Gravity, 1012; Bile pigment rather less than yesterday; Bile salts between 75 and 30 required, or between 240 and 200 per cent; Urea, 153.864.

22nd May. Quantity 9 ounces; Specific Gravity, 1019; Albumen between $\frac{1}{3}$ and $\frac{2}{3}$; By Estach's tube, 20 or 21 grammes per litre; Bile pigment increased; Bile salts, results not got; Urea, 63.8802 grains.