On the Tests for the Bile Salts

and on the

Renal Elimination of the

Bile Salts, Urea, Indican and Sugar,

with a Report of Clinical Cases.

A Thesis for Graduation

as

Doctor of Medicine.

By

John Stevens, M.A., M.B. C.M.

April, 1887.
May 1889.

I have read the thesis
of John Stevens M.B.
and recommend it to the Faculty
of Medicine as
worthy of Competing
for a Medal.

Rutherford
Note: I have given at the end a clinical report of thirty-three cases referred to at various parts of the tissue, some of them only for reference if desired.
I have to express my gratitude to the Professors of Clinical Medicine for the invaluable opportunities which they have afforded me of examining patients in the wards, and especially to Professor George Stewart, to many of whose private patients I have had access during the last year, and who suggested to me that I might carry out the work which I had begun as Stark scholar and afforded me facilities for doing so along with investigations which we were together making in regard to other subjects.

John Stevens.
MEMORANDUM.

From the Dean of the Faculty of Medicine.

To Professor Greenfield

Theses for competition.

Have the goodness to circulate the Theses sent to you in the following order:

To Professor Y.R. Fraser,

" Sir Wm. Turner

" Grainger Stewart

P. Dean,

Note.- The Theses sent to you are by Drs. Stevens & M. Welch
I. On the Renal Elimination of the Bile Salts.

Herberts, the clinical testing for bile in the urine has been confined generally to the detection of bile pigment by the color reactions which it gives 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. The pigment is to a greater or less extent chemically changed within the body, and it is only the unchanged or slightly changed residuum which appears in the urine in jaundice. As we cannot estimate the extent to which it is 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 changes which they undergo are mainly at least such as do not impair or hinder their characteristic reactions. The conjugate acids are split up, but cholic acid, united with potassium as its base, remains.

While there is no doubt as to the presence of bile pigment in the urine in jaundice, there have been and still are, wide differences of opinion as to the presence or absence of the bile salts. The best authorities have differed, not only as to the methods for their detection,
but even as to whether they are ever to be found in the
serum at all. Thus Virchow held that, being destroyed
in the blood, they were never to be detected in the serum even
in severe jaundice. Luschinsen admitted that traces of
them had sometimes been found. Others again have
made their presence or absence the ground for
differential diagnosis as to the nature of the jaundice,
their presence indicating that the jaundice is due to
obstruction to the outflow of secreted bile and consequent
reabsorption of it, whereas their absence indicates that
the jaundice is due to suppression of the biliary function
of the liver and consequent accumulation of bile pigment
in the system; the bile pigment being, according to this theory,
formed in the liver and removed from it by the liver,
whereas the bile salts are formed in the liver. This view,
formerly held by Bichat, is maintained by Dr. George Banting
in his work on Diseases of the Liver. Others again, such
as Hühne, hold that the bile salts are to be detected in
all forms of jaundice, whatever its duration. Recent
investigations have, however, shown that by careful
analysis they may even in health be detected in the urine
in minute quantity. While they have not yet been
detected in normal blood, Fawcus and Dragendorff have
actually separated them from non-jaundiced serum. Another
step in the same direction has been the detection of bauvin
in small quantity in the renal excretion. Ruppin and Durrer
have lately proved that the chief catalyst of taurocholic
acid is due the greater part of the para-ascorbic acid
in the urine.
(1) Guide to the Practical Examination of the Urine. p. 91

(2) Dr. Janvier. p. 61

(3) Diseases of the Liver. p. 484

(4) Diseases of the Liver. p. 737
The wide differences of opinion to which I have referred, and also the various modifications which have been made in the method of detecting the bili peri, must, I think, be taken as good evidence that there is some serious difficulty in the method or something unsatisfactory in the results obtained.

The test is really a difficult one. Regarding it, Dupuytren says that "such detection by the direct application of Pettitkofer's test to the urine or to any other animal fluid is practically impossible, even if the bile acids are present in considerable amount." Further modifications have been tried, but none have proved satisfactory.

Dr. George Harley introduced a modification by which the method might be applied directly to the urine — by adding to two droplets of the urine in a test tube a small fragment of leaf sugar and then pouring slowly in about a droplet of strong sulphuric acid, a deep purple line at the line of junction indicating the presence of bile acids. But it is easy, as Murchison points out, to apply this method to three 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 colour with all three. Some of the urinary pigments give this same reaction, and albumin gives a reaction not much different. Indeed Harley has admitted the failure of his method. To detect the bile salts in the urine by Pettitkofer's test (except in occasional cases in which they are present in very large amounts), it is necessary to go
through a complicated chemical process to extract them from the urine, and this, as Auerbach 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 investigations.

Dr. Olivi of Turin 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 albumen or peptone in a fluid of requisite acidity. The urine, which must be clear, is first diluted to the specific gravity 1008 and is then added in measured quantities to 60 minutes of a standard solution of peptone until the opacity produced is equal to or a little greater than that of the standard. With a normal urine 60 minutes should not give more than the standard opacity. In this way the proportion of bile salts is calculated, 100 per cent representing the normal maximum amount.

After an extensive trial of Dr. Olivi's method I can fully confirm what he says as to its delicacy and reliability. The physiological and clinical data obtained (both in health and disease), have been to my mind, as to his, strong evidence in favour of the value of the test.

The method has been very carefully worked out by Dr. Olivi. 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 sugar is usually increased. Consequently, when it is diluted to the specific gravity 1008 the amount of normal urinary solids present in a given quantity will be less than the amount in non-saccharinuric urines diluted to the same extent. To obviate this fallacy which this produces, the saccharinuric urine must be diluted not to the specific gravity 1008 but to that specific gravity plus the increase of specific gravity due to the sugar. If the specific gravity of pure water be taken as 1000, each grain of sugar per ounce increases the specific gravity by about one. Thus an urine which contains, say, 11.5 grains of sugar per ounce should be diluted till it has the specific gravity of 1008 plus 11.5, that is 1019.5. The difference which this makes in 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 having always at hand a reliable peptone solution. The solution is difficult to prepare and can only be properly prepared by a good chemist. Unless properly prepared, no one to be of the slightest service.
it is of course useless for quantitative results. Further, such a solution, if much used, proves to be expensive. Special, though comparatively simple apparatus is required, and the test takes a fairer time than those in actual practice could as a rule afford to give. Besides, the value of having a definite quantitative result is to some extent only apparent, for there is a pretty wide difference in the amount of bile salts secreted in health in different persons, and this difference must influence the amount present in disease as well. A simple test, though only giving qualitative results, is therefore still required.

To supply this want, I venture to suggest a method which I devised last summer and which I demonstrated at a meeting of the Medical Chirurgical Society on 7th July 1886. It depends on the same property of the bile salts as Dr. Oliver's test. I shall speak of it as—

The Albumen and Nitric Acid Test for the Bile Salts.

While testing for albumen by the cold nitric acid method in a case of albuminuria from nervous exercise, I observed that, in addition to the ordinary precipitate of albumen at the line of junction of the acids with the urine, there was a well marked precipitate higher up in the column of urine. This upper precipitate which is sometimes seen in albuminuria...
(1) The Alterers of the Union - London, June 12th 1856.
former, is distinguished from a precipitate of urates by not disappearing with heat, and it is also to be distinguished from the viscous precipitate which appears when such medicines as tallow wood oil are being administered. When the reaction to which I refer has been observed it has been ascribed to mucin precipitated by the acid. D. Blaquière, while describing it as the mucin reaction, has expressed doubt as to whether it is really due to mucin, because he has never found it apart from the presence of albumen and he has seen it in urines in which acetic or citric acid did not precipitate mucin. I have frequently, however, noticed a very slight precipitate slowly appearing in the same portion, whether the urine contains albumen or not, and this slight precipitate is, I believe, correctly ascribed to mucin. This slight mucin precipitate is therefore to be distinguished from the more dense precipitate which sometimes occurs in the presence of albumen. It is clearly to this latter that D. Blaquière refers, but it is not due to mucin.

I have come to the conclusion that it is due to the bile salts precipitating the albumen in the form of the uric acid which has reached the requisite degree of acidification and that when the reaction is well

marked it is an indication that the bile salts are present in excess. The bile salts have the property of precipitating albumen or fetiform when the solution is of a certain degree of acidity. This, as D. Blauhir has shown, when an albuminous pruse is acidified with
citrine or acetic acid, the addition of a solution of the salts precipitates the allum; so also, if the lime salts are present in excess in the allumnum water, the addition of a little of either of these acids will lead to a precipitation of the allum. An excess of acid renders this precipitate or precipitates precipitation. The action of the nitric acid in producing the upper precipitate in some allumnum waters requires its explanation on this property of the lime salts. At the line of contact it precipitates the allum, but it also mixes to some extent with the column of urine above. The lower part of the column of urine thus becomes less acid to allow the lime salts to precipitate the allum, whereas the upper part of the column, i.e., much mixing of the fluids has not occurred, is not sufficiently acid. It is thus only at a certain level that the precipitation of allum by the lime salts occurs.

That the lime salts are the real precipitants may readily be proved experimentally by adding to an allumnum urine which gives with nitric acid, only the ordinary precipitate at the line of junction, a few drops of a solution of baryta chlorate of soda. Cold nitric acid will then give not only the precipitate at the line of junction but also a well marked precipitate higher up, the density of which depends, if there be a sufficiency of allum present, upon the quantity of lime salts added. If again a urine be taken with an excess of lime salts, and another with
Allumun but without excess of balsam, nitric acid will give with the prime under no portion or only a slight precipitate of mucic, and with the latter of the precipitate of allumun at and a little above the line of contact. If, however, a little of the alluminous prime be first added to that with excess of balsam, nitric acid will give, not only the ordinary precipitate of allumun at and a little above the line of contact but also a well marked precipitate higher up than and quite distinct from the other.

The best experiment exemplifies the method which must be adopted in applying the test to a prime which does not contain allumun.

In alluminous prime storers very well as a supply of the allumun necessary for the reaction. As only a very little is required each time a few ounces will serve for a large number of testings. The presence of a little sulfuric acid does not in any way affect the test reaction, and by its means the alluminous prime can be kept for any lengths of time. The inconvenience of requiring an alluminous prime is thus reduced to a minimum.

In doing the test it is necessary to prevent too much mixing of the acid with the prime and also too much shaking of the prime. If the prime is rendered too acid the reaction will not occur and if it is shaken the precipitate is very readily made to diffuse through the prime and so the delivery
Of the test in brief. The test can be done in a few lines, the dilute acid being put in first and
the prism being very gently on its surface, but the
method which I find easiest and most satisfactory
is to pour a considerable quantity of urine into a
conical flask, to add a little alumminous urine,
if necessary, and then to pour a little nitric acid
very carefully down the side of the glass. In this latter
method there is no disturbance of the column of
urine. As there is more mixing of the acid and urine
in this flask the precipitate appears higher up than
when the former plan is adopted; hence the necessity
for using a considerable quantity of urine. If the
urine to be tested is turbid it must be filtered, or
otherwise rendered clear. In selecting an alumminous
urine for the test care must be taken not to select
one which itself contains an excess of silica salts, and it
is best to have an almost highly alumminous as long as
it is thin required for the test. If a small quantity
of it is required compare with the quantity of the
urine to be tested, not above a fourth or eights
of this amount, or even less if it is sufficiently
alumminous.

The reaction of the reaction

As actually do the fixed salts precipitate alumina
that when the latter is in small quantity the fixed salt
reaction may be as distinct as that produced by
the nitric acid, and it is sometimes seen the more
distinct of the two. Not only does it occur when
the fixed salts are present in excess; even the small
quantity which is excreted in health often suffices to
give a slight reaction, especially if the urine
is concentrated. As the extent of the reaction
which may occur in healthy urines with the
concentration of the urine, it is well to dilute
concentrated urines to about the normal specific
gravity before applying the test.

When we recognize the degree of reaction
which may be present when the bile salts are
normal in amount we are able with readiness
to detect by this method an excess of these substances.
As I shall subsequently point out, the great majority
of normal urines give more or less of a reaction
with this test, but in them this reaction is not marked;
it requires some portion of a minute to appear and only
becomes well marked in a few after standing for a
minute or so. In a few concentrated urines containing
the normal maximum of bile salts the reaction may be
almost immediate and may become pretty distinct.
No reaction can therefore be regarded as indicating
an excess of bile salts unless it is not only well
marked but appears at once. If it is at all delayed
there is no excess. There are, of course, a few urines,
but only a very few, in which it is difficult or impossible to
pay from this test whether there is the normal maximum
amount of bile salts or a slight excess. To clear this
up it may sometimes be necessary to have recourse to
a quantitative estimation by Dr. Oliver's method, but it
is only in relation to a slight and probably unimportant
Bedside Human Testing - 3rd Ed. 2/14.
occurring not at the line of contact of the acid with the prussic but at little higher up. This well-marked precipitate, occurring in the absence of albumen, is thus an indication of the presence both of peptone and of an excess of alike salts.

This combination of peptone and excess of alike salts, though it has been observed by Dr. Oliver, is a rare one, whereas the presence of an excess of alike salts alone or along with albumen is not infrequent, and the reason why so little attention has ordinarily been paid to their detection is, I believe, mainly because there has been no satisfactory test for them of such simplicity as could be used in clinical work.

The precipitate of mucin produced by nitric acid resembles the albuminous precipitate which the like salts occasion in being soluble in excess of the acid, so that it also forms a layer at a certain height in the column of urine and may be indistinguishable from the slight albuminous precipitate produced by the like salts when they are not in excess. Dr. Oliver has, however, shown that the like salts precipitate mucin as well as albumen, and he suggests that this is the explanation of the precipitation of mucin in the presence when nitric or nitric acid is added. But it seems more probable that the faint precipitate of mucin which frequently occurs in normal urines is due to the acid added, whereas the more dense mucin precipitate which occasionally
occurs at least in tampered wines is to be ascribed to the presence of an excess of lime salts.

At any rate it is only occasions when I have observed a very dense and permanent precipitate have been in cases with excess of lime salts in the

precipitate of mucin by the lime salts appears to differ from the ordinary slight mucin precipitate in the fact that it is much less readily soluble in excess of the acid. Thus in non-albuminous tampered wine a well-marked precipitate is sometimes produced by cold nitric acid, extending from the line of contact or a little above it for a considerable way up the wine, forming a yellowish opacity which from the closeness of its lower part to the line of contact, might almost be mistaken for albumen. It requires considerable mixing with the acid to dissolve this precipitate whereas the mucin precipitate produced by the acid itself is so readily soluble in excess that it only appears some distance up in the column of wine. This well-marked precipitate of mucin is therefore not a source of falling but is actually an indication of the presence of an excess of lime salts. If a precipitate of mucin by the acid alone is ever so dense as to be a source of falling in the use of this test it must, I think, be extremely seldom. One other practical point regarding the test I think it right to mention. When only a trace or little more
w 25 & 40. vol. 1, p. 381.
of albumen is present the reaction with the bile salts may become at least as distinct as that at the limits of contact, even when they are not in excess. This appearance may lead to the mistake of suspecting an excess. It is important, therefore, in all cases to make the primary distinction, though not highly, albumenins, if not so already, before applying the test.

Another method, depending on a different property of the bile salts remains to be discussed. I shall speak of it as follows:

**The Surface Tension Test for the Bile Salts.**

Since I denied the albumen and nitric acid method, there has appeared in Landor’s and Stirlings’ *Text book in Physiology* a brief account of Professor Matthews’ as its interesting research on the property of the bile salts of lowering the surface tension of fluids. This property Professor Kay found can be used for their detection in urine. On trial I have found that, as Professor Kay stated, one part of bile salts to 10,000 or 12,000 parts of water can be detected by this property. The property may be demonstrated by pouring sulfuric acid or precipitate, sinking through the fluid containing bile salts, whereas in pure water it floats. When making some special observations, for another purpose, with a solution of bile salts added to urine I was struck with the smallness of the drops discharged from the nipple-shaped jetype used in Olivier’s method. This effect I soon
ascertained, was due to the influence of the bile salts on the surface tension. Owing to the smallness of the drops, their number in a given quantity of fluid was correspondingly increased. In this respect I find that this effect on the bile and number of the drops delivered from a jetette affords the best method, depending on the lowering of surface tension, for testing for these substances. I have made numerous trials of the sulphur method and have found that, while it does not fail to indicate an excess when that is present, it does not always give more or less in the large majority of normal cases, at least on standing, but in some quite as readily as when the bile salts are present in excess. I therefore regard it as less reliable than the method by dropping, as no clear line of distinction can be drawn between the rate at which the sulphur may sink when the bile salts are in excess on the one hand, and when they are not on the other, whereas with the droppers' method this can be pretty accurately done. The plan which I have adopted is this: A right-angled jetette

1) Such jetettes as I have used are supplied by Messrs. Bodelon & Son, Pharmaceutical Chemists, Margate, who have prepared it for their purposes in Dr. Olivier's method of testing. I got a jetette for the test here described must be taken to get me which fulfilled this condition as to this size of 2.2 cm in diameter and with pure water, this size as they vary considerably in this respect.
graduate for minutes is made, the jet being so made that it delivers drops of pure water whose size is as nearly as possible 1/2 minute each. Thus 10 minutes will yield about 20 drops. If 10 drops cannot be made all exactly the same in this respect, it is therefore necessary to determine what number of drops the jetette to be used delivers, and it is necessary to test slowly, so that each drop is allowed fully to form before it falls, otherwise the drops will be of unequal and uncertain size. The jetette must be held exactly vertically as, if it is oblique, the size of the drops will not be the same. Care must be taken that the mouth of the jetette is clean, for if it is greasy the size of the drops will be affected. These simple precautions are easily observed.

The jetette is graduated to 20 minutes, but 10 minutes is found to be a convenient and sufficient quantity to use. With this method the presence of the lime caustic is demonstrated by an increase in the number of drops. By numerous observations I have found that even the smallest amount of lime caustic present in normal urine as a rule makes itself evident by an increase of one or even two, but seldom by even a fraction more than two, in the number of drops. If the number of drops is increased by more than two in a pint not above the ordinary specific gravity, it may be concluded, as the absence
of a cause of error to be afterwards mentioned, that the bals are present in excess. If, however, the specific gravity be abnormally high, the drops may be measured by three or between two and three without any actual excess in the quantity of salt present. Even at the upper limits of the normal range of specific gravity (1.026) there may be an increase to at least between two and three in the number of drops. It is well therefore to dilute concentrated solutions to the normal specific gravity before using the test, just as in the albumen and nitric acid tests. When the bals are present in excess, this fact is shown by a greater increase in the number of drops than is produced when they are within the normal range. The greater the increase in the number of drops, the larger the quantity of bals present, though the rate of increase differs according to the quantity of bals present as will be explained below.

This influence of the bals may be illustrated as follows. A 2 per cent solution of haemochlates of soda in salt solution of specific gravity 1.017 yields 27 or 31 1/2 drops in 10 minutes instead of between 20 and 25, the number given by pure salt solutions. A 1 per cent solution yields 34 drops, a fall of half a drop or less, a 0.5 per cent solution yields 36 1/2 drops, a fall of
half a drop. A 0.1 per cent solution yields 33 drogs – a fall of 3½ drogs for dilution to a fifth of the previous strength, equivalent to a fall of 19½ drogs for each dilution to half the previous strength. A 0.05 per cent solution yields 30 drogs, a fall of 3 drogs by dilution to half the previous strength. A 0.2 per cent solution yields 26½ drogs, a fall of 3½ drogs, equivalent to a fall of 24½ drogs for dilution to half the previous strength. A 0.005 per cent solution yields 22½ drogs, a fall of 4 drogs for dilution to a fourth of the previous strength, equivalent to a fall of 18 drogs for each dilution to half the previous strength. The following series was obtained by doubling the dilution each time.

The tannic acid of pure dilution gave 33 drogs, and so on downwards.

The dilutions in this case were made with pure water. The numerator above shows the number of dilutions, and the number below it indicates the solution so diluted gives in ounces.

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The last result (22½ drogs) is the same as the pure water gave. Thus the rate of increase in the number of drogs, after a certain degree of concentration has been reached, diminishes, while, on the other hand, the proportion of the latter below this degree of concentration, successive dilutions have again less effect in diminishing the number of drogs. The rate of increase or diminution in the number of drogs this does not go on pari passu with the concentration; dilution of the solution, but is greatest within the intermediate degree of concentration and diminishes towards each end of the scale, especially towards its upper limit.
It is evident therefore that the test gives results which in a relative manner have some quantitative value - the greater the number of drops the more the quantity present. The result is however affected to some extent by the specific gravity, so that a little dilution of the amount of increase in concentrated prunes they should be diluted till they come within the normal range of specific gravity. If so not, I think it would be best all prunes to the same specific gravity for that would render dilution to a fixed constant specific gravity and, as I shall point out, much dilution of the urine makes the test unnecessarily delicate. The difference is in the result owing to varying specific gravity in prunes within the normal range is not so great as to render this necessary. We can thus in any case with cholera estimate roughly from day to day the rate of elimination of the biles. The simplicity and ease of application of this method make it, I think, one which will prove practically of service, the simple shaped receptacle being all that is required for its performance and the manipulation not taking more than the fraction of a minute. In regard to purity and quickness there is therefore not much to choose between this test and that with albumin and nitric acid. The purpureus renin method is not known in all cases so reliable as this, as I shall now proceed to point out.

It has already been pointed out that an advantage which the dripping method has is that it gives at a more definite idea as to the amount of
like cells present, as the albumen and nitric acid test
this being shown simply by the density of the precipitate,
which, if, however, I think, a different
indication for general purposes. On the other hand
a defect of the dropping method is that in dilute
puissat it is not sufficiently delicate to indicate the
slightest degree of increase, the drops sometimes not
being increased in number by so many as two, though
the excess of little pails left by the nitric acid method
and by T. O. E. T. E. E. quantitative method as found to be
quite distinct. Apparently also the presence of
albumen in the urine, while it supplies the necessary
condition for the nitric acid test, interferes to some
extent with the delivery of the dropping test; the
explanation, I think, lies in that the albumen, by
increasing the superficial viscosity, counteracts to
some extent the effect of the little pails in lowering
the surface tension. In one or two albuminous cases
in which dropping showed no excess but the nitric acid
did, on the albumen being removed by boiling and
filtration the dropping method then showed an excess
corresponding to that shown by the others. It is only
however with the lesser degrees of excess that
this would occur. Yet I have observed the same effect in comparing the results
of tests in dilutions of a cerelitate of a solution with albumen and with salt solution.

Another source of falling which affects both
tests is met with in cases in which salt solutions or other
resins are being administered. These substances have
a very marked effect on the surface tension, as may be
shown by adding a little salt solution to a pure water.

The methyl
of days may elapse before substances, when in the urine, are oxidized progressively along the line of contact of the urine and saliva, and may be reduced to their elements, whether albumen be present or not. In some cases of孩子
whose former I presumed I was struck with the presence of albumen in the urine, which, had it been due to bile
salts, would have indicated a very large amount, and this led me after a time to detect the source of error. In one case the urine, which contained a considerable amount of
bile, gave with nitric acid a red precipitate of ferric nitrate and the presence of albumen at the site of contact. Ten
minutes gave 30½ drips. The urine was clarified and the
albumen first removed by settling and filtration. The reaction of the urine, which contained a considerable amount of
potash, was tested with nitric acid a marked reaction as well
as the presence of albumen at the site of contact. Ten
minutes gave 30½ drips. The urine was clarified and the
albumen first removed by settling and filtration. The reaction
were all as marked as before, 10 minutes giving 32½
drips. With the Jeffrey solution the standard gravity was
obtained with 6 minutes (I). This therefore is a source of error
in using the Jeffrey test also. In another case nitric acid
and gave a marked reaction and 10 minutes gave 31 drips,
while with the Jeffrey solution ten minutes gave the standard
gravity, which would indicate 60% percent of bile salts.

A week after they had stopped the sandalwood oil 10 minutes
were only 20½ or 22 drips, but the urine was too turbid
in otherwise treated. I do not dwell upon further on this
point, capsules of sandalwood oil were taken. Before they
had commenced these number of drips in 10 minutes was 25½ or 26-
drops and albumen and nitric acid gave no reaction. Under
the now of the experiment the number of drops in 10 minutes
rose till it reached 30, nitric acid gave a marked dropy
some distance above the contact line and the filtrate solutio
 gave the standard density with 25 or 30 minutes of und
uble to the specific gravity 1574. The world directed 200 or
230 lit. of water into the apparatus. After the capsoule were set
these quantities gradually diminished till the water returned
to its previous condition. Lasted a few days afterward it
gave about 24 drops in 10 minutes and 60 minutes duration
of the 10g gave with the filtrate solutio on largely
points lower than the standard. The administration of
such powders are therefore a source of error with both
the albumen and nitric acid and the droppping water, and
apparent with the Z Blum's filtrate test also, but in the
next point I intended to make further observations which
have not as yet been able to do.

A particular source of falling affecting the droppping test
sometimes occurs accidentally when afterwae of some are ported
into the vials, which have contained some volatile ingredient which favors
surface tension. Some substances have a very marked action in this
way, such as paraffine oil acid, Camphor, acetic acid, etc.

In one case I encountered and the source of error of the
droppping test. The patient is female, had a normal pulse, and no
symptoms, which appeared to consist mainly of belly disten, yet minds
with the urine. Ten minutes yielded fully 36 drops filtrating poured
this filtrate disten completely and this urine then came through the
filter paper. Ten minutes of this clear urine gave only 25 drops,
corresponding with the
and Z. Blum's meths show the quantity of bile polar the 300 per cent.
I cannot explain the process, so I do not know the particulars of this case.
For the purpose of satisfying myself fully as to the results given by these tests with normal urine, I examined by the dripping method and by albumen and nitric acid the urines of thirty-two young men of different healths and regularly engaged in their work, which, except in one case, was intellectual. The dripping method was also tried in twenty-one of them, but for reasons already stated, its use was abandoned. The urines examined were nearly all passed between 12 and 2 o'clock, and the results were taken during this day. In some of the cases Dr. Oliver's method was made use of for purposes of comparison.

Of these forty-two urines, only two showed a recognizable albumen, and in both it was the least recognizable by Dr. Oliver's method — 150 parts per cent. It is noteworthy that, as regards the qualitative test, while albumen and nitric acid indicated an absence in both, the dripping method did so only in one which had a specific gravity of 1028, the number of drops being 23 (a number below which in a urine of 12 high specific gravity could not be taken as indicating an absence for certain). In the other the number of drops was 21 or 21 1/2, and this is one of the examples of the failure of the dripping method when this urine was diluted, the specific gravity in this case being 1014. The fact that this urine contained a little albumen may also in part account for the failure. It is very probable that the gentleman may have been the subject of a nervous disorder from exercise of which I speak elsewhere. In this there was no difficulty, as to whether there was a slight excess or not. In one, a urine of specific gravity
Between 10.26 and 10.27, the number of drops in 10 minutes was 23 or 24 or more, about a drop more than the normal maximum number in pure water of ordinary specific gravity, while the albumen and nitric acid method gave a fairly distinct reaction after a time, but not sufficient to indicate definitely an excess. In the second case, in a pure of specific gravity 10.28, the number of drops was 22 or 23, and albumen and nitric acid gave a reaction which was not quite immediate, but which became fairly distinct in the course of a minute.

In the third case the number of drops was a little over 22, just the maximum limit of health and albumen and nitric acid gave a reaction which became fairly well-marked after a time. A careful quantitative estimation with the Leitz solution left the matter in precisely the same position, so it was impossible to decide whether 60 minutes gave the requisite degree of gravity or whether it required 60 minutes. The conclusion therefore was that the normal limit was not distinctly overstepped in all the three cases there was no doubt from any of the tests that the elimination of bile salts was distinctly within the maximum limit recognised as healthy. In some, in which the qualitative tests gave reactions at or near the upper limit of their normal range, but distinctly below not preceding it, their existence was confirmed by the quantitative estimation showing that the amount of bile salts did not exceed the normal maximum. The doubt there was regarding the cases above referred to indicates the importance of diluting concentrated prunes.
so as to bring them within the normal range of specific gravity before applying the tests.

In all these previous tests the albumen and nitric acid test gave no standing for a little perceptible reaction. In many it was very faint. In one it was quite imperceptible. It is noteworthy also that there is a well marked though not complete correspondence even within the narrow limits of health, between the number of drops and the degree of reaction produced by the same test. Thus, if the urine which did not react with albumen and nitric acid, gave 60 drops in 10 minutes, one gave 20 1/2, and one only gave 21. As the one reaction approaches more and more near the upper limit of health, so does does the other. This I think is strongly reinforced by the view that the upper precipitate albumen and in normal urines, produced when nitric acid and albumen are added, is like the more marked precipitate which the test gives in cholera due to the bile salts. This slight reaction is however indistinguishable in appearance from the reaction given by urine when nitric acid is added.

These observations show that an excess of bile salts in the urine in health does not, when it does occur, to very slight degree, that the surface tension produced by dippings is not sufficiently delicate if the urine is under the normal specific gravity.

Third, that the delirium of the albumen and nitric acid test is not personal interfered with when the urine is below the ordinary specific gravity.
Forth, that with nearly all normal persons both
tests give reactions which are at once recognisable
as being within the limits of health;
Fifth, that as the case of a few apparently healthy
individuals, the reactions are such that the rate of
elimination of the bile salts must be regarded as at
the transition point between a normal maximum and
a slight excess.

Observations on the Renal
Elimination of the Bile Salts
in Disease.

I shall now give the results of my
observations regarding the renal elimination of the
bile salts in disease. These consist of two series,
first, a series of observations made by Dr. Olear's
method on cases recorded at the end of this thesis
and on some others of which more brief notes are
given; and second, an inquiry of a more extended
nature which I have been enabled to make during
the past winter by the aid of the simple tests
which I have described.

I
I shall first give the results of the
series of observations made by Dr. Olear's method, classifying
them according to the systems to which the diseases belong.
In the alimentary system all those in which there was
jaundice are classified by themselves. The normal maximum
reaction is represented by 10 per cent.
Icterus Galligenus.

1. Cases with Jaundice.

1st. of Readings.

(1) Catarhal Jaundice (recovery). Bile salt slowly increased, - 166 per cent, but became normal before the bile pigment disappeared.

(2) Catarhal Jaundice (recovery); some hepatic tenderness; gall bladder distended, bile salts in excess; no bile pigment.

(3) Catarhal Jaundice. 2nd. of recorded cases. Bile salt increased to 200 per cent. but became normal before the bile pigment disappeared.


Bile salt 500 per cent.


13th June. Bile pigment a mere trace. Bile salt 240 per cent.

16th June. Turbid, light albumin, still present. Bile salt 240 per cent.

19th June. Bile slightly albumin, slight escharotic bilious itching, hp 292. Albumen, Bile pigment a trace. Bile salt 183 or 200 per cent.

15th June. - Trace of albumen, no passage, dark color.
with nitric acid but no distinct green. Bill. salts 16.6 per cent.

16th June. (Summit quite gone). After 1810.

Not at all bilious looking. Tent trace of albumen

with cold nitric acid. No bile pigment and not much

so much reaction for primary pigment. Bill. salts 15.0 per cent.

(5) Hydatids of Liver obstructing the biliary ducts

Rupture & Suppression. throw to have a very severe

pain at the back of the stomach. This past to cease

for two or three hours. It was much increased by

food or pressure. After a while it extended to the

right hypochondrial region and became at irregular

intervals, the lower back painful. The present

symptoms had lasted for three months when the man

admitted to the Infirmary. On admission there was

marked jaundice; the features were jaundiced feature

the cheeks cedematous. There was a high temperature

with distinct delirium; but without delirium.

The stools were pale but not absolutely bilious. The

liver was considerably enlarged and was tender particularly

in the epigastrium region. The spleen was also enlarged.

The heart and lungs were healthy. The urine when admitted

(2nd Dec 1856) was markedly bilious, of 8.228, acid.

Albunin present in urine. Well marked reaction for bile

pigments. Positive for 5.7 per cent. Large deposit of

uric acid. The liver enlarged still further while he was

in the Infirmary. Later on 1810 it measured 11 inches in

right hypochondriac fundus. There was marked jaundice, and their
was cirrhosis. Prior to this, the family of the patient was notified by the sudden enlargement of the abdomen, the pain and the feverishness. The operation of the patient, performed by Dr. James G. Grant on December 24th, involved the removal of the spleen.

Between two and three hours of that were drawn off. The patient, who was in the 4th month of the 1st pregnancy, was in a state of intense distress. The operation was performed by a senior surgeon, and the patient was in a state of great anxiety. The patient was in a state of great pain, and there was a rapid diminution in her condition, till on the 16th day that congestion was almost clear of return. In 18 1/2 hours there was only a trace of bile pigment in the urine, and a distinct diminution had occurred in the amount of bile salts present, as is shown by the fact that on the day before the operation the number of drops in 10 minutes was 26, while on 18 1/2 hours it was less than 24. The bile diminished still further, measuring 18 1/2 hours 91/4 inches in the maximum line. With the diminution in the bile, the liver and gallbladder became palpable, and on aspirating the liver, two small lumps of bile and cholesterol crystals were obtained. Notwithstanding the relief afforded to the liver by these operations, the patient became worse and died. At the post mortem it was found that the spleen had formed in the cellular tissues on the right side of the abdomen, where it had been getting on pressure. There were no fluid spots in both the right and left lobes of the liver, with the exception of the left lobe having undergone suppuration. There were also a few small hemorrhages present in the peritoneal cavity.
small petechiae elsewhere throughout its substance. The gall bladder was almost empty, its mucous membrane atrophied, and the cystic duct occluded. The hepatic ducts were greatly dilated so as to form a large cavity which contained numerous hydatid cysts of various sizes. The common bile duct, which contained bile and fluid, and also its duodenal orifices were greatly dilated, as if from the passage of echinococci during life. The left kidney weighed 9 ounces and the cortex was enlarged and fatty. The right kidney weighed only 1½ ounce and was mostly transformed into two pears masses, one about an eighth of an inch of almost cortex being left. These pears masses of urine most probably have been the result of old hydatid, though no certain evidence in the way of hydatids was obtained. There was a fistula at the lower part of the kidney. The pelvis of the bladder was obliterated, and the ureter was quite impassable. The spleen was partially soft, and there were numerous perfecting hemorrhages in the mucous membrane of the stomach. On the anterior surface of the heart at the base of the right ventricle there was, under the pericardium, a small cyst the size of a small pea containing a clear, almost colorless fluid.

6) Obstruction Jaundice with icteric on abdomen, the result of a burn. 3½ of recorded cases.

Berbaphine increased to from 200 to 300 per cent.

Bile pigment present.

7) Biliary Colic with Jaundice. 4 recorded cases.
Bile salts increased when bile pigments present to form 200 to 300 per cent.


(9) Gall Stones. Abscess on gall-bladder, jaundice, malignant disease of liver and ducts. 5th recorded case.

Bilirubin increased, usually 200 or 300 per cent. great increase before death. over 600 per cent. Bile pigment in large quantity.

(10) Malignant Disease of Liver and Peritoneum with Jaundice. 6th of recorded cases. Bilirubin decided increased. Bile pigment in large quantity.

(11) Malignant Disease of Liver with Jaundice.

Male, aged 40, admitted to March 22, Royal Infirmary on 22nd. Nov. 1886. He always had headache and obtundation of the middle of August of that year, with loss of appetite, nausea, pain in the epigastrium and back tenderness.

Within 6 weeks before admission jaundice was first noticed a fortnight before admission and it steadily increased. On admission there was marked jaundice, slight oedema of the legs and hands, some capillary dilatation in the face. The tongue was furred, there were marked digestive troubles (loss of appetite, nausea, etc.) and the abdomen was distended. The abdomen was distended and the fluid considerably enlarged. There was some confusion of the first sound of the heart.
There was severe expectoration with some blood in it. There was no dulness over the lungs but some emphysematous patches were brownish, amber in colour, deposited coarces, especially, contained a trace of albumen, but gave no distinct reaction for bile pigment. The bile salts were present in large quantity — 60° percent. Nitric acid gave a marked pinkish reaction close to the line of junction. After his admission to the infirmary, the abdomen became more distended, more prominent in the epigastrium, and the jaundice increased. A constant rise in the jaundice was shown by a small quantity of bile pigment; chiefly giving with nitric acid a very dark pigment reaction, but not green. The bile salts were always in large excess. The area was generally much diminished, and was covered with a fine, yellowish white appearance. The liver became distinctly irregular. On Dec. 12, there had been delirium, and on Dec. 14, it is a matter of note that the jaundice was increasing, that bleeding had occurred, and that hemorrhages of an exuberative character appeared on the abdomen and up towards the shoulders. The jaundice increased. On Dec. 15, the hemorrhages had extended over her chest and on Dec. 17 he died.

At the post mortem it was found that the hemorrhages were not only palataneous but extended through the muscles. The liver was much enlarged and was studded with cancerous masses to such an extent that the left lobe almost no liver tissue was visible. The cancer also affected the lungs, the naso-
the transverse was color at the ventrums. The
gutted end of the stomach was thickened and fiery and
the pancreas was hard but to the naked eye to be
distinctly pancreatic. The bile duct was greatly
dilated and there was no fluid in the duodenum.
The pancreas involved the pancreas in the portal region
and there was inflammatory pancreas and about the
bile duct was injected, and gall bladder distended.
The obstruction was produced probably by the presence
of the gall bladder and bile could thus pass
into the duodenum. There was thus an evident cause
of obstructive jaundice present.

(12) Cancer of Stomach and of Liver. The
patient left the hospital and died shortly after the ob-
struction was made. Liver colored with bile, 80 per.
cell, no albumin in the urine. Bile salts increased
to 240 per cent. Bile pigment and considerable
quantity of cholesterol a few yellow casts with
granules. bile stained, and acid emulsions. Ten
(13) Cancer of Head of Pancreas with jaundice and
glycosuria. 7th of recorded cases. Bile salts
increased to 200 per cent. Bile pigment in
considerable quantity.

(14) Cancer of Head of Pancreas with jaundice;
8th of recorded cases. Bile salts very largely
increased - up to 600 per cent. Bile pigment in
large quantity, no sugar.

(15) Cancer of Pancreas with jaundice of ten months
duration. Early in the illness caused the jaundice
is said to have disappeared for a time. No history of gall-stones. Now present, she had well marked jaundice and paracentesis. Abdomen not distended. Liver considerably enlarged, with no regularity but with slight tenderness at the margin. Gall bladder felt below it about three 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 pulsation upward, not tender. pulsation communicated through it from the aorta. It seemed to be connected with the tender surface of the liver. The note 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. Blood salts normal or only very slightly increased. Bile pigment present, but reaction not very deep.

2. Beliousness.

(18) Acute Beliousness of two days' duration. At return, urine high colored with large deposits of sugar. 10.30. No albumen nor sugar. Bile salts increased to 301 per cent. No bile pigment.

(19) Belious; enlarged liver; dyspepsia; yellow teeth with dental irritation, Eried acids, pains and albumen in large quantity. Blood bile salts 161 or 183 per cent. No bile pigment.
3. Cases of Malignant Disease in which there was no jaundice:

(18) Malignant Disease of Liver, Hepatitis and Cholelithiasis — the hepatitis not acute. 9th of recorded cases. Bilirubin diminished, no bile pigment.

(19) Carcinoma of Liver, which extends down to the level of the umbilicus, with nodulated surface and irregular margins. Chine tailed from points which from a large deposit, yellowish amber, of gr. 1034, acid; no albumen nor sugar. Bilirubin increased to 15 per cent. No bile pigment.

(20) Malignant Disease, probably of gastro-intestinal tract, 10th of recorded cases. Bilirubin normal maximum, but no distinct increase, (by 50 grains the standard amount of gravity). Bilirubin pigment in small quantity.

(21) Carcinoma of Liver which is enlarged, reaching to the level of the umbilicus. No jaundice. Chine of gr. 1036; large deposit of protein. Albumen in considerable quantity. Bilirubin normal maximum or slightly less. No bile pigment.

(22) Carcinoma of Stomach with uterine anaemia, a few nodules of cancer in liver. 11th of recorded cases. Bilirubin — no increase except once slightly (166 per cent) nearly a month before death. Pigment diminished to the normal or a little below it. No bile pigment.


(25) Cancer of Lesser Arc of Peritoneum and of Liver. 12½% of recorded cases. Bile salts generally normal, sometimes up to 300 per cent, sometimes with, sometimes without a trace of bile pigment.


(26) Dyspepsia, Enlarged Liver, Congestion: perhaps also Cirrhosis. Urine browned past, tested, pH 10.28, acid. Albumen in large quantity. No sugar in blood. No distinct reaction for bile pigment but marked pigment reaction with nitric acid, due to excess urinary pigment. Bile salts markedly increased 600 per cent.

(27) Congestion of Liver with Ascites. 13½% of recorded cases. Congestion not active. Bile salts normal or slight increase. No bile pigment.

(28) Cirrhosis of Liver with Ascites. 14½% of recorded cases. Bile salts not increased. No bile pigment.

(29) Limited Peritoneal Effusion; probably partly at least hepatic; also cardiac valvular disease. 15½% of recorded cases. Bile salts not distinctly increased, perhaps once. No bile pigment.

(30) Hepatice Cirrhosis of Liver, Enlarged Splenic, Cardiac Valvular Disease. 16½% of recorded cases. Bile salts distinctly increased on admission, only on slight increase after that (66 per cent). Bile pigment a trace on admission, did not disappear quite as soon as the bile salts. When the bile salts were...
increased again the presence of a trace of bile pigment was doubtful.


(32) Cirrhosis of Liver. - Urine turbid, orange coloured, p. H 10.18, acid, albumin in large quantity, blood and urochrome present. Bile pigments increased to 166 or 183 per cent.

(33) Cirrhosis with perhaps some other affection of the liver as well. (Middle aged gentleman). Patient for several months, and has been suffered every nine or ten days for a considerable time. Liver not diminished - rather enlarged. A mass is felt below the liver, probably connected with that on the right side below the ribs. The patient is thin and pallid. Last patient, actual jaundice. Name of first name - Unreadable. Jaundice and albumin in urine. Bells isle. 15 June 1886. - Treated from exposure winter, pediatrie colored. No distinct reaction for bile pigment with nitric acid, but a deep red colour. Bile pigments increased to 240 per cent. Trace of albumin.

(34) Child aged 5 years with enlarged liver, most probably cirrhosis or possibly enlargement resulting from abscess pericardium. Petites, passing yellow from time to time. Distended abdominal veins. Bronchitis. No cardiac murmur. Temperature normal or slightly normal. Clinic - age 1023. No albumin and bile pigment. Bile pigments increased to 300 or 400 per cent.

(35) Cirrhosis of Liver following upon Congestion, middle aged man. Very alkaline, phosphoric. He has for the last seven years had attacks of pain in the epigastrium
shutting to the back and on the right side below
the rib with occasional pains. Liver enlarged and
indurated; edge rounded and hard. Possibly also gall-
stones and possibly malignant disease. Otitis had been
on the left ear for sometime a fatty large nodule
was detected in the right side below the hair, moving
with it and evidently growing from it. He had left
jaundice on his admission but this varied and was
ever well marked. Urine generally highly coloured from
primary pigment, but without any distinct reaction
for bile pigment. Red blood corpuscles, e.g. 185 to 200 X
3. Enlarged Liver from other causes
than the above.

37. Acute enlarged Liver with pain, tenderness. Spleen
slightly enlarged. Oedema of legs and slight ascites. Brucelitis
found in placenta. Cardiac and hepatic murmurs. The patient
quite passed before and after a period with increased
temperature showed no perceptible increase in the
quantity of bile salts.

38. Enlarged Liver (? Fatty). Weak Heart. 17.28 in
recorded cases. Bile salts normal. 0 to 100 pigment.
39. Enlarged Liver. Consolidation of upper part of right
lung. Appendicitis. Rigors followed by sweating. Atmopnic
temperature 99.4. Urine of the day before the occurrence
of the rigors (after removal of blood and albumen), bile salt
3.240 per cent. Urine found during the rigors at 3 P.M.,
bile salts 3.6 per cent. There was thus not a great
difference in the elimination before and during the rigors.
6. Biliary Colic and Distended Gall Bladder, etc.

(40) Recurrent Attacks of Biliary Colic. 10th of the attacks while in the supine, 98th of the recorded cases. Bile salts not increased. No bile pigment.

(41) Attacks of Biliary Colic. 10th while in the supine. Bile salts normal. No bile pigment.

(42) Distended Gall Bladder. 20th of the recorded cases. Bile salts normal or slightly diminished.

7. (43) Gastric Disorders; attacks of chilliness. Bile salts diminished. 60 minutes giving only one half of the standard quantity.

8. Peritonitis and Neon.

(44) Chronic Peritonitis with obstruction of large intestine and paralytic distension of small intestine. Bile salts normal or slightly diminished.

(45) Umbilical Fistula (?Chronic Peritonitis) Bile salts normal maximum. No bile pigment.

(46) Chronic Peritonitis with fistula to left of umbilicus. Non-digestible procoag. acid; no albumen. Bile salts increased to 183 per cent. Bile not extractable much greenish, probably due to indigo which is present in large quantity.

II. Haemopoietic System.


(49) Anaemia. Bile salts much diminished.

(50) Advanced Anaemia. Bile salts diminished half the standard.
III. Circulatory System.

51. Cardiac, Enlarged Liver, slight jaundice on admission; albuminuria, 52% of recorded cases. Bile pockets not treated for till the jaundice and albuminuria had disappeared. They were then found to be diminished. No bile pigment.

52. Cardiac, Enlarged Liver, 53% of recorded cases. Not treated till he had made some improvement. Bile pockets diminished.

53. Cardiac, Enlarged Liver, 54% of recorded cases. She had edema and ascites for which she was treated. She had improved greatly before the bile pockets were treated for, the edema having been almost for some time. Urine contained no albumen. Bile pockets normal. No bile pigment.

54. Cardiac, Enlarged Liver, 55% of recorded cases. Bile pockets sometimes show some increase, up to 200 per cent, sometimes normal. No bile pigment.

55. Cardiac, Enlarged Liver, Ascites. A little albumen.
IV. Respiratory System.

(60) Phthisis Pulmonalis, with enlarged fatty liver, 24/15 of recorded cases. Urine — albumin in small quantity. Bilirubin normal, no bile pigment.

(61) Phthisis, fluid slightly enlarged. Large quantity of jaundice pigments. Bilirubin increased to 166 per cent. No bile pigment.

(62) Phthisis Pulmonalis, fatty liver, urine greenish yellow, turbid, papers 1016, acid, no albumin nor sugar. Bilirubin increased to 166 per cent. Bilirubin pigment in small quantity.


(64) Pneumonia of left case with slight albumin and slight jaundice — 28% of recorded cases. Bilirubin increased to 240 per cent. The bile pigment disappeared before the excess of bilirubin disappeared.

(65) Pneumonia of right case with albumin and a trace of sugar in urine. 79% of recorded cases.

Bilirubin largely increased, up to 300 or 600 per cent. Bilirubin pigment in small quantity at first, soon diminished to a trace and disappeared several days before the bile pigment had ceased to be in excess. checked red pigment reaction with nitric acid.

(66) Pneumonia of right case. He has been absolutely
and the once had great abdominal distension which has left striae (probably from ascites due to congestion of the liver). Distinct petechial conjunctiva, bluish-pink colored, turbid from urine. No albumen. 
Bile salts increased to 240 per cent. 

V. Integumentary System.

Bile salts increased to 240 per cent. Trace of bile pigment. Four days afterwards, urine amber-colored, almost 1027. Acid; no albumen. Bile salts increased to 230 per cent. More trace of bile pigment.

VI. Urinary System.

(68) S. Young - a child. Urine 1024. Bile salts, standard of purity is got with 500 minims, so that they are quite up to the highest normal point, but there is no distinct process. On the following day a distinct excess was found, amounting to 300 or 400 per cent.

(69) Pelletier's chlorate (22 grains). Sugar for urine. Urine dilute to 1030 (1008 plus 0022). Only slight turbidity produced with the system solution.

(70) Septicemia, chlorate through 4+-487.-preceding cases. Bile salts distinctly diminished. No bile pigment.

(72) Allulunemia, probably accidental. Allulunemia slight. Urine normal. R. bile salt = normal maximum (100 per cent).

(73) Jaundice for 10 months. No pain. Liver not enlarged. R. bile salts very small in amount, giving from 1/10 to 1/6 of the standard quantity.

(74) Chronic Lead Poisoning. Third stage of从此Bright's disease. Kidney diminished urine (20 ounces in 20 hours). Urine 2.5 to 1.5 gr. No bile pigment. R. bile salts several times present and always some present. R. bile salts = 0 gr. from 183 to 300 per cent.

(75) Many Bright's Disease with Nephritis or Nephrosphrenic Abscess. No passage of bile salts most of the time, but they become present a few days before death. From 240 to 300 per cent.

(76) Jaundice. 

A Jaundice of the left side of the abdomen extending under the ribs (possibly anterior). Allulunemia constantly present in the urine, but allulunemia small in amount. Occasional hematuria without any symptoms, probably normal. Rins of normal size, fainter than and pale, urine of average quantity or rather more. Urine normal or slightly increased - on day 5-18 grains, another day 6-23 grains. R. bile salt = no increase - about these fourths of normal maximum. No increase either when the hematuria ceased.

(77) Functional Allulunemia. Allulunemia constantly present in small quantity. Urine increased in quantity to from 150 to 180 ounces daily. Urine in pressure. R. bile salt definitely increased (to 150 or 166 per cent), at other times normal. Allulunemia from Exercise. (See page 60). R. bile salt varied from normal to about 600 per cent. This case...
VII. Locomotory System.

(79) Acute Obliteration, 31 out of recorded cases.

80. Salts in large excess - 600 per cent. Trace of bile pigment which disappeared before the second test.

VIII. Blood or Haemorrhagic Disease.

81. Purpura Sanguinosa - Urine amber colored, clear, very 10.25 acid. No albumen. Bile salts increased to 200 per cent. Two days afterwards, when rapidly improving.

82. The bile salts had diminished to 150 per cent.

83. Purpura Haemorrhagica, 7th June 1817 - Large quantity of blood in urine. No bile pigment. Bile salts a little below normal maximum. It is possible however that over-acidification of urine separating the albumen from the blood may have vitiated the result. On 11th June - Blood nearly disappeared from the urine. Bile salts increased to 183 or 200 per cent. The haemorrhage had been so severe that the patient never rallied but died soon after the last observation was made.

82. Haemophilia. No haemorrhages at the time the urine was examined, but marked anaemia, urine contained no albumen nor sugar. Bile salts much diminished. No bile pigment.

83. Leptalitis (under treatment). Bile salts normal maximum.

IX. Complicated Cases.

84. Marp Liver, Stomach, and Kidneys, Phthisis. 32 of recorded cases. Bile salts normal or diminished.
(85) Diarrhea, Inflammatory Bright, Swollen and afterwards slight at diminished level. Potassium oxalate paper (owing to acidity). 332 of recorded cases. Bile palpable normal at first, but gradually increased to 260 per cent. Urine acid gave a general blue reaction, but it was doubtful if it contained any bile pigment as there was a large amount of indigo present.

(86) Inflammatory Bright Disease, Cirrhosis of Liver, Ascites and Oedema of Legs. Urine contains albumin. Bile palpable markedly diminished, not giving more than a fourth of the standard quantity.


At the first mortem vegetations were seen on this persons of the internal valves. The lungs were in a state of brown embolization, hyperstatic congestion and oedema. The liver weighed 5 lbs 2 oz. giving and fatty, spleen considerably enlarged from chronic venous congestion. Kidney in a state of congestion with interstitial inflammation. Haemorrhage on the dorsum of the body and legs. Right ligament swollen and decolourised. Blood in body very fluid.

(88) Paralysis from malignant disease which was widely spread throughout the body, affecting the vertebrae, etc. There were complete loss of power in both lower limbs.
and loss of sensation from the fourth pel downwards.
Right pupil smaller than left. Light returns of
conjunction. Pupils dilate increased to 166 per cent.

A special importance necessarily attaches to the
observation in cases of jaundice, as the presence or absence
of the bile salts has been made by Hardy and others the
basis for differential diagnosis between obstructive
jaundice and what has been called jaundice from hepatitis.
The discovery of their presence even in normal persons, however,
shows that no obstruction to the outflow of bile is required
to lead to their presence in the urine. The practices which
Dr. O'Brien's febrile test gives with the urine, both of healthy
individuals and of patients unaffected with any form of
liver diseases, support the conclusion of O'Brien and
Dr. O'Brien of the bile salts as 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 marked product in the urine but merely a
difference in the quantity of one of its constant, or at least
normal, constituents. Dr. O'Brien states that he usually
found an increase, and generally a very decided increase,
of the bile salts in all forms and stages of jaundice; this
can be in cases of from one to four years duration. Of
the fifteen cases which I have recorded, two only showed
a distinct increase, varying from 166 per cent to 600 per cent.
Of the other cases one had only a slight trace of bile pigment
and it was doubtful if the bile salts were at all increased.
In this 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. This was a case of jaundice from obstruction, probably complete; there was 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 has ceased. This was not so in any of my cases, particularly in the cases of febrile and acute phlegmonous jaundice, in which there was only a small quantity of bile pigment with a large quantity of bile salts. It was also observable in the second and fourth cases of chronic jaundice; the case with the first and third cases (cases of chronic jaundice) - the discharge of bile salts had returned to the normal amount before the bile pigment disappeared from the urine. Towards the end of these cases also, therefore, there was jaundice, or at least bile pigment in the urine, with a normal secretion 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 the want of correspondence becomes more marked when we include in our study these cases due to heart disease, phlegmonous fever, &c., in which the presence of bile pigment is variable and its amount slight, while the discharge of bile salts may be large. Some explanation may, I think, be offered in regard to this variability in the relative quantity of these two ingredients of the bile discharged.
To explain these differences we must consider the conditions which influence the amount of the pigments of the liver in the system. These may be classified under three heads:—First, an increase in the amount of bile, if one or other of its constituents, secretin, is diminished; second, an increased absorption into the blood, due to increased pressure or increase in the blood vessels and bile ducts; third, a diminished or increased metabolism in the blood. It is the pigment which undergoes change, while the bile salts are little affected.

The first point in the explanation is, I think, the fact that the primary elimination of the bile salts in health differs fairly widely in different people, conventional urine containing a quantity which gives a reaction equal to the standard grating, while in others the opacity produced with the test so much less than that. This difference will necessarily affect the amount discharged in disease also. In the second place the composition of the bile may be altered. It is now well known that certain enzymatic agents produce jaundice. The most interesting substance in this respect is tyrosine, which has a powerful influence in liberating the haemoglobin from the red blood corpuscles. The result is that the liver is suffused with an abnormally large amount of free bile pigment, from which to form bile pigment; consequently the bile mixture contains a much larger proportion of bile pigment than is normal and becomes so viscous that it stagnates within and obstructs the ducts. The bile pigment, being so much increased, we cannot
W. Online Dreams of the River 1730.
expect the bile salts to appear in the urine in a degree proportional to the jaundiced color. Again, in jaundice from disease, while the metabolic conditions lead to the presence of 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 Harly, the bile salts are in greatest quantity at the commencement of cases of obstructive jaundice 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 changes in the rate of production and absorption of the bile, but the rapidity of the chemical changes which it undergoes may be altered, becoming more or less active under different metabolic conditions. It is mainly the pigment which undergoes change, so that in the former case the amount of its discharge 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 frequent 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 acid (just as the urine becomes concentrated), while the hepatic congestion which occurs leads to an increased.
absorption, even if no important change has taken place in the liver itself. On account, however, of the more rapid metamorphosis, the bile pigment is changed in the blood, so that little, or, as it may be, none of it is eliminated as such in the urine, whereas the bile salts are eliminated in large amounts. We may therefore rightly regard this excess of bile salts in the blood and urine as a colourless 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 jaundice.

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 a rule greater when it is due to, than when it is independent of obstruction, but there is in many cases of this latter class a pernicious blood change which may influence the composition of the bile in a manner similar to that of anemia.

Cases of jaundice from obstruction probably therefore in their early stage have a larger amount of bile salts in the urine than in the latter cases of jaundice, independent of obstruction, although these substances are eliminated in excess in both classes of forms.

While therefore the bile salts are my opinion present in excess in the urine in jaundice, I cannot agree with Dr. Blair that they are in every case present at all stages. Further, if, as is possible, there be a purely haemoglobin 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 pigmentation in the serum with a normal discharge of bile salts. I have, however, no facts bearing on this point. In all the cases the jaundice could be explained by the reabsorption of bile secreted by the liver.

The fourth case of catarrhal jaundice gives a very good illustration of the indication afforded by the bile salts in the urine as to the state of the biliary function. At first, when the jaundice was well marked, the bile salts were increased to 400 per cent. As the patient improved, this quantity gradually diminished, till, two days after the bile pigment had disappeared, it had fallen to 150 per cent., the smallest amount of excess recognizable by D. Oliver's method.

The chief interest regarding the case of catarrhal jaundice is the very marked effect which the operation of bile stasis had on the condition and function of the liver; the organ becoming smaller, the jaundice rapidly diminishing and the area becoming increased. To this I refer in relation to area.

In regard to the eleventh case there was very much less of the reaction for bile pigment than one would have expected in a case of such marked obstructive jaundice. There was no intense dark pigment reaction, but little or no green. Apparently the jaundice due to the liver had interfered with the ordinary pigmentary transformations which take place in it.

In the case of acute cholecystitis there was a marked process of bile salts without any bile pigment,
But with a pretty large amount of juvenile pigment. In the liver cases of biliousness there was a slight increase of bile salts with no bile pigment. These cases pointed to the action of which the bile salts give functional disarrangement of the liver even in the absence of bile pigment. In the cases of cancer of the liver without jaundice the results were variable, two showing an excess, one a diminution and two a normal amount, of the latter having a small quantity of bile pigment. One case, in which the main disease was jaundice, showed a normal amount except once when there was a slight increase. Even when there was marked enlargement of the liver, there might only be a normal amount of bile salts discharged. Of the two cases of cancer of the stomach, one showed a normal quantity and one a diminution.

Of the two cases of congestion of the liver, the one which was in a pretty acute stage showed a marked increase without any distinct reaction for bile pigment, while in the other which was not acute there was no distinct increase, only earlier observations on Carbutus showed very little in the way of increase, but later observations have altered this result. Thus in the eight cases, four showed an increase varying from 166 to 401 per cent, while a fifth showed a slight increase once. The others showed no distinct increase, in one of them there was a distinct diminution. In all congestion and Carbutus it is noteworthy that the jaundice is often deeply colored from altered pigment and gives
a marked reddish colour with nitric acid, but partly.
If the segment
is ferrous contains more than a small amount, our
often contains none at all, even when the bile salts are
present in pretty large quantity. This absence of bile
segment may occur in icterus too, as is shown by the
case described.

In these three cases of enlarged
liver (from rigueux) the quantity was normal, in
one case in spite of the occurrence of a first liver
In the fourth case the increase may be accounted for
by the rigor and rise of temperature. It may also
however suggest a hepatic origin of the icterus.

In the two cases of Biliary colic (with
the having attacks at the time) and in the case
of doubtful gall bladder the quantity was normal.

The nature of the case with gastric disorder
and attacks of chilliness in which the quantity was diminished
was somewhat obscure.

Of three cases of chronic Peritonitis, two
had a normal quantity and in the third there was none
increase.

In Simple Anæmia I have not found any
increase as Dr. Oliver had in some cases, but this may,
I suspect, be due to the fact that in none of the
cases had I the opportunity of examining the urine
while the anaemia was developing. 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; elsewhere did I
and any distinct process in this case of Pernicious Anæmia is in that of Falloès Anæmia.

Dr. Oliver had no opportunity for observations in Pernicious Anæmia. 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 is one of rapid destruction of the red blood corpuscles being more rapid than the normal, owing to the action of the blood, as evidenced by the presence of the bile salts in the urine. Hence the frequent frequency of jaundice and the value of arsenic in some cases.

In the case of Tubercular Disease of the liver, there was some increase which occurred in part at least to the elevation of temperature.

Of the few cases of Heart disease, known to which there was marked embarrassment of circulation, showed an increase, one in a fair condition showed a normal amount, while two who had made considerable improvement showed a diminution. I have never observed any change in the skin pigments. This variable condition of the secretion of the bile salts in Heart disease may, I think, be readily explained. Owing to the interference with the circulation through the liver and the changes in its function, the secretion 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 theory will explain...
the diminution in the amount of bile salts in the urine. Hence, though the patient has been restored to a pretty comfortable condition, there is a marked permanent change in the liver, but no interference with the flow of bile in the ducts. When fever, 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 formed in so large quantity as in health, are reabsorbed in large 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 sputum is, therefore, as far as these results show, of common occurrence in advanced phthisis, and this may be ascribed partly to the high temperature and partly to the marked changes in the liver which occur in phthisis.

The four cases of pneumonia all show a marked increase, one of them nearly as 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 presence of bile salts. The high temperature, in whatever way it acts, in doubling partly the cause of this presence of bile salts, but pneumonia still differs as to this explanation of jaundice in pneumonia. There appears to be a rapid destruction of red blood
(1) 
Droste of this Line £ 466

(2) 
Str. £ 466
propose, in the 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 red pigment reaction given with nitric acid. The bile salts, however, being less liable to be transformed in the system are excreted in large quantity. Despite of the presence of jaundice in the reaction for bile pigment may be quite absent and this is regarded as an unfavourable symptom, indicating apparently a great alteration in the ordinary chemical changes in the body. The jaundice has been ascribed by Arndt to deficient oxygenation, by others to congestion due to reflex irritation from the veins in the lung, and by S. Landor Brunt to some fungus – perhaps a mycotic organism – in the blood; the pneumonia in such cases being accompanied by typical symptoms. If no more than likely that not one but several conditions must be taken into account in this affection – the high temperature being accompanied by congestion of the fluid, cloudy swelling, and possibly some cataract, the high temperature and congestion probably leading at first to increased pressure and then to justification of the bile and consequently to increased pressure in the bile ducts and greater reabsorption. The deficient oxygenation may also be an element in this case, but if it were an important one, jaundice would
In more frequent cases with pyogenic than in e.
acellular organisms in the blood are doubtless also a
cause in cases with typhoid symptoms. Indeed
pyogenic foci in the blood are well known causes of
jaundice, and some chemical foci, such as
mycobacteria, produce jaundice partly by their
action on the blood. The reflex influence from the
lungs in the inflamed lung is doubtless also a cause
producing congestion and edema of the liver.
In the case of Rehenna there was on the one
day a normal maximum discharge, or otherwise a
distinct success. Dr. Reid on the other hand has always
found the elimination to be subnormal in Rehenna.
The slight reaction given by diabetes prima
may be explained by the large quantity of urine passed.
In the case of Rehenna there was always a
marked diminution below the normal in the excretion of
the bile salts, indicating probably a diminished formation
of bile salts by the liver which was slightly diminished
in size. The diminution in the elimination of the bile
salts suggests that possibly there had occurred chemical
abnormality may find its explanation in a formation
of the sulphon containing nitrogen in place of part of the
sulphon containing taurine which becomes conjugated into
taurine acid. Dr. Reid, in my opinion, says:
"Its composition forms an obvious point of
ressemblance between it and taurine, one of the elements of
the bile, Gbretto, however, no observer has succeeded
in making out that there is anything abnormal about
the hepatic secretion in those persons who have cystine in the urine, and has it been shown that this substance takes the place of the normal constituents of the urine containing cystine. The amount of sulphuric acid, at any rate, appears not to be much less, if at all, in urine containing cystine than in that which is healthy. As to whether there is any change in the quantity of the organic sulphuric compounds that exist in healthy urine urine, there seems at present to be no evidence. The absolute weight of the cystine present daily is probably never very considerable; it is a light, though constant, daily deposit.

The presence in the case of Enlarged Prostate and Cystitis seems accounted for by the rigor and high temperature.

The case of Albuminuria probably due to some return of the primary passages more than normal secretion.

"The Albuminuria in cases 73 and 76 had probably no relation to the kidney. In the latter it was probably a symptom of the malady, breast cancer."

The case of Carstairs Wright Davis from Chronic Lead Poisoning gives a different result from what I found in that form of kidney disease. In his case there was a distinct diminution whereas in this case there was a distinct and fairly constant increase.

The case of functional albuminuria was rather doubtful in nature. The cause of albuminuria suggests that in self-obligation by increased tonus the kidneys may explain it.
I am indebted to Professor Forsyth Stewart under whose care the patient was for the opportunity of making the observations on the elimination of the bile-pulse and serum.
The case of Alluminaria from illusory increase is one of special interest, especially as the pathology of this affection is still so obscure. I have described the case in relation to the urea excretion and shall now state here the facts relating to this discharge of the urine, which are of much interest, as well as those regarding the urine. I shall first give in tabular form some of the results of the examination so far as possible of the urine. A sample of each menstruation was obtained so as to make a full investigation into the condition.

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<td>25 June</td>
<td>7:45</td>
<td>Bed</td>
<td>70.1°F</td>
<td>Trace</td>
<td>240 or 300 cc</td>
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<td>12:45 PM</td>
<td>1.5</td>
<td>Bed</td>
<td>70.8°F</td>
<td>Trace</td>
<td>240 or 300 cc</td>
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<td>9 PM</td>
<td>3.5</td>
<td>Bed</td>
<td>70.5°F</td>
<td>Small quantity 150 or 160 cc</td>
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<td>2 PM</td>
<td>8:30</td>
<td>Bed</td>
<td>70.2°F</td>
<td>Trace</td>
<td>150 or 200 cc</td>
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<td>8:30 AM</td>
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<td>Bed</td>
<td>70.1°F</td>
<td>0.28</td>
<td>300 or 400 cc</td>
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The results on the 30th June and 1st July are far more accurate than the others owing to the purity of the urine. The urine in all the samples was free from bile pigment and sugar.

Dr. Oliver has shown, by a series of observations on the urine of a healthy individual, that there is normally a circadian cycle in the discharge of bile salts, the chief characteristic of which is that the elimination is greatest during the period of fasting that is, during the night, and that there is a rapid fall in the elimination after a meal and a rise again before the succeeding meal. This we may regard as being due to the accumulation of bile in the gall bladder and biliary passages during fasting.
Allowing for greater absorption, and to the discharge of bile into the intestine during digestion diminishing the amount which can diffuse into the general circulation, the bile reabsorbed from the intestine being again, during this period of active secretion, rapidly removed from the bowel by the liver.

In the case now described there is a marked change in the urinary cycle, in fact its variation almost in fact to be supposed. During the night the rate of elimination is at its lowest, but is quite up to and often above the rate of elimination during the period of health. The urine passed on rising shows a marked increase in the elimination, the process being then as a rule well marked. The urine passed after going about for a time and before breakfast is taken shows a still larger amount, this increase occurring coincidently with the appearance of albumen, and as I elsewhere show, with a marked diminution in the area of elimination. But the departure from the cycle observed in health is rendered most evident by the fact that after breakfast, the rate of elimination of bile products does not fall or fall only slightly from what it was while going about before breakfast, continuing in marked excess during the day while the albuminuria is present and the discharge of urine is the greater part of the day at least is as a rule low. Towards evening the rate of elimination again falls and it reaches its minimum during the night. The effect of exercise is well exemplified in this case - On 2/30 from the patient rose at 5:45 A.M., two hours earlier than usual. The urine passed on rising showed the bile products increased to 165 for cat.
That found at 4.45 contained a sequestrum of 300 per cent.
She then returned to bed till 7.45, and the same found
after resting for this time showed a fall in this sequestrum
to 200 or 240 per cent. The sequestrum found at
7.45 till quite exceptional at this period of the day, is
probably due, to an error in this estimation, mostly likely from
being required to add a little water and aldehyde to remove
the other sodium and having added in too much. The other
occasion on which the effect of exercise is well exemplified
is on the following day (24th June), when the patient
remained in bed till 10.30 A.M. When this patient was
at 7.45, the sequestrum was 240 or 260, and at 10.30 it was 200, a
considerable decrease, whereas had she been going about she should
have expected an increase. There is thus an absence of
the usual rise at this period associated with an absence
of exercise. The patient rose at 10.30 A.M. and after
exercise the urine passed at 6.30 A.M. was found to
show the sodium increased to 300 per cent. (The data
were: 9.30 A.M. and 12.30 A.M.) Both as if they had been
transformed, possibly from a mixture or blocking the bottle.)
There is therefore an increase in this bile salt elimination
produced by exercise, but this cannot be the whole ex-
planation of the condition because there is quite an
marked increase above the nightly elimination, and above
what is normal, in the per cent passed on rising. Further,
when the patient was kept in bed for thirty-six hours
a diurnal cycle continued to be observed with their
maximum during the day, but, as I have said, the
results for this period were less satisfactory than the others.
It is noteworthy, however, that when exercise was resumed

in the following morning, there was an unusually

marked increase, to the elevation of from

450 per cent on rising to 600 or 700 per cent at

three quarters of an hour afterwards.

These facts therefore give evidence of some marked

condition of the fluids which is affected by exercise but

which is recognizable independently of it. It requires only

one step further to associate this observed abnormality with

the abnormality in the blood-pressure and with

the occurrence of the albuminuria, but of this I shall

offer no anticipation here.

The blood in our case observed a somewhat

similar relation between the albuminuria and the discharge

of the palate. In this case the albuminuria occurred after

food and with it an excess of the palate. When the

albuminuria did not occur after food, neither did

the excess of the palate. His case was thus apparently

influenced by food, whereas in the case I have described

exercised (and that only in the upright posture) was the

factor at work, while diet appears to have little or

no effect.

The cause of acute albuminuria resembles that

of acute hemorrhage in the large excess of the palate

with the trace of blood which disappears before

the excess of the palate. The conditions to high temperature,

congestion, destruction of red blood corpuscles, and the

consequent excessive formation of red pigment and
preparation of life are in all probability beside the 

factors in this explanation, but have different relations 

has in this case certainly nothing to do with the 

process. The question as to the action of 

micro-organisms here also suggests itself. 

The cases of hemorrhagic Diarrhea are 

interesting owing to the well known power of the bile salts 
in causing hemorrhages. They were increased in both cases 
of Peripneumonia, though not greatly. It is of course possible 
that they may have been in larger quantity when the hemorrhages 
occurred. The gases at least indicate a deranged condition of the liver in such cases. Reference may here 

be made also to the case of enlarged liver with Hæmaturia 

(no. 59) in which the bile salts were markedly increased. 

This influence of the bile salts suggests a possible relation 
to Hæmophilia. In this case I examined there was a 
distinct diminution, but there were no hemorrhages 

occurring at the time. Dr. Priest found a distinct 

increase in leucocytes; there was no excess in the same 

I examined, but this may have been because the 

patient had been undergoing treatment. 

In the case of Megalos Diarrhea there was no 

increase. 

In the case of Peritonitis Diarrhea with 

inflammation Bright's Disease, etc., in which there was first 
a normal and afterwards a gradually increasing pleasant, 
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 within primal addition.
to the intestine. The most probable hypothesis is, I think, that the bowel, at first partly due to constipation, led to the formation of enteric masses or other parasites in the intestine, and that these, being absorbed, set up the nephritis and by their action with fever led to certain degeneration and to a subacute atrophy of the liver, with such influence interference to the flow of bile that the gall salts were reabsorbed in excess. Unfortunately, a post-mortem examination was not obtained.

The case of Carcinoma of the Liver and Inflammatory Bright Disease, with ascites and oedema showed a marked diminution. The ascites, as we have seen, might or might not of itself lead to excess, whilst the renal disease would interfere with elimination and so sufficiently account for the diminution.

The case of Bright Disease with enlarged liver and ascites and with ascites and oedema showed a pretty large excess which was sufficiently accounted for by the high temperature (due to pyrexia) and by the anemia and fatty condition of the liver found at the post-mortem. This patient, like many in whom the liver is diseased, had towards the end hemorrhages in the skin of the body and legs and the blood in the body was very fluid.

In the case of Periaphlegia, the malignant disease was very extensive throughout the body; there was slight jaundice and the bile salts were present in slight excess.
These observations have mostly been made coincident with a series of observations on the incidence of Allisonia in which I have been engaged under Professor Brauner's directions.
The Second Series of Observations.

The simplicity of the albumin and urease tests has enabled me to carry out a fairly extensive series of observations on the peculiarities of the tests both in health and disease. I have already given the results obtained on the series of forty-two apparently healthy men. Those of 156 patients in the Royal Infirmary were tested by the albumin and nitric acid and the browning method, and done by the peptone method also. The series of 18 Fever patients were tested by the albumin and nitric acid and the browning method, and a similar series of observations was made on the series of 26 jaundice patients, but I shall speak of these latter separately. The series of 117 female patients were tested by the browning method alone, except in those, therefore, the one test acted as a check on the other, and in cases where these tests left any doubt Dr. Black's quantitative method was employed to clear it up.

I shall first give a tabular statement of the results obtained in the Infirmary, Private and Fever cases, and, to make the table as complete as possible, I shall include in it the results already given in the first series of observations as well as a few others from out-door Infirmary and Fever cases, which I have obtained at miscellaneous times. The results are given under four headings — a large success, a considerable success, a slight success and no success, those in which there was an actual diminution are included under the last head.
Table of Results of Observations on the Renal Elimination of Various Solids in Inflammatory, Fever, and Private Patients.

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### III. Circulatory System

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<td>Aortic Insufficiency</td>
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### IV. Respiratory System

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<td>Congestion of Lungs</td>
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<td>Recovery</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>------------</td>
<td>--------------</td>
<td>----------</td>
</tr>
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<td>Coccyx</td>
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<td>Pustules</td>
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**VII. Urinary System**

<table>
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<tbody>
<tr>
<td>Acute Pyelonephritis</td>
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<td>Chronic Pyelonephritis</td>
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<tr>
<td>Bloody Urine</td>
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<tr>
<td>Abnormal Protein</td>
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</tr>
<tr>
<td>Albuminuria</td>
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</tr>
<tr>
<td>Hematuria</td>
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<tr>
<td>Diabetes and Polyuria</td>
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</tr>
<tr>
<td>Pyelitis, acute</td>
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<tr>
<td>Nephritis, acute</td>
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<td>Pyelitis, bilateral</td>
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**VIII. Reproductive System**

<table>
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<td>Endometritis</td>
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<tr>
<td>Menorrhagia</td>
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**IX. Nervous System**

<table>
<thead>
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<th>Condition</th>
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<th>Inflammation</th>
<th>Recovery</th>
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<tbody>
<tr>
<td>Intracranial Meningitis</td>
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Note: The numbers in the table indicate the severity or presence of the condition, with larger numbers indicating more severe or frequent occurrences.
<table>
<thead>
<tr>
<th></th>
<th>Large Game</th>
<th>Cons. With B.</th>
<th>Right B.</th>
<th>As Success.</th>
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<tbody>
<tr>
<td>Hemiplegia</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
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<td>Hemiplegia &amp; Aphasia</td>
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<td>Aphasia</td>
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<tr>
<td>Cerebral Paralysis with Splenic Sympathy</td>
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<tr>
<td>Dementia</td>
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<td>Nerve Ruin &amp; Special Motions</td>
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<td>Giddiness</td>
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<td>Bells Paralysis</td>
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<td>Progressive Muscular Atrophy</td>
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<td>IX Locomotory System</td>
<td>Large Dose</td>
<td>Combination</td>
<td>Night Excess No Opening</td>
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<td>----------------------</td>
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<td>Acute Rheumatism</td>
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<td>Vasomotorism of Former</td>
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<tr>
<td>Haemophilia</td>
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<td>Peritonitis</td>
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<td>Purpura</td>
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<table>
<thead>
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<th>XI Constitutional Diseases and Conditions</th>
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<tr>
<td>Gout</td>
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<td>Chronic Alcoholism</td>
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<tr>
<td>Anaemia</td>
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<tr>
<td>Tuberculosis</td>
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<tr>
<td>Tertiary Appendicitis</td>
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<tr>
<td>Gangrene, Ulcers, Ulcers</td>
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<tr>
<td>General Weakened Hydrothorax</td>
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<tr>
<td>Overwork</td>
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<th>XII Complicated Cases</th>
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<tr>
<td>Dehiscence, Inflammatory</td>
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<tr>
<td>Bright, Endo 53 Brewers</td>
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<tr>
<td>Dehiscence, Bright, Inflammatory</td>
</tr>
<tr>
<td>Bright, Inflammatory, Bright, Endo 53</td>
</tr>
<tr>
<td>Bright, Inflammatory, Bright, Endo 53</td>
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</table>
The results revealed by these statistics, comprising 378 cases in all, correspond closely with those generally obtained in the series of 88 cases in which a quantitative estimation was made by C. Oliver's method. The results cullled by the 309 new cases, in which the simpler methods were used and C. Oliver's method only occasionally resorted to for confirmation, afford therefore additional evidence of the reliability and clinical value of those simpler tests. Subject of course to what has already been said regarding the fallacy to which they are liable and which were occasionally met with during the investigations.

I shall now make a few remarks regarding these thirty-one new cases, and shall after that, in part of the subject with the general conclusions which I appear to be warranted by the observations here recorded.

The cause of the salts found in thirteen out of the forty-one cases of Nephritis with or without other affection may be regarded as showing that there was a hepatic element in the nephritis in these cases. The cause in some cases of Dilatation of Stomach, Malignant Disease of Stomach, and of Gastric Ulcers may readily be explained by the gastric discharge having caused some functional...
or other disorder of the brain. The slight excess in urine,
may be similarly explained, and further, one of the cases
appeared to be tuberculous. In tuberculous and peritonitis,
this and the fever which may be present explain the excess.
The case with considerable excess was one of chronic peritonitis
following upon typhoid fever, and the temperature was
elevated and resembled that of typhoid in its type. The
excess in the case of pneumonia is probably from an inflammatory
in the frequent dependence on obstructed circulation in the fluid.
The result in the class alimentary remains practically correspond
with those previous given. The last case of nausea alimentaria,
it will be shown, shows a slight excess. The result of
the more extended observations in diseases of the Pulmonary and
Respiratory Systems are very similar to those already given.
An excess is found in some cases in all the paroxysmal lesion,
but the two which showed the larger excess were cases
with terminal pneumonia. One of these patients passed
into a state of postmortem condition for a time, which may have
had some relation to this excess of bile pupils present in
his system. There was distinctly jaundice and the jaundice was
marked. The urine was high, colored, dejected, watery, and
contained a considerable amount of albumen, but no red pigment.
There were specific parts with granules in them. The blood alkaline
measured his pulse in the fright diastole. The number
of droops in 10 minutes of urine was 28 or 28 1/2 instead of
26. Two days after when he had made considerably progress,
out the number of droops had fallen to 23. Another case
of Carletti Bright Disease in addition to that previously recorded,
showed a slight excess. There is some
doubt however, as to whether this case was purely cerebri or not. The absence of a constant (so I learned afterwards) from the resident physician in charge of the case, and as the specific gravity of the urine when I examined it was higher at 1027). The case may therefore have belonged to the so-called functional or nervous group. The considerable nervous ill-handling is interesting in relation to the influence of the lithium salts in producing kerosignosis. It has already been suggested by Dr. Smith that this may be a factor in the explanation of some such cases. The so-called tubercular meningitis is readily explained by the fever, and possibly by the occurrence of tuberculous pleurisy. What was the precise explanation of the slight success in the case of Wiltse, the two cases of Neurasthenia, the case of the spinal injury, and the fact that he had been in the hospital several times? It may have been I do not know. More likely there was some temporary degenerative arrangement in which the lier shared. The occurrence of the meningitis may have
been connected with something of this nature. The case of Neurasthenia and frostbite I examined very carefully. He had attacks of pain in the left lower back, and shooting in the
line of the lower dorsal nerve. Forward to between the
ribs, there were tender points corresponding to the branches of the lower nerves. There was also on the
right side, some on the left. The condition was evidently
functional or visceral nature. The lier admitted that
right arm was extended from the fifth rib to the
nose, a distance of six inches—an abnormally

large measurement, but he was not quite in fright.

Pread there was no complaint at all connected with the

condition.
With these must have been some functional alteration of its to account for the considerable excess of bile pools in the peritoneum, and this alteration was probably associated with the signs of jaundice and of the dyspeptic symptoms—weight, feeling of distension, heartburn, of which he complained. It is interesting that this hepatic abnormality was associated with a complete haemorrhagic tendency. It appears that for some time his gums and nose had bled readily and that he had occasionally on the limbs and trunk of the blood from his description appear to have been purpura. When he was examined it was noticed that two or three of these on the abdomen had not quite disappeared. There was no jaundice, nor was there any bile present in the urine, but it contained a small quantity of albumen. The venous blood had the normal—35–65 gm.

and the patient excrated freely every morning. A steady diminution took place in the quantity of bile pools after his admission to the infirmary. On the day of his admission, 10 minima gave a little over 24 drams; on the following day, 23 drams; and about ten days afterwards, 22+ drams, just the upper limit of the normal range. The albumen and albuminoid test gave corresponding results—showing a marked excess on his admission and no excess ten days afterwards. I saw them frequently while he was in the infirmary, but am just aware of the recurrence of haemorrhages. This considerable excess in the following case suggests a possible hepatic origin of the jaundice. The considerable excess in the case of Phenolphite from Menigo-Septicaemia finds a ready explanation in the fact that the patient was
at the time suffering from acute poisoning from a
bide in his part of the body, and had a
high temperature, which reached once at least to 107° F.
The fever in the cases of Acute Aluminaemia is peculiarly
explained by the temperature. The slight jaundice in the
case of Aluminaemia is a phenomenon of the fever explains
the course of the patient. Physical examination revealed
nothing abnormal in regard to the liver. A slight catheter
of the ducts is the most probable explanation. The process
found in these of the cases of Constitutional Aluminae
and conditions is readily explained by the Fatigue arrangement
with which they are liable to be associated.

The Scarlet Fever cases show a marked
manner the effect of septic conditions, as noted
by Dr. W. in increasing the elimination of the
cells along the normal. Out of 10 cases only 3 showed
no distinct fever. In one of them, there, with temperature
of 103°, the discharge was certainly at least up to the
normal maximum. In the others the temperature were
not obtained. In most of the others the temperatures
were obtained, and they ranged from 99.2 (in a case
with only a slight fever) to 105°. In nearly all
the cases it was the fever of the fourth day of the
fever which was examined.

One case I have omitted to mention in its Judge order
a second case of Aluminaemia from Infection. It showed no fever
of the patient at any period of the day. It was not however a very marked case,
the aluminae appearing in the appearance of the yellow fever, and only in the afternoon fever.
In this case,

One would not therefore expect such marked change in blood volume as the other
I shall now state the conclusions drawn from the foregoing observations regarding the renal elimination of the bile salts. These are:

1. That in the large majority of cases, both normal and abnormal, the presence of the bile salts can be demonstrated by all the tests.

2. That in health there is very rarely an excess of bile salts, and that, when there is, the excess is slight.

3. That in health the elimination of bile salts is not infrequently below the normal maximum standard, sometimes very considerably so.

4. That an excess of bile salts in the urine is frequently found in cases, whether the liver be the organ mainly involved or not.

5. That there may be in some cases no other distinct signs of hepatic disarrangement.

6. That there is frequently an excess of bile salts in the urine without any liver complaint, but that it may frequently, as in certain of the fevers, be associated with the presence of an excessive amount of other ingredients in the urine, more or less difficult from that present in the urine in health.

7. That while the slighter degrees of excess of bile salts are pretty frequent, the larger degrees of excess are much less common.

8. That they are rarely present in such amount as to produce any serious toxic symptoms, but that sometimes toxic symptoms are observed.

9. That the presence or absence of excess of bile salts...
in this period is a more reliable indication of the
functional condition of the liver than the presence
or absence of bile pigment, as the latter so much
more liable to change within the body.
10. That there may however be no excess of serious
infective diseases such as paralytic and cancer.
11. That there may be an abnormal diminution
in their amount in the urine, but that
conclusions cannot be so certainly drawn
from diminution as from excess owing to
the frequent low elimination in health.
12. That in all cases, whether the main
disease, an excess of bile salts in the urine
is to be explained by a concomitant disorder
or disease (functional or pathological) in the liver.
13. That an excess of bile salts in the urine
is pretty constant in jaundice, but that there is
not always an excess, at least at all stages.
14. That in cases which are recovering, or whom
the bile pigment disappears first from
the urine, while in others the excess of bile
salts disappears first.
15. That in long standing jaundice from
obstruction there may be no excess of bile
salts in the urine.
16. That in jaundice the relative quantity of bile salts
and bile pigments vary to a much greater extent in different
cases, the importance of salts & pigments being especially great in
J. That we may proceed to this, presume a colorless
judicious, in which an excess of bile salts, irrespectively
but in which no bile pigments is present as such.
8. That in all the cases here recorded the jaundice
can be influenced by the reabsorption of bile secreted
by the liver.
9. That in Belcher's the bile salts are present in
excess with less of urinary pigment, but with no
bile pigments.
20. That in Gout, and in Malignant Disease of the
Lungs, the secretion of bile salts by the kidneys varies
in different cases, — more increased, in others reduced
in others diminished — this depending upon the ratio
of secretion by the liver and the mechanical conditions
influencing reabsorption which are present.
21. That in some forms of liver disease, the occurrence
of hemorrhages is associated with the presence of an excess
of bile salts in the urine and therefore in the system, but
that such an association is not constant.
22. That in some hemolytic or hemorraghic diseases
or diabetic conditions, such as Diabetes, Pernicious
Anemia, Paraplegia, Hemorrhagic, there may be present of the
bile pigments in the urine, pointing to a deranged condition
of the liver as having some relation to the occurrence
of the hemolysis or hemorrhage, either by the influence
of the bile pigments otherwise.
23. That in diseases affecting the circulation through
the liver, such as paroxysmal valvular disease, there—
may or may not be an excess of bile salts in the
urine, this depending on the mechanical condition
of the blood vessels and bile ducts present in
different cases.
25. That there is frequently an excess of bile salts
in the urine in chest diseases associated with high
temperature or vascular obstruction.
26. That there is usually no excess in Bright's
Disease, but that even in the uricostatic variety
a slight excess may sometimes be found.
27. That so far as these observations show there is
little or no excess found in people suffering
Aluminuria.
28. That in Aluminuria from muscular exertion
the bile salts have been found in marked excess and
that an abnormal duodenal cycle has been made out
in the elimination, influenced by uricostasis, but
also depending on some marked condition of the liver.
29. That in Gout the marked distention have
been found which may be possibly related to a
deficient formation of uric acid and its replacement by
uricostasis.
30. That in Constitutional Diseases and Conditions
there is not infrequently some excess, resulting from
the Defective arrangements which are liable to occur.
31. That in these and other diseases associated with
gouty fever, the excess of bile salts is, to be explained by the
influence of the high temperature on the liver, inducing congestion, cloudy swelling, and perhaps catarrh, increased pressure in the bile ducts and consequently increased absorption, and perhaps also in some at least, more rapid secretion of bile containing a larger proportion of bile pigment than normal.

(32) That in Dyspepsia there is not infrequently an excess of bile salts in the urine, indicating that the liver shares in the digestive disturbance.
Another series of observations in regard to the renal elimination of the bile salts still remains to be recorded, namely those on the urine of peritoneal patients. This series of observations was made along with an investigation which I conducted under Professor Brown's Gummich direction in regard to the occurrence of Bile fractions during the perfusion, a subject suggested by a recent paper by Tschakaroff on detaching bile fractions in the urine of a considerable proportion of peritoneal patients. The test used by me that perfected by Dr. Palfo in which the presence of bile fractions is demonstrated by the formation of white sediments which appears when a urine containing them is run upon the surface of a little Zollinger solution: a fact which in my two trials of the twenty-six cases was such a reaction obtained and in these two it was my failure. I therefore felt justified in concluding that there is no marked elimination of bile fractions during the perfusion, though it is possible that more delicate tests to them than which we used may reveal traces of them. Allomass, as one would expect, was frequently present, even though the urine was drawn off with the catheterites as to present adventure with the Koch's. In regard to the elimination of bile salts some interesting results were obtained. I shall give these results in a tabular form, stating the number of cases examined each day after delivery, and the number in which there was a large, a considerable, or a slight success, and the number in which there was no success. This I gave on the following page, as in the previous statistics these terms used to denote the amount present are only comparative, depending on the varying intensity of the reactions in different cases.
### Renal Elimination of Bile salts in Puerperal Patients

<table>
<thead>
<tr>
<th>Day</th>
<th>1st Day</th>
<th>2nd Day</th>
<th>3rd Day</th>
<th>4th Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Delivery</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Day of Delivery</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2nd Day (5 or 6th)</td>
<td>15</td>
<td>7</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3rd Day</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>4th Day</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>5th Day</td>
<td>11</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6th Day</td>
<td>10</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7th Day</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>9th Day</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>9+ Day</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

These statistics bring out pretty distinct results. Only specimens from one case were preserved before the delivery and these showed that for about a fortnight at least before delivery there was a large or at least a well-marked excess. In the specimen obtained from the patient on the day of delivery the same result was obtained. On the second day fifteen were tested, in all except three there was an excess, and in only three was the excess slight. In two it was considerable and in three it was large. Of the three specimens which showed no excess or no distinct excess one was from one of the cases which had been found to show a large excess on the day of delivery. Specimens from the other two cases had not previously been obtained. On the third day we find a marked difference. Of the seventeen specimens tested, in only one was the quantity not six excess, while in none of the others patient was the excess more than slight. There is shown the
third day a very marked fall in the elimination of the salts.

From this period onwards the only distinct feature is a
proportional increase in the number which show no process.

The specimens, however, taken on the fifth and on the
sixth days respectively showed a considerable process. A
specimen from one case was examined on each of these
days. By the two previous days the process in the urine of
this case had only been slight. What the explanation of
this process may have been I do not know. The other
considerable
specimen which showed a marked excess on the fifth
day had not been previously tested. The other one showing
a considerable excess on the sixth day had not been previous
ly tested since the second day and the explanation of the
persistance of this amount of process cannot be explained
by the fact that the patient was suffering from cholera.

These results show that at the period of

delivery (and probably for some time before it) and during
the day after delivery there is as a rule a marked increase in
the elimination of the salts and that after the second day of
the operation, and sometimes sooner, there is a marked fall in the
elimination. The process, whatever its frequency, before
delivery is, I think, to be explained by the interference with
the portal circulation which advanced pregnancy involves. During
delivery the severe muscular strain exerted upon the abdominal
organs and the general disturbance of the system which occurs
are sufficient to explain the process. Then after delivery there
is to a large extent a cessation of this condition which
furnished led to the process, and thus, in the course of two days
or so, the process, if it continues, becomes as a rule slighter
(1) Route from St. to Lago. Kilometres and Kilom. Meters 2 315.
While, however, the phenomena are to be explained, they may have a further meaning. They not only the causes of the cells in the system at this time have some influence in leading to the degeneration and breaking down of the tissue, which muscular fibres of the wall of the uterus. This power of destroying the red blood corpuscles is well known. The muscular wall of the uterus after delivery having lost its function, is just in a condition to be so acted upon. They have no power to be acted upon by any locomotory action, but they might cause a fatty degeneration and breaking down of the muscular muscular fibres, the product of which would then be removed by the blood. Indeed it has been shown by Reydon that the bile acids cause a fatty muscular degeneration not only of the glands but also of the muscles. The large quantity of bile salts in this system at this period may not only therefore be due to interference with the hepatic function by conditions which cannot be regarded as physiological, though bordering on the pathological, but may also have a physiological function to perform in relation to the resolution of the uterine.

These observations may also be taken to regard as giving some support to the suggestion of Dr. Olney that the power of the bile salts to produce haemorrhage, they being present in the blood may be a factor in the production of bleeding in some cases.
Detection of Bile Salts in Serous Exudations.

In these cases I have by Dr. Oliner's test detected the bile salts in serum fluids.

In the case of Fall, Stone, Access in the Gall-Bladder to which was operated upon by Dr. Rowan, I examined the fluid found in the peritoneal cavity at the post-mortem. I have given an account of this in the report of the case. The albumen was removed from it, and the clear fluid was then diluted to the specific gravity 1008. The minims were then found to give a density equal to the standard. Thus, if in this wound, which a much as was found in the urine the last time an estimation was made before the patient's death.

In the recent recorded case of Cancer of the Pancreas with (Margaret Miller) the fluid from a pleural was similarly examined, and the bile salts were found to be present in much larger proportion than in normal serum. It will be remembered that they were present in large quantity in the urine.

In the first case of Carcinoma Bright-Dowman, which showed an excess of bile salts in the urine I examined the fluid drawn off from the pleura by the aspirator. After removal of the albumen by careful sedimentation, boiling and filtration, the specific gravity was found 1038, and thirty minims gave the standard amount of density. In the proof the amounts varied from 183 to 300 for cts.
Determination of the Amount of Bichlorate which gives an opacity equal to that of the Standard in Dr. Oliver's Salt.

With the view of determining the actual weight of the salt discharged, I made some observations with a solution of bichlorate of soda in order to find what weight of it was required to give an opacity with 60 minutes of the fifteen solution equivalent to that of the standards. Solutions of known strength were made, and those of the experiments closely corresponded, the weight of the salt required in one case being 171.43, in another 176, and in the third 174.4 grains. Of these, to correct the weight of the salt (of it entire in the form of bichlorate of soda) present in 50 ounces of normal prime would be about 5¼ grains. This in a few per cent with 600 per cent, there would be 50 ounces be 33 grains. This is a considerably larger amount than has been found by this method. Thus Count Boscoty gives 0.5 for end of lake acids (not bichlorate) as his highest estimation, and he gives 0.3 grammes (9.6 grains) "as the maximum of lake acids present in fumigation by the prime as 30 hours." Further observations on the subject are however required. Dr. Mitchell says that "it may be doubted if the real amount of lake acids in this prime has ever been properly estimated." I have not been able to go into the subject as fully as I desired and I only give the above results tentatively.
(1) Disease of the heart p. 314 - 315.

(2) Inflammation of the brain and third synvule - p. 107
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 has still more interest in some other diseases in which haemorrhages occur, such as paroxysmal haemoglobinuria, purpuric exanmia, and perhaps others, appear to be related to or dependent upon some moulded 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 due to various engorgement from impeded circulation in the liver (such as haemorrhages from ulcers and the profuse or even fatal haemorrhage which occurs from the distended vessels at the coronary end of the thorax and lower part of the mediastinum in cases of advanced peritonitis), there remains a class of haemorrhages into the skin, mucous surfaces and other parts which are characteristic of liver diseases and which on 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.

(1) A physiological account is due to some altered condition of the blood. Dr. George Harvey refers to these, as to those other forms, a mechanical explanation, ascribing them all to the obstruction to the circulation through the liver, tending back on the arteries and so raising the blood.

(2) Articles in Letter - 30th May 1895 re.
pressure. This explanation, though it accounts for some haemorrhages, appears to me quite inadequate to explain them all, especially as the occurrence and the amount of such haemorrhages appear to bear little relation to the amount of vascular obstruction. If the obstruction to the venous circulation were the cause we should expect them to be much more common than they are in heart diseases. Further, with an altered state of the blood by itself, explains their occurrence. As it is particularly in febrile diseases with jaundice that haemorrhages are apt to occur and as the bile-paths are known to have the power of destroying the red blood corpuscles and of causing haemorrhages when injected into animals, the haemorrhages which occur in diseases have been ascribed to them also. To讲解 of Mr. Lea, as I have already stated, justice better as having shown that the bile acids cause degeneration of the muscles as well as of the glands, and he suggests that the cause of the haemorrhages may be found in degeneration of the middle coat of the arteries. It would give a simpler explanation, pointing out at the same time, the fluidity of the blood, especially which die after the injection of the bile-paths.

In the cases which I have observed in addition to those in which there were haemorrhages from mechanical or accidental causes, there were at least seven which had haemorrhages of the kind now under discussion. These were the case of cancer of the pancreas with jaundice and glycosuria, the case of gall-stones (with aspiration) and cancer,
(case 5), one of the other cases of Cancer of the Pancreas (case 8), the case of persistent diarrhea with jaundice and Bright's disease in (case 33), the case of Carbuncle and Bright's disease in (case 84, among the first few cases of this type), together with a case of carcinoma of the liver (case 30), and a case of malignant disease of the liver in (case 41, among the first few cases of this type). Of these, five had jaundice more or less distinctly, namely the first, fifth, and the seventh, while all had constantly an excess of bile salts in the urine except the sixth, in which there was only a slight excess seen during several months, yet this was the most marked case of haemorrhage of them all. On could scarcely see a more marked case of jaundice, and he presented the golden-brown symptom (in hepatic disease) of haemorrhage from the urinary tract, the mucous membrane of the bowel 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 the bile salts were present in excess in the blood owing to their being insufficiently eliminated by the kidneys. Therefore in some of these cases also there were haemorrhages probably of a similar nature and defending blennorrhea in the stools. Such are the two cases of Purpura, and perhaps that of membranous, all with an excess of bile salts in the urine. The haematuria in the case of enlarged liver with constipation of the upper part of the right lung, in whose urine the bile salts were present in excess, may also perhaps be explained in the same way. There is no reason to believe that the membrane and Purpura affected
in the case of delayed necrosis, with excess of bile salts, were of hepatic origin.

While, therefore, both experiment and clinical observation favour the view that an excess of bile salts in the blood (choleasma) is to be regarded as an important cause of haemorrhage in hepatic disease, it is probably not the sole cause, apart altogether from those which are mechanical. The bile salts may cause, or favour the occurrence of, the haemorrhages in three ways, — by causing degeneration of the walls of the vessels, by destroying the blood corpuscles by their haemolytic action, 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 ways the bile may be said to produce a haemorrhagic diathesis.

In certain forms of disease their presence in the blood in large quantity is probably an important cause of haemorrhages. Other causes, however, markedly alter the blood and vessels; thus in some forms of poisoning (e.g. phthisis) there is degeneration of the walls of the vessel as well as of other parts and the coagulability of the blood is markedly altered. In the chronic form of liver disease, such as cirrhosis, we have in many cases the action, constantly or intermittently, of the slightest degree of excess of the bile salts, but we have also to take into account the fact that the deficiency of the absorption function of the liver must also produce a morbid state of the blood and consequently of the vessel walls, and this, as well as the action of the bile salts, must be an important cause of haemorrhage.
Some of the other toxic symptoms which occur in jaundice are known to be due to the bile salts, such as slowing of the pulse and weakening of the heart's action, and they may also be a cause (though not the only one) of the head and other serious symptoms which occur in some forms of jaundice. The explanation why serious symptoms are not more common from this cause appears to be that in jaundice, the bile function of the liver is generally to a large extent in abeyance. Thus, Schmiedeck found that very little bile pigment was discharged with the urine in jaundice compared with the amount normally secreted by the liver, and the same is true regarding the bile salt. It is rare to find more than 600 per cent (six times the normal present in health) or even as much as that. Ordinarily, even in cases of severe jaundice the quantity does not rise above 300 or 400 per cent. We should expect the quantity to be much greater, at least in jaundice from complete obstruction of the liver, were it to continue for a few days in health.

It will be observed that in the case of gallstones with suppuration and cancer (case 5) the amount of bile salt rapidly increased the day before suppression of jaundice occurred, and that this was followed by suppression of fever, brownness, etcetera, delirium and death.
(1) Mein Med. Wochenblatt 1865 - p. 989. - Gusta vom
F. W. Lappo-Bili, Janvier und Bilharz Disease - p. 366.
On the Renal Elimination of Urea.

The daily discharge of urea in most of the cases of renal disease which I have examined has been diminished—some markedly so.

The following is a tabular statement of the daily urea eliminations in the cases of Malignant Disease:

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Cause</th>
<th>Disease</th>
<th>Urea from Journal</th>
</tr>
</thead>
<tbody>
<tr>
<td>R.</td>
<td>11</td>
<td>Cancer of Bladder &amp; Liver</td>
<td>206 &amp; 157</td>
<td></td>
</tr>
<tr>
<td>D.</td>
<td>9</td>
<td>Malignant Disease of liver, jaundice</td>
<td>750 &amp; 407, nearly much diminished</td>
<td></td>
</tr>
<tr>
<td>M.</td>
<td>9</td>
<td>Malignant Disease, possibly of intestinal tract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.</td>
<td>10</td>
<td>Malignant Disease, probably of intestinal tract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.</td>
<td>12</td>
<td>Malignant Disease, probably of intestinal tract</td>
<td>371 &amp; 466</td>
<td></td>
</tr>
<tr>
<td>M.</td>
<td>6</td>
<td>Malignant Disease of liver, jaundice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.</td>
<td>5</td>
<td>Jaundice, probably of liver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.</td>
<td>7</td>
<td>Cancer of Bladder, jaundice, jaundice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.</td>
<td>8</td>
<td>Cancer of Kidney, jaundice, jaundice</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In all except two of these there is a distinct depression of the output and some of them a marked diminution. In one case the amount is normal or not much diminished. In the case of Robertson although the output was, at least, most of the time, complete or nearly complete, obstruction to the biliary duct with intense jaundice, the previous quiet, if not normal, standard is shown by the following examples of the estimations made:

<table>
<thead>
<tr>
<th>Date</th>
<th>Weight (gr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8th Dec 1875</td>
<td>494 grams</td>
</tr>
<tr>
<td>24th Jan 1876</td>
<td>613</td>
</tr>
<tr>
<td>9th Feb 1876</td>
<td>652</td>
</tr>
<tr>
<td>3rd March 1876</td>
<td>631 grams</td>
</tr>
<tr>
<td>18th</td>
<td>310</td>
</tr>
<tr>
<td>28th April 1876</td>
<td>538</td>
</tr>
</tbody>
</table>
In both cases of cancer and the obstruction, pneumonia therefore, the force in this case kept well up to the normal standard and sometimes even exceeded it. The explanation seems firmly to be that there was a chronic digestive process going on which acted as a stimulus to the liver. The relief afforded by the operation to the congested liver, though the jaundice was not removed, probably helped to keep the force of the liver and with it the elimination. The jaundice also rapidly failed shortly before death, the jaundice was in the small quantity which was secreted falling to half what it had been before. I have already pointed out that in the case of the dog jaundice to the occurrence of the suppression, the jaundice of the State had markedly increased.

In the case of Cancer of the pancreas with jaundice and glycosuria I refer to the steady diminution of the force when discussing the case in relation to the glycosuria.

In four cases of Congestion or Carcinoma of the liver the results were as follows:

Nurmi, Case 16. Jaundice + Carcinoma. 262 to 384 grains.

Lepcha, 15. Jaundice + Carcinoma. 240 to 390 grains.

Pedra, 14. Carcinoma + Jaundice. 324 grains.

Pymington, 13. Carcinoma + Jaundice. 399.9 grains.

In the case of Pedra, during a severe attack the pressure to 657 grains. In the case of Lepcha the elimination was very variable, but was at times diminished. In the case of Nurmi it was always diminished. In the case of Pymington the diminution was not great.

In three cases of jaundice in addition to these.
already given the results were:

Allen, Case 3; Creation of blind wound; 169 to 336 grms.

Henderson, Case 2; Catarrhal Jaundice; 328 to 429 grms.

Smith, Young; Production of liver with jaundice; 169 to 396 grms.

In the first there was a diminution, in the second a normal or nearly normal amount, and in the third a diminution. The third case requires further notice on account of the interesting fact that the man was found to have undergone a marked increase after the operation of hepatic resection. Some days before the operation the amount was 169.4 grms. and on the day after the operation the pressure fluid was found to contain 375.99 grms. This effect was apparently due to the relief of the congestion of the liver, it had a marvelous effect on the jaundice which rapidly diminished till on the fourth day after the operation it was scarcely detectable in the conjunctivae. The enlarged liver also underwent a distinct diminution. Though it was hopeless to look for recovery in such a case the benefit of the operation in the aspects I have indicated was very marked. My reason for introducing it here is in relation to the case. Further observations on the pressure before and after the operation are still desirable but I think the case strongly suggests that a diminished pressure of serum owing to the congestion greatly interfering with the hepatic function is one of the most important indications for its performance. In hepatic the area is as a rule increased owing to the greater activity of the secreting tissue, but if this inflammation becomes so severe as to greatly interfere with the functional activity, the area...
(1) **Compt.** vol 1, 1871 £ 469.
Means demonstrated, hence the best is the condition in which the operation is more especially warranted. A rise in the excretory urine after the marriage is well known, but there is no reason to believe that this is the explanation of the rise after the operation. It is by the direct effect on the state of the liver. It is interesting in relation to this to observe that Parkinson found that when the liver was actually congested and enlarged the amount of urine was increased, but that when congestion seemed to diminish, the diminution being proportional to the extent to which the secreting tissue was destroyed. He further observed that there was an increase of urine after stopping the abcess. It is interesting to note that adhesion of a distended gall bladder may be followed by an increase of urine, though no congestion of the liver is present. I had the opportunity of seeing a case in which this occurred in the Royal Infirmary this spring. Probably in such cases a reflex nervous influence explains the change.

In regard to the remaining cases, the case of Ewing showed a diminution (365 to 142 grains); in the case of enlarged liver with incline hart there was a diminution (228 grains); in the case of cysticercus (617 to 317 grains) the amount was normal, in the case of distended gall bladder there was a slight diminution (613 to 313 grains); in the case of peritoneal tuberculosis with inflammation on the right aspect the urine was a marked diminution (217 to 107 grains), in the case of locoystomia there was a diminution (268 to 200 grains).
In the case of acute alcoholic jaundice there was an increase in the area.

Examples of this amount in other cases are given in the following:

- 680 grams in one, 630 grams in the other.

This corresponds with what has been found in such cases by Dr. Roddy. The case of albuminuria from muscular junction (a girl of 13 years) showed a pulse about 50.
Medical Times and Gazette, vol 1, 1861, p. 666.
regarded as a normal discharge, e.g., 236 grs., 251 grs., 287 grs., but on one occasion it rose to 310 grms.

In the last mentioned case, a patient of Professor Grange's, I had the opportunity, while working on
the subject of Albuminuria under his direction, of making at
the same time a series of careful observations in regard
to the discharge of urine and bile salts. The whole series
of each determination was obtained as a separate test. I have
already given the results as to the bile salts. As to the urine,
the hourly elimination at different points of the twenty-
four hours was determined, and as this result proves
certain striking facts, I afterwards made for comparison
a similar series of observations in regard to the hourly elimi-
nation of urine in a healthy individual (the writer). This
subject I shall now discuss.

On the Hourly Elimination of Urine
in Health and in Albuminuria from Muscular
Exercise,

I shall first describe the features of the
hourly elimination of urine in health at different periods
of the day. I have, since making my own observations,
read the report of a long and very careful series of investigations
made by Dr. Edward Smith, partly on this subject. He
found that the largest hourly elimination occurred between
12 and 1 o'clock during the day, that there was a decrease
after the early dinner until after the llamnoon, when
there is another considerable increase, continuing from
about 3 to 4 P.M., and afterwards the quantity falls to the
eight parts of emission. The latest parts of emission, both of air and of urinary water, occurs in the night and to the breakfast hour, as the heat is found in the middle hours of the day, between the morning and evening meal. By our months, which I give in a tabular form, correspond with those of Dr. Smith in the main, though they do not very distinctly show a subsidence during the day. The hours of the meals, however, and other conditions will doubtless influence this in different cases.

Table showing the Hourly Elimination of Urine at different periods of the day in Health.

Commenced 31st Jan 1887.

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 P.M. to 12 midnight</td>
<td>going about in house</td>
<td>24°</td>
</tr>
<tr>
<td>12 midnight to 7.30 A.M.</td>
<td>in bed</td>
<td>17.4°</td>
</tr>
<tr>
<td>7.30 A.M. to 8.15 A.M.</td>
<td>before breakfast - up.</td>
<td>16.16°</td>
</tr>
<tr>
<td>8.15 A.M. to 11.45 A.M.</td>
<td>after breakfast - going about.</td>
<td>26.7°</td>
</tr>
<tr>
<td>11.45 A.M. to 2.45 P.M.</td>
<td>going about</td>
<td>20.84°</td>
</tr>
<tr>
<td>2.45 P.M. to 7 P.M.</td>
<td>dinner - going about.</td>
<td>19.4°</td>
</tr>
<tr>
<td>7 P.M. to 12.30 A.M.</td>
<td>in bed</td>
<td>21.91°</td>
</tr>
<tr>
<td>12.30 A.M. to 7.35 A.M.</td>
<td>in bed</td>
<td>17.1°</td>
</tr>
<tr>
<td>7.35 A.M. to 8.20 A.M.</td>
<td>before breakfast - up.</td>
<td>16.96°</td>
</tr>
<tr>
<td>8.20 A.M. to 1 P.M.</td>
<td>going about</td>
<td>18.2°</td>
</tr>
<tr>
<td>1 P.M. to 7.30 P.M.</td>
<td>going about</td>
<td>21.2°</td>
</tr>
<tr>
<td>7.30 P.M. to 1 A.M.</td>
<td>in bed</td>
<td>20.0°</td>
</tr>
<tr>
<td>1 A.M. to 7.30 A.M.</td>
<td>churning water.</td>
<td>16.0°</td>
</tr>
<tr>
<td>7.30 A.M. to 8.20 A.M.</td>
<td>up - after breakfast.</td>
<td>16.78°</td>
</tr>
<tr>
<td>8.20 A.M. to 10.30 A.M.</td>
<td>going about</td>
<td>21.93°</td>
</tr>
</tbody>
</table>
10.30. AM to 3 PM  going about  20.36
3 PM to 8 PM  going about  18.5
8 PM to 11 PM  in house  14.6
11 PM to 1 AM  in bed  11.9
1 AM to 8.15 AM  up before breakfast  14.68
8.15 AM to 2.30 PM  going about  20
2.30 PM to 8.30 PM  going about  19.66
8.30 PM to 12.45 AM  walk & in town  23.76
12.45 AM to 7.45 AM  in bed  17.76
7.45 AM to noon  going about  23.01

It will be observed that the urine passed on rising and that passed intermittently before breakfast were separately estimated, that object being to compare the results obtained with those previously obtained in the case of albuminuria from muscular exertion. Breakfast was taken about 8-15 or 8-30, dinner about 2-30 or 3-30, tea, and then a light supper in the evening. There was a good deal of walking, exercise between breakfast and dinner, a little between dinner and tea, and two or a short walk in the evening.

It is evident from these facts, that in health the secretion of urine distinctly falls during sleep. The urine secreted after rising and before the morning meal is taken shows no decided change in the rate of urine, except sometimes there is a slight diminution, sometimes a slight increase, and sometimes the elimination continues about the same. Consequently, therefore, the rate
If urine elimination during this period continues the same as during sleep, after breakfast, however, there is a marked increase, which continues for some hours and sometimes for several hours before dinner, and sometimes after dinner. The large hourly elimination continues till bedtime, but there is no distinct increase in the rate of elimination in the afternoon or evening, and the urine is, as stated above, not usually voided at all in the earlier part of the day. While there is this marked influence of diet, exercise has no perceptible effect.

The features of this hourly elimination of urine in the case of A.B. were not to be described. The patient was a girl aged 13½ years. The allunum was produced in the spring of 1882, some time after an attack of diphtheria, but it was certainly not the effect of this diphtheric poison, indeed, it did not appear till after she was going about again. It was first noticed by those attending her to present the well-known characters of allunumia, from muscular weakness, the allunum being absent from the urine passed within hours, the patient being on the wing, but present in that passed after she had begun to go about. The case was a very typical one of its class, allunum appearing in the urine very rapidly after she got up, increasing gradually after dinner, as much as or at any other periods of the day. I shall now give in tabular form the results as to the hourly elimination of urine. The allunum
were several times obtained both on rising and before breakfast, and it is the period of the before-breakfast period which presents the greatest interest. During the period for which these results are given it will be observed that some experiments were tried. On one occasion the pot was at 5 a.m. walked about till 6-05 a.m. then went to bed and rose again at 7 a.m. On another occasion the pot was at 6 a.m. and 10:30 a.m. and on another for thirty a.m. hours.

Table showing the Hourly Elimination of Alumina at different periods of the day in a case of Albuminuria from Muscular Exercise.

<table>
<thead>
<tr>
<th>Time</th>
<th>Pot</th>
<th>Urine</th>
<th>Amount of Alumina Eliminated</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-30 a.m.</td>
<td>7-45 a.m.</td>
<td>8 a.m.</td>
<td>Breakfast 2:15 a.m. 0:135 p.e.</td>
<td></td>
</tr>
<tr>
<td>8-45 a.m.</td>
<td>10-30 a.m.</td>
<td>11 a.m.</td>
<td>Breakfast 7:30-10:22:50 0:05 p.e.</td>
<td></td>
</tr>
<tr>
<td>10-30 a.m.</td>
<td>11-30 a.m.</td>
<td>12 p.m.</td>
<td>(after anesthesia) 4:33 p.e. 0:12 p.e.</td>
<td></td>
</tr>
<tr>
<td>11 a.m.</td>
<td>12-30 a.m.</td>
<td>1 p.m.</td>
<td>6:93 0:3 p.e.</td>
<td></td>
</tr>
<tr>
<td>12-30 a.m.</td>
<td>1-30 p.m.</td>
<td>2 p.m.</td>
<td>13:96 0:24 p.e.</td>
<td></td>
</tr>
<tr>
<td>1-30 p.m.</td>
<td>2-30 p.m.</td>
<td>3 p.m.</td>
<td>10:31:1 Than.</td>
<td></td>
</tr>
<tr>
<td>2-30 p.m.</td>
<td>3-30 p.m.</td>
<td>4 p.m.</td>
<td>11:62:9 0:18 p.e.</td>
<td></td>
</tr>
<tr>
<td>3-30 p.m.</td>
<td>4-30 p.m.</td>
<td>5 p.m.</td>
<td>8:04 0:05 p.e.</td>
<td></td>
</tr>
<tr>
<td>4-30 p.m.</td>
<td>5-30 p.m.</td>
<td>6 p.m.</td>
<td>9:48 0:05 p.e.</td>
<td></td>
</tr>
<tr>
<td>5-30 p.m.</td>
<td>6-30 p.m.</td>
<td>7 p.m.</td>
<td>7:47 0:05 p.e.</td>
<td></td>
</tr>
<tr>
<td>Time Period</td>
<td>Value 1</td>
<td>Value 2</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>---------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>5:45 AM to 7 AM</td>
<td>14.02</td>
<td>-</td>
<td>Trace</td>
<td></td>
</tr>
<tr>
<td>7 AM to 7:45 AM</td>
<td>37.716</td>
<td>0.06</td>
<td>µm</td>
<td></td>
</tr>
<tr>
<td>7:45 AM to 8:30 AM</td>
<td>6.1336</td>
<td>0.85</td>
<td>µm</td>
<td></td>
</tr>
<tr>
<td>8:30 AM to 9 AM</td>
<td>12.483</td>
<td>0.16</td>
<td>µm</td>
<td></td>
</tr>
<tr>
<td>9 AM to 10 AM</td>
<td>15.54</td>
<td>-</td>
<td>Trace</td>
<td></td>
</tr>
<tr>
<td>10 AM to 10:45 AM</td>
<td>8.2048</td>
<td>-</td>
<td>Trace</td>
<td></td>
</tr>
<tr>
<td>10:45 AM to 11:30 AM</td>
<td>9.147</td>
<td>-</td>
<td>Trace</td>
<td></td>
</tr>
<tr>
<td>11:30 AM to 12:30 PM</td>
<td>0.49</td>
<td>-</td>
<td>µm</td>
<td></td>
</tr>
<tr>
<td>12:30 PM to 1:30 PM</td>
<td>13.091</td>
<td>-</td>
<td>Trace</td>
<td></td>
</tr>
<tr>
<td>1:30 PM to 2:30 PM</td>
<td>7.36</td>
<td>-</td>
<td>Report by F. J. H.</td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Moisture</td>
<td>Saline</td>
<td>Albumen</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>--------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>8 AM to 8:45 AM</td>
<td>6:30 - 6:45</td>
<td>Yp.</td>
<td>6.5-04</td>
<td>0.079 Yp.</td>
</tr>
<tr>
<td>8:45 AM to 10:30 AM</td>
<td>Yp.</td>
<td>9.7833</td>
<td>0.057 Yp.</td>
<td></td>
</tr>
<tr>
<td>10:30 AM to 12 PM</td>
<td>(2nd estimate)</td>
<td></td>
<td></td>
<td>(estimation)</td>
</tr>
<tr>
<td>12 PM to 2 PM</td>
<td>Yp.</td>
<td>12.7</td>
<td>0.1 Yp.</td>
<td></td>
</tr>
<tr>
<td>2 PM to 4 PM</td>
<td>Yp.</td>
<td>10.028</td>
<td>(estimated)</td>
<td></td>
</tr>
<tr>
<td>4 PM to 6 PM</td>
<td>Yp.</td>
<td>7.087</td>
<td></td>
<td>(estimated)</td>
</tr>
<tr>
<td>6 PM to 8 PM</td>
<td>Yp.</td>
<td>15.899</td>
<td></td>
<td>(estimated)</td>
</tr>
<tr>
<td>8 PM to 9 PM</td>
<td>Yp.</td>
<td>16.784</td>
<td></td>
<td>(estimated)</td>
</tr>
</tbody>
</table>

The estimations were made by Dr. Brown's method by means of a standard salinity. While I am not satisfied that this method gives results which are quantitatively accurate, the data given are at least of comparative value, showing the increase or diminution of the albumen from time to time.

While there is some variability in these statistics as is inevitable in such an investigation, from circumstances which cannot be accurately gauged, some general conclusions may, I think, be drawn from them. The point of importance is that in this case muscular exercise has a marked influence on the secretion of urine, whereas in health it has little or none. There is evidence of the effect of diet, and notwithstanding the variability in the results, a general cycle may be made out. The nightly elimination however, tends to be abnormally large, and there is also a tendency to an unusually large elimination in the evening or in the latter part of the day. The main fact, however, is that during the earlier part of the day there is an abnormally low discharge of urine, and this low discharge is generally observed to begin coincidently with the
that of the albuminuria. This is very well marked on the morning of the 21st June when, with the onset of the albuminuria on getting up, the hourly discharge of urine suddenly fell from 8.793 grains to 2.761 grains. For nearly two hours after breakfast there was again a pretty large elimination, but that was followed by a far paler of elimination during the rest of the day, and then there was a very obvious discharge in the evening. During the night the amount of urine was pretty high at first from 9 to 10.30 AM, while up, the hourly discharge fell to nearly half of what it had been during the night, and this in spite of the fact that breakfast was taken about 8 O'clock. The same fact is illustrated in a very marked way on 23rd June, when the patient got up at 6 AM. While the remainder of the urine discharge markedly diminished while the man was slept again, from 5.45 to 7 AM it increased to a higher figure than it had reached during the night; then when the got up again there was a marked fall in the rate of discharge later on and this continued through the early part of the day. About day the remainder was still till 10.30 till, and though there was a fall at first the excretion remained tolerably high. Then, when the got up, the rate of excretion fell and during the whole day till about 6 PM it remained low, while the albumin was in larger amounts than usual. This association of a low urine excretion with (for the case) a comparatively large amount of albumin is also seen on several other occasions, particularly in the earliest part of the day. In the evening the rate of urine excretion again increased. The following night the excretion was unusually low, but its fall still leaves the next few days to go down. On 24th June there was a slight increase instead of a diminution in
in the three quarters of an hour after rising, but this was followed by a diminished discharge during the rest of the day, the total discharge from 9 to 9.30 still being only 9.9 grains, although this was the period of stagnation, whereas during the previous night it had been 10.358 grains. On the following morning the fall in the discharge of urine on the patient getting up was again distinct. On the 28th June, when the remains in bed, the hourly discharge from 9 to 9.45 still was one good. Unfortunately there is a doubt regarding these results, apparently the urine cannot have been all got or some other error must have occurred. On the following morning the fall in the excretion on the patient getting up was again distinct. The same day again shown on 4th July in the help breakfast question. In the first breakfast question which showed no diminution there was nevertheless a fall in the specific gravity from what it had been during the previous night.

These facts, I think, prove pretty conclusively that during the more active periods of the albuminuric, and especially at its onset, there is a diminished excretion of urine.

But there is every reason to believe that this healing is healthy thinking, there is no ground for believing that there is an accumulation of urine in the system. We must ascribe the low elimination to a diminution formation of it. Besides, no organic renal change could account for such rapid changes in the rate of elimination. I have already stated that this case, like others so called functional cases, shows no depreciating of urine in the twenty-four hours, and it has been pointed out particularly by W. Ralfe that there is actually an increased elimination of urine in what is called functional albuminuria, owing to the more rapid destruction of red blood corpuscles.
(1) Journal of Anatomy and Physiology, Oct 1886 and Jan 1886.

(2) British Medical Journal, Nov 24th 1885 - On the Relationship of Ulm to certain Disease Processes.

(3) Proc. vol 2, 1886 p 164.
in the blood. While this is so (and it is exemplified by some of the cases which I have quoted) it is obvious that in this case the excessive formation of urine is not constant, but, like the albuminuric itself, intermittent. The last part of the formation of urine in the earlier part of the day is made up of poor later on, but as a rule the urine in this case, though up to the normal for a girl of his age, cannot be said to be excessive.

This peculiarity and quite abnormal dependence of the urine formation on exercise, which in health has little or no effect on it, is, I think, an important fact in the pathology of this very imperfectly understood ailment. Some interesting researches bearing on this subject of urine formation have been published. It appears to be demonstrated that the red blood corpuscles are not only the source of this pigment, but are also at least an important source of serum. Dr. Virchow has shown experimentally that the secretion of urine is related to the activity of the liver secretion, and that substances which stimulate the liver to secrete more bile increase at the same time the elimination of urine. Dr. Thomas Price, from the clinical side, has come to the same conclusion. He believes that the red corpuscles are, like the health and activity, the chief source of urine. Dr. Price again in a recent paper on the functional albuminuric relations of the kidney to peripheral hemorrhagic albuminuria explains that by increased hemolysis. The urine, being supplied with an excess of globulin, forms urine in excess, but cannot keep pace with the liberation of the globulin from the corpuscles, which is therefore eliminated as such. In functional albuminuric, the hemolysis is all changed into globulin and then into urinary pigment.
In hemoglobinuria, there being some necrotic as well as albuminous mass the urine fails to transform, with albumin and blood fragments are discharged by the kidneys. The results which I have given, however, show that the albuminemia may be associated with a temporary diminution in the serum formation, the liver for some reason failing to transform the liberated albumin as actively as it should. The globulin liberated from the hemoglobin is evidently not in a fit state for being of further use in the economy. Its further destiny is to be transformed into album in the liver and discharged as such; the liver having failed to change the whole of this albumin, the remainder is exerted by the kidneys, as other forms of mercurial albumin are when introduced into the blood. Such appears to be the most probable explanation of the albuminemia in these cases in the light of the investigations of Dr. Polon, Dr. Thomas Hurd and Dr. Ralf, as in the light of the facts which I have now brought forward.

It is beyond the province of this thesis to discuss fully the various theories which have been proposed in explanation of such cases of albuminemia, but it is obvious from what has been said that no purely mechanical theory of transmigration of albumin through the walls of altered vessels is adequate to explain the condition. While an increased permeability of the vessel walls might account for the passage through them of albumin and for an increased diffusion of the parts into the blood and thence into the urine, it would not account for the frequent occurrence of albuminuria and the occasional presence of sugar in the urine. Alterations in the circulation perhaps a diminished blood pressure and
with a diminished blood supply to the liver) might account for the diminution in the size and for increased differences of bile salts in the system, but such an alteration leaves unaccounted for the fact that, while the formation of urine is diminished, the destruction of blood corpuscles in the liver goes on and in this absence of bile formation, showing that the supply of solubilis to the liver, whether normal or increased, is greater than the organ can make use of. Where diminution of blood or of blood pressure could not account for this, then, whatever fortuitous mechanical conditions may play in the process, functional we must recognize in this case a hepatic abnormality leading to altered or diminished chemical metabolism and markedly influenced by muscular exertion. The facts already recorded as to the elimination of the substances support this conclusion.

There seems, however, every reason to believe that the same explanation will not apply to all cases. Different cases differ widely as to the facility with which the albuminuria can be induced. The bile salts are, of course, in every case, and it is not likely that all cases of albuminuria from pressure can be related to a marked condition of the liver. In some cases it is probably induced simply by prolonged and protracted muscular exertion and in such it may be explained by a mechanical theory. We are, however, I think, justified in accepting a hypothesis as one of the types of this ailment, and the case of which I have spoken is a well marked example of it.
Observations on the Excretion of Indian in the Urine.

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

The observations are as follows:

I. Diabetic Melalunitis.

1. Urine of the 10th day containing nearly 22 grains of sugar per ounce. No protein.

2. Complicated with phthisis pulmonalis and pleuritides. Passing 180 or 200 ounces of highly excreting fluids daily. Being treated with salicylates of soda. Diabetes only a trace.

3. No treatment. Little or no protein.


5. Complicated with albuminosis. Indian slightly increased.

II. Cancer of Bladder.


On 12th Nov. Indian much increased.
- 16th - Little or none.
- 30th - None.

7. Of recorded cases. - No antisyphilitic given. Indian always increased, generally largely.

8. Following upon gastric illness. Symptoms of severe gastro-duodenal symptoms. Took 0.5 of koch's mixed sulfulphate of soda on 29th Jan.
31st. Long — Indicative only; slight increase.
1st July — Not much increase.
2nd — Moderate increase.
3rd — Diminished from yesterday.
4th — Light amount.
5th — Light increase.
6th — Light, not in distinct succes.
The patient died on 8th, and the diagnosis was confirmed at the post mortem.

(2) Indicating in large quantity.

III. Cancer of Liver, Pancreas, etc.

(10) 9th of recorded cases. — Malignant disease of liver, hepatitis and jaundice. Indication always or almost always increased.

(11) 10th of recorded cases. — Malignant disease probably of the gastric and hepatic. Indication — large increase.
Bilirubin in small quantity.

(12) 11th of recorded cases. — Cancer of head of pancreas with jaundice and glycosuria. Indication — distinct increase, but doubtful owing to bile pigment which was not removed.

(13) 12th of recorded cases. — Malignant disease of lesser case of stomach with some cancer nodules visible. Indication largely increased.

(14) 13th of recorded cases. — Gall stones, suppuration in gall bladder and bile ducts, jaundice, cancer of bile ducts and liver. Indication — distinctly increased, especially before operation.

IV. Peritonitis and Infections.

(15) Chronic Peritonitis with a nodule to the left of the
(16) A persistent, not well defined mass was felt in the right side of the abdomen below the line, with peritoneum not much involved, but without much tenderness. The patient vomited every few days. Bowels very constipated, which vanes, check dark; no jaundice. Urine contained no albumin, sugar or bile pigment. Indium in very large quantity. At the post-mortem it was found that there had been chronic peritonitis with cells. The large intestine was obstructed and the small intestine was distended, but with no constipation.


(18) obstruction (? malignancy) in large intestine. Indium not increased.

(19) Acute Peritonitis - indium in very large quantity.

(20) Chronic Peritonitis following typhoid fever. Indium in very large quantity, giving the urine a brownish colour, almost as if it contained bile. Natric acid gives a marked bismuth green colour both before and after removal of bile pigment by acetate of lead. It is doubtful if there is any bile pigment present at all. There is a trace of albumen but no sugar.

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

(21) 25% of recorded cases - liver considered increased.

(22) 28% of recorded cases - indium increased.

(23) 28% of recorded cases - indium considered increased.

(24) 22% of recorded cases - indium slightly increased.
(25) - "At times also— Ureum contains a small quantity of
albumin. Ureum is moderate or perfectly free.

(26) 26° of recorded cases, complained with for Constitutional.

(27) 24° of recorded cases— no albumin.

VI. Congestion and Cirrhosis of Liver.

(28) Cirrhosis of liver— Albumin and an albuminous
white pigment. Ureum— distinct increase.

(29) 15° of recorded cases— Cardiac disease, limited
functional action (3 cirrhosis of liver). Ureum— four
times its increase; only once some increase.

(30) 14° of recorded cases— Cirrhosis of liver with
ascites. Ureum— no increase.

(31) 13° of recorded cases— Congestion of liver with
ascites. Ureum— no increase.

(32) 12° of recorded cases— Hepatitis. Cirrhosis of
liver. Ureum— no increase.

VII. Jaundice and Biliary Derangement.

(33) Attacks of jaundice, occasional rigor, biliary
attacks. Liver enlarged, but with no irregularity. Pain
occasionall, below jambes— Probably a case of Bell Stone
and Biliary Bile. Possibly commencing carcinoma of peri-
colic tissue. Colour of skin suggestive of Addison's disease.

(34) 30° of recorded cases. Obstructive jaundice, large-
and tense tendon on abdomen. Ureum distinct though
not great increase.

(35) Severe bilious jaundice— Patient improving. Tenderness
our sense. Distended gall bladder. albums philiformes. albumen in pugor or fibrin. pigment in distinct. things not great excess.

(26) Acute Delirium. Ill for two days. Vomiting high. albumen in concentrated, but with no albumen like pigment or sugar. Indicae considerably increased.

VIII. Condylus Liver.

(27) 17° of preceded cases. Whitish color and yellow liver (adultery fat) no indicae.

IX. Gall Stones and Distended Gall Bladder.

(28) 19° of preceded cases. Distended gall bladder. Indicae - generally some increase.

(29) 4° of preceded cases. Attacks of bilious colic. Indicae generally moderate increase.

(39) 18° of preceded cases. Recurrent attacks of bilious colic and jaundice. No attacks when jaundiced. Indicae no excess.

X. Many Diseases

(40) Many Liver, spleen and kidneys - 32° of preceded cases. Indicae slightest most of time, became much increased towards the end. Jaundice worse than Jaun. Spleen detected.

(41) Many Bright Disease with loss of bowels or hemorhagia. albumen in wih and that like protein.

Absence. The privy for twenty few hours before death, contained indicae in large quantity.

XI. Jaundice and Bright Disease.

(42) 33° of preceded cases. Indicae in large quantity, giving the privy a brownish color.

XII. Anemia and Acromatousness.

(43) Indicae in large quantity.
XIII. Disease of the Hemopoetic System.
(44) 25th of recorded cases. Thrombosis of lymphatic glands. Iodine - no increase.
(45) Tuberculous - Iodine little more.
(46) 26th of recorded cases. Leucocytosis - Iodine - no increase.

XIV. Disease of the Respiratory System.
(47) 27th of recorded cases. Pneumonia with loss of color of the pink. Iodine in considerable quantity.
(48) 27th of recorded cases. Phthisis with fatty liver. Iodine - no increase.
(49) Phthisis - Urine contains no albumen nor bile pigment. Iodine - no increase or in large quantity.
(50) Phthisis - Urine colorfully yellow, no albumen nor bile pigment. Iodine slight or moderately increased.

XV. Urinary Derangements.
(51) 28th of recorded cases. Cystitis. Iodine in large quantity.
(52) calculus (degeneration in urine) Iodine not to be increased.

XVI. Healthy Individual.
(53) Iodine slight or increased.

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

The results of these observations may be summarized as follows:
1. That in uncomplicated Diabetes there is little or no tendency to excess of uric acid. (This is the case, however, in one or two of the cases, which see.)

2. That in three cases of cancer of the stomach there was a very large quantity, but that in one other case it disappeared while he was taking sulphate of soda, while in a fourth case the mode of treatment with sulphate of soda the quantity was moderate, or slightly increased and was sometimes not increased at all.

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

4. That there is a large quantity in both acute and chronic gastrenteritis.

5. That in obstruction of the large intestine there may be done, but that the presence or absence of excess cannot be used as a means of diagnosing the site of obstruction unless other causes (e.g. gastritis and cancer) which produce an excess can be excluded, and unless there is no evidence that the obstruction has not taken place in the small intestine, so much as to produce paralytic distension of it — that is, to produce secondary obstruction of the small intestine.

6. That in heart diseases with symptoms of backward pressure, such as enlarged liver, the results are variable.

7. That in long-term and permanent acidosis of the liver, the
results are variable. Of five cases, two had an increase, one of them however showing the increase only once in three examinations made on different days, while three had no increase.

8. That in cases in which there is a distinct interface with the liver function of the liver, as in jaundice from various causes and even in lithotrificial, there is a very constant cessation.

9. That in cases of gall stones, when there is no jaundice and the patient is free from colic, there may be no excess, and that in cases, even where present in a case having attacks and in another with destitute gall bladder.

10. That in a case of many stones observed during several months, the increase was only much increased towards the end, and that within two or many stones also showed a large excess shortly before death.

11. That in a case of persistent diarrhea with inflammatory appearance, Bright's disease, the quantity of urine excreted, probably due to fermenting by decomposition, product absorbed from the intestine, the quantity was very large.

12. That in anaemia and haematemesis, the quantity may be large. (This, as the results of previous observers, may be due partly to the anaemia or to the condition producing the haematemesis.)

13. That in tubercular diseases of glands, even in tumor metastasis, there may be no increase.

14. That in icterus neonatorum the quantity may be considerable, but in the case examined that may be explained by the resulting hepatic derangement.
15. It is possible, even when far advanced, that they may or may not be in curvature.
16. In conditions of the urine depending upon drainage of the food, the results are variable. In the case of dysuria, the large pressures probably tend to inflame in the general state of condition of the digestive organs which was present, as indicated by the dilated stomach, the somewhat diminished fluid and the diminished secretion of bile salts. In renal aegyris there was no mercury.
17. That even in health the quantity may sometimes be distinctly over the normal.

In regard to Jaffé's conclusion that

nucleus is in excess when there is obstruction in the small intestine but not when it is in the large intestine,

Case 18 in group IV supports the statement in reference to the large intestine. As regards the second case of the same group, the fact that there was chronic gastritis is sufficient to account for the excess of indigene apart from obstruction altogether; and further, the small intestine had become essentially obstructed owing to the gradual accumulation of the intestinal contents above the point of obstruction. Such a case therefore shows the limited application in diagnosis. Jaffé's observations on this point are, because this distinction can only be applied to cases in which there is no other cause of excess of indigene, and in which the obstruction has not been in the small intestine so as to lead to its obstruction. Finally, some of the chief causes of obstruction are among the most important factors producing excess of indigene.
(1) Medical Times and Gazette vol 2, 1877, p. 336. - From Centralblatt Med. Wien (Vol. 20, 22, 1877)

(2) London Medical Record 1880, p. 459-1. - From the Archives of Medicine, Augt 1880
With the observations of Senator, mine in large measure correspond, though I found no increase in a case of Tulas disease, in any of the advanced Phthisis nor in one of Carcinoma.

With the results of the post-mortem investigations of Aeneman mine correspond pretty closely, as is shown by the results of various diseases, phthisis, delirium of the stomach, diarrhoea, peritonitis, turberculosis, etc.

What I wish, however, particularly to draw attention to, in regard to my own observations is the relation of the discharge of mucus to the condition of the bowel secretion and the discharge of bile into the intestinal tract, for there has been no clinical method by which we could gauge the condition of the bowel function, but this has recently been supplied by Dr. Oliver's juice test for bile, the results of which I have already given. What I was concerned with here is the relation which the state of the bowel function, as shown by the renal elimination of the bile salts, has to the formation of mucus in the intestine and the consequent presence of mucus 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 substances in all the cases included in the Indian statistics in which they have been tested for. They are arranged in groups as before and the numbers correspond with the numbers of the Indian observations, so that the cases can in this way be identified.
Table showing the Relation between the renal elimination of Indocian and of Bell Salts.

<table>
<thead>
<tr>
<th>Group</th>
<th>Stomach</th>
<th>Disease</th>
<th>Nicotine &amp; Loss of Nicotine</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>Glucose of Pyramids</td>
<td>Increases in</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Moderate slight</td>
<td>No increase</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Marked increase</td>
<td>Normal</td>
</tr>
<tr>
<td>III</td>
<td>10</td>
<td>Subject R. of Bell</td>
<td>Loss of kidneys</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>weaving 20%</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Subject S. of Bell</td>
<td>Very large</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>weaving 20%</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Subject T. of Bell</td>
<td>Very large</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>weaving 20%</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>Bellman 80%</td>
<td>Normal</td>
</tr>
<tr>
<td>IV</td>
<td>15</td>
<td>Chronic Pyelitis</td>
<td>Very large</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Chronic Pyelitis</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Renal Infection</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Acute Pyelitis</td>
<td>Very large</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Pyelitis after Typhoid</td>
<td>None</td>
</tr>
<tr>
<td>V</td>
<td>21</td>
<td>Pyelitis</td>
<td>Considerable</td>
</tr>
<tr>
<td></td>
<td>22</td>
<td></td>
<td>Decreased</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td></td>
<td>Considerable decrease</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td></td>
<td>Slight increase</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>VI</td>
<td>26</td>
<td>Carious of Liver</td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td></td>
<td>Diminished</td>
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<tr>
<td></td>
<td>28</td>
<td>Carious of Liver</td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>Carious of Liver</td>
<td>Slight increase</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>Carious of Liver</td>
<td>No increase</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>Carious of Liver</td>
<td>Diminished</td>
</tr>
</tbody>
</table>
| Group | Number | Disease | Description
|-------|--------|---------|-------------
| VII   | 32     | Attacks of diurnal fever, | Distinct increase slight fever all day.
|       | 33     | Otitis media, reddened | Distinct increase, 200 or 300 p.c.
|       | 34     | Carotid sinus | Moderate increase slight fever.
|       | 35     | Acute Rhinorrhea | Distinct increase, 300 p.c.
| VIII  | 36     | Enlarged liver, white ascites | No increase.
| IX    | 37     | Acute fall, bladder | Generalized, normal.
|       | 38     | Attack of falling block | Generalized, normal.
|       | 39     | Recurrent falling block | No increase.
| X     | 40     | Mary Alice, Allen Viner | Light to moderate fever, normal.
|       | 41     | Mary Bright, ovarian | Large quantity, increased.
|       | 42     | Francis, young girl | Large quantity, normal.
|       | 43     | Andrew, Lethargic | Large quantity, normal.
| XI    | 44     | Tuberculous Hepatitis | Both very normal.
|       | 45     | Jules, ascites | Jules, ascites.
|       | 46     | Lame, ascites | Lame, ascites.
|       | 47     | Leukorrhea | No increase.
|       | 48     | Pleurisy, left side | No increase.
|       | 49     | Hepatitis, right side | Large quantity, slight fever.
|       | 50     | Hepatitis, right side | Moderate to absent, normal.
| XVI   | 51     | Suppurative | Large quantity.
|       | 52     | Healthy man, slight fever | Distinctly decreased.

This table shows that there is a marked correspondence on the one hand between the occurrence of a normal quantity, or a total absence of indicem and a normal amount of leukocytes, and, on the other, between the occurrence of an excess of indicem and a change in the elimination of
the salt, either in the way of increase or diminution. In the whole series of cases, except two or perhaps three, there is such a correspondence or the want of correspondence can be explained on other grounds. Thus the apparent diminution of the salt in the case of diabetes, without sugar, is to be explained by the large quantity of urine voided causing a great dilution in the proportion of salt to a given bulk of fluid. In the cases of cancer there is a want of correspondence, but cancer is itself an important cause of an excess of indigo. 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 many disease, persistent diarrhea and Bright's disease, anemia and leukocytosis, and cysticum with dilated stomachs, etc., there is enough to explain the excess of indigo without reference to the salt-palts, though in only one of these is there a want of correspondence. Of the remaining twenty-five cases, in which no important cause in the production of indigo apart from the liver function is present, only two or perhaps three, as before stated, show a want of correspondence, and even in regard to these the want of correspondence is somewhat doubtful. Of the remaining twenty-three cases, ten show a normal or nearly normal amount of salt, two show an increase of salt, while four show an increase of indigo with a distinct diminution of salt. Those showing the diminution of the salt may be regarded as having less weight as evidences than those showing excess; still I think they also may be accepted as being cases in which the formation of salt-palts is less than in
Healthy individuals, the deficient formation resulting in a diminished quantity in the intestine as well as in the urine. Again, all the cases with excess of bile pooled in the peritoneum, with the possible exception of the pneumonic, may fairly be regarded as having a normal or more probably a diminished (but far from an increased) quantity of bile, perhaps different in quality, which, owing to obstruction in the ducts or to changes in the pulsations of the liver, is made to diffuse a larger quantity than is normal into the blood and hence in abnormally small quantity (or not at all) into the intestine. Even in the case of the pneumonic, the jaundice conditions are probably present, the bile, perhaps forced to pass owing to the fever, being unable to diffuse more into the blood and to pass in smaller quantity into the intestine owing to engorgement of the liver or cataract of the ducts, perhaps aided by stagnation of the bile increasing further the pressure in the ducts.

The view which I have suggested is rendered all the more probable when we further compare the different groups of cases. Thus in the group of Jaundice and Bilious Congestion, all the four cases have an excess of jaundice and also have the other cases of jaundice not placed in this category. There seems therefore to be a constant or nearly constant excess of jaundice when there is a marked interference with the biliary function. Of the four cases in the group of Congestion and Stenosis of the Liver, only one showed an excess constantly, while another showed a excessive once in five examinations on different days, and the other showed no excess at all. The results in heart diseases are somewhat similar, and they show the correspondence to which
I have referred to a very marked manner. In these last 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 led, justified in concluding that in all or almost all these cases with jaundice in the urine and in similar cases, there is a diminution of bile in the intestine; whether the quantity of bile present in the urine has increased or diminished, while in cases with a normal or nearly normal amount of bile present in the urine, the quantity of bile discharged into the intestine was as a rule not far removed from the normal either. A complete correspondence in every case could hardly be expected, for, on the one hand, the liver might in some be secreting more actively than in normal, so that, while sufficient amount passed into the intestine, an excessive amount might diffuse into the circulation and appear in the urine; and on the other hand, in a certain liver secreting much less than the normal amount, the condition might be such as to favour absorption so that the quantity present in the urine might in that way reach the normal maximum, but not 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 and other diseases in which the biley function or the discharge of bile into the intestine so liable to be interfered with, and in which no other obvious
cause of an excess of mucus is present.

Can any explanation be given of how the

mucous should have this influence? I think two explanations may be given. It is well known in the case of the

mucous as a product, not of digestion, but of irritation, and that it is formed only when the contents of the

digestive tract become alkaline as they normally do when the biliary and pancreatic secretions are mixed with them.

Conditions which promote the irritative processes or

which interfere with the absorption of the proteins from

the bowel, such as paralytic distensions of the small

intestine, lead to an increase in the formation of mucus

and similar products. It might therefore be inferred that

the bile salts, which have some antiseptic power, would

interfere with the formation of mucus, and such a view

is supported by the fact that indium in this manner may

diminish or even disappear during the administration

of antiseptics as it did in one of the cases of cancer of

the pylorus whose sulphate of soda was being given. The case

of cancer of the pylorus

which was being treated with sulphate of soda showed only

a moderate or small degree and was distinctly no cancer at all,

whereas cancer of the pylorus is one of the divisions in which indium

is characteristically most abundant. Unfortunately, the

observations only commenced after the sulphate had

been begun, but for half in this case also, the formation

of mucus was held in check by the antiseptic action of the

sulphate. This then is the first explanation, but

then there is, I think, another of greater interest in regard to

digestion. When the bile comes into contact with the
acid eluye from the stomach, it precipitates the gluten 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 gluten so precipitated are prevented from passing as far 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 right up in the intestine by the mucous membrane with which they are in contact and which is stimulated to more active absorption by the influence of the bile. This stimulates, to be the second explanation of the effect of the bile salts in preventing the process of formation of indol, and it is probably the more important of the two. If the bile salts are deficient or absent in the intestine, it follows that not only is this catalytic action diminished or lost, but the gluten are insufficiently precipitated or are not precipitated at all, and consequently they are under less favorable conditions for absorption, are carried in large quantity further down the intestine and there in an abnormal degree undergo the process of fermentation which lead to the formation of indol and such odors, the products of which are more or less absorbed and appear in the urine.

I shall now conclude the subject with a few general conclusions regarding the presence of indol in the urine. These are:

1. That both in health and disease, decomposition of albuminous substances in the intestine must be regarded
2. That the frequency of an excess of induration or affection of the liver, particularly in those in which the liver function or the discharge of bile is markedly interfered with, affords to show that the one factor at least in the occurrence of such excess is the diminution or absence of the physiological action of this bile in the intestine.

3. That in the absence of other causes, an excess of induration in the liver is usually accompanied by an excess, or less commonly, by a marked diminution of the bile faecal discharge, so that we have a direct evidence of liver derangement apart altogether from the symptoms.

4. That with these observations and those of others how indicate to be in excess in a large number of diseases of very diverse nature, some severe, others slighter.

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

6. That in many diseases an excess may be present in some and absent in others cases and that in the same case there may be an excess at one time and not at another.

7. That in many cases in which it is found increased the excess is not in any way pathognomonic of the
described but is due to concomitant and subsidiary
conditions such as derangements of the tonuch, bowls
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,
tuberculosis, and, according to Dr. Grossuch, fracture
of bone.
1. Ibid. p. 276.

2. Ibid. Also in Bartholomew's Hospital Reports 1873, vol. 15, p. 161.

3. Ibid. p. 277. (Reg. No. J.3026.)
On the Occurrence of Sugar in the Urine in Three of the Recorded Cases.

Three of the cases which I have recorded present the symptoms of glycosuria, namely, a case of cancer of the head of the pancreas (case 7), a case of malignant disease probably affecting both stomach and liver (case 10), and a case of pneumonia of the base 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 a symptom which is 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. So rare is it that I can find no reference to it among the cases of obstructive jaundice recorded by Dr. Maclean, and Mr. Melville Legg, page 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, "glycerin disappears from the urine and that when the foetus is deprived of both the same circumstances, no sugar appears in the urine." On the other hand, he states that "Blochman found that when milk was given to a dog artificially jaundiced, sugar appeared in the urine."
British Medical Journal Mar 5-12, 1887. An Address on some of the rare symptoms produced by gall stones.
in the urine in the course of chronic and exhausting diseases is generally the forerunner of a fatal termination."

Dr. Ogden, in an address on some of the Rarer Symptoms produced by Gall Stones, states that they may produce obstructive jaundice and glycosuria. He relates a case in which, in an old man, jaundice with complete obstruction persisted after an attack of bilious colic and in which, soon after the jaundice commenced, polyuria began with thirst and loss of flesh. The liver was greatly enlarged, but not painful or tender. The specific gravity of the urine was 1030, and it contained sugar and some albumin. "Surely," he says, "we have evidence of the reflection upon the basis of an animal agency 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 Diabetic cases, the glycosuria in the form I have described 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 sugar also diminished greatly, till shortly before death the urine was quite free from sugar. This disappearance of sugar before death is, apparently, characteristic of such cases, just as diminution of the sugar in ordinary diabetes..."
occurs before death. Of the three cases of cancer of the pancreas with jaundice which I have examined, this is the only one which showed sugar in the urine.

This case is of course apparently quite at variance with the results of Dr. Segers' experiments, and the fact that these experiments were performed with great care and yielded a perfectly definite conclusion, while as this case has been subjected by chemical evidence under the scrutiny of the present case as to the difficulty of finding an explanation of it all the greater. The patient's diet was restricted in carbohydrates, and though the sugar underwent a diminution, it remained in considerable quantity till shortly before death.

The case recorded by Freislich is in many respects similar to the one I have described. There was jaundice from complete obliteration of the bile duct by cancer of the head of the pancreas, and there was constipation except near the end, when there were some diarrhoeic stools. The jaundice diminished come to the jaundice as did also the amount of bile pigment discharged in the stools. Discharge of blood from the bowel was a more marked symptom in Freislich's case, though it occurred in this also. There were polyuria and glycosuria, but while the former diminished in Freislich's case it remained above the normal till the end. In both cases, the sugar entirely disappeared. In relation to his case Freislich remarks that "Obstructive jaundice of this nature from low and the formation of sugar in the juices satisfied with fatty degeneration of the flow of bile. The frequency with which diabetes is accompanied by jaundice of this nature has appeared to me remarkable, out of nine cases I have seen strictly or fatty degeneration of the
(1) Biarsi & Thistlethwaite Physiology vol 1 p.377.

(2) University and Town Drainage. p.281.
glance is fair. It is still undetermined whether these diseases are to be regarded as the exciting causes of diabetes, and of its implicit manner they operate." These two cases afford strong clinical evidence against the conclusion which Dr. Legg drew from his experiments, that "in jaundice, if the obstruction be complete, no sugar from the blood shall appear in the urine." In relation to this it is of interest that not only does glycerin disappear from the liver when the bile duct is occluded in ligature, but in advanced diabetes in man Charles Lea finds that the glycerinic function of the liver is almost abolished, no glycerin being found in a portion of the liver removed by a surgeon. Robert states that in a variety of diseases and pathological conditions it quickly disappears, and that "the circumstances preceding death from diabetes, such that the liver usually contains a trace of amylaceous substance when examined post mortem." Apart therefore from any interference with the liver function, the disease condition of the advanced diabetes as to glycerin after ligature of the bile duct is found when death occurs from this cause. The theory of Perry, supported by experiments that diabetes may be due to a deficiency of the liver - the much oxygenated blood being supplied to it, naturally suggests itself an explanation, as an irritative condition of the liver with enlargement and congestion is produced when obstructive jaundice occurs. This, however, is a common result, whereas glycerin is seen in connection with it, and it was not particularly marked in the cases which placed the symptom under discussion. We should also expect it to be more common in jaundice from complete obstruction of the bile duct, owing to

(2) London Medical Record, 1881, p. 152.
the less of the digestive functions of the body passed into the general circulation. In Dürck's case hemorrhage into the fungal clotting was observed. In the case here described it is stated that the constipation in the course of the fever proved somewhat atrophied, but that there were no marked changes of disease. It seems very probable that the origin of the diabetes in such cases has no relation to the brain, evidently arising as it does directly from local changes in the stomach. Evidence to the muscular theory of diabetes action given by Dr. Bashford fits in well with the facts, especially as the amount of sugar was distinctly affected by diet. We are therefore content to this view and adjacent organs for an explanation. Herein lies, I think, right, emphasizing the importance of the pancreas in relation to diabetes and lacerations and diabetes have described 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 "Fermenting Diabetes," ordinarily commences with vague intestinal manifestations, vertigo, vomiting and diarrhea. There is habitual diarrhea with greasy or fatty stools, sugar is present in the urine in great abundance and there are polyphagia, polydipsia, polyuria and asthenia. The two cases I have spoken of do not present this group of symptoms, as the diuresis was not really abundant but in places of diarrhea there was constipation. In this particular there are also differences. In all probability former, though the cases are not typical of the form above described, the pancreatic disease was the origin of the diabetes, and so on way in which the pancreas may produce diabetes is through the intestine fluid.
it is interesting that in this case I have recorded the right
sacral ganglion appeared to be abnormally hard. Possibly
therefore the generative disease produced the glycosuria not
by itself but in conjunction with the fever, a marked
glycosuria or the presence of that function being part of
this process.

Though the precise explanation of this glycosuria
is doubtful, the description of such cases may do something on
the clinical side towards clearing up the pathology of glycosuria in
diabetes.

I return to the occasional association of jaundice
and glycosuria, it is interesting that Von Mattich has found
that fresh human bile has the property of transforming starch
into sugar, while Bajcinca found that the fresh bile converts
dextrose into glycogen and albumin. The action was not
due to either the bile pigment or the bile salt, whether
this action may have anything to do with the occurrence
of glycosuria in jaundice is however very doubtful owing to
the rarity of the combination of the two conditions. It is
indeed remarkable that there is so frequent grave disarrangement
of one or other of these two important digestive functions and yet
very rarely any evidence of a disarrangement of both together.

There are some other features of interest in this case
to which I will here briefly refer. — 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 liver obstruction. A few hemorrhages occurred,
but this was not a marked symptom. The diminution in
the daily quantity of urine toward the termination of the illness was accompanied by a diminution in the specific gravity.

During this diminution the quantity that was lost in the secretion of urine was more severe, but there was also a marked diminution in its daily amount. The daily leading

of urine gradually fell from 467 grains on 16th July to 189

grains on 26th August. Whether it fell still further

toward the end I do not know. This steady fall in the

discharge of urine is such a case as I think a very grace

point in progress. During the earlier part of the time

occupied by this fall the patient's general condition did

not markedly change for the worse, but the diminution in

urine made me suspect that he was beginning rapidly to

lose ground, and the subsequent progress showed that it

was so. The sugar both diminished in urine, and still

more markedly so from 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 this sugar.

The steady fall in the renal excretory function was

increasing failure in the functional activity of the liver and

there was further evidence of this in the fact that there was

some diminution in the proportion of bile pigment in the

urine and that, notwithstanding the great diminution in the

amount of urine the proportion of bile salts which persisted

continued about the same as when the quantity was large.

The second case, that of malignant disease,

probably affecting both 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

juice was tested. Similis in the case was about 249 pills

and only was coming back into the intestine. The case as far as small is present, may be compared with that received by Mr. George Kirby, and his remarks regarding the Pequod's

case, if the symptom may fairly be applied to it. I have

seen of the few cases of malignant disease was sugar found, though it's occasional presence, apart from Similis, is well known in such condition.

A case included in this is one in which evidence statistics

also showed the presence of sugar before death, such as the

case of W. Bright. Disease with Jeverness is known above

The juice of the twenty-four hours before death contained a

trace of sugar while that of the juice he contained none.

Similis in the same brand at the same time an excess of

seeds and a large quantity of juice.

The third case, one of Bright's, showed only a trace of sugar and that disappeared along with the fluids regurgitated from after the crisis. The Bright's case affected the case of the right lung and was accompanied by a

small amount of like fluid from the urine with a large

 succes of like salts. Contrary to what occurred in this case,

in diabetes, when a fulminating condition is set up, the sugar in the

juice commonly diminishes or may actually disappear. In this

case the sugar, passing with some water, together, might

be suggested as an explanation, just as emaciated precipitation

in dogs and rabbits, whether from disease or other causes may
(1) *British Medical Journal* vol 2, 1885, p 1052.
produce it. It may however with greater probability be ascribed to an inflammatory condition of the lungs with hyperaemia set up by reflex influence from the pleura of the inflamed lung, cut — the presence of bile pigment and excess of bile salts in the urine give evidence of such a condition of the lungs. Another suggestion which might be made is that the presence of the trace of bile in the urine in this case may have some relation to the fact that glycerin is present in the consolidated lung of pneumonia in larger quantity than in normal lung.

Glycerin in fever, in particular in pneumonia. Dr. Markham Hewlett related a case before the British Medical Association at Cardiff in which the patient had a feverish attack of about eleven days duration, "possessing no special features, with the condition of acute glycerin, in which the characteristic symptoms of diabetes — thirst and the excretion of a large amount of sugar laden urine — were prominent features." In a more recent instance of fever, the glycerin was here evidently induced by the fever state, and it disappeared when the fever ceased. The fever rapidly subsided under treatment with salicylate of soda. The marked influence of the drug suggests a muscular origin of the glycerin in this case.
Remarks on This Case.

Case 26. - Cardiac mit Pericarditis.

The chief feature of interest in this case is the recurrence of pericarditis under such conditions as apparently a complication of the second attack of pleurisy. During his first attack he had had induration and fluctuance as well. During the second attack this process is clearly seen in connection of the cardiac mischief, and it is interesting to observe that this pericarditis appears to have commenced over the part of the heart near the base and to have extended from there. Whether it was set up by the a direct extension of the inflammation or not, it is difficult to say. The mere chronic extension of the pleuritis is not a definite cause, and I think we must enter this under it as a direct extension of the inflammation which had probably been ignited up in the pericardium as a dependent chronic inflammation occurring as a complication of the pleuritis. Whatever view may be taken of it, the case is interesting in account of the rarity of this symptoms under such conditions.

In some of the other recorded cases persons with pleuritis also occurred, but in them it was readily explicable. This is the second recorded case (Case 247). It occurred in the same. In the case of many lymphatic and tuberculous pericarditis occurred and was highly fatal. In a case of malignant
disease of the liver. In this case, no focal points, pain, or tenderness in the liver, heart, or spleen was noted. There was general swelling of the parts about the affected area.

A more unusual (in fact very rare) complication was the occurrence of jaundice in the course of a case of diabetes mellitus. The jaundice was not due to the diabetic process, but it extended to the right for three or four miles over an area of about two fingers breadth in the line of the costal margin. There was tenderness in the subcostal region and distinct jaundice was noted. The liver was not markedly enlarged. There was no jaundice nor constipation. The bowel was normal, but there were well marked signs of phthisis and bronchitis, the opacities being especially numerous over the front of the chest on the right side.

The occurrence of jaundice in diabetes is certain, but in this case which I have examined it has not been mentioned. A possible explanation is that the inflammation may have extended through the liver from the pancreas.

[Note]
as it sometimes does, but this seems doubtful. It may
on the other hand have been connected with a circulatory
change which has been observed in some cases of diabetes.

Case 3.

CASE OF OBSTRUCTIVE JAMOHNES WITH LARGE DENSE
PLAQUE IN THE PATE OF THE ALBOMEN.

The patient gave a history of the most of the
plaque which might point to its being vascular, but
that it is purely a potential plaque is rendered improbable
by its peculiar persistence. It is plainly of obstructive
origin and this fact, in fact, if true has led to a more
viable in the abdomen five years ago suggests two explanation
-on the more probable, that a diverticulum has formed
after the burn, and that the consequent circulatory change
had led to plasmous of this common like such - the
other, that the infection spreading inwardly by the pleural
ligament and that the plaque has thus been involved in a
pneumonous process which has led to its occlusion.

Case 5.

CASE OF VESSEL STONES, AFFIRMATION IN VENTRONAL
and WIDE DUCTS, CANCELE IN DUCTS and HEAD.

This case is of much interest in regard to the
question of operative treatment. So far as could be
determined it was a suitable case for this, tho' not
well known, pain relief followed the operation, the jaundice,
Case 8.

Case of Cancer of Pancreas with Obstruction.

In this case the bile salts were present in unusually large amount, but their sediment as gradual diminution from 600 per cent in Nov. 14th to 300 per cent in Nov. 30th - three days before the patient death. It is here therefore a well marked example of the progressive diminution in the secretion of bile salts on pancreas from obstruction, owing to the functional capacity of the gland being more and more interfered with. So, it confirms the view of Dr. George Harley on this point.
Case 16.

Case of Hemorrhoidal Fissure, &c.

The point of interest in this case is the peculiar limitation of the area of ulceration - the right hemoroidal and right side regions remaining clear, in spite of other marked ulcers. The clear area on the right side further was not affected by change of position. The additional fact that this clear area extended, during this lifetime, posteriorly to the left, before there was only a half or half an inch in the level of ulceration in the middle line points to some peculiar localization of the fluid in these fissurement. There was nothing in the cause of the patient to explain such a peculiarity, it being more probably itself parane or partly hepatic.

Case 16.

Case of Hypertrophy of the Liver.

In this case from though the patient examined such obstruction to the circulation as to produce great enlargement of the spleen, there was no ascites. This was apparently explained by the insufficiency of the splenic force tissue in the liver allowing a sufficient free circulation to prevent the occurrence of ascites, but it is peculiar that the spleen should have undergone its great enlargement.

Before death the patient presented very characteristic foci hemorrhages which occur in advanced Carbohydr.
Case 33.

Case of Persistent Diarrhoea with Inflammatory Bright's Disease, Enlargement and subsequent diminution of the liver.

I have already given briefly the view which I have formed of this case. Apparently at first he had merely acute diarrhoea, most likely the result of cold. This proved intractable, and the most likely explanation appears to be that putrefaction decomposition of the intestinal contents produced poisonous substances perhaps phlegmonous which were absorbed and led to the change in the liver organs - a pan-hypogastria inflammation of the kidneys, and an enlargement followed by a subacute atrophy of the liver. This large amount of putrefaction in the intestine was produced both by the slow flow of the stools and by the great excess of indines in the urine. The great duration of the sickness is a possible reflection of the persistence of the diarrhoea.
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Case 1.

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

Professor Frank B. Harrison, Head.

James McGovern, age 21, Laborer,
Admitted on 10th Feb. 1885, suffering from Jaundice of about nine days duration.

History. He used to be the worst of drunks as a rule every Saturday and he has been in the habit of eating butter and bread to excess, taking 1/4 to 1/3 lb of it twice or thrice daily. 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 a general headache and weakness, but with no pains, churning or vomiting. The skin became itchy and he had a bad taste in the mouth. He had diarrhea for the first four or five days with pain and flatulence. He also vomited some greenish fluid. After the diarrhea ceased he had a feeling of heaviness in the scrobal region. This disappears 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 distention
Temperature 98.6.

Elementary system. Some slight anæmias.

Tongue frosted towards the back and clean at the tip. The mucous membranes are deficient and a bitter taste is constantly present in the mouth.

Appetite good. The feeling of weight in the pelvis becomes worse about three hours after food. He suffers from flatulence. Bowels constipated. Feces 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 percussion. The gall bladder gives an increased note for fully an inch below the margin of the liver and for fully an inch transversely between the right parasternal and middle line, extending a little beyond the parasternal line to the middle line.

The hepatic dulness extends from 4 inches above the umbilicus upward for 3 1/4 inches. In the right mammary line it extends from the 4th rib downward to about 1/2 inch below the costal margin, a distance of fully 6 1/2 inches. The superficial dulness begins at the 6th rib. In the right and auxiliary line it extends from the 6th intercostal space downward for 6 1/2 inches. The superficial dulness begins at the 6th rib.

In the left parasternal line the deep cardiac dulness begins at the 3rd 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 5th interspace on the left mammary line. I call the cardiac area the first sound is followed by a soft systolic murmur and the second sound is slightly accentuated.

Pulse 70 per minute, regular, of moderate volume, rather collapsing, soft, easily compressible.

Except for the jaundice, the other systems are normal.

Treatment - 21st July - Serulate powder
23rd July - Rhusbark, Bismuth, Joda powder, one ounce daily.
A blue pill was also given.

On 12th July, his condition had not markedly changed. The gall bladder was palpable, color is yellowish brown. The stomach, which is not distended, is soft below the pubesline. Stomach not enlarged.

By 20th July, the discus was becoming a little clearer, but there was still a deep yellow color of the conjunctiva.

On 26th July, the liver is still a little tender, with a tendency to palpation of abdomen. Tongue covered with yellowish white film.

On 27th July, the discus dulness in the middle line extended from 5 inches above the pubesline, upward for 3 inches. In the right mammary line just extended from the 4th interspace to an inch below the ribs, a distance of 6 3/4 inches. The superficial dulness commenced at the 3rd interspace. The mid portion

for the dulness extended from the 6th rib downward for 6 inches. Superficial dulness at 7 1/2 ribs.
There was slight tenderness in the epigastrium in the middle line. No tenderness on palpation of liver.

Complaint of pain in left side of region of lower part ribs. Slight palpable retrosternal movement.

Stools slightly yellow, but jaundice least marked in conjunctiva. Still some yellowish film, but not so much. Feels like his stomach after food.

He was discharged on 15th day, only a slight slighticterus noted remaining in the conjunctivæ. He had almost quite recovered from the jaundice, but the liver still remains large.

Examination of Urine:

16th Feb. – Clear, distinctly bile stained. Deposit of albumen after 1036, acid. No albumen nor sugar.

Bile pigment in considerable quantity. Bile salts slighter increased — 240 parts = 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.

Professor Greenfield said.

John Henderson, age 36, Engineer. Admitted on 5th March 1896, suffering from Jaundice of about seven weeks duration. The history and symptoms all point to it being an ordinary case of Catarhal Jaundice.

On admission he was distinctly jaundiced, and the liver was distinctly though not greatly enlarged.

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

In March he was not quite so deeply jaundiced. The cardiac impulse was felt as far out as the anterior axillary line, and there was a slight gallop note and a faint diastolic murmur was heard.

The cardiac condition has not, however, given him any trouble. The biliary diuresis in the right mammary line extended from this to the middle line for 2 1/2 inches, and 1 1/4 inches below the costal margin. In the middle line it extended for 2 1/2 inches above the umbilicus and 2 inches for 6 inches. In the umbilical line it measured 1 1/2 inches. Pulse 46, regular, small, easily compressible.
The patient gradually improved, the jaundice becoming less, and the stools a little darker. No marked change occurred in the size of the liver, but it became less firm. On 18th March the jaundice, which had for some days been yellowish, was found to give the reaction for bile pigment. It was distinctly acid.

On the right forearm and some other places there were patches of eczema-like patches. Spleen not enlarged.

On 18th March the jaundice had become much less, but was not quite away either from the skin or conjunctiva. There was still slight itching of skin. Tongue slightly furred. Slightly a little coloured. Pulse 76, moderate volume, collapsing, no pain. The patient left the Infirmary on that day, much improved.

Treatment - 6 grs of Calomel were given on 5th and again on 7th. March.

5th March at bed time, and 37% of liquid, hence next morning. The calomel was repeated on 7th, 9th and 7th March. A dose of Harington's solution was given on 11th, 12th and 13th March.

Bct - Milk, Porridge, Light puddlings 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 of the mact was acid. At first was 1014, afterwards normal. There was no albumen or sugar. The temperature from 99.9 to 99.6 normal.
Hydroid parts containing granules and highly granular cells, deeply blue stained, and cells probably from the Hockey, also blue stained. CUTTER there were besides the usual small vesical epithelium which was a little blue stained, deeply blue stained granules, some densely crystalline.

Quant. 20 Dec.
8th March. - Quant. 60.02, Turbid from water. Bile pigment in pretty large quantity. Bile salts - 2.35 pounds, or 183 per. Urine 499.988 per.
12th March. - Quant. 40.02, Hyg. 10.21. Bile pigment in smaller amounts, Bile salts not perceptibly increased. Urine 578.46 per.
Case 3

Case of Obstructive Jaundice with large dense Cecum in the front of the abdomen. Professor Frank's case.

Elizabeth Allen, age 25. October 4th, 1879, farm servant. Admitted 23rd Sept., 1879, on account of jaundice of nine weeks duration.

History: There is nothing of importance in the family history. She had had good food, a comfortable home, not too much work, and has been contented. She has had no previous illnesses. Five years ago she accidentally cut her right wrist and artery of the abdomen was torn very severely. There was not much pain, but a considerable amount of blood was destroyed, and there was resulted a large and very dense cicatrix at and around the umbilicus. The wound was healed within six months.

There is no history of hematuria or other symptoms of urinary or intestinal disturbance following the burn.

Present Illness. Few weeks before admission, when suffering from lassitude she took a smaller dose from a neighbor's pipe—she had never smoked before—and almost immediately the cancer set. The vomits mostly consisted partly of altered food, and contained the stools. The pallorness 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 only less so now, though not so much.
Since his admission, there has been a little 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 diarrhoæa.

When examined on 29th Nov., there was marked jaundice of the skin and mucous surfaces. The tongue was covered with a yellowish white fur, and no tone owing to the colonic effusions which were produced by ataxia. The sputum 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 projection as before mentioned, occupying the epigastric and umbilical regions and extending to the upper part of the hypo-gastric region and to the lower hypochondriac regions. The palpable contraction has caused a retraction of the abdominal wall laterally. The pelvic part of the projection found the umbilicus and for two or three inches above it is very hard, and the surface is fractured all round it. There is no tenderness, there is nothing abnormal to be felt in the abdomen. There is no dulness except over the liver, which is soliphatic. In the middle line the liver dulness extended from 12 inches above the line of the xiphisternum downwards for 5½ inches. In the right mammary line it extends from the
fourth interface to about 92 mm above the crystal level, a distance of 6 1/4 inches. It then
right mediastinal line it entered from the 6th
interface downward for 5 meters.

Circulatory system - normal except that heart
seems to work. Pulse 70 per minute,
regular. Of moderate size, easily compressible.

Respiratory system normal.

Digestive system - the ceuneum and the
jejunum.

Urinary system - no subjective phenomena.
Output normal at end of case.

Nervous & locomotor systems normal.

The patient was treated for about a week
after admission with Colonel, Bruxner and
Assistant Secretary in full. This had to be stopped
away to the great readiness with which salivation
was produced. On 1st Oct. she was ordered
Bruxner's lamp and lymphatic Salutation
On 1st Oct. fall, no order containing blood.

Akbar, Bruxner and Assistant Secretary

The patient remains in the Infirmary till
13th Nov. During this time she was in the
Infirmary, her condition underwent little change,
though she said she felt stronger. It is doubtful
whether this comes over contained any bile. They were
carefully examined on 16th Nov. by D. Robertson myself.

They were of yellowish consistency & color, with
no evidence of bile in the upper part. There was
a large quantity of fat present but very little albumin. The quantity varied somewhat in intensity from time to time. The gases sometimes held owing to the astringency produced by the tobacco. The temperature was normal or subnormal all the time.

The urine was generally about normal in quantity; it varied from 24 to 34 ounces per day. It was always deeply red-stained. There was only a slight mucous deposit, which on microscopic examination showed numerous epithelial cells and sometimes a little granular matter. The specific gravity varied from 1011 to 1013 except on 12th Aug. when it fell to 1006.

There was never any albumin 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 exceeded being 300 per cent (normal = 100 per cent) and the smallest about 180 per cent.

Indeed was several times carefully tested for the bile and bile pigments being first removed by precipitation with oxalic acid. It was found to be always in excess, generally considerably.

Microscopically there were epithelial columnar epithelial some mucous cells, granules of bile pigment, rare acini, clusters of polyhedral epithelial cells, granular casts, casts partly epithelial. The size varied from 160 to 330 µ. In general, generally normal, 282 µ.
Case 4

Case of Biliary Colic.
Professor [name] Stewart's case.

Martin Welsh, age 45: Calculus.
Admitted on 15th Sept. 1885, complaining of pain in the right side extending across the front of the abdomen, pain in the back, and itchiness of skin.

Duration about a year.

History:—His family suffered from jaundice, but it was not of long duration. He has been good. He has for twenty years been in the habit of smoking to excess on Saturday nights. He is a miner and has been exposed to wet and to alterations of temperature, and has had to work in a damp and foul atmosphere. Previous health good. About eight years ago his neck was badly hurt below the right shoulder. No history of rickets. He had haemorrhoids which sometimes bled in 1870. They sometimes got better and did not get worse again till the present illness commenced. During the last few years he has been 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 liver pits. This was accompanied by yellowness and itchiness of skin, jaundiced urine and pale, but not quite white stools. He got a chill a fortnight afterwards which made the pain worse and 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 pain became less pronounced. 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 itchiness of the skin. The colour of the skin did not quite clear up. He had to stop work on 30th June. As the pain occurred every day he having got a chill when he did not at work. The pain began first in the right side, then extended across into the epigastrium, and then to the back, which was so painful that he could not lie in the same admission. The first attack occurred on 13th Oct. He had been improving. At 9 a.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 rigidity followed the pain. There was also some sickness, but no vomiting. Temperature 98.4°F. 10 grains of Glaucophate of quinine was given on 12th Oct. 8 p.m. 8 p.m. Next day no severe, the leg with the little lego extended, meaning 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 local dryness in the right mammary zone extended
to about 1/2 inch below the mental arch. From this point to the middle four\thalfs of the line of dulness passed slightly downward, being distinctly lower than normal in the middle three. Opaque presentations were applied over the epigastrium. At 9-15 the temperature was 103.6, the pain was less, and he was feeling better.
On the morning of 10th he was again in his usual condition, the rigor and severe fever having passed off.

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

On 3rd his condition was as follows: He has lost about 10 lbs weight since the illness commenced. The pulse and thin, conjunctive have a distinct though not very deep jaundiced colour, thin and narrow.

Alimentary system: Tongue clean, slight jaundice, no under the lower right side. Appetite good. Pain between meal, especially directly after food, with sometimes a feeling of weight, distension and heart burn. Also acidity, flatulence and water reach. Pain in right side when at stool. The poxences now chiefly after the stools. Stools but are not fairly normal in colour.

Abdomen: The abdomen 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 navel. It does not move with respiration, but he says it increases 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 mammary line the hepatic dulness extends from the 8th 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 liver margin is 2 inches above the umbilicus and the hepatic dulness extends upward for 5½ inches. In the right mid-axillary line the hepatic dulness extends from the 6th rib downward for 5½ inches. The superficial dulness begins at the 7th rib. The lower border meets the right costal margin on the left side three inches to the left of the middle line.

Abdominal System. The duodenal dulness is continuous with the liver dulness in front of the linea alba, not well defined behind. In the left mid-axillary line it extends from the 11th rib downward for 4 inches. There is enlargement and induration of the inguinal glands, but not of any of the others.

Circulatory System. The jugular vein is slightly elevated to some extent. In the initial area the first sound is
Inflexible. The second sound is slightly accentuated. Otherwise, this system is normal.

Respiratory system normal.

Digestive system normal except for the diarrhea and slight jaundice.

Urogenital system. He has pain in the region of the bladder and clothing along the urethra when urinating. He requires to urinate once or twice during the night.

Dorsal system. A burning sensation is sometimes felt all over the body, especially on the right side and back. He complains considerably of sleeplessness. This system is otherwise normal.

Locomotor system normal.

Treatment. - On was first ordered Dextro

Santo Hydrochloride 25. On 11th, 20c. Ball was ordered containing Strychnin, Ergotin, Podothylin, and Pilo.

Hydro. - Me at bed time. - 2 Ac of Barlind Hall in the morning.

5th. The pain has been worse today. The tenderest part is below the pubis about 2 or 3 inches to the right of the middle line.

7th. The pain has again become very severe since he got up. Skin & conjunctiva more jaundiced than usual. Great boarding of abdominal walls.

8th. P. regular, moderate volume, tension good, easily compressible. Morning temperature 103° F. In the evening, temperature 99° F.

9th. Some food again this morning.

11th. Worse pain. - No much pain.
January 28th, 1887.

11th. 11th. Evening. Very little pain, but feels tension over the prominence below the bifurcation, which, as well as one lower down, appears to be in the abdominal wall. The surface of the liver is felt to be nodular, the nodules being small, and the lower margin is rounded and irregular like the anterior surface. Abdominal wall: slight fulness in epigastric region. Liver: tender. There is slight fulness in the left Pectoral region except over liver. In the middle line, there is a distinct feel of the liver. The percussion of this liver is much the same as on 3rd. Nov.

13th. Nov. Januriew's more marked today. He has not had a severe attack of pain during the last twenty-four hours. He takes an attack of pain with rigor.Liver 11 7/8 fl., Pain not so bad now. Lying with knees drawn up to pelvic the pain, Pulse 85, of moderate volume and comresponsibility.

14th. Nov. Much more jaundiced today. No vomiting.


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

The nurse has several times searched for gall stones, but none have ever been found. The stools have sometimes been black, often a little darker. To-day there is marked jaundice of the skin. No Complaint of the pain. We left the Infirmary today by his request, his condition not having undergone much change.
The urine always contains a considerable quantity of albumin. It never contained sugar, and only once was a small quantity of albumin present—on 13th Nov., on which day he had a severe attack of pain, which subsided after an hour only. means copurples and symptoms of Richter's cells. Some days after an attack.

28th Oct.: Hgsr 10/12; acid. Bile pigment in small quantity. Bile salts, 3 g. required—twice the normal, or 200 per cent. Increase in bile quantity 100 times. Area per unit—9.378 sq. mm.

3rd Nov. (no attacks for some time). Hgsr 10/24; acid. No bile pigment. Bile salts—normal constipation.

Indica—marked increase. Area per unit—4.938 sq. mm.

6th Nov. (attack I paid 8th yesterday today). Hgsr 10/24; acid. Bile pigment in considerable quantity. Bile salts—7½ g. required—three times the normal—300 times.

Indica—distinct, gastritis from increase. (In the pigment were first removed by acetate of lead).

13th Nov. (attack 8th paid 12th). Hgsr 10/24; acid.

Albumin = ½. Bile pigment in large quantity.

Bile salts—7½ g. required—twice the normal.

Indica—considerable (Other pigments first removed by acetate of lead). Area per unit—8.917 sq. mm.

15th Nov. (attack free from pain since yesterday; jaundice much less). Hgsr 10/24; acid. Bile pigment—only a trace.

Bile salts—normal, or only very slightly increased.

Indica—moderate increase (Other pigments removed as before). Area per unit—10.097 sq. mm.

28th Nov. (very free) Hgsr 10/24; acid. Bile...
segment as small quantity, but not extinct.
Case 5,

Case of Gall Stone, Suppuration in Gall Bladder and Bile Ducts; Cancer in Ducts and Liver.

Professor Harvey's Service Ward.

George Robertson, age 49, Dock Porter.
Admitted on 8th Dec. 1885, complaining of a dull pain in the epigastrium and more acute pain which started 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 gales for which he was operated on seven years ago. They have been of slighter occurrence since he is constipated. He has long been subject to 'cholic attacks', during which his skin becomes yellower. Once about 19 years ago he had an attack of jaundice. He had pain in the stomach, afterwards owing to this settling.

Some weeks before admission he began to suffer from diarrhoea. He continued at work, however, for five weeks, when he took a chill with pains 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—pains worse by breathing relieved by bowels. He felt hot at night but did not take a sigh again till the night before admission. There have been headache, sleeplessness and a constant
feeling of nausea. There has been frequent vomiting, at first about half an hour after dinner, and later a greenish-purplish discoloration of the conjunctivae, which remained throughout the day.

On admission there was some yellowish mucus in the conjunctivae, and the skin had a yellowish-orange tinge, but was not distinctly jaundiced. There was some diffuse pallor in the left half of the epigastrum, and extending to the right of it. The abdominal wall was of moderate thickness and tension. There was tenderness in the hypogastrium over the liver, below the psoas, most marked in the epigastrium just below the xiphisternum. The lower margin of the liver was felt extending across 1½ inches above the umbilicus; it was palpable to a distance of 2½ inches, so that it was possible for some distance, to the left and right, to feel its ridge. There was no tenderness except over the liver, its junction.

In the middle line, the liver's dulness extended from 1½ inches above the umbilicus upward for 6½ inches. In the right mammary line, the dulness extended from the 5th rib to 1½ inches below the costal margin, a distance of 7½ inches. In the mid-axillary line, it extended from the 5th rib downward for 6½ inches. The spleen was considerably enlarged.


Respiratory System—Normal.

Nervous System—Some mild perspiration along with the fever.
Uriney System. - He has a constant desire to pass urine, and there is a burning sensation in the penis during micturition.

In the evening of 14th Dec. he took another

fever. Temperature was 101.6°. Pulse 107, regular, no

Powerful pulse, tension good, acting well filled

between the beats.

From 8 to 10 with severe he had intense deep-

seated pain in the upper part of the abdomen and

in the back with exacerbations. Melanty pruniers

came on and persisted. The stools were pale but

as a rule not absolutely looseless. Once or twice they

contained a little blood. The temperature was normal

in the morning but was several times elevated at-

night - once (16th Dec.) as high as 103°. The faun was

kept open by Carlolat salts. Rectus were applied on

16th Dec. To the anus and over the loin, and after

this the pain was diminished. Rect and thighs from incision

were applied over the loin. 19th Dec., the pain was

again severe and had to be relieved by sandernum.

On 20th Dec., the patient was operated on by Dr.

Lawson Salt. An incision was made a little below

the right pectoral arch. Thirty-nine gall stones and

a quantity of pus were removed from the gall bladder.

After the operation the pulse rate was 90 for minutes and
the temperature was 98°. The pulse was 80 per minute, but some shall 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 15th Dec. the temperature was normal or subnormal, the morning being 98.4°, the evening 101.4°. It was sometimes a rise in the evening. On 30th Dec. he had a fever with a temperature of 102.4°, and several respirations occurred after this during the progress of the case. There was some soreness in the breast after the operation, but after some days the rest entirely disappeared from them. During the rest of his progress they contained generally a little bile, sometimes none.

On 28th Dec. his urine filled a little. From 18th Dec. to 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. He had a rash that was not much elevated. Temperature.

On 29th Dec. - the skin and conjunctivae were still deeply jaundiced. There was no itching of the skin, neither he never had had any. Tongue clean, but flocculent.

The abdominal examination on 28th Dec. was as follows:

There was general fulness and tenderness in the right- upper quadrant from the umbilicus to the left of the middle line. No distinct fluctuation. Margin of liver to the right also tender. In the right mammary line the pain and dulness extended from the 3rd rib down to the 5th rib and 6 1/2 inches. The dulness in the hypochondriac region fully 2 inches above the umbilicus and the tenderness was greatest at this part where the dulness began.
There was some dulness below the level in the right mammary line. After this,

After the operation, drainage tube was inserted into the cavity, and the patient perspired from ever afterward. The fever 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 still at the end of March gave a slight reaction for little fragments. After this it gave no reaction for little fragments.

After the wound had created 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 20th March, the

The patient was observed to show more prominence than before, but this after a time went down.

The symptoms varied, becoming more marked after

The rigors, which were not accompanied by fever,

The rigors sometimes became absolutely listless. The nurse patted the face during this period, the

It became visibly more pronounced. After this

On 1st March, he complained of a little of itching in the

On 14th March, a quantity of blood, partly blooded

was discharged when the cavity was washed out.

He had a good deal of pain around the wound which caused him to return to bed. There had for some time been tenderness of the skin of the back, and on the lower
Just then had been a slight lacerare, which however healed up. After this time there was more or less hemorrhage from the wound. The tenderness found it increased with a considerable amount of swelling of the ulcer, which occurred in the same foot. This was relieved on Dec. 1st by a small incision from which nothing but blood escaped. On Dec 22nd, the flatness in the middle line commenced. It was along the umbilicus and the lower border extended from one thigh to the other and met the posterior margin near the left mammary line. Below the point there was dulness for about 1/2 inch. There was very little if at all tenderness. A day or two after this a node of the foot 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.

30th March - Wound Healing with prolonged peritonitis, and a few lymphatics over the point of the chest. There was also some ulcers with moderate infection. Pulse 80, regular, moderate volume, collapsing, easily compressible. Appetite continues good.

31st March - The discharge which for a time was yellow, had become more green since part of the blist had been replaced by corporae. Some evidence of jet attacks from being up a little and after this the bed occurred very readily.

14th April - It has been getting normally weather with more evidence of the legs. For several days the pain has continued considerably more than...
recently. On 11th 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 griping. Later he had a high fever, at 12:30. At the temperature 97°. The pulse was 108. The temperature 93°. At 8:30 it was 92°. The fever was 92°. The patient was found in bed last night and was washed out with corrosive sublimate lotion. Today there is no hemorrhage from it, the discharge is still liquid, and the wound itself is looking bad. There is considerable abdominal distension. Nausea for some time have been loose and are so still, Vomits very little. Had a pain in the abdomen at about last night, was in a dying condition. Cough as before, has to hold the left of the bed to assist his breathing. Pulse 92, regular, soft, weak. Tongue slightly covered and dark. Had a little fever and seems to be dry. Speaks in a low, thick, voice. Seems a little deaf. Pain now gone. There is hemorrhage on the chest and little legs a little above the ankles. Bed sore if feet in spite of his lying in bed.

15th April — Worse to-day. Taking chief drugs. Has become dry and pale. Pulse 66, regular, small, soft to feel. Complained this morning. Has to use the bed. Considerable amount of diarrhoea. Percussion of liver the same as before. Guarnier. Had dry, he has found
only about 4 ounces of pericardium yesterday & which were drawn off by the catheter this morning. At 2 PM he was restless over the joints and afterwards both ankles were just round and hard to cause inspiration. He perspired freely. At the evening he was very weak. - Pulse 19, regular, but fairly regular. Breaths moderately by stethoscope.

Wife and children too are very well.

Fever 103 1/4 Febr. 4th. Very weak, but said she feels well.

Wife and children are a good deal. Skin has been getting gradually darker. Some points of papillary dilatation in face. Mucus somewhat contracted. Still vomiting at times, bringing up tough mucus. Abdomen much distended - more tympanitic. Discharge from wound very fetid. Suppurative bubbling in tissues round it. An incision above the diaphragm gave exit to about an ounce of pus. About 2 inches of urine were drawn off at 1-30 PM - highly alluminous. 

In the evening the pulse rate was 82, yecky and irregular. Breathing fast & shallow. Semi-comatose. Mucus contracted. Skin very dark. Palate almost the same as a few days ago. A little pain passed.

A good deal of hæmorrhage from cavity opened today. Vesica breaking down round the wound. Discharge profuse. Abdomen fixed & distended. Considerable tympanites. Bulges in ilex flanks and for some distance above juxta. At 8.30 PM he has become more comatose. Breathing 28, shallow and regular. About 11 PM he had
There abdominal pain and distension continued. This was relieved by 15% Chloroform for 20 minutes. The anus was densely swelled up but remained dry.

17th April. At 3-00 a hypodermic of 1/8gr of morphine was injected, and after this he became quiet. He died this morning at 10-30. Still after being comatose for some hours. Resp. 21-14.

From 5th to 20th April there was some rise of temperature in the evening reaching as high as 101.6°F on the 12th. During the last three days of his life the temperature was subnormal.

The patient was treated with Inj. Apericin and with 0.5% Chloride of Ammonium, 11% Nitric Hydrochloric acid and Tararecum, but none of them had any marked effect either in the patient or in his general condition.

The patient's weight was formerly 14st 7lbs. On 2nd Feb it was 13st 3½ lbs. On 21st April it was 13st 3lbs. Between these dates it had only varied a few lbs.

Post Mortem Examination - 19th April.

The face and superficial muscles of the head were deeply injected. The superficial veins of the face and neck were marked. The subcutaneous veins and arteries were markedly distended. The veins of the head, neck and upper limbs were similarly affected. The arteries of the neck were all patent. The right carotid pulse was most pronounced. The skin of the face and neck was dry and the hair was standing up. The body was in a rigor mortis. The lips were dry and the tongue was protruded. The eyes were closed. The hair was of a light brown colour. The ears were dry and of a greenish tinge.

The nose was large and the external nares were well developed. The nostrils were dilated and the turbinates were inflamed. The septum was deviated to the left. The mucous membrane of the nasal cavity was inflamed. The tonsils were covered with a yellow exudate. The uvula was pink and red. The palate was smooth and the uvula was pink and red. The pharynx was inflamed and the tonsils were covered with a yellow exudate. The larynx was normal. The trachea was patent. The heart was not enlarged. The liver was not enlarged. The spleen was not enlarged. The kidneys were normal. The adrenals were normal. The gall bladder was not enlarged. The bladder was normal. The appendix was not enlarged. The stomach was not enlarged. The intestines were distended. The duodenum was inflamed. The jejunum was inflamed. The ileum was inflamed. The colon was inflamed. The rectum was inflamed. The prostate was normal. The seminal vesicles were normal. The bladder was not enlarged. The urethra was patent. The testes were normal. The epididymis was normal. The scrotum was normal. The penis was normal. The urethra was patent. The prostate was normal. The seminal vesicles were normal. The bladder was not enlarged. The urethra was patent. The testes were normal. The epididymis was normal. The scrotum was normal. The penis was normal. The urethra was patent.
still slightly marked in lower lumbar. On right side, about 1/2 inch below ribs are two openings, the upper one leading into a sinus connected with the muscles immediately below the ribs, the lower one appearing the original opening by which the absence was evacuated. Below the lower opening is a granulating surface, evidently opening into the abdominal cavity. On putting into the muscles of the abdominal wall, one or two small hemorrhages into them are seen. There is adhesion of the peritoneum over the liver to that lining the abdominal wall round the wound. Considerable thickening of the peritoneum round the wound and suppurative below that. A good deal of bruising of the liver. Adhesion of the transverse colon to the under surface of the liver. All the tissues round the gall bladder are bound together by adhesion of considerable standing. On the upper surface the liver is bound down to the peritoneum in front and also, but not so markedly, to the diaphragm. Very considerable thickening of peritoneum in front of liver. Liver had a quantity of soft fibrinous lymph on anterior surface. Some injection of vessels of peritoneum 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 extremely distended, and
contain a large quantity of pus, comparatively unisetated. 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 externally. 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 surface of the right body of the liver are a number of nodules which on incision are seen to be well defined cancer nodules. I have there is a deposit of the central portion which appears to be somewhat gelatinous, or necrotic. liver, peripheral zone of lobules somewhat yellow, and running through the liver are minute nodules. These vary in size from a filling to a large pin head. One or two nodules in left lobe.

Size enormously enlarged - 1st 9:12. Some fibrous masses on its surface from old peritonitis. A state of chronic venous congestion - vessels filled with blood, whole substance firm, without

Left kidney - 9/12 St. extremely flabby, firm bound down to surrounding tissues. No distinct congestion or surface. Capsule at some parts does not stick off readily. Lobules very well marked. Bile lying of lobule pale and central congestion. On section, cortex thickened, extremely mottled, showing marked fatty degeneration. Malpighian bodies very indistinctly seen. No waxy change. Vessels in cortex don't contain much blood. Those in pyramids contain more, labeled
Page 3

Jelly. Intense blue staining of whole organ. The condition is one of prolonged bile staining with intense nephritis shortly before death.

Right kidney - II. II., 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 peritoneal mass.

Heart. Evidence of comparatively recent pericarditis at the base. Both ventricles contains bile stained fluid. Anterior and pulmonary valves competent. Right thickening of ends of mitral valve and atheromatous tendencies, but not very marked. Slight also in aortic, but not so marked as mitral. Muscular substance not very friable.

No motting of muscular papillae.

Slight adhesion of anterior margin 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 deep bile stained fluid in both thoracic cavities.

Left lung weighs 3 lbs., 5 oz., intensely congested and edematous throughout. Both stumps. Small fibre creation and a minute cavity with perfectly smooth fibre wall, evidence of longstanding at apex near this creation.

Right lung. Hepatic congestion & edematous.
Some emphysema at anterior margin. A firm fibrous reaction also at posterior border of lung and partially a considerable amount of cicatricial tissue at stumps. The lobe are firmly bound together. Very marked congestion of mucous membrane of branches of both lungs.

The contents of intestine were like fine clay in colour (we had had some bland diet shortly before death).

The liver was not put into and the cause of 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 color, turbid, depositing a considerable quantity of greenish-yellow pus on standing—about 1/5th of its bulk. Decidedly acid reaction. Allusion in large quantity. Distinct reaction for bile pigment. Blood present. The albumen was albuminous and the clear fluid related to 45.1008. The bile salts by Blixen's method were then found to be in large quantity—10 minutes giving with 60 minutes of the standard Jaffe's solution a density equal to that of the standard. Microscopic areas were seen from corpora, in large number, red blood-corpuscles, and epithelial cells from the peritoneal surface. Some large rounded granular cells, fibrous and the up cells from the peritoneum were also present.

The fluid from the gall bladder was of a dark brownish red color, very acrid, consisting chiefly
of blood, partly clotted. Flight reaction for bile pigment. Marked reaction for blood. Microscopic:
it contains red and white blood corpuscles, mucous corpuscles, some epithelial cells, some of them in apposition, mucous granular matter, a few crystals of cholesterol, and numerous fat globules.

Examination of the Urine.
From 17th to 14th Dec. the quantity varied from 60 to 14 ounces daily. On 18th Dec. 44 oz., 19th 56 oz., 20th 80 oz., 23rd 52 oz., 24th 44 oz., 25th 62 oz., 26th 80 oz. All this time the specific gravity varied from 1014 to 1020. Reaction acid.

As early as December, and until 16th April, there were no albumen. Except when admitted the bile pigment was almost always between 60 and 100 oz. Except at first it was always deeply turbid and of a deep yellow color. Specific gravity varied from 1014 to 1020. Reaction acid.

Sugar and albumen were never seen. Except when admitted the bile pigment was never excessive. The urine varied from 610 to 310 grains daily. Microscopically there were generally some albumen casts containing granular, epithelial cells, bile pigment, albumin, casts of bile pigment granules, epithelial cells, and granules of bile pigment. The formation was otherwise normal.

8th Dec. Clear amber colored, Apr. 1020.

4th Feb. Pigment in bile falls about normal. Some distinct increase.
Urea about 49.375g.
Urine just after opening. No pigments in
considerable quantity. Neti salts - about 200 P.E.-
24th Jan. - Quantity 92 cl. 44g. 1016. - Neti salts -
y 25 drop - 240 P.E. Urea - 613.2 4x4 gos-
28th Jan. - Quantity 100 cl. phg 1016, Neti salts-
y 20 or 25 drop = 300 or 240 P.E. Indicine -
quantity small.
26th Feb. Urea - 462 gms.
19th Feb. - Neti salts - between y 25 to 30 drop =
240 or 200 P.E.;
26th Feb. Hg 1016, - Neti salts - y 25 drop =
240 P.E.]
3rd March - Quantity 74 cl. Hg 1016, - Neti-
salts - y 20 drop = 200 P.E. - Urea - 431.6 gos -
9th March - Quantity 64 cl. Hg 1014 -
Neti salts - y 25 drop = 240 P.E.
18th March - Quantity 64 cl. Hg 1017, - Neti-
salts - y 25 drop = 240 P.E. - Urea - 319.5 gos -
29th March - Quantity 72 cl. Hg 1017, Neti-
salts - between y 20 to 25 drop = between 300 to 240 P.E.
Urea - 433.2 4x4 gos.
25th April - Quantity 74 cl. Hg 1016, Neti-
salts - y 30 drop = 200 P.E. - Urea 421.8 gos.
Microscopic cell, half round or lens with two-
membrane, each containing a nucleus.
13th April, Day (the day before operations) -
Quantity 80 cl. More deeply foci organism than
recently, Hg 1015, - No albumen. Bile pigment -
in larger quantity than recently. It has been increasing
for some days. Neti salts - y 15 or y 18 drop =
about 0.8 oz., 1840-5.38.2 yrs.

Microscopically much the same as before.

15th A.M. morning of 15th April—5yrs, 4 months.

Feces yesterday (15th) 2 ounces, Subjects were drawn off by the catheter this morning. Tubid,

brown-coloured, Greenish-yellow when shaken up.

Deposits flat, cells, acid. Allumen in large quantity.

Kim salts about 28 gr. = over 600 p.c.

Vine for tincture 3.533 g.

Microscopically casts & cells much the same as before.

16th April—Same drawn off by catheter, same

physical characters as the previous. Allumen in

large quantity. As blood. Mice pigment in considerable

quantity. Mice salts in as large if not larger

quantity than before, but exact quantitative

estimation not obtained on account of the smallness

of the quantity of urine.

Microscopic—large hyaline casts, deeply lib-

stained, some with catarhal cells on surface.

Epithelial & granular casts. Numerous large

cells deeply libestained and very granular, many

with two, three, or four nuclei. Many of these

cells appear vacuolated. Numerous spermatic

buds & mucous pericules. Granular matter,

large quantity of bacilli—some of them in

threads.
Case 6.

Case of Malignant Disease of the Liver and Peritonemum with Jaundice.
Professor Granville Stewart Read.

Mrs. Fox. Age 53. Housewife.  
Admitted 1st June 1885.  
Recommned 2nd June.

Complaint. Pains in region of stomach and liver, increasing weakness, jaundice, itching of skin.

Duration. The pain in the stomach has lasted about a year, the jaundice and itching have lasted about ten weeks, and the itching about twelve or fourteen weeks.

History. Family history unimportant, she has been married twice and has had few children.

Food, habits of living, 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 chiefly of altered food. The gradually became weaker. About ten weeks ago she suddenly became jaundiced and the colour of the skin at first was the same, 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. Her symptoms continued.

The rash that, when the color of her skin first changed, was a pasty green or yellow, disappeared before her eyes, but she sees things that frighten colors now. She has had no distress of sight. For the last month she has been troubled with itching of the skin, and sometimes of the eyes also.

A slight eruption, conjunctivitis and furuncles have come out with slight hemorrhage on the surface, apparently due to scratching. She has had no headache but has felt drowsy. Her hands were paresthetic at first, but have been rather loose during the last month. The stools, natural before, became very white when the jaundice commenced. They are not as white now. The urine has been slightly jaundiced. There has been no ascites nor edema.

Present condition: She is a small woman with wasted, flabby muscles, marked jaundice of skin, conjunctivae and other mucous surfaces. She has a remote and anaemic expression. She cannot lie on the left side as she is prone to the pain produced over the liver. Temperature normal.
After this she began to suffer from a dull pain in the region of the liver, both over and below the ribs. The symptom continued. She noticed that, when the colour of her skin first changed, that the parts green or yellow stained before her eyes, but the green things then disappear colourless. She has had no decrease of sight. For the last month she has been troubled with churning of the skin, and sometimes of the eyes also. A slight eruption, convulsive and papular, has come out with slight hemorrhage on the surfae, apparently due to percutaneous. She has had no headache but has felt dizzy. The louche eyes, as you say, at first, but have been rather more during the last month. The eyes, natural before, became very white when the jaundice commenced. They are not so white now. The urine has been deeply jaundiced. There has been no ascites nor oedema.

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

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 nodular. Some of the nodules are much larger than those prominences on the surface of the abdomen and they can be felt with great distinctness over the thin 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 dulness:

Hebdomadally:

From 4th interspace to umbilicus — 6½ inches.

Right maxillary line, — from 4th interspace down for 8½ inch.

Ciliated muddy line, — from 6th interspace to blad. post — 9 inch.
Right Scolopial Line. - From 9th interspace to diaphragm.

Hematopoietic System. - Enlargement and induration of glands in left groin and in left axilla.

Spleen, dullness normal.

Examination of Blood (6th June)

Red Corpuscles. - 4,810,000 per c. millimetre

Leucocytes. - 37,000

Corpuscles fairly well formed and pretty equal in size.

Circulatory and Respiration Systems normal.

Pulse 76 per minute.

Integumentary System. - Skin dry, deeply jaundiced. Cutaneous - Eruption as before described. Marked emaciation.

Urinary System. - No subjective phenomena.

(Report on urine at end of case).

Nervous System. - The mental faculties seem to be somewhat dulled. Her memory is defective and she is often slow in answering. Otherwise this system is normal.

Respiratory System normal.

Treatment. - Pelocarpins, Nitro-hydrochloric acid and Succus Larancaei.

6th June. - Bilirubin detected in saliva by curdine and nitric acid, and lute acid by D. Clow's method.
8th June. - The patient was to-day discharged at his own desire.

Result. - No change.

The urine. - Several examinations were made. - e.g.,

6th June. - Quantity in 24 Hours = 26 ounces.

Deeply red colored. Considerable deposit of
mucus &c. After 1019, Acid, Albumen in
small quantity. Red pigment in large quantity.
Bilirubin detected in large quantity by Dr. Oliver's
method (also by Kottmedler's test). No sugar
nor blood. Chloride, sulphate and earthy phosphates
normal. Lactic increased. Urin - 230.66 grm.

Microscopy. - Granular casts. Hyaline casts
with cells and granules. Few porphyrin red
masses. Other cells - some squamous, some
of other forms, varying in size and shape,
with large malic and highly granular. One tabular
cells. Some granular matter - probably albumo-
phosphates.

The quantity of urine passed in 24 hours varied
from 24 to 36 ounces, and the pears varied
from 230 to 425 grms - the not therefore
outside the limits of health.
The urine was twice carefully examined forphenic and tryptoxin, 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 there-
fore be asserted.
Case 1.

Case of Cancer of the Head of the Pancreas with Jaundice and Glycosuria.
Professor Harris Ward.

Adam Fowler. Age 59, Station Agent.
Admitted 9th April 1886 - Examin'd 6th to 8th July.
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 73, but he does not know the causes 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 10 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 Smallpox when about 25 years old. There is no history of Venereal Disease.

Present Illness. Eight weeks before admission, when going to bed one night, he felt a sharp pain in the epigastrium almost in the middle line. The pain was constant, and he does not remember
of it pointing to the umbilicus or in any other direction. There was with it some swelling in the epigastrum, and he was troubled with flatulence and gaseous eructations. With the accumulation of the wind there was an increase of the pain. He did not become pale or faint, nor did he vomit. He senceally fretted very all that night, but walked about or tossed in bed, he went forwards and backwards 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. Defecation did not make it worse, but he sometimes had pain across the lower part of the abdomen during micturition and defecation. He continued at work for the first few days and then gave it up and stayed in bed most of the time till shortly before he came to the Infirmary, when he sometimes got up a little. The pain continued till the day after his admission, since then there has been very little pain till the last few days when it has become a little worse, though it is still slight compared to what it was at first. He cannot tell whether or not the pain was relieved by pressure.
after this 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—worse at night when he becomes warm. Before this 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 purgative. At first the motions had a worse smell than before, but that no not so bad now. He has had no appetite since he turned ill till the last eight days, when it has improved somewhat. While at home he simply took water, hot tea and milk, with scarcely any solid food. There is not so much flatulence now. He did not notice the pain 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 I love who had charge of him for a week or two after his admission informed me that at that time he had detected sugar in its pick small quantity. The patient was not much troubled with thirst before the beginning of the present illness, but after it commenced, during the past week he was at home, he was considerably troubled with thirst and...
drank a good deal of starch water. The thirst has become still worse since he came here. The urine, besides being jaundiced, has been dry since this illness commenced; only during the last night or two there has been some perspiration. 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 polyuria was noticed was the fourth after his admission, when the quantity passed was 40 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 this 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 febrile fever. He has not slept well, has often waked up and has then felt a heaviness as if there were something oppressive at the same place as he had the pains. He has lost flesh considerably.
On his admission on 9th April the liver
was found to extend in the right mammary line from the 5th rib to 1½ inches below the costal margin,
1/4 inches from the median line. Palpation revealed some
enlargement downwards in the middle line. No
unequalities were felt on its surface. Palpation caused
tender pain in the middle line. There was marked
jaundice - even the sides showing some yellow tint.

On 6th May his weight was 10 ft, 4½ lbs, his height
being 5 ft 8½ in. There was tenderness on pressure
below the costal margin in the right hypochondrium.
The liver margin of the liver was distinctly felt and
appeared to be thickened and somewhat rounded. In the
middle line just under the costal margin a somewhat
rounded, semi-elastic body, having the characters of a
distended gall bladder, was felt. The liver dulness
in the right mammary line extended from the lower
margin of the 5th rib to an inch 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 murmur of the first sound
of the heart, but no murmur. The pulse was sometimes
regularly intermittent. Respiratory system fairly normal.
The patient was at that time passing 100 ounces of urine
once or twice
an hour. His colour was greenish brown,
Age 40, 10½, - acid; no albumen. Both present absent.
It is said that no urine was at that time detected by the flesh,
but, considering the quantity of urine, the specific gravity of

the fact that dyspnea and present with weak and often
without any important change in the condition of the
patient, we must I think conclude that the non-detection
of dyspnea was an error in observation.

On the 6th June it is stated that the patient's general
condition was decidedly improved, the locomotion
being regular without lassitude. The motions were very
pale. The pulse was rather less rapid in colour and
the urine was less, its specific gravity 1.010. The anterior
margins of the face were less prominent.

On the 6th of July I examined the patient
and found his condition to be as follows: - There is a
removal of the dyspnea, especially in the subcutaneous tissues in the
right infra cardiac region. This has existed for many
years. Development good. No itching nor cyanosis.
The face of the whole body, especially that of the abdomen,
has a yellowish green, somewhat ill-defined. On
the arms there are a few papules, some with
formation on the surface, due to scratching or account
of the oedema. On the lips the papules are larger and
more numerous, some of them tending to form small
granules. There are no papillae. The skin is
red and dry. The face is slightly flushed with burning.
The face is expressive of sadness and anxiety. The
temperament is not marked. Attitude not unusual.
When up he feels some distress, like a weight, at the
upper part of the abdomen. Temperature and respiration
Elementary Systems: The eyes and gums are normal
and the mucous surfaces as well as the skin are healthy.
billplains. Teeth nearly all out. Tongue pale, at.
slightly curved, covered with a yellowish film.
Posterior. Taste fairly well. (Mouth normal in quantity.
Drooling 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. He has a feeling of want in the epigastrium in the morning before food.
No unpleasant sensations after food except flatulence.
No increase vomiting, etc. Bowel regular. Vomits normal in consistency, but quite pale from absence of bile. His gall stones or biliary concretions have been detected in the stools through careful examination has been made.

Abdomen. The skin has an olive green color.
Considerable development of hair over abdomen. A few macules on the skin. Subcutaneous veins not distended. On palpation the abdominal walls are of moderate thickness and are very lax. Slight bowels is complained of in the epigastrium a little to the right of the middle line and two inches above the level of the pubis. No feeling of resistance except over the liver. In the right mammary line the margin of the liver is distinctly felt to move up and down with respiration a little below the costal margin. The border is here felt to be of normal thickness and consistency. The margin can be traced inward and slightly downward to within 1 1/2 inches of the middle line, while it passes obliquely upward and to the left till it meets the costal margin.
In the epigastrium the margin is felt more pronounced than on the mammary line. There is slight tenderness when the finger on the mammary line passes under the gums during deep inspiration. The liver, as far as can be felt is quite smooth and regular. Below the umbilicus, between the right mammary and middle lines the distended gall bladder is distinctly felt.

Respiration - In the middle line the hepatic dulness begins 3 inches above the umbilicus and extends upward for a distance of 6 inches. I the right mammary line the deep dulness extends from the 6th rib to 1 1/2 inches below the costal margin, a distance of 7 1/2 inches. I the mid-axillary line the dulness extends from the 5th rib downward for about 6 1/2 inches. Over the rest of the abdomen the note is good. There is no dulness in the flanks.

Haemopoetic System - Thyroid normal. Suprarenal glands slightly enlarged. Spleen not enlarged.

Circulatory System - Heart normal in size and situation. Sounds very feeble, but otherwise normal. No murmurs. Pulse regular, rather small, easily compressible. Rate varies from 68 to 90.

Respiratory System normal.

Integumentary System - Nothing in addition to what has been stated.

Urinary System - No subjective phenomena. During the day the indicator gave three or four hours; during the night from two to three times. Urine report at end of case.

Nervous System - Nothing further. locomotor system normal.
Treatment: The patient was placed upon a modified anti-diabetic diet. On a few days after his admission, desiccated Cascara sagrada was ordered for the constipation. Various medicines were given including sulphur, cannabis, salicylic acid, feverfew, carbon, soda, and bromine, but no medicine had any effect on the progress of the illness.

Progress: On the 10th July he was feeling rather better, but still had the conscious in the epigastric region 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 starts in the back, yesterday and the day before he believes there was a little reddish fluid passed with the stools which were otherwise the same as before. This afternoon he passed two solid masses which on examination were found to consist of purged mucus. The mucus was in large, darker than before, but he does not know whether there was any blood in it.

Abdomen: There is some tenderness in the epigastric region 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 pubes. In this 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 is 3½ inches above the umbilicus, and the hepatic dulness extends upward 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-sacral line the dulness extends from the 3rd rib downward for 4½ inches. The inferior border curves downward external to the mammary line, so as to be lower on the epigastrum than in the mammary line. In the epigastrum it makes a curve downward. Then it curves upward again towards the left. Right hepatic dulness is got for 3½ inches to the left of the middle line, but this...

The abdominal examination is otherwise as before. The condition as to jaundice the remains unchanged.

22nd July. He has had some turbid fluid in the lower part of the abdomen. From one to two inches above the level of the umbilicus and 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 as much the same as before. There is some fluid extravasation round a purpurule on the conjunctiva of the right eye.
There are no oedema 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
formed owing to the use of bran bread whose use was
commenced a short time ago. The phlegm appears
paler, less coloured.

28th July. A good deal of pain yesterday both in the
epigastrium and below the umbilicus; not much today.

Since the diet was rectified - this means being furnished
with bran bread and skimmed milk quins - the patient
has been less and there has been a considerable
diminution in the amount of urine. Some resistance
is felt below the liver about 2 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. The jaundice
but of this kind is not quite as deep as at first.

Tongue flabby and covered with a thick, dirty white
film. Complaints of distension after food and pain
in the loins. In the epigastrium, especially the
right half of the liver of the liver is felt rounded,
thickened and slightly irregular, with some tender-
ness on palpation. He has not been much troubled
with thirst lately till yesterday. When the urine again
considerably increased in quantity he was also constipated
and the patient passed little stools. After the stools were
passed the patient was relieved. He has not felt any
worse lately.
12th Aug. — Feels very weak, jaundice paler, more marked than recently. Tongue coated with a whitish cream fur, oedema of feet and ankles slight. Not getting up much. Legs still puffy coloured. Has complained for several days of a good deal of pain and swelling in the epigastrium.

Epigastrium — There is diffuse prominence in the epigastrium 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 epigastrium the margins 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.

Liver — In the middle line the hepatic dulness extends from ¼ inch above the left of the xiphisternum upwards for 2½ inches. From the middle line the lower border passes upwards and to the left and downwards and to the right, passing under the costal margins about ¾ inches to the left of the right mammary line. In the right mammary line, the hepatic dulness extends from the 6th rib to a little above the costal margin, a distance of 4 inches. In the right – mid axillary line the dulness begins at the 6th rib and measures 4½ inches.
29th Aug: The larynx continues in much the same condition as to previous day, but has been gradually becoming weaker. The furnace much diminished in quantity, having for about a week been considerably under 50 ounces daily. It contains much less purge. The bowels or twines passed solid masses by the hand, but they have consisted chiefly of semiliq.

The motions are still white. The tongue and vesica are much as before. The vesica is entirely flaccid. The tongue.

The abdomen is generally prominent, with its walls somewhat tense. Its distention of entenious veins, its thrill, tenderness as before, &c. &c. &c. now extending to both side of it. The lower margin of the bowel cannot now be palpated.

Measurements:

- At level of epiploicetusum 39 inches.
- Midline between epiploicetusum, umbilicus 38 1/2 inches.
- At level of umbilicus 38 inches.

There is dulness in the flanks from the presence of some fluid in the peritoneum. Movement of the liver gives a slight larger area of dulness than when it was last noted.

1st Aug: We took a pull this morning. Possibly due to his mind being disturbed by the death of another patient. The morning temperature was 99°. At 11 it was 99°, at 12 10 P.M. 101°, 12 10 P.M. 102°. Expectations at base of lungs, but no other marked change in the physical signs. Abdomen still distended, with dulness...
in the flakes and slight stool. He is very weak and depressed. Much smaller amount of urine today.

On 8th, he is better this morning and the temperature has fallen to normal.

As I left town on the 7th, I did not see the further progress of the case. We gradually became weaker, the fluid in the abdomen and the edema increasing. Morphinum was given to remove the dyspnea, but it had very little effect either in diminishing the dyspnea or in increasing the urine. The liver is the urine continues to diminish, and for at least a day before death Dr. Bramwell did not detect any at all by Fehling's solution. Stomach: The dehydrated stomach.

The patient died somewhat suddenly on 9th.

The temperature during most of the time was in
the abdomen was either normal or subnormal.
During the last month or so there was an occasional slight rise of the evening, and this became more frequent toward the end.

Post-Mortem Examination.

(From examination by pathologist.)

Length 67 inches. Circumference round shoulders 36 inches. Much emaciated, deeply jaundiced, Pupils equal and contracted. Rigidity slight. Lividity

mil. Feet, legs and abdomen considerably distended with fluid.

Brain, scalp, skull, cap, dura and other

membranes natural. Weight of brain 3 lbs. Consistencies
on the surface seemed somewhat atrophied. No
marked eye appearances of disease.

Thorax. - Pericardium uniformiy attached by old
adhesions which, however, could be broken down by the hand.
Heart weighs 16 oz. No valvular lesion. Deeply lili-stained.
Right slightly atrophic.

Right lung uniformly adherent. Weight 1 lb. 10 oz.
Very edematous. Left pleural cavity contained 11 oz. of
lili-stained fluid. Left lung - weight 16 oz. jaundiced
and looked somewhat compressed.

Peritoneal cavity contained 170 oz. of turbid lili-stained fluid.
Liver - weight 11 lb. Capsule slightly thickened.
Organ exceedingly soft and pulpy.

Kidney - Left - weight 5 lb. Capsule stripped off
Corpus pale and lili-stained. Right - weight 5 lb.
A cyst on its surface. Otherwise the same as left.
Right seminal vesicle ganglion seems large. A large
quantity of fat at back of abdomen.

Right suprarenal capsule very soft; left parenchyma
enlarged.

Kidney, weight 5 lbs. 6 oz. Bile ducts well dilated.
Organ deeply lili-stained and is in condition of early
cirrhosis. "All bladder and duct much distended
with
Pancreas - Head much enlarged, but gently rounded
and adherent to liver. - Cancer. - Some of
the pancreatic ducts enlarged.

Stomach, duodenum and intestines normal.
Examinations 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 his admission the quantity was about 30 ounces. Next day it rose to 70 ounces. For about a week after this (12th to 19th April) it ranged from 60 to 80 ounces. Then it rose rapidly to 112 ounces on 22nd April, and from this time to the 3rd June it was generally 100 ounces or more, reaching once as high as 130 ounces. On the 5th of June, it rose to 188 ounces, and from this time near the end of June it kept rather higher than before, sometimes reaching to 150 ounces. After this there was a gradual fall, but till the 14th July it kept more briskly between 100 and 140 ounces.

After this there was a considerable fall in the quantity very slowly being only occasionally 100 ounces or more. From the 20th July to the 29th July, it varied from 84 to 82 ounces. In the latter part of the month it was rather lower. On the 11th August it rose again to 78 ounces. From this fell the 22nd August it varied from 66 to 40 ounces. From then till the 31st August, it varied from 40 to 30 ounces.

On the 2nd September, the day on which he had his rigor, it fell to 16 ounces. It again rose, reaching 32 ounces on the 3rd September. On the other days before his death, the quantity was 13, 16, and 24 ounces respectively.

For a time the fluid drunk was measured. This varied from 3 to 7 pints daily, and in this while a distinct correspondence is observed between the amount drunk and the quantity of urine.
While speaking of the quantity of urine I may briefly refer to the weight of the patient during the course of his illness. On the 6th May his weight was 10 ft. 4½ lbs. On the 24th July (just about the time when the oedema of the feet first appeared) it was 10 ft. 6½ lbs. He had therefore lost no ground so far as weight was concerned. From this time there was a steady increase in weight, coincident with a diminished evacuation of urine and the development of oedema and fatty degeneration of the tissues around the heart.

On the 31st July, his weight was 12 ft. 1½ lbs. So that since the 24th July it had increased by 1 ft. 9½ lbs, fully a stone of weight was gained between 22nd July and 31st July.

There was merely a slight trace of albumen present. Bilirubin was present in large quantity all the time, but there was a distinct diminution in its quantity as the case went on. The bile salts were present in distinct excess, usually about 1½%.

I refer elsewhere to the manner in which this excess of urine affects the quantitative estimation by Dr. Oliver's method, and the modifications in the methods necessary to avoid the fallacy to which it would lead.

Indium was several times tested for, as towards the termination of the case a marked fall was got by hydrochloric acid, hyposulphite of lime and chlorate of potash, but there is some doubt as to the result in this case as it was not one of the earliest cases in which this substance was tested for and the bile pigment was not first removed.

Microscopically, the albuminous globules and casts are far better defined.
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Case 8

Case of Cancer of Head of Pancreas with Jaundice: some Cancer in Liver.

Professor Francis Stewart Ward.

Margaret Noble, age 40, Housewife.
Admitted on 17th March, suffering from Jaundice of seven weeks' duration.

Past History. Her father died when aged 60 of "Black Belt", one of the symptoms being jaundice. Her mother died, aged 67, of heart disease. One of the patient's brothers died of jaundice, she has had no family.

Previous Illness. Forty-two 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 "Belt" 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 wine every night, and sometimes a glass of whisky. It was afterwards learnt that she had been intemperate.

Present Illness. For several months she had not been feeling as well as usual. She looked thin, her food was not touched with cheer, 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 she...
jaundice came on and became gradually more intense. She felt some itching at first, but this soon passed off. She has had a poor 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 'swelling' through her body. This feeling was worse at the time when the jaundice came on. At present she feels a soreness 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 dropsy nor oppression. Nothing unusual at stool.

There is some fulness of the abdomen. The wall is fairly taut, with a large quantity of fat which gives a feeling of distension, 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 1 1/2 or 2 inches below the costal margin in the right mammary line, and it passes the middle line about 2 1/2 inches above the pubes. 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
mental and astric areas. The second sound is slightly accentuated. Other 60th minute, regular, weak, small, easily compressible.

Rheum are heard all over the chest.

**Treatment** — The patient was put upon fluid diet, and half an ounce of castor oil was given three daily. Except for the first day or two a blue and a cologne bath 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 freely. The diet altered. Caffeine was continued.

On 25th March port wine was given as the patient seemed anorexic, and either wine or spirit were given for breakfast. On 26th March pills were ordered containing quinine, senna, and solutions, one three daily.

The patient gradually became better. Considerable elevation was caused by the blue pills and the calomel gave the bowels action for the regiment. 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 elastic. It arches downward somewhat in front of the mammary line passing to the middle line. No pain or tenderness. In the middle line the hepatic dulness extended from 1 3/4 inches above the umbilicus upward for 4 3/4 inches. In the right mammary line it extended from the 5th
the downward for 6 inches, ending ½ inch below the lateral margin. The thighs, slightly enlarged, superficial veins at either a little distended.

21st March - There was some red 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 blood.

29th March - The patient was very weak and the pulse was slow, small, weak and irregular. Tongue coated with yellowish white fur. Little yellow opaque film on the lateral margin of the tongue. The liver extends two fingers down than before. Still some phlegm in chest and breathing short.

27th March - Weak. - There has been perfect no bile in the stools for a week. No redness.

30th March - Weak.

4th April - Much weaker. Talking incoherently. Jaw more deeper. Tongue firm and cracked back of brownish and dry. No headache, but pain in right shoulder. The complaints of soreness in the region of the liver, but there is not tenderness or palpation of the liver where bile is about the same as when last examined. No bile in stools. No oedema of feet. Still as much phlegm. Pulse 70, regular, weak, small & easily compressible.

2nd April - Very weak and prostrate. There has been considerable profit of the breath for some days. Watery from the mouth, consisting of bright blood. They had also recur several times purging. Lips very flaccid. Skin of deep lemon-yellow color. Some capillary dilatation.
on face. Pulse 60, fairly regular, almost thrifty.

Feb 28th. She has been lying in a drooping condition all afternoon. Haemorrhage occurred from mouth as well as from rectum both last night and today. No fever. Jittery from chills and palpitation. Now of face has a more deathly appearance. Pulse at wrist almost imperceptible.

3rd April. The patient died at 5:45 A.M. There were no further symptoms except that she gradually became more agitated. No more haemorrhage.

The fluid from a blister was examined on one occasion. After removal of the albumen, the reaction for bile pigment was obtained and Dr. Oliver's hepatitis solution reveals the presence of bile salts in pretty large quantity— in much larger proportion than they occur in normal urine. The diagnosis was repeated with similar results.

The temperature was normal or subnormal except occasionally in the evening up to 38°C. This when it was slightly elevated. For about two days before death it was subnormal.

Post Mortem Examination—3rd April—

Body very much swelled. Hands and feet swollen. Some oedema on legs. About 1¼ inches of fluid

extensive fat over thorax & abdomen, deeply bile stained. Abdominal cavity contains a quantity of bile stained fluid in the usual quantity. 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 a pole the transverse colon.
and a hard irregular mass, about the size of an hen's egg, could be felt at its mesenteric extremity. This was found on section to consist of a serous deposit in the head of the pancreas undergoing colloid degeneration. The common bile duct was occluded by it. Two dark brown faceted gall stones were found in the gall bladder from the inner surface of which the purplish color almost quite disappeared owing to the distension. The surface and section of the head were deeply lichenated and of a greenish-yellow color. Throughout its substance there were numerous yellow glistening looking bodies, dark green in color, from the side of a fruit laden to a pink. There were also some yellow nodules of cancer, some of them as large as a hazel nut.

The stomach was in a state of putrefaction. The musculature and mucosa were extremely fleshy, the appendix especially very large. The vermiform appendix was healthy. It measured 11 1/2 in., like an orange and of the yellow connective tissue grey.


Right Kidney — 5 1/2 lb. The yellowish streaks the size of a grain. Otherwise similar to the left.
The lungs were in a state of congestion and edema, and there was yellow necrotic purulent fluid in the bronchi. On the surface and on section there were numerous yellowish foci on the side of a lung head. There were some fibrous adhesions to the chest wall on both sides.

The pericardial sac was empty. There was an excessive deposit of deeply blue-stained fat under the pericardium. The aortic cusps were somewhat thickened and in a state of early atherosclerosis. There were two vegetations on one of the cusps. On the aorta above the sinuses of Valsalva there were two large firm calcareous plaques which had partly penetrated through the adventitia. Above this there were traces of early atherosclerosis. The cusps of the mitral valve were somewhat thickened, weight of heart 11/2 lb.

The bile in the gall bladder was somewhat thin, brownish, colored and gave a deposit of bile pigment and cells. Reaction acid. Linseed in large quantity, no jujus. Only a trace of albumen.

Bile pigment present. After being cleared by boiling and filtration, it means of it gave with a drop of Dr. Oliver's test solution an opacity equal to that of the standard showing that bile salts were present. The filtrate, when made up to the fluid volume, appeared in large quantity. This presence was also revealed by met vitreous red reaction with pepsin HCl and zinc oxide. Microscopically there were a few platelets of cholesterol, masses of bile pigment, columnar epithelial cells, many of them in opposition, detached rounded cells, and numerous
Examination of Urine.

From the time of admission till 26th March the

urine was normal or a little over the normal.

After this it could not be collected. It was always

dark, bile, pigments, specific gravity low. Reaction acid.

From her admission to 26th March, inclusive there

was no albumin nor sugar. On 26th March there

which just came from hemorrhoids,

was albumin, due to the presence of blood but no

sugar. The bile was present in very large quantity

at first, but somewhat diminished as the case

progressed. The urine on admission 23rd March

was 314.7 grams per day. Always after this it was
distinctly diminished, varying from 228 to 283 grams.

Sensitively there were the cells from the renal

epithelial, bile-conduct cells, containing highly granular cells

and granules. Bile-granules, all dark bile stained,

bile-epithelial cells containing granules of bile pigment;

sometimes granules of bile pigment, some with crystals;

sometimes bile-pigmented casts, and crystals. On

29th March there were masses of dark, brownish bile

pigment (2.6 millimeters or 0.01 millimeters). On 31st March

there were just a white blood periphery.

To determine whether the fluid produced by the bile tissues

the bile-and water 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 is produced. This was done on 21st

March, when the bile salts were in very large quantity (600 per cent).

Pettenkofer's reaction was obtained with the same specimen.
Tabular Statement as to Lime.

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<tbody>
<tr>
<td>Mar. 1st</td>
<td>100</td>
<td>70 per 700 lbs, 600 per</td>
</tr>
<tr>
<td>2nd</td>
<td>46</td>
<td>702 574.7 lbs, 600 per</td>
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<tr>
<td>4th</td>
<td>40</td>
<td>712 574.7 lbs, 600 per</td>
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<tr>
<td>8th</td>
<td>44</td>
<td>712 574.7 lbs, 500 per</td>
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<tr>
<td>12th</td>
<td>46</td>
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<td>16th</td>
<td>62</td>
<td>712 574.7 lbs, 500 per</td>
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<tr>
<td>19th</td>
<td>46</td>
<td>712 574.7 lbs, 500 per</td>
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<tr>
<td>21st</td>
<td>42</td>
<td>712 574.7 lbs, 400 per</td>
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<tr>
<td>22nd</td>
<td>60</td>
<td>712 574.7 lbs, 400 per</td>
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<tr>
<td>26th</td>
<td>46+ 1010</td>
<td>712 574.7 lbs, 400+500 per</td>
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Though there was some diminution in the amount of this payment, while the quantities diminished, there does not appear to be a decrease corresponding to the decrease in the amount of lime paid, and it Increased again towards the end, when the quantities increased.
Case II.

Case of Malignant Disease of the Liver with Pericholangitis.

Professor Strangeways, St. Luke's Hospital.


History: — There is no history of malignant disease in the family. The patient's wife's first conception ended in a miscarriage at the third or fourth month, due to a fall. After that she had five children, all born at full term. She died from the effects of a burn. The others are always healthy. He says he has been good. He has for a long time been in the habit of drinking a good deal of whisky — frequently going to excess. He did not 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 gouty attack, but there was no history of any other renal 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 'walk' in the right side of the chest. Besides these illnesses he has
been troubled with hernia for the last thirty years, produced pain, he says, by playing in the cold.

Present Illness. Last week my last day, 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 be 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 diaphoretics were given, and mustard poultices were applied to the side. Be also got a cough which accompanied it. The pain has been relieved, but tenderness remains in the part for ten days or so. It was very sharp and was intensified by respiration. It occurred last Tuesday morning. He has lost through to the back below the ribs and shoulde. There has been no change in the colour of the skin. The skin has been light-coloured. The bowels have been regular. He has not noticed the character of the stools.

State on Admission: — Well developed.

No jaundice, dropsy or cyanosis. Face somewhat flushed.

any illness, trouble with flatulence. One morning after he had the form he vomited some clear fluid. Bowels regular.

There is a rounded prominence in the right side of the inguinal region, extending a little into the right hypochondrium below the ribs. The abdomen is otherwise normal in appearance. The abdominal walls are of moderate stiffness and tension. There is no tenderness at present. Tenderness is felt over the liver below the ribs, especially over the prominent part which is rounded, like the section of an orange in side 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 inward it also descends, so as to be lower in the middle line and for some way to the right of it than in the mammary line. The peritoneum over the liver is clear except over the ribs. In the middle line the hepatic dulness extends from 1/2 inches above the umbilicus upward for 5/2 inch. In the right mammary line the hepatic dulness extends from the 3rd rib to an inch below this costal margin a distance of 5 1/2 inches. The superficial dulness begins at the 6th rib. In the right breast and axillary line the dulness extends from the 6th rib downward for 5 1/2 inches. The superficial dulness begins at the 14th rib. On auscultation,
friction is heard over a large area of the liver, especially distinct over the prominent part.

Hepatomegaly present, spleen not enlarged. There is considerable enlargement and induration of the liver in both zones and slight enlargement of those on the right side of the neck.

The heartbeat is slightly irregular. The first sound is firm and the second sound is accentuated, especially in the initial area.

The breathing is slightly harsh. There are moderate expectorations posteriorly, especially at the bases. There is nothing further abnormal in the respiratory system.

There is some visible dilatation of the veins of the legs. There is no evidence of any nephritic affection of the skin.

Nervous and locomotory systems normal.


The patient was treated for about a month with Chloride of Ammonium, and after that with Hydrochloric acid, Sulphur of Mercure and Tyrothricine.

Progress: The palpable liver steadily progressed, the liver becoming larger as a whole and the prominence in the epigastrium increasing. On 29th Oct the icterus was much less marked, and a deep jaundice on the right side of the}

...
right mammary line a large massule was felt extending down to about an inch above the level of the anterior iliac spine of the ilium. It was round in shape and was later a small apple in size, free to move with inspiration. This massule also steadily increased in size. Apart from this there was no diminution of the inner surface of the liver.

On 25th Nov. the liver dulness in the middle line extended from 5/10 inch above the umbilicus upwards for 6 inches. On the right mammary line it extended from the upper border of the 8th rib to 3 inches below the costal margin. The superficial dulness began at the 8th intercostal space, distance of 4 inches. In the mid-axillary line the dulness extended from the upper border of the 9th rib downwards for 6 3/10 inches. The superficial dulness begins at the upper border of the 8th rib.

On 25th Nov. friction precidius and was felt extensively over the liver below the ribs. Friction was heard below the ribs and over the lower ribs, most marked between the mammary and anterior axillary lines. It was almost absent above them. Soon after this the friction increased and became more extensive. On 14th Nov. there was a slight but quite distinct tactile taut of the conjunctiva 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 precidius was felt especially hard and pitting over the liver, but below it on the right side.
The lower margin of the liver was thickened and nodular; there was no ascites. On 25th Oct the jaundice became very marked. The pain was very severe; there was no jaundice from this tenderness but frequently the face and left conjunctivae were yellow. He was quiet and conversed on 8th Dec. On 7th Dec the jaundice extended right across the abdomen and was very severe. He looked thinner, failer and more cachectic.

On 8th Dec. friction jaundice was distinctly felt over the intestines - very marked on the right side, slighter on the left side. Auscultation corresponded.

The abdomen was more distended and there was some dulness on the left flank. The bowels keep stooling had increased in size.

The pain in the stomach has been fairly constant and was admitted, especially after food. The difficulty of swallowing has not been great. He has some heart-burn, and often has something gaseous passing. He can't take food now - has no appetite for it.

The patient went out by his own desire on 22nd Dec. He has been gradually losing ground and the death not long after clearing the reformer. The temperature has been normal or subnormal all the time. The urinary sediment was from 30 to 38 per cent. - was fresh for different days and in large quantity. Normal food appearance. contained no albumen. No fluid test paper.

The left pulse was always distinctly under the

The emesis varied - sometimes severe vomiting, sometimes no distinct increase. Urine - 335-638 gms.

Remarks: Urine and crystals. Urine acid. 28th Dec to 1st Jan.
Case 10
Malignant Disease, probably both Gastric and Hepatic; small quantity of sugar in urine.

Professor Fraser's case.

John Haymer, age 53, had sore of funnels' tongue. Admitted on 14th Oct., complaining of pains 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 few or six weeks.

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

Examin'd on 15th Oct.

History: — Nothing of any importance can be ascertained regarding hereditary tendencies. His job has been fairly good, but he has drunk a good deal of whisky, but very little during the last year. His work was light but he was a good deal exposed to the weather. He had an illness a long time ago which he says was Rheumatism 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 urine,
he has greatly 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 pain 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 extending oblique into the epigastric 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 nodule was compressed 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 4th Oct, a mixture was ordered containing
Bromthyl Salicyl acid, Hydrocynic Oil, Hyoscini and
Hyoscincine. On 11th Oct. 16th gr. Morphine Hypodermic
was ordered to be given every night. On 18th Oct he was
ordered pills containing Calc. Phos., Calc. Hydroxyam., and Carb. Gota in one every night, repeated if necessary.

The temperature was normal or subnormal until the evening of 15th Oct., when it rose to 102.4. On the morning of 16th Oct. it was 101.2 and in the evening it was 103.4. The patient's general condition worse and died that evening.

Post mortem examination was performed.

The urine—The quantity has been small, varying from 12 to 20 ounces per day.


Age 1.5%. Acid. Slight trace of albumen, slight by general tests, with urine acid included.

Bile pigment in small quantity. Bile salts absent. 1/50 grain the standard quantity. Therefore not decisive of our 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 urines. Iron nitrate 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.

Albumen present in large quantity.

Urea — 263.85/12 gpm.

Mesenteric, Amorphous crystals, Uric acid crystals, and various parasites.
Case II

Case of Cancer of the Pyriform with some secondary cancerous growth in the Liver; Intestinal Anaemia.

Professor George Stewart Ward.  
Thomas Renold, age 43. Admitted 1st March.  
Complaint: Pain in the region of the Stomach & Liver.  
Duration: Since August 1884.

History: Family history unimportant except possibly that one brother probably died of cancer, at the age of forty-nine. Patient made have been irregular and hurried. He took too much and also a good deal of cheese. Comfortable home.  
Temper: Work heavy and working hours long. A good deal exposed to cold, wet at work.

Previous Illnesses: Measles & Scarlet Fever when a child. About ten years ago an affection of the Knee - probably Acute Bursitis. He has had haemorrhoids for 2 or 3 years. Two years ago they came down and became infected, with no history of syphilis or other venereal diseases.

Accident: Besides some slight accidents, which have left scars on the forehead & cheek, he sustained a fall sixteen years ago while carrying Coals, and this caused a slight pugnial
lumina, for which he has had to wear a truss.

Present Illness. This began on day 1st August 18...
stomach or head). There was considerable anaemia as was shown by the pallor of the face & lips. After this he received treatment (Bromide) at Montaque Dispensary. Near the end of February the same took effect very generally all over the stomach, and next day it extended to the right side also. He was admitted to the Infirmary (ward 22) for the second time on the 7th March. He had not vomited more than twice since he left it - the vomit taking on a brownish color. He had been constipated during his illness. I do not know whether any blood was 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 a yellowish wax appearance. He vomited almost immediately after admission, the vomit consisting simply of altered food.

On the 8th 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 the right 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 shooting through to the back. A nodule was indistinctly felt on the surface of the liver. Red solder of mercury 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 vertical headache.

11th March - Drowsiness and pains in limbs, with a burning sensation in epigastrum. Note a clear over the nodule 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 sinews along the limbs; but he vomiting very seldom, only three from his admission to the end of April. His appetite was fair; good but he had various digestive symptoms besides the pain. He continued to have numerous phenebo and worse perspiration all over the chest, though the acute attack had of Bronchitis had subsided.

When examined on the 28th May there
was marked pallor of the skin and mucous membrane.

There was oedema of both legs, most on the right.

There was slight varicosity of the superficial veins of the legs. Koninck's sign remained.

General appearance that of cachexia with extreme anaemia. Temperature 99° to 99°6 F.

Alimentary System: Tongue pale, furrowed posteriorly. Appetite good, some thirst, expiring at night. The dyspeptic symptoms had considerably subsided. Urinating rarely occurred, and the stools were regular.

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

Palpation: Abdominal walls moderately taut. Tension. No tenderness except prepucially immediately below xiphisternum. Some slight irregularity of the surface of the liver felt near the xiphisternum. To 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. The right lobe of which could be felt by pressing deeply to 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 in the surface. Its edge was like the declivity of a large range. It moved with respiration; was not tender; and extended for about 1½ or 2 inches below the ribs.

Perception was good over the whole abdomen except over the fundus and the tumours above described. On the right lobe of the liver, over the fundus the hepatic dulness begins at the fourth interspace. On the right mammary line the liver dulness begins at the upper border of the 3rd rib, and the dulness extends for 2 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 6½ inches. The 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 dulness is found to become impaired almost exactly in the middle line. The line of impairment extends downwards and very slightly to the left, and to pass slightly to the left of the middle line. Then it lateral
a curved course to the right and crosses the middle line about 1 3/4 inches above the umbilicus. It then becomes more transverse, and, nearly 3 inches to the right of the middle line, it runs slightly upward, then passes nearly straight backward, and meets the rectal margin a little behind the anterior axillary line. The lowest point of the line is between one and three inches to the right of the middle line, where it is about 1 3/4 inches above the level of the umbilicus. At the level of the right pectoral muscle the dullness becomes absolute 1 3/4 inches to the right of the line of impalement. The line of absolute dullness takes a curved direction downward and to the right, becoming further from the line of impalement, until there is 2 3/4 inches between them. It then becomes transverse, and meets the rectal margin a little to the right of the right mammary line, and a little beyond that it becomes continuous with the line of impalement already described.

(End of text)
Red Corpuscles - 2,670,000 per c. millimeter.
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 palpable, but otherwise normal.

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

Ciliary System - No subjective phenomena.

On 28th May the urine was clear, pale, pH 6.8, 1019, nil for acid, and contained neither albumen, sugar nor bile pigment.

Nervous System - Normal except the eyes. There is conjugate paresis in left eye, worse in the left eye. The looks entirely with the right eye, the left being turned outwards. There is also conjugate nystagmus. He can see large letters with difficulty. He sees near objects best. He can tell the number of figures correctly if they are near, but if they are two double the number or more if they are further away. He can see best in a subdued light. Pulse equal, of medium force, regular.

Locomotor System normal.
Various medicines for the stomach were administered, and the diet regulated. Some improvement was obtained, the pain became slight, but the physical signs did not change much. He was discharged on the 6th June.

Early in July he suffered from diarrhoea and anorexia. The diarrhoea yielded to treatment. 20th July. The tumour in the epigastrium so much the same as before—perhaps rather smaller. The liver has undergone some diminution in size, extending at the right mammary line from the 5th rib to slightly below the costal margin, a distance of 5½ inches. In the right paracostal line the vertical diameter over the liver, tumour is 6½ inches, in the rightternal line 6 ¼ inches.

On the 15th August he was readmitted, having become worse about a week previous, with pain after food, stickiness, eructations &c., but no vomiting. His appetite was very fair as before, but with a more haggard appearance. No jaundice or diplopia apparent. The tenderness is more extensive than before. The lower part of the tumour is now tender. The tumour is found
Examination of Blood on 9th Aug.
Red Corpuscles 2,930,000 per c. millimeter.
White 4,800
Haemoglobin - a little under 30 per cent.
The red corpuscles have the same appearance as before.
10th Aug: A slight haemorrhage is heard over the heart.
11th Sept: The tumour has been gradually becoming tense. The pain has been more. Tumour larger - has for some time caused bulging of the right costal cartilage.
No ascites nor oedema of feet.
29th Sept: Tumour increasing. Some oedema of left foot and leg. Friction tremortis is felt below the ribs over the prominent part of the tumour a little posterior to the right mammary line. Rough抓住 greating friction heard over the tumour - first noticed about a fortnight ago.
9th Oct: Considerable oedema of abdominal walls & tympietes.
19th Oct. - Pain in lower part of abdomen.
Abdomen distended. Pegs redolent.

20th Oct. - Pegs yesterday with great pain in temperature rising 100.8. Abdomen, sickness, purging & green gum externally. Hypodermically & ipecac.unctions applied. This morning, a good deal of pain, especially in the right side of the abdomen, difficult to get anything to remain on his stomach. Some milk & hot water makes him feel better.

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

21st Oct. - Sockets into intercostal right leg yesterday. 4 ounces of fluid removed.

For some days after the fever there was diarrhea.

The gradually became more cachectic and the evacuation 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 pustule and edematous. He gradually sank and died about 2 or 3 o'clock this afternoon. Breathing too rapid to omit some dark greenish fluid. To the last there was no jaundice though the dun had a yellowish-coloured colour owing to the anemia.
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 arising to the abdominal pain and distension.

The urine never contained any albumen, bile pigment nor sugar. The bile salts were only once found to be slightly increased (26th Oct.) when 40 gave the standard gravity instead of 40. In all the other examinations they were found to be rather normal or slightly diminished. Indigo was almost always found in large quantity. The urine was distinctly diminished in amount. It was several times estimated, and the largest quantity found in 24 hours was 246 grams, in all the other estimations it was under 200 gms.

Post Mortem Examination - 26.10.47

Thorax: A 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 exudate adhering to the chest wall & also to the surface of the lung. Pleura considerably injected.

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

Right Lung - firm adhesion all round to chest wall. Very marked congestion & oedema. Remainder of pleura adhesions. Towards the apex, some emphysema. Some pigmentations. Weight 1 lb 9 oz.

Tissues in front of pericardium somewhat oedematous. In the pericardial sac there were 1/2 oz of fluid.

Heart - Subcutaneous tissues somewhat oedematous.

Nothing important.

Abdomen: Easily contained 2/4 oz of clear, straw coloured fluid with a few flakes of lymph.
Quadrants considerably retracted. Liver drawn up under ribs, and at its lower margin is a firm nodular mass connected with the duodenum to transverse colon, colon passing back to the spine & pressing on the inferior vena cava.

After (4 1/2 oz. in each) a series of dark fragmented spots.

Kidneys - weight of each 5 1/2 oz. Right kidney, in pelvis veryedenations. Capsule does not strain off readily at some parts. Cortical somewhat smaller than normal at first and slightly irregular. Somewhat clefted; pale streaks passing in between the vessels.

Stomach, there is direct communication with the duodenum. The pyloric end is involved in the cancer mass which is apparently sessile. (thickened growth). It 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 plastering into the inner surface of the liver.

Duodenum. The mucous membrane is all replaced by the tumor. Bill duct greatly patent.
The rectum was dark. There is a small cancerous nodule on the side at the anterior margin of the right side close to the middle line. The rest of the rectum is free from malignant deposit, except that there is some cancerous infiltration on the under surface in the region of the quadratus lumborum. There is a small thrombus in the hepatic artery. There is also a thrombus in the inferior vena cava where the tumor is fixed on it. There is a small inflammation on the external surface of the diaphragm, but the internal surface is quite healthy. No nodules in diaphragm.

The tumor involves the stomach, duodenum, omentum, pancreas 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 consistency. The small intestine is involved in the malignant growth. The mesentery is thickened.

Large Intestine - Thrombosis in the main vessel - due to drop of Alderan. Considerable number of thrombi in the portal arteries.
I find Vena Cava, The whole tumour feels as it but does not move it. Thrombosis at as before stated.
Case 12.

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

By George Brunton, Esq.

Wm. Montith, aged 53. Housewife.
Admitted on 24th Jan 1876. Complaining of soreness in abdomen, gapeing, loss of appetite, and pain after food. The symptoms lasting two years duration.

The patient gave a history of severe headache, vomiting, giddiness, and dull pain in the hypochondria.

A year past last October she had an attack of what she calls inflammation of the lungs. The pain has been worst after food. She has not vomited for some months but has often been sick. The vomit never resembled coffee grounds. She has had various digestive symptoms. She has not had any jaundice, though her face became more yellow when she had the attack of vomiting. Nails have been constituted, and the face is worse when they are so. Boners, health, good except that she had had rheumatic pains in the fingers and wrists.


Abdomen. Some universal prominence with slight bulging of flanks. Very slight comparison fulness in region of and below right costal arch.
in region of mammary line. No dilated veins. Respiratory movements natural. Walls placed with considerable amount of adipose tissue. Below right costal arch a rounded swelling is felt entirely from beneath costal margin downward to about 1/2 inch below umbilicus. Its margin edge is very distinct felt immediately above umbilicus in the middle line. Above this it is in relation to the calf's line. The lower limit of this swelling has a rounded smooth curved border which can be traced to the right for a distance of 1 inch. The surface feels smooth and firm and gives no definite sense of fluctuation or plasticity. It moves distinctly with respirations. The inner edge diminishing above the umbilicus is very distinct and sharper than either the inner or outer limit, 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 pectoral muscle is firm, uneven and obscurely nodular.

Peritoneum: The abdomen over the pelvis is continuous with the fixed abdominal.
The relative liver dulness begins in the right mammary line at the 5th upper border of the 6th rib, and on the left in the midst-aciliary line at the upper border of the 5th rib. The absolute dulness in these lines begins at the 3rd to 6th ribs respectively. The lower limit of liver dulness in the middle line is an inch above the umbilicus, the line of envelopment is continued from there upward to the left to reach the costal margin in the mammary line.

The lower margin of the spleenic dulness is a continuation of this line and corresponds to the lower border of the 9th rib. Its upper border is at the upper border of the 6th rib. The stomach, much obscured, can be obtained through the liver. Towards the right, the line border of the liver passes the paralyz below it at a level a little above the umbilicus, reaching its right border in the mammary line where a distinct angle of friction is felt. From this the lower margin of the liver continues upwards and very slightly forward, reaching the costal margin in the antero-aricular line. It can be the most tender part is at the lowest part of the swelling and over the liver to the right of this.

3½ bps, left posteriorly.
With first sound, heard all over precardiac, some accentuation.
Flead sound in pulmonary area.
Pulse 72: palpable high tension.
5th Feb. The lady 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 fever and vomiting. After this the patient made some improvement. Fever and the tenderness diminished and her general condition became better.


Abdomen very much as before, but the lower margin of the liver is nearly an inch further down. The swelling below it is larger considerably. No much tenderness.

The patient left the infirmary on 1st March. Her condition was in the whole not much changed. The temperature at night varied from 99.5 to 101.4. In the morning it varied from 98.5 to 99.7.

She was readmitted on 10th 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 20th March a fine needle was introduced 1 inch below right costal margin and 1/2 inches from the middle line and about 2 1/2 inches above the level of the umbilicus. The needle was passed deeply and in a downward direction. It drained of a somewhat thick, brownish yellow fluid.
were withdrawn. The fluid contained a large amount of albumen and a trace of bile pigment. The microscopy showed many erythrocytes, occasional leucocytes, and some pyknotic nuclei. Besides numerous fine granules there were many cells, large and highly granular, some with two or more nuclei, some rounded, but most of very irregular, various shapes, some evidently dividing, some with long processes, some spindle shaped, most at least epithelial in structure, evidence of carcinomatous origin.

The setting produced the idea of tuberculosis and it was not followed by any local symptoms.

She had also begun to suffer before the 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, afflicted with some hyperesthesia. The pain was said by her to be relieved by palpation of a node which was known for it, but a small dose was found to be as offensive as a large one.

Throughout, she has had no jaundice since readmission, more which for food and no gastric symptoms of importance. Pulse: 70, regular, weak, easily compressible, rather small. Tongue somewhat dry & cracked, covered with brownish white film. The abdomen is flabby and there is tenderness over the lumbar, especially in the middle line and a little to the left of it. No irregularity of the lordosis felt.

18th April. - Swelling extends to 1 3/4 inches to left.
Cells from fluid removed from abdomen on 10th March

Cells from fluid removed from abdomen on 22nd April.
of middle size and tumours of the canoe's bologna level of
sublunary very tense and painful on pressure,
especially on inferior border. It extends into the right
lumbar region. It appears continuous with the lines
on its upper and right border. The over upper third
of swelling is almost completely dull; lower two
thirds, partially dull on right plexus.

12-45 P.M. - The tumour was again aspirated and
11 ounces of thick, slightly viscous brownish-gray colored
fluid were removed. It deposited a cream sediment.

13th 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 20 ounces of fluid were drawn
off, partly clear at first, towards the end a
thick, creamy part of fluid escaped. Under the microscope
foveal cells of various kinds, shapes seen as before.

On 26th April several ounces of fluid were again
drawn off. On standing it deposited three-fifths
of its bulk, supersaturated fluid turbid and of brownish
yellow color. Deposit brownish-yellow; albumen no large
and third
quantity. Pigment also present. Pigments
microscopic characters much the same as before - cells
of varying shapes and sizes, all very granular, fatty,
some very large, some with more than one nucleus. Sugar
kernels, numerous fat globules.

The patient gradually became weaker, more and more
emaciated. In cachexia, suffered greatly from loss in
The tumour became larger than pea, and reaching near to the umbilicus. It was soft, and it was not thought of any use to repeat the laparotomy. Towards the end of May, she began to pass urine in bed, and a bed sore formed over the vacuum and the festuflis 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 subcostal space. The tumour was felt over the liver in the right subcostal space, and the liver there was sometimes somewhat tense. There was slight or no jaundice. Towards the end she slept a good deal and died on the 20th or 22nd June.

During the second period of her residence in the hospital, 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—June 25th—

Pericardium and pericardial sac, moderately dilated, subject to aconitum. Large haemorrhage of peritoneal region, forming at one side, healing at the other. Post mortem rigidity completely absent. Ascites absent. Some adhesions of inner coats. There is commencing gangrene of the lower parts, inner side of the left astragalus. In the right side of the hypogastric region and extending into the inguinal, there is a marked swelling, 3/2 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 tumour with a little omentum attached. The colon was displaced by the tumour.

The gall bladder was completely filled with gall stones and the new growth had taken place posteriorly. The pancreas jutted out to be the lesser of the two tumours. The liver was enlarged and cancerous. It contained some deep old peritoneal contractions due apparently to cancer of long duration.

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

Right Kidney - Pale, surface roughened. Capsule stretched off readily. Light 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 altered. The medullary bodies and the pyramids were wary.

Left Kidney - 3/4 oz. Capsule stretched off readily. Light congestion. In a similar condition to the right.

Heart - Firm, close and the ventricles, also on the left auricle. The right auricle was empty, also a thrombus of auricle. Vegetations in the middle valve. Sino-atrial valve normal. and at the aortic.

Left Lung - Somewhat emphysematous anteriorly, somewhat congested and reddened.

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

There was a cancerous growth in the tympanum and also in the sphenoid. The fracture of the sphenoid (result of the pain) was intracapsular.
Examination of Urine.

The urine was always small in quantity, the largest quantity per day being 32 ounces or 1.4 liters. Generally 20 ounces or less. Specific gravity usually high. Reaction acid. It generally deposited praecl or uric acid, and frequent urates also. There was no albumen till 12th May when albumen appeared. No sugar. Nitric acid except at first gave a slight reaction like that for bichromate, but this may have been due to the indoxin which was always present in large quantity. The bile salts were in normal quantity at first, but on 3rd June and always afterwards they were in excess. The pcrsa varied from 39°F to 146 grams. Occasionally there were ammonium, praecl, uric acid, and sometimes urates. Also means of pus corpuscles and squamous epithelial cells.

On 12th May in addition to albumen there were present a few cells from the renal epithelium, and one or two epithelial casts and hyaline casts containing cells and granules.

The bile salts on and after 28th March were generally present in double or nearly double the normal maximum amount (200 per cent). On 28th May their quantity was as large as 307 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 (Acme) with Ascites.

Professor Granger Stewart said

Horatius Bonner Lyngington, age 50, laborer in saw works. Admitted on 1st July 1886, complaining of pain in the right side with swelling of the abdomen.

Duration of illness about 6 months.

History. He used to take a good deal of alcohol, but not since he had swelling on the left side two years ago. He has had good food. His home has been comfortable. He had scarlet fever seven years ago. About a year ago he had a slight attack of colic. Since then he has had several attacks. About two months ago he had a severe attack which confined him to bed for four weeks. Ever since he had this swelling he has had pain in the left side region on lifting a heavy weight.

Present Illness. About a year 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 continues 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 furred. 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 wall was moderately tense. There was no tenderness present over the part of the liver below the ribs. Between the middle and right mammary lines the lower margin of the liver was obliquely felt. There was no irregularity. The percussion note was clear in front, but the left side of the note became dull six inches to the left of the mamillae. In the middle line the dulness commenced about two inches above the pubes. On the right side there was profound dulness in the flanks, but the tympanitic note of the ascending colon was heard through it.

In the middle line the hepatic dulness extended from about 4 1/2 inches above the mamillae upward for 4 1/2 inches. In the right mammary line it extended from the 4th rib to fully 1/2 inch below the costal margin a distance of 5 1/2 inches. In the mid-axillary line it extended from the 6th rib downward for 5 1/2 inches.

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

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

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

The patient denied any jaundice and the first sound was inspire. There was no murmure.
There was no dulness over the lungs. The expansion was better at the right than at the left base. There were impressions with deep inspiration above and below the clavicle on the right side and also at the left base. The inspiration was a little prolonged at some parts. There was no pleuritic friction.

On Feb. 25th a mixture was ordered containing

'A solution of Digitalis,perm. Alum.4 parts, and

Ammonia Circumdata. This was discontinued on 1st Feb.

On 26th Feb. A wineglassful of hot water, imperial

three daily was ordered. The patient had to get an

asceptile fall on account of symptoms.

By this time, the pulvisil improved. The

friction had disappeared by 21st Feb. The pain also

dissolved. The ascites diminished, and, when he left

the Infirmary on 13th March, was very slight.

The fluid gradually diminished in size, till when

he went out it was within the normal limits—

measuring 4.4 inches in the diaphragmatic line. The

often became normal in size. The superficial veins

for a time, when the fluid began to diminish, were

more distended, but after a time they also diminished

in size.

He left the Infirmary on 13th March, much

improved in regards to the abdomen, but the pulmonary

effects was a little profound. There was found on

this previous day slight dulness at the right apex posterior.

The breathing was harsh at the left apex in front with

occasional phonemes. At the right apex in front and
behind the fright was such I approached the torchlight
in terror, and it was accompanied with edifications. The
second sound of the heart was slightly accentuated in
the cardiac + pulmonary areas. The first sound was
profuse. There was no murmur and the cardiac
 dullness was within the normal limits.

There was a slight rise of temperature in the
 morning during most of the time he was in the
 hospital, 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 14th and 26th Feb. and on
18th March. It was normal in appearance and
there was only a meagre deposit. It contained no
albumen, bile pigments or sugar, and the bile
salts were present only in normal quantity on 14th
Feb. and 27th March, but were found slightly increased
on 26th Feb. and 1st Apr. Quantity 46.52. Albumen
found to be not increased.

26th Feb. - Quantity 38 oz. pH 6.92, slight acid.
Bile salts normal or slightly increased.
1st April - Quantity 24 oz. pH 6.21. Slightly
acid. Urine - 399.9 grs.
Case 14.

Case of Carcinoma of the Liver with Ascites.

Professor Hampson Stewart read.

William Peden, age 40, Pueblica.
Admitted 13th June 1885. Examined 14th June.
Complaint - Drooping Duration - Four Months.
History - The only thing of importance in the family history is that one of his brothers died of Drooping at the age of 39 after four years' illness. He was frequently tapped. He had been temperate. The patient was a coachman till a year ago, enjoyed good health and used temperate, but took on an average three pints of light table beer daily, with occasionally a glass of whisky. About two year ago he became a publican and thenceforth about six "wifs" a day. The work was not particularly 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 life for two months or about three weeks after his disease began to show the present illness commenced. His breathing became very difficult. On July 6th he consulted a doctor who treated him for Congestion of the Liver with a slight tendency to Drooping. He was ordered Carlsbad salt to every morning and a mustard was also given him. This treatment he continued till three weeks ago when the medicine was altered to Aspirine, Brand's Sweet Spirits of Nitre.
and delicacy of appearance. Since then he has got worse - the swelling of the abdomen increasing daily, the legs became more puffy, and the sensation of nausea began to tell. He was not confin'd to bed during this day, whilst he remained at home.

State on Admission. - For a few months before the New Year he had felt out of health and was treated for stomach disorder. He used to be healthy, but became pale. Since last summer he had then has had a more yellowish colour than before, almost like yellow jaundice. This has now greatly left him. About the 4th of July when he consulted the Doctor, he noticed that his urine was smaller in quantity and dark coloured, and that it became turbid in standing. He had a cough for some months and it became worse three weeks ago, when he got into a state of asthenia.

Height 5 feet 8½ in.

Marked atrophy of the extremities and lower limbs. Some peaty excretions over the front of the legs. Most comfortable when supine but can now sleep when lying down.

Digestive system. - Tongue somewhat flabby and slightly purged. Sometimes troubled with flatulences.

Abdomen. - Marked prominence with bulging in flanks and other signs of ascites. The dulness is 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 ½ inch of the
-costal margin, a distance of 4½ inches.

Measurements of Abdomen -
  At level of 4th rib: transverse 42 inches.
  Midway between 9th rib: transverse 45½ inches.
  At level of umbilicus: 46½ inches.

Stomach: Protuberant

Liver palpable - several palpable glands on right side. Spleen somewhat enlarged.

Circulatory System - Heart somewhat palmarly displaced. No murmurs. Pulse 104 regular, somewhat small; Arteries healthy.

Respiratory System - Breathing 26 to 30 minutes, entirely sternal; Cough troublesome at night.

Urine yellow, thick white. The prepuce is red and hot. Incision 2½ inches.

March breathing in front. - Posterior over the larynx, numerous medium expectorations, especially with inspiration. Vocal cord points: Head, resonance point.

Integumentary System - Freckles to a foot. Freckles on face.

Genital System - Freckles to the lower limbs, some redness of testicles and penis, and also of chest wall. The testicles are firm in the testes.

Skin: one spot of leg.

Urinary System - Bladder: 4 or 5 ounces, said.


(As I was unable to examine the patient, I am indebted to the clinical report for the facts as to the state on admission.)
1st July - The proctitis 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 purulent nor systemic. Tongue covered with white fur, especially posterior. Appetite has been good all the time of his illness. Since admission he has felt a fulness in the epigastrum after food, and has had poor evacuations which he attributes to the sweet milk. Troubled with eructation and gasous evacuations. Vomits 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 nates become dull about 1 or 1½ inches below the umbilicus and laterally about 6 inches from the middle line. The deep liver dulness in the right mammary line extends from the 3rd rib to the costal margin, a distance of 14 inches.

Circulatory System - much the same as before, but slight shortening of first sound in the mitral and slight accentuation of the second sound in all the areas. Pulses - 92 per minute, regular, small, easily compressible. Venous of abdomen distended. Capillaries normal.

On his admission he had felt upon examination of the diet, unwilling at night and was ordered a dinner of: meats, eggs, potatoes, bread, butter, and tea. Treatment of Digitalis,
This treatment, continued with strong purgatives, was continued till 20th June with very little influence on the ascites. On 20th June the abdomen was aspirated and 0.710 m.c. of a milky yellow fluid were removed. From this time he made a pretty steady improvement, interrupted only by a slight diarrhea attack with a very slight retentive part of the conjugation. The size of the abdomen as shown by the measurements gradually diminished. The oedema of the posterior legs soon diminished and disappeared. On 6th July the ascites was still considerable, and the liver dulness in the right mammary line extended from the 3rd rib downwards for 3.74 inches, the lower border being above the costal margin. On 20th July he was much improved, still some ascites. His face has a better colour now. He complains of itchiness and a tendency to vomit in the morning, but he does not vomit much. He got up for a little about the 18th July.

28th July. The ascites has now almost gone. In the right mammary line the liver dulness extends from the 3rd rib to 11/2 inches above the costal margin, a distance of 3.52 inches. In the right mid-axillary line the hepatic dulness extends from the 4th rib downwards for 3.74 inches. In the middle line anteriorly the vertical hepatic dulness is 2 inches in extent, ending below about 1/2 inch below the base of the xiphoid cartilage. There is very
little left-sided dulness to the left of the middle line. The position of the heart has thus undergone a decided diminution while he has been in the Infirmary, and it is now distinctly though still slightly diminished in size.

The patient's general condition is now much improved and he is able to go about quite well, 24 July. The patient was discharged to day, the pulse having almost disappeared.

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

The urine was diminished (12 to 20 ounces on admission but from 10 ounces to near the normal amount), and for a time after the attack it somewhat exceeded the normal amount. It contained no albumen, bile pigment or sugar. There was no increase in the bile colour. The faeces was not diarrhoea, on no occasion a little cholagogue sufficient to cause was present as well. The uric was a little diminished (324 to 335 grains) except at the time of the fits, attack; an estimation made at this time gave 637.79 grams in 24 hours.
Case 15.

Case of Limited Peritoneal Effusion in a Patient with Cardiac Disease, but in whom the effusion is probably in part at least due to Gynecitis of the Liver.

Andrew Byers, age 37. Civil servant for the last five years, formerly an agricultural laborer. Admitted 2nd July 1885.

Complaint - Swelling and heaviness in abdomen.

Duration: Three weeks.

There is little of importance in the previous history. He has been in the habit of taking less, but not too much. As a minor he has been much exposed to damp and cold. He has never had rheumatism, nor has there been any history of diabetes. 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, particularly the matter with his eyes. He continued in this state for a fortnight, and then it was 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 dispensary. 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 rigors, but with considerable swelling of the feet and ankles. He was only on his

Alimentary system: Tongue moist at the edges, covered with a thick white fur. Mouth dry, constant thirst during his illness. Discomfort in stomach after food. For the last fortnight he has had diarrhoea.

Abdomen: Marked distension, especially at lower part, umbilicus projects. No bulging in the flanks. On palpation the walls are tense, but the lower part of the abdomen a distinct thrill is elicited. On percussion there is dulness below a line drawn from prompt 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, then curving upward & backward along the lower border of the 9th rib. Over the stomach there is a highly tympanitic note, extending up to the 4th rib. In the left mammary line & the right lateral sternal line there is clear percussion extended up as far as the junction of the 4th & 5th costal cartilages with the sternum. The liver dulness in the right mammary line extends from the 6th rib to the 10th intercostal space. The left lobe cannot bepercussed. There is an area of dulness in the right hypochondrium 1/2 inches to the mammary line, continuous with external. Above this dulness and extending down to the level of the umbilicus. This area is 2 inches broad. Measurement of abdomen at level of ileum transverse 30 inches, at lower extremity of flank 39 inches.
Stomach: Tumour Slight enlargement of auxiliary to pyloric glands. Otherwise normal.

Respiratory: Slight respiratory distress in anterior auxiliary line. No unusual respiration of first kind.

Treatment: He was put on a milk and corn diet, and was ordered a Digitalis and cinchon mixture. This was stopped in two days. A laudanum pill was also given. On 4th July he was ordered Infusion of Manna and Balsam, and on 15th July a mixture containing Infusion of Digitalis and Chlorate of Nutmeg was ordered.

Progress:

5th July - Complaints of dyspepsia, and pain in the right mammary region.

7th July - The abdomen projected for much anteriorly that a catheter was passed under the supposition that the fluid might be due to retention of peritoneal fluid without any pressure being drawn off.

9th July - This morning he had a severe attack of dyspepsia, with imperceptible pulse, pyrexia, and distension of veins. On examination after this attack had passed off, the pulse was beginning, there was no pyrexia, but some oedema of the legs, ankles, feet, and extremities, and in a state of arthritis. There was a slight murmur in the initial area. The abdomen was uniformly distended, prominent anteriorly but with no bulging of the flanks. The abdominal veins were not disturbed. The walls were tense, and there was
a distinct thrill. When setting up the tube, the dulness in the middle line begins about 2 1/2 inches above the umbilicus and the line of dulness extends to both sides on a level with that. Below the line there is dulness over the whole abdomen except in the right lumbar & right iliac regions where there is a clear cut which becomes gradually crowded in front. Forward till the line of absolute dulness is got running vertically about 1 1/2 inches anterior to the umbilicus & sixth rib inserts. This plane, or to the right is not affected by change of position. The abdomen was ascites, the tube being inserted about 2 inches below the umbilicus a little to the right of the middle line. 120 ounces of the 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 xanthomata & indurated skin of the abdomen gradually passed forward till it was at least 3 inches in front of the previous position, while the level of dulness in the middle line had only become lower by about 1/2 inch. As the fluid was further drawn off the dulness diminished in much the same way, becoming lowered considerably lower in the middle line. The aspiration was completed, the tube was clear, and above where the middle of the aspirator was inserted a considerable area of dulness remained on the left side of the abdomen.

Summary - Much better. If the line of dulness is now found to begin at the 4th rib in the mammary line and to be considerably increased in patients is the middle line
the lower border of the liver dulness is at the top of the
eniform partitio,

16th July. Some increase of fever today.
13th July. Oedema of feet gone.
20th July. He was steadily improving since the stopping.
Abdomen greatly prominent, slight bulging in left
flank. Umbilicus, level with others. Abdominal veins
not enlarged. Walls firm. No tenderness. No
feeling of respiration or fluctuation.

Measurements:

At level of eniform partitio 3 3/4 miles
Abdomen from eniform partitio 3 5/16 miles
At level of umbilicus 3 11/16

There is about the clear area on this right side, even when
the patient is lying on that side, 2 parts of this however
had a narrow base of dulness extending right up to the liver.
In the middle line this liver dulness is not more than
1 or 1 1/4 miles. In the right sternal line it is 1 3/4 miles,
in the right paramedial line 3 1/4 miles; in the mammary
line 4 3/4 miles (from 4 to 5 to about 1 mile above
costal margin); in the mid axillary line 6 1/2 miles.

The spleen is normal in size or slightly increased.
The heart is slightly increased from right to left. There
is a somewhat rough systolic insufficiency, and the
second sound is accentuated, especially in the pulmonary
area.

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

Measurements:
At level of xiphisternum 37 inches.
At level of axilla 34 inches.
At level of umbilicus 33 inches.

The outline of dulness is now as follows: it commences below 1/4 inch to the right of the middle line, passes almost vertically with a slight inclination to the left, and crosses the middle line nearly 1/4 inch above the umbilicus. It then passes to the left with a slight curve downward, then purrs across to its former level and then passes almost transversely backwards. The note is clear above and to the right of this line. The feel dulness of the right mammary, rectus abdominis, is still less than when last described.

The abdominal measurements are diminished to on the whole 6 1/2 inches.

The vertical line of dulness has now passed to the 1/4 inch to the left of the middle line. There is a considerable area of clear percussion to the left side of the dome. When the patient was changed on to the right side there was some resonance in the left flank but the area of dulness, both on the right and left side of the abdomen remain 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 3/4 inch to the right of it. The upper border on the right mammary line is at the 5th rib, and the lower border is an inch fully above the ilio. The measurements are as follows:
Right mammary line - 3 3/4 inches.
Right mid-anillary line - 4 1/2
Median between mammary and iliac 2 1/2.

Vig. Aug. - The patient left the Infirmary today much improved. The physical signs found in the abdomen were slight. The feces have since his stay in the Infirmary undergone a gradual diminution in bulk, so that, instead of being puckered up, it is now rather diminished.

The morning temperature was slightly elevated for the first fortnight, after that, it was normal or subnormal. 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 & 22 July) but it increased after the tapping to 30 ounces, and in week afterwards became normal. It was very concentrated at first (10th July) and showed a large deposit of protein; after the tapping of normal specific gravity without urates as a rule. A trace of albumen was only detected once (25th July). There was no sugar nor bile pigment. The sediments were not distinctly discerned except perhaps once. The albumen was tested for five times, and only once, shortly before he went out did it show any increase.

The price on 8th July was 461.8. On the 9th July it was 574.8. It varied from 240 to 374.9. It never rose above 461.8, 574.8, 240.8, 374.9, 299.3, 3.2. 8. 299.
Case 16

Case of Syphilitic Cirrhosis of the Liver

with Valvular Disease of the Heart and
Enlargement of the Spleen; Extensive Haemorrhages before death. Professor J. Stewart was.

William Miller, age 45; Depporter for 20 years.


Complaint: Feeling of heaviness and slight pain in epigastrium; weakness; sickness; yellowness of skin; inability to work.

Duration: 6 or 10 weeks.

History: Family history unimportant. He has been a habitual drinker. 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, evidence of syphilis on the legs. When 28 years old he fell from the top of a ladder, but was not seriously hurt.

Present Illness: About two weeks ago he began to suffer from sickness. 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 five 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, worse during the last few days. He has had very little appetite, but

He drank a good deal owing to his thirst. He felt cold.
and had cold perspiration at times. He has had some diarrhoea 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 terms of the illness. The stools have been quiet, 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 feeling at times. He has slept well.

Station Admission - Height 5'4.25. Weight 125lbs. Height - returned of plain tunics and trousers. There are two pellagra places on the right leg, and there are also two cutaneous, one white, the other copper coloured.


Symptoms given in history of illness.

Abdomen - Slight diffused prominent on right half of epigastrium. A few fluctuation, especially in the right side of the abdomen below the level of the umbilicus. There is tenderness on palpation over the part of the line below the pubis. The lower margin of the line in the right mammary line can be felt.
during deep inspiration to pass below the ribs, and the
margins here feels normal. From about an inch
external to the right mammary line to slightly beyond
the middle line there is a prominence felt of the
abdominal part of the liver, with tenderness.
The margins between the points noted is lower than in
the mammary line. It is felt to be distinctly thickened
and indurated. Irregularity of the surface or margins
can be distinctly felt. The gall bladder is not felt.
The peritoneum feels clear except over the liver and
spleen. The liver dullness extends in the mid-
axillary line, from the 6th rib downward for 2 3/4 inches.
In the right mammary line from the 3rd rib to 1/2 inch
above the costal margin, a distance of 3 inches in
the middle line to the right of the middle line the liver
border is 3/4 inch lower than in the mammary line,
and here the vertical dulness measures 3 1/2 inches.
Shifted to the left of the middle line it is 3 1/2 inches.
To the left the hepatic dulness reaches the splenic
dulness 3 3/4 inches from the middle line.

Hepatomegaly System - Distinct enlargement by
inflation of hepatic glandular tissue, and to
a lesser extent in the caudal mesentery.

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 inches.
Further it extends to 3 1/2 inches from the spine.
Beyond it extends to about 1 1/2 inches in front of
the left mammary line.
Lobes of the spleen, inferior and anterior, can be distinctly felt, passing below the ribs. A notch is felt at the anterior and lower part of it. There is no tenderness.

*Thyroid Gland not enlarged.*

**Examination of Blood.** (6th Aug.)

Red corpuscles: 3,000,000 per cubic millimetre, White 7,000 n

*Haemoglobin 66 per cent.*

**Circulatory System.** - Appearance on canthin.

*Oldness (fistulae present).* Has had pain on precursor, but not markedly. These heart is not marked enlarged, but there is little evidence of mitral incompetence, and the pulmonary second sound is accentuated. Pulse 81 per minute, regular, palpable small, venous pulse poor, easily compressed.

*Arterial wall distinctly thickened.*

**Respiratory System.** - Dilatation of veins over upper part of chest. - Lung fairly healthy.

**Integumentary System.** - A few petichiae and conjunctival patches on the back and shoulders.

**Urinary System.** - No subjective phenomena.

- Report on urine at end of case.

*Serous System normal.*

*Locomotor System normal.*

The patient was put upon conserving diet with milk at night, and a mixture was employed containing powdered aluminium, biuret, and chloroform.
Progress.

The patient remained in the hospital until the end of September, and during this time he made some improvement; the yellowness of the skin of conjunctiva diminishing, and the tenderness and prominence of the epigastrium becoming less.

The stools were somewhat pale, and the last three or four stools of diarrhoea. The pulses improved. The urine returned to albumen. On admission it contained a trace of bile pigment and an excess of bile salt, but after this the bile pigment was detected and the quantity of bile salts was not in excess. The urine on the 26th was 38.8 grams at first; on the 29th it was 38.2 grams. There was no excess of sugar, but the reaction for the chloride neglected. The chyle was not very distinctly obtained.

At 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 cease bawling from the gout. He also complained of a weight and sinking in the stomach after food.

295. Presently it had subsided and the temperature had been in the evening of 28th Oct. normal or subnormal, but last night at 10 and 10 1/2 and after. This during the rest of the progress of the case there was frequently a greater or less increase of temperature, and the morning temperature was also sometimes somewhat elevated. After this time the frequent hard quiet sleep, chilliness, and
...in fact complained of severe headaches. On 24th the prominence in the epigastrium had become much less, but some irregularity of the surface of the liver at this time was made out. About an inch posterior to the manubrium a solecism was felt in the anterior margins of the liver. This gradually lessened, and became more so as the case progressed. The intensity of the yellowish color of the skin varied from time to time, but it never disappeared, nor did it pass into what could be called a distinct jaundice. The amount of tenderness 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 to resemble the middle liver lobule, without normal firmness. This often, on the other hand, steadily increased in size. The blood underwent a steady deterioration. In the 12th week the estimations of the blood showed its condition to be as follows:

- Red Corpuscles: 3,390,000 per c. millimetre
- White: 9,000
- Hemoglobin: 65 per cent.

There was a slight tendency to the loss of the red corpuscles, and they varied considerably in color. There was no marked tendency to the formation of jaundice.

On the 24th day again the condition was this:

- Red Corpuscles: 2,320,000 per c. millimetre
- White: 27,000
Hæmoglobin, 38 per cent.

The coloration of the eruption was much the same as before. No further examination was made, but the determination certainly progressed to the end of the case.

In January 1887, the ulcers on the leg had healed, but some purulent discharges occurred in the legs and he began to have hæmaturesis occasionally. The purulent discharge first appeared about the middle of January on the thighs a few weeks above the patellæ. There were now signs of a slight pulmonary consolidation at both sides, especially at the right apex. The color of the breath continued and the tongue became ferric before, had now a dirty brown color owing to the hæmatoura from the lungs.

On 1st Feb., there were some dilatations of the superficial veins, both on the leg and thigh, and there was observed a series of fusiform capillary dilatations arranged in a transverse line a little below the umbilicus, extending across the suprastomachic and into the hypochondriac regions. This line had been noticed before, but was now more marked and evident. There was a blue discolouration from a hæmatoura of some standing on the upper part of the chest on both sides, and there were some patches of recent hæmatoura on the abdomen. There was also a patch of capillary dilatation on the left thigh with a slight recent haemorrhage in this region.

On 20th Feb., his temperature went up to 102°.
The evening, and he rose (her three times) he had a severe verti cal headache. There were some patches of capillary dilatation on the philtrum nose.

On day 6, regular pulsation was noticed, the vessel when compressed filling from below. The cough and signs of consolidation at the apex were by this time more distinct. The abdomen was more prominent, but there was no dulness in the flanks. Some stridings of the feet andClick here to view image.

He frequently complained of pain in the stomach. At the end of Day 7, he became very weak and lethargic and was unable to stand. His breath was very foul, rendering antiseptics necessary around his bed. He had no inclination for food, but took milk readily. He slept and dealt there was a good deal of hemorrhage from the mouth and the back of the nose. The head was more tender, and the spleen had decreased (by percussion) to 1/2 inch to the left of the middle line. The tongue was dry and packed, and covered with dirty brown fur, subcutaneous tenderness was present last night. His to lose and light-coloured, Pulse 90, regular, of moderate volume, easily compressible. A corrosive sublimate lotion was used for the mouth and nose.

On 24th March he was observed as asleep with his
icy. In half closed. A good deal of blood passed in the nostrils, partly bright, partly dark.

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

On 4th March he was in a drowsy, semi-comatose state, there was sometimes low delirium, and he complained of slight vertigo and headache. There was a good deal of bleeding from the mouth, nose, from the rectum. He had a premonition of death.

On 5th March he first vomited his food and then a solution similar to bright blood, of meconium or haemorrhages, bright red, thin, clear, appeared over the shoulders, back and limbs, just like an attack of purpura. There was also haemorrhage into the conjunctivae. An ice bag was applied to the abdomen if the haemorrhage returned, and he was fed on milk and beef tea.

After 3 PM on 5th March he became comatose and continued so till he died at 11.25 PM.

Onset 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 on the skin. Oedema of the limbs came on before death.

Besides the treatment already mentioned for pain, digitalis, quinine, quinacrine, iron sulphate, strychnine, mercury and tinct. jujube. Austriates were used. For...
this month. Its treatment had evidently influenced the progress of the disease. The peripheral jaundice which was ordered on 5th July had to be stopped in a few days owing to the great irritation produced.

Post-mortem Examination. 8th March.

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

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

Lungs. 1 lb. 1 oz. Carefully examined. A few thickening's on anterior surface. On section, substance firm, and in some parts mottled and deeper in colour, Kalmel's prominent. Mallaghian nodules in some cases enlarged. In many sections with iodine.

Kidneys. Left, from adherent capsule, superficial veins dilated. Superficial cortex apparently normal in thickness. Interpyramidal cortex increased considerably. But surface mottled substance pale. On surface, numerous red spots. Mallaghian bodies present irregularly distributed along the sides of the vessels, and in some cases appear to be enlarged. The uncles
membrane of fibrin of having almost traces of 
crystallizations on its surface. As was previously 
published.

Right Kidney - 3 ounces. Surface like that 
of the left. On section, more congested. Otherwise, 
the appearances much the same. The substance 
not so flabby. capsule more adherent, 
beige, weight 3 lbs. 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 pathological process of long standing, 
surface roughened. A series of chrome-yellow 
patches surrounded by more translucent con-
gested tissue, apparently corresponding to lands of 
fibrous tissue. Some depressed structures on upper 
surface. On section, bile stained masses of liver 
fibers with a large amount of fibrous tissue 
within - the fibrous tissue being very vascular, 
( this explaining the absence of color). Liver tissue 
in small quantity and bile stained, ellipsoid cells of 
small size, bile stained and notably soft. The 
condition is that of diffuse cirrhosis. Immediately 
under the region on the upper surface there 
is a large area of fibrous tissue, and the it are a 
number of blood vessels. A trace of fatty tissue 
material. The small partially detached portions 
of the left lobe is in the same state as the 
right - a dense fibrous mass separating the
two portions. No many reaction.


Left Lung — 2 lbs 1 oz. Congestion and edema. No hemorrhages on visceral surface. At the apex the remains of an old cavity. Calcarea particles embedded in a firm fibrous reaction.


Pancreas somewhat enlarged, firm and firm. The fibrosis tissue slightly congested. Other tissues normal.

Stomach. — Mucous membrane somewhat congested along the larger curvature. Numerous minute hemorrhages 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 esophagus, where it joins the cardiac end of the stomach were dilated for the distance of 1/2 inch or 20. The surface at this part was ulcerated.
and slightly bloating.

Intestine somewhat oedematous with a few seelzymoses, but not well marked; but on surface of mucous membrane, especially in upper part, there was a good deal of tarry material, evidentlyblood acted on 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 up to the last, the extreme limits being 30 and 60 ounces per day. The specific gravity during most of the time was normal. During the last month as it fell markedly below the normal—lying 1014 to 1014, Reaction—acid, sometimes neutral. There was no albumin in it until the symptoms commenced. Blood pigment was present in small quantity on his admission but it soon disappeared and was never again detected. Sugar was never present. The urine salts were slightly present on his admission but they came within the normal range before the blood pigment had quite disappeared. The only time when there was a slight excess was when he returned from the Convalescent House in the end of October, and at this time there—
The presence of bile pigment was doubtful, at all times this quantity was either normal or slightly diminished. The duodenum was also frequently tested for. At first there was no bile color set by the hydrochloric and hydrochloric acid and chloroform, but instead the chloroform took off a deep pruik or mace color (due to the presence of chloroform sulfate solution). After he had been in the Asylum for some time, however, a slight blue color was obtained as well, and after a time the red of mace color ceased to obtain. Only once in the course of a considerable period of testing could it be said that the duodenum was present in excess, and that time (15-21st) the excess was slight.

The area for urine has ranged from 264 to 384 grains — usually over 300 grains. There was great one discharge fell in the general area towards the end, the quantity decreased on 3 illness (two days before death) having been 240-77 grains. In their estimations during the previous month, however, it ranged between 261 and 287 yrs. — There was therefore apparently some diminution in the general area during the latter part of the illness.

During most of the time all that was found microscopically were granules of urates like a myriads of nuclei. Phosphates, nuclei, and epithelial cells. After the blood appeared there were found red white blood corpuscles, leucine casts, with cells, blood corpuscles, granules, granular casts, renal epithelium.
Case 14

Case of Weak Heart and Enlargement of the Liver.

Professor Fraser's hand

David Jamieson, an old man, was admitted on 27th January 1886 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 puffed when he was admitted. By 29th January only the oedema had disappeared.

On 29th January his condition was as follows: - Face swollen and florid. Mucous interior tincture of conjunctivae. Tongue fleshy, covered with yellowish white film. The abdomen was full, but without localised prominence. There was slight dilatation of superficial veins. No tenderness. No ascites. The liver was considerably enlarged, uniformly 20 ins. measuring 6 inches in the middle line and 7½ inches in the mammary line in which it extended for 3½ inches below the costal margin. The spleen was not enlarged. The first sound of the heart was impure - a systolic murmur double, second sound accentuated. Pulse 82, regular, small, easily compressible. There was some emphysema of the lungs. There was some dilatation of the veins at the upper part of the chest and in the neck, but no pulsation.

He was treated with Perchloride of Mercury and Arsenic.
The patient made decided improvement and the liver gradually diminished in size. On 26th Feb., the hepatic dulness in the middle line measured 6½ inches and in the mammary line 5½ inches, where it extended 3 inches below the costal margin. The first sound of the heart was normal and the second sound was slightly accentuated in the pulmonary area. Pulse 110, slightly rapid, small and easily compressible. There was slight dulness over the upper part of the sternum and over a small area both over the roots of the lungs posteriorly. The breathing was harsh, and there were a few phrenic and expiratory. Some odour of the mouth had returned during his going about, but it did not nauseate him.

He was discharged on 3rd March.

Examination of urine:— The urine was almost normal in quantity, contained no albumen nor sugar. With nitric acid it gave a florescent urine at the junction of the fluids and above this a yellowish green ting became a trace of bile pigment seems doubtful. It may have been due to the toluid of atropine which he was taking.


Stool: Quantity, 62 cl. Yellowish, faintly colored, slightly turbid. Apr. 1816, acid. Male salts slighty diminished. In a day— with hydrochloric acid a faint colour. With hydrochloric and hydrobromic it became after precipitation of the pigment by acetic acid, the chlorophyll came down with a beautiful red from its colour. (? due to toluid of atropine.)

Vomit—238 cl. on 22nd Nov., 1818. Male salts distinctly diminished.

There was thus a diminution of male salts from the normal as the case progressed.
Case 187.

Case of Recurrent Attacks of Bilious Colic with Jaundice.

Professor [Name] Stewarts said.

Catharine Oberto, aged 55, admitted on 21st August 1855; complaining of attacks of severe pain in the epigastrium, 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 and accompanied by yellowness of skin, dark greenish colored urine, and pale face. These attacks last about two days at a time. She has been subject to them for two months, but the yellowness of the skin was first noticed about two months ago. The attacks have become more severe, more frequent and longer duration. The pain is severe and constant during the attacks; it first commences in severity and then passes away gradually. There was rise at the beginning of the attacks, and lately there has been vomiting also, and yellowish of the skin. She has felt some swelling in the epigastrium during the attacks, but cannot distinctly localize it. She becomes very choleric when the attacks occur.

She has had hard work as a greengrocer in Ontario, but has done no work for the last year. She takes tea and coffee; otherwise her food has been good. Temperature. She has been subject to bilious attacks.
for fifteen years or more, the bow flaring on the left side seven years ago, the knee had shown no palsy.

**State on Admission.** - There was no tendering or other obvious morbid appearance. There was no tenderness on palpation and percussion in the epigastrium or on each side of it. The abdominal walls are somewhat lax, the margins of the liver is not distinctly felt. There is no 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 the level of the 2 inches above the umbilicus upward for 5 1/2 inches. In the right maxillary line it extends from the 5 3/4 inches downward to a little below the costal margin, a distance of 5 inches. In the mid axillary line it extends from the 7 1/2 inches downwards for 6 3/4 inches below the lower border in the epigastrium and a little to the right of it, extending for about half an inch downwards there is an area of firmness - percussion which varies somewhat from time to time.

The spleen is not enlarged.

There is a slight systolic murmur, and the second sound is slightly accentuated, especially in the pulmonic area. The heart presents an attack of Pericarditis with harsh Pericardial friction sounds. Treatment. 1309
Otherwise the systems are normal.

The last attack the patient had occurred a few days before admission. The patient in the infirmary till some time in September, but both in attack all the time. Her condition underwent no important change while she has in the infirmary.

The pulse was normal in appearance, after 1015, rapid, contained no allusion, like pigment nor sugar. The liver cells were not increased. There was no fever of any kind. The respiration of a was 50. 426 good for one.
Case 19.

Case probably of Distended Gall-Bladder.

Professor Everedfield said
James Kelly, age 27. Labourer. Admitted on 24th Feb. 1883, complaining of pain in the upper part of his abdomen and loss of appetite. He had a severe attack of scarlet fever when a child. He had gonorrhea and seak 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 o mephitic or any other disease than those mentioned. He has been interrupted.

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

Present Condition. Well developed, no jaundice. He finds the pain easier when he sits up, and also when he draws up the legs.

Excretory System. Tongue slightly furred, appetite good. The pain is not relieved when he fasts. Sometimes it is worse after eating. Urine 347,000,000. Concentration. No vomiting or pain, admission. Bowels regular—consistently lighter colour. Stool—light yellow color.
Abdomen - A very firm and dense resistance is felt about 2 miles below the right costal arch. The note now is smooth and firm. It does not move with respiration. It is tender to palpation. No resistance is perceptible. No tympany can be heard. The lower margin of the fluid is the right mamma. Find the 12th rib below the costal margin. Upper border at 3rd intercostal.

Oct. 27th 1845 - A firm, persistent body is felt passing from the right costal margin towards the umbilicus for 3 miles. It is 3 inches wide at the base, at the costal margin, and 7 inches wide at its smaller end. Towards the umbilicus it is slightly elevated over it. This area of dulness is continuous with the lower dulness.

These signs of the condition of the abdomen are taken from the clinical report of the case in the patient at first. They correspond to what I found in subsequent examination.

The hemorrhagic, circulatory, and respiratory systems were normal, and the respiratory system was also fairly normal.

In regard to the urinary system, conditions became more frequent when the pain was severe.

Treatment - The bladder was emptied over the affected part. A 20% Balsam Ointment was ordered for the pain. A 6% Balsam containing camphor and powdered salicylic acid was inserted.
containing bile, leucocri and dilute nitric hydro-
chloric acid were ordered. On 1st Nov a mixture
containing twice of 100 grammes Sphy. Manna
was ordered on account of difficulty of evacuation.
9th Nov. For some time the attacks have
been coming on every night about 2 A.M. The
pain is worse greatest over an area 1 1/2 inches or
a little more in diameter immediately to the right
of the umbilicus and extending a little below its
level. This is distinctly lower than before. There
is slight fulness within area and a little below it.
It is tender on palpation and percussion. There is
some indefinite fulness and resistance in this
region, but no body can be distinctly palpated.
The liver dulness in the mammery line reaches to
the rectal margin. The dulness below the liver
has distinctly diminished in extent whilst it has
extended further down. There is now fulness in
the liver a semi-resonant area of about
each 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 parasatal
line it extends to 3 1/2 inches below the pubis, being
about half an inch below the level of the umbilicus.
Transversely it extends from about 1/2 inch to the
right of the middle line for 2 1/2 inches to the right.
The boundary on the right being an almost vertical
line situated between the right mammery and para-
ternal lines.

24th. The symptoms have improved considerably. The present and still shows an almost
complete split for this down still, but is not so
well defined as before.

1st Dec. Not much pain now, but still worst
at night; worst about an inch below and to the
right of the umbilicus. Some tenderness on palpation
at this point and also a little below the level, about
2 or 3 inches to the right of the umbilicus. Below
the level in the right half of the epigastrium, a rounded,
semicircular body can be felt. Peristalsis varies
from time to time. In percussing upwards about
an inch to the right of the middle line, the note
becomes gradually impaired, the expansion
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 level of dullness, the note is much impaired and
has a left-fitted sympathetic character. The
area of dullness extends laterally from a little
to the right of the middle line for 2 or 3 inches
to the right. The rest of the
abdomen is peacorous.

The level of dullness is in the right
mammary line extending from the
5th rib to 1/2 inch below the costal
margin, a distance of 4 1/2 inches.
The patient was discharged on 6th Dec. much improved.

The temperature was normal or subnormal all the time he was in the Hospital.

The urine varied in quantity from 24 to 82 ounces—was usually near the normal, normal in appearance. Specific gravity varied from 1022 to 1017. Reaction acid. It never contained any albumen, bile pigment or sugar. The urine was never normal or plump under the normal movements. There was a moderate increase in the amount of indin. The urine varied from 510.02 to 413.565 grains per day. There was nothing seen microscopi-
Case 22.
Case of Tuberculosis of the Lymphatic
Glands.
Professor Granville Stanley said:

At Donald Hall, age 18, Apprentice Engineer, Admitted on 21st April 1886, suffering from Tuberculosis of the Lymphatic glands.

The lymphatic glands 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. They 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 apex of the lungs. The heart was slightly enlarged and so also was the spleen.

While he was in the Infirmary he became gradually weaker. He had usually an irregular temperature with occasional exacerbations of feverishness. The glands at times became pustule and inflamed and on at least became pustule and gave some evidence of fluctuation. He was much troubled with pruritility of stomach, and bitterly bad symptoms accompanied, accompanied with delirium. These became more
from and he died on 8th July. There was no fever.

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 and spleen, but none in the liver. The liver weighed 3 lbs. 3½ oz.; it was much congested, but otherwise healthy, and the peripheral zone was very pale.

The gall bladder was much distended with very dark greenish bile.

Examination of Urine.

No examinations of the urine were made after 16th May, except:

4th May - 8 gr. 1014, acid, bile salt, p<sub>y</sub> 50 or
60, gave gravity equal to the standard - normal maximum
Temperature 100°

17th May - Quantity - 50 oz., 8 gr. 1014, acid -
Bile salt - normal maximum, p<sub>a</sub>era - 24.1. 28;
(Temperature - morning - 101°, evening - 103° - little higher than previous day - temperature had not been so high before)

13th May - 8 gr. 1010., - Bile pigment - very slight trace (3)
Bile salts - p<sub>y</sub>y 55 per cent or 183 p<sub>e</sub>. (Temperature 102°. C. 102°)

16th May. Orange colored, large precipitate of urates, no bile pigment.
Bile salts - p<sub>y</sub>y 50 per cent or 200 p<sub>e</sub>. (Urate has been luxury up - 8 wt. grams 10°, Gravity 103. 6. }
were and he died on 5th July. His cause of death is found in the post mortem examination. The lymphatic glands were found to be tubercular, and many of them were in various stages of conversion. There was also some tubercular deposit in the lungs, kidneys and spleen, but none in the liver. The heart weighed 3 lbs. 30 oz. It was much congested but otherwise healthy, and the peripheral zone was very pale. The gall bladder was much distended, with very dark greenish bile.

Examination of urine.

No examination of the urine were made after 1st day. Except perfusion, it contained no albuminous sugar or bile pigment. It was normal in appearance except on 16th day. Nothing was found microscopically except on 16th day when there was a large deposit of urates.

A day or two after admission - Aug 4th 1912. - “Bile salts” praction a little less than normal maximum.

Acid - no excess. (Temperature about 100°)

2nd May -graf 101.4 acid. Bile salt 3/50 or
60 grains quantity equal to the standard - normal maximum.

Temperature 100°


Bile salts - normal maximum. Area 261.25.

Temperature - morning 101°, evening 103°. Highest than previous day. Temps had not been so high before.

13th May - Grav 101.0. - Bile pigment - very slight trace (5)

Bile salts - by 33 per cent. or 193 cc. (Temperature de 102° & 106°

16th May - Orange color, large precipitate of urates. No bile pigment. Bile salts - by 39 per cent. or 200 cc. (Temps been rising up -

& 16th. morning 102°. Evening 103°.}
Case 24

Case of Splenic Leucocytosis, with Enlargement of the Liver.
Professor James Stewart Ward.

William McGillivray, age 32.
Admitted 29th June 1865, Examined 4th July 4th.

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 Linnhe 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 did not take much alcohol. The only complaint he has had previously was a rheumatic pain in his left shoulder about six years ago; it lasted about a year though not constant. There is no history of neural disease. He has not been abroad and has not had syphilis.

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 preceding he had felt a hard swelling on the left side of his abdomen. This has since and considerably increased.
Illness, and for a time this was very severe, and
accompanied by fever. He was treated by Dr. Donald,
drugs. For about two months he was confined to bed. He became improve and was able for
his work in the house till shortly before admission,
though not feeling strong. He has again become
worse, becoming breathless on exertion. For some
two days before admission there was return of
the usual sensations, difficulty in the breathing and
being about the morning.

Admission. - On previous no Oedema,
marked oedema of both lower limbs below the knee.
He cannot lie comfortably on the right side owing to
the weight of the tumour on the left side of the
abdomen. Slight fever, no constant, occasional

Abdominal Systole, a soft, full. Slight slightly
symptoms. - No vomiting except once lately when
he became sick after a hard day's rowing. Bowels
at present regular and green in colour.

The abdomen is generally prominent, referring
to the left of the middle line and below the
umbilicus. There is no ascites. The liver is
considerably enlarged. - In the mid-axillary line
the dull dulness extends from the 5th interspace to
the 10th rib, a distance of 1/8 inch. In the right
intercostal line it extends from the 6th rib to
1/2 inch below the costal margin, a distance of 1 inch.
In the middle line the dulness extends from 2 3/4 inch
above the umbilicus upward for 6 inches. Beyond
the middle line on the left side the liver dulness becomes continuous with the spleenic dulness.

Haemopoietic System. - The spleen is enormously enlarged, reaching from the 6th rib in the left mid-axillary line down to the pectoral fascia, and extending a little beyond the middle line.

The cardiac and general glands are considerably enlarged and indurated, as are also those of the aorta and neck to a less extent. Thyroid gland not enlarged.

Circulatory System. - Dysphagia on motion. There is a pustolic murmur, first of harmonic origin. Heart sounds doubled, slightly accentuated, especially in the pulmonarv area. Pulse - 64 to 74 per minute, regular, of moderate volume, easily compressible.

Respiratory System Normal.

Integumentary System. - Perspires a good deal at night. Odema of feet only.

Urinary System. - No subjective phenomena.

Digestive System. - Stomach pains at end of case.

Nervous System. - Normal except for sleeplessness.

Lymphatic System Normal.

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

He left the Infirmary on 18th July, little change having occurred in his condition.
The patient was general paralyz surgeon examined on 14th July. The condition was as follows:

Red corpuscles - 3,070,800 per c. millim. 
White - 394,000

Platelet white to red 1 to 7.

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 tailed. 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 due to the fragments having come to the centre of the corpuscles. In one this apparent nucleus looks as if it were dividing in the centre thus -.

One corpuscle is seen with a construction in the middle thus -

the two halves of which are each as large as a single large red red corpuscle. It shows no ejection in the centre. Further half, and it looks rather like a red corpuscle which has increased in size and is beginning to divide into two or after two red corpuscles which have partially fused into one. There is no appearance of a nucleus in it. There are several micros to 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 2% potassium tartrate the granules are brought out very distinctly. By adding acetic 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 from three to four small nuclei.

The urine,—
On 16 July the quantity of urine was 38 oz. It contained no albumen, and the pears amounted to 24.86 grains.
Case 22.

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

Professor Greenfield's Ward.

Thomas Wilson, age 40, Engineer.
Admitted 22 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 intemperance, but is now an abstainer. His work has involved heavy lifts and he has been exposed to considerable alternations of temperature. His general health has been good. There is no history of personal disease. No watery phenomena, no accidents.

Present Illness. Nearly two years ago he had an attack similar to the present but not so severe, brought on by exposure to cold. He was 11 weeks in the Western Reforming Home, where his family resided. He now again falls ill by exposure to cold. He took a second attack in January 1885 and from it 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 asthenia. He has been unable to sleep. His feet have never been swollen.

State on Admission. Well developed. Little-icteric tint of conjunctiva and skin. No cough. Malarie
Diagnosis of life and now. Refluxing delation in nose teeth. Anosmia impression. Orthopnoea or pnea orthopnoea.

Alimentary system. Tongue covered with yellowish white fur. Affected from considerable thirst. Weight & distension as noted. Flatulence.

Anus on morning. No vomiting. Vomels constipated.
The stools have been foul owing to his having been on milk diet.

The abdomen is generally prominent, particularly in the epigastrium, and on either side of it, most on right side. Soft distention if superficial veins, hard considerably enlarged, but with no irregularity from spleen or margins, etc., accords.

In the right mammary line the liver dulness extends from the 6th rib to 2½ 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 1½ inches above the umbilicus anteriorly for 9 inches, in the mid-anterior line the dulness begins at the 5th intercostal space and extends downwards for 9 inches.

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

Circulatory System. There is prominent
hypertrophy and dilatation of the heart. There are pyeogenic and acute acute mitral murmurs, and
probably a transformed cystic adenoma of the ovary.

Pathologically, early compressible, collapsing, somewhat smaller. Wall of cyst somewhat thinned.

Respiratory System. There are slight signs of consolidation at the apex, especially the right.

There are marks signs of congestion and oedema of the lungs, especially at the bases posteriorly.

There is nothing important in this other system.

The patient was treated with digitalis, ergot and diffusible stimulants.

The patient remained in the infirmary till 17th, when

and made considerable improvement. After admission, the pyrexia diminished and by the 8th, 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 hiccough at attacks but latterly these became infrequent. The heart distinctly diminished in size. On 17th, there

the measurement of the right side were:

- In the middle line from nearly one inch above the base of the diaphragm downward for almost 6 inches, in the right mammary line, from

- The distance of 1 1/4 inches; absolute depth at

- The distance of 1 the right mid-axillary line at 1 1/2 inches from the 17th downward for about 1 1/2 inches.

The pulse at first was much diminished

in quantity, 16 or 20 ounces, and the pulses

and generally raised from
30 to 3.9 ounces for meat. The specific gravity was at first high (10.30) but soon became normal. Albumen was present in large quantity at first (1/3" of column in test tube) but it rapidly diminished and by 6th Dec. had disappeared. There were no any bile pigments, sugar or blood. The bile salts were not tested till 12th Dec., and they were found to be distinctly under the normal maximum quantity, C. J. then and subsequently. Indica was several times tested for and a moderate increase was found. The area on 4th Dec. was 240.6 grams, 3 on 6th Dec. 192.87 grs. After this it increased, to 331.2 grs on 12th Dec., 306.4 grs on 19th Dec., and 405.08 grs on 29th Dec. Microscopically there were amorphous masses at first, and afterwards crystalline masses.
Case of Cardiac Disease with Enlargement of the Liver.

Professor Greenfield's Case.

Edward Simpson, age 45, Devon.
Admitted on 5th Oct 1885, complaining of Breathlessness of five months' duration.

History. His wife had Rheumatic Fever. Three of his seven children, the third fourth fifth were still born. There are alive and well. The patient had been temperate. He had been in India in 1853, in 1863, while in India he had an attack of Rheumatic Fever. He has never had it since. He had typhus in 1868, and in 1869 he has had another attack since he came home. Four years ago he had what is called "Pressure" due to working under pressure below the water. It affected his arms—sharp severe pains darting through them from time to time. The sensation was not lost. He has had no venereal disease.

Present Illness. Two 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 cough. Two days afterward cough commenced and he spat some blood. He had got some cold also before the pain commenced. This settled but returned if he exerted himself. He had pain under the right side across the back. The temperature at first was...
104°. Next day 103° and the third day 101°.5. — He lay in bed most of the time for three months. Since the illness commenced he has had bad 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, yellowing or epoxuris. Temperament phlegmatic. Attitude, vertical, except at times when he required to sit up on account of dyspnoea.Temperature 98°.

Alimentary System. — Tongue fleshy, covered with a yellowish white fur, tremulous in front. Appetite good. Troubles with flatulence and gaseous eliminations. He vomits occasionally, the vomitus consisting partly of white oily matter and partly floculent.

Abdomen normal in appearance. Right tenderness in epigastrium. Lower margin of liver indistinctly felt. No dulness except over liver.

The liver dulness in the middle line extends from an inch above the umbilicus upwards for 6½ inches. In the right mammary line it extends from the 3rd 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-clavicular line it extends from the 9th rib downwards for 6½ inches.

The spleen is not enlarged.

The heart is considerably hypertrophied. There are a systolic musical murmur and systolic and diastolic
Aortic murmurs. Pulmonary second sound accentuated.

Pulse - 108 per minute, collapsing, regular, full, moderately compressible. Arterial wall considerably thickened.


Other systems normal - (Report furnace at end.)

The patient was treated with digitalis and iron. He improved steadily and was discharged on the 16th Oct.

The Clinic:

6th Oct. - Urine from a woman which also formed a large brick red deposit. Reddish amber colored.

Ug 10.32, acid. Ammonia, 10 mgm. Pent. neg. Sugar. Urea per cent. = 1.045, 8 grams.

Amorphous urates.


Bik salts, - under normal maximum.

Urea - 224.4, 275 gms.
Case 26.

Case of Cardiac Disease with Enlargement of the Liver.

Professor Frances Stewart, M.D.


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, the last fifteen years a year ago. The right has been much improved 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 puffy. The swelling extended upwards to the abdomen, she became very breathless and could not 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 22nd, and 20 ounces of serum were drawn off. Since that time she has gradually improved. There has been no edema for some time.

Present Condition: Well developed. No paroxysms of coughing or expectoration. Attitude not to somnolent...
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 and the lower shadows extend from the inner margin between the umbilicus and the base of the xiphisternum to 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 axillary line, the dulness extends from the 10th rib downward for 4½ inches. The superficial dulness begins at the 8th rib.

The splenic dulness is not increased.

Circulatory System. Percussion dulness. Valvulae visible over a large area of the chest. The aorta can be felt in the 7th intercostal space near the mid-scapular line. The bruit is diffuse in character and is felt over a wide area. Below the nipple there is a presystolic and presystolic thrill. Above the nipple there is a systolic thrill. The veins at the upper part of the chest are distended. There is epigastric pulsation and there is venous pulsation in the retromental 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 4th rib the deep dulness begins an inch to the right.
of the sternum, and extends to the left for 6½ inches, ending between the anterior and mid-anterior ends.

In the initial area there is a short presystolic murmur and a loud, sibilant, presystolic murmur, conducted to the axilla and pericardia towards the sternum. The first sound is distinctly heard between them. The second sound is faintly heard. Near the sternum, the character of the murmurs changes, becomes shorter and rougher and is entirely systolic in time. Here the second sound is accentuated.

In the anterior area there is a very short rough systolic murmur, and the second sound is prolonged and accentuated; there is no distinct diastolic murmur. The murmur is louder and more prolonged in the pulmonic area, and a little out from it. The second sound is loudly accentuated in this pulmonic area.

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

Other symptoms normal (Report on condition end).

For a few days at first the patient was treated with Tincture and Infusion of Digitals and with

Picroliv 1 4th. 20th of Oct. He was ordered

Polandi's Pills with Brains of Iron. 21st Oct.

He was ordered pills of Lannais Suffr, Pills.


After this taking the patient made great improve-

ment, and was sent to the Convalescent Home on 29th Oct.
The service of the urine sublues on 28th Oct, was slightly larger than it had been at the 15th Oct.

The temperature was normal or subnormal all the time she was in the Infirmary.

The urine was at first much diminished - the longest quantity being 12 ounces on 27th, again on 4th Oct. - After this it measured roughly - 40 oz. on 5th Oct. - and it then varied from 36 to 60 ounces.


Microscope - Squamous epithelial cells.
Case 25.

Case of Cardiac Disease with Enlargement of the Liver.

Professor James Ward.

Andrew McAnnes, age 33, admitted on 1st Oct. 1883, complaining of dyspnea and other symptoms of cardiac disease resulting from Rheumatic fever. He had several attacks of rheumatic fever, and one came home two years ago. The dyspnea first troubled him in March, 1883. The cardiac lesion is due to mitral regurgitation, and there is now failure of compensation. The liver is much enlarged—measuring 7 1/2 inches in the right mammary line. There is congestion with pulmonary congestion and oedema, and the lower limbs are oedematous. There was a slight detachment of the conjunctiva at the inner canthus of the left eye in which the subconjunctival tissue was very thin. There were no palpable nodes. Absence of lymphatic vessels at other times.

After a time he improved under Worcester, but in the end of Feb. 1884 he became worse again, and he died on 31st March.

The urine was bright yellow, and sometimes gave a chronic deposit of urate. It was never found to contain albumin, bile pigment or sugar.

5th Nov. Bile-salts double the normal 200 p.p.m.

Urine: presence of 9.7 mg. acetic acid, considerable increase of diurnal amount.

10th Nov. After 10.16 a.m., acid. Bile-salts normal 200 p.p.m., no increase. Urine 313.5 mg. acetic acid.
Indium = moderate quantity. No marked increase. (Other pigments first removed.) Urea 14. 84. 26, yrs per ounce.
28th Nov. After 10.29 am. Bub-salts about normal. Indium = moderate increase. (Other pigments first removed.) Urea per ounce 16. 89. 28, yrs.
28th Feb. After 10.27 am. Acid = Bub-salts 27. 32. or 66 required = a slight increase 166 or 150 yrs.
7th March Bub-salts = 27. 35 required 183 yrs.

She had made some improvement by 20th Dec.
By the 28th Feb. when the bub-salts were again found to increase she had begun to get worse.
Case 26

Grae of Heart Disease (Mitral and Aortic) with Enlargement of the Liver from Chronic Venous Congestion and with Pericarditis.

Professor James Stewart Ward.

Alexander Campbell, age 25, Baker.

Admitted to ward 22 on 20th April 1885. Discharged on 22nd and 23rd May 1885.

Complaint: Shortness of Breath, Palpitation, Vomiting, and Pain in the Right Hypochondrium.

Duration of Illness: He has suffered for eight years 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 naps. He has been on the whole temperate, but has sometimes drunk to excess. He has had hard work, involving heavy lifts, and has been much exposed to considerable alternations of temperature.

Previous Illnesses: He had Scarlet Fever when young and four years ago he was laid up for a fortnight with what he calls "Meningeal Fever," but the nature of the complaint is doubtful. 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 date from that illness. He has had some symptoms of
heart disease ever since. There is no history of afflills. He has for long had occasional epistaxis.

The patient's present trouble commenced about eight months ago when he began to distinctly to suffer from cardiac dyspnoea, palpitation, paresthesia, vomiting, irregularity of the bowels, diminished and high colord urine. 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 external 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 that, when lying on his right side, he felt with respiration a sensation like putting on 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 just as 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, and 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 hospital. The states that since then the pain in the right side commenced there has been swelling of the abdomen.

Since his admission the temperature has not been above 99° F., and he has been constipated.

The pain in the region of the liver was slight for a fortnight, but after that became more severe and was accompanied by some cough. For a time friction sensations were distinctly felt over the lower part of the liver below the ribs, but this is now absent. A distinct dull 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 (May 22) 190 lbs.
- Well developed. Muscles soft and flabby.
- Slight oedema of abdomen. No pitting.
- Face and lips pale. Slight flush over the malar bones.
Slight oedema of legs. Expression of face bland.
Yet no oedema of face. Temperament phlegmatic.
He can sometimes lie quite well on his back,
But is sometimes in a state of orthopnea, and
Generally is a state of semi-orthopnea. Since
The pain in the region of the liver commenced
He has been able to lie on the right side
Only within Fallow under it for support.


Alimentary System. Tongue slightly furred,
Covered with a yellowish-white fur; papillary prominences
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 as with solids and liquids.

Appetite poor, but improving. Some dyspeptic
Symptoms. Before admission he was frequently
Sick and vomited after his food. He has only vomited
Twice since admission. diarrhoea before admission; constipation since. Since January
If not sooner the stools have been paler and of
A more yellowish color than before.

Abdomen - General prominence. Diffuse
Induration in epigastrics. Superficial veins not
Distended. Parites slightly tense, and of
moderate thickness. Tenderness on pressure over
the line below the ribs, extending from near the
left mammary line across the epigastrium to the
right hypochondrium. Pain at other parts, also
tenderness over the part of the abdomen. Officitent
respiration is not now felt. The percussion
note is good over the front of the abdomen to
within 2¼ inches above the pectoral margin, at which
point it becomes dull. Note that in both flanks, become
dull when he turns on the side. No distinct
thrill.

The liver's dulness in the right mammary line
extends from the fourth rib to 2¼ inches below
the ribs, a distance of eight inches. In the middle
line anteriorly, the upper border cannot be differentiated
from the cardiac dulness; the lower border is 4 inches
below the face of the Xiphisternum and 2½ inches
above the pectoralis. In the mid-axillary line
the liver dulness begins in the 5th intercostal
and extends to a little below the margin of the
ribs, a distance of 1½ inches. The lower margin
of the liver meets the costal margin on the
left side in the left mammary line. On
auscultation below the ribs, some friction is still
heard, least in the right mammary line.
The liver is regular in outline with no indentation on the surface.

Haemopoetic system normal as to colour, etc.

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 in size.


Pericardium: heart considerably enlarged. Deep dulness extending transversely from 3/4 inch to right of sternum to the left anterior axillary line, a distance of 7 inches.

Inspection: Central Area - loud muscular systolic murmur replacing first sound, systolic diastolic murmur both heard in the axillae. Articular areas - sounds replaced by systolic and diastolic murmurs which are also heard in the pulmonary and tricuspid areas.
Otis heard from the pulmonary vein the second sound as heard.

Blood 93 per minute, slightly irregular. Volume considerably, easily compressible, typical apyan, name expelling sensation is seen in area of congestion produced on the forehead.

Respiratory System. — Breathing 28 per minute, regular, costal-aborinal. No pain now. No much cough since a week ago, clear and pretty.

Chest well formed, expands a little better on right than on left side. Lungs slightly purfused at left open, both anteriorly and posteriorly. Breathing somewhat harsh. No new palpations at this left open, one in the axillary regions and at the bases posteriorly.

Integumentary System. — Light edema of ankles and legs. Otherwise normal.

Urinary System. — No subjective phenomena.


Phosphates normal. Indecisive normal. Anoscopic
present. 

Net in 24 hours = 288.42 grams.

Microscopic - Amorphous particles + tongue of mucus.

Reproductive System - Normal.

Nervous System - Normal.

Respiratory System - Muscles flabby and wasted.

No joint affection at present.

The patient was treated with digitalis, strong saline, potassium bicarbonate, and milk. He improved and milk was given. The patient was fed milk.

29th May - Die at 7 o'clock. 54 inches.

" nine inches higher. 33 "

The patient for a time suffered from considerable dyspnoea with some cyanosis. This was relieved by...
Case 27.

Case of Phthisis Pulmonalis with Enlarged (Fatty) Liver.

Professor Greenfield's Ward.

Admitted: 18th June 1893. Examined 19th June.
Complaint: Pain in the chest and Cough;
Breathlessness, Weakness in Legs.
Duration: Eighteen months. Swelling of the abdomen was first noticed five months ago.

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 edema of the legs and ankles.
He has become much emaciated and the phthisis is now far advanced. Haemorrhoids for 4 months.

Alimentary System — Tongue a little dry.
Afebrile with a white fur Gastroenteric. Some dyspeptic symptoms present. No vomiting. Vomits constipated.

The liver is much enlarged.— In the right osseous line the deep dulness begins at the 4th rib and extends down for 8½ inches. The superficial dulness begins at the 6th rib. In the mid-clavicular line the dulness begins at the
6th in and extends downward to within an inch of the base, a distance of 8½ inches.
In the middle line the thickness extends to the
periphery. 
Olfaction gives an scent
corresponding to pepperance. The surface and margins
are smooth and there is no increased firmness of
the peel to a substance to be made out. There
is slight tenderness in the pippastum and at the
lower border of the seed a little to the right of the
middle line.

Flesh not enlarged.

Flab. - Fruit slightly in marial area about about 1
inches. 

The physical signs in the lungs are those Phenomenal
of night running for some time.

While in the Infirmary he had vomiting of diarrhoea and the
lives became large. He was removed from the Infirmary
on 27th July and died soon after. There had been a
rule a slight evening rise of temperature, one or two
as high as 104.2° F. There was no jaundice.

Urine - Mechanical somewhat frequent. - Scurvy or
Thrice during night. Quantity of urine measured from
71 to 102 ounces. Several examinations made -

27th July - Quantity on 24 hours - 69 ounces.
Straw colored, slightly turbid, deposit of
mucous "x". After 10½. Acid. Albumen present.
in small quantity. No sugar, blood nor bile pigments. Bile salt not increased.
the Indian - no increase.

Urine (estimated without removing the albumen) 37.9 grams.

Urine (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 hydrometric process for estimation of urine, and the result is that it has little or no effect, so that clinically we can estimate the urine quite well without the tedious process of removing the albumen.

Microscopic - Granular casts, becoming fatty. Hyaline casts, mostly containing granules and a few cells. Granular matter, and considerable quantity of mucus, albumen, and granules. The pise varied from 302 to 37.9 grains.

Remarks. - The state of the urine shows pretty conclusively that one way
change had occurred in the kidneys. The occurrence of diarrhea while he was in the
erysipelas renders it probable that there was also some commencing miliary disease of the
intestines. As regards the face, while the
miliary disease would not all probably affect
it too, the physical signs (especially the want
of increased density) render it probable that
miliary it was at the same time fatty, and
these may have been the more marked change
of the two.
Case 28.

Case of Pneumonia with slight Jaundice and with Bilirubinuria and Excess of Bilirubin salts in the Urine.

Robert Cartwright, age 40, flashy carpenter, admitted on 10th May, 1886, suffering from Pneumonia affecting the lower part of the left lung. Hist comic on 1st day.

On the evening of 10th May the temperature was 102.6.
On 11th May the temperature varied from 103.2 at 2 P.M. to 101.2 at 10 P.M. Normal pulse 120, Resp. 54.

On the evening pulse 122, Resp. 56.

On 12th May the temperature varied from 100.4 at 10 A.M. to 102.4 at 9 P.M. Normal pulse 120, Resp. 58.

On the evening pulse 150, Resp. 56.

On 13th May the temperature varied from 102 at mid-night to 99° at 9 P.M. Normal Pulse 128, Resp. 50.

On the evening pulse 152, Resp. 58. On this day it is first noted that there was a yellow tinge of the conjunctive.

Its position in the morning was as follows: - Pulsus regular, collapsing. Slight exsanguination. Slight reticulum of conjunctiva and of surface of skin. Delirium up to third pulse in anterior axillary fold on left side. Mucous confused in 2nd interparietal, hyperresonant in 12th interparietal vein. Abundant precipitate with both inspiration and expiration at the upper limit of the dull area and a little above it. Some shranked in first interparietal. Respiration tubular over the dull area.方影 very feebly with slight grumb
large. In the right mammae and the lower border of the liver dulness is at the costal margin.

The pangs occurred during the night.

On 14th May the temperature fell from 20.7° at midnight to 19.2° at 8 A.M. After this the temperature continued normal except that at 10 A.M. & 9.2° on the evening of 16th May and to 99° on the evening of 14th May.

On 14th May he was perspiring profusely. Dulness up to second rib in front. In the pyramidal there was still a slight honeycomb of the conjunctiva and of the blood of the upper part of the chest. Breathing rapid, regular, collapsing. Effusion still persist with greenish tinge. Tongue still coated but more moist. Cyanose less. Cataract at base posteriorly, still high with standard to spine in 13th & 14th day.

By 17th May, the effusion had lost its purplish colour, the tongue was cleaner, the pulse lower and steady, 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. 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. No salts were present in excess, and this began to diminish on the day before the crisis (13th May). Bile pigment was present
in a more brisk at first, it increased up to the 12th, and began to diminish on the 13th, and was almost on the 16th, the bile salts being still in excess.

The bile pigment therefore evidently appeared later than the excess of bile salts and its color appeared sooner.

The price was in marked excess during this fever.

There was never any blood or purg. Microscopically there were numerous erythrocytes, and on the 16th May there were also a few acanthocytes. Chlorides diminished during from 10th May. By 10th May - albumen about 1/6. bile

10th May - albumen about 1/6. bile between


12th May. Bile red coloured, By 10th May. Albumen - about the same as yesterday. Bile pigment more than yesterday. Bile salts between 25 and 30 grains


14th May. Bile red coloured, By 10th May. Albumen a trace. Bile pigment rather less than yesterday.

Bile salts - By 35 grains or 183 grains.


16th May. No albumen nor bile pigment.

Bile salts - By 30 grains or 200 grains.

16th May. Quantity 40 ounces. Reddish amber coloured.

By 10th May. No albumen nor bile pigment.

Bile salts - By 35 grains or 183 grains.
Case 29.

Case of Pneumonia with albumen, trace of sugar, Bile Pigment and excess of Bile salts in the urine.

James Crawford, age 14, admitted on 28th April 1886, suffering from Pneumonia of three days' duration. The Pneumonia was on the right side and had extended over the greater part of the lung, a portion of 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. Antiphlogistine, Perquin, Soluble Salts of Soda, Strophanthus andカフェine stimulants were administered.

The temperature was 103° on the evening of 28th April. On 29th April it varied from 101° to 103°; on 30th April from 101° to 102°; on 1st May from 100° to 101°; on 2nd May from 98° to 100°; on 3rd May from 98° to 101°; on 4th May from 99° to 101°, and on 5th May from 99° to 100°. On the night of 5th May the temperature fell very low and the patient had to be brought round by hot bottles and brandy. After this the temperature was normal or subnormal. There was not much purty fever in the sputum. Cyanosis was present but slight. There was either no distinct return or very little. After 3rd May he steadily improved, and by 16th 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 colored, 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 the 11th May it was absent. Pigs 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 that it was entirely absent. All the salts were present in large quantity. They increased up to 7th May, after which they diminished. There was a constant and distinct excess till 12th May. During this time the urine was green, in addition to the reaction for pig pigment, a marked blue red colour, below it showing that there was a great mixture present in 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 7th May. On 6th and 7th May its presence was doubtful and after that there was none.

Chlorides were diminished to a trace during the fever. Afterwards they were increased. Albumen was found for on 4th May and was found to be present in considerable quantity. There were no blood. On and after 3rd May the urine was rather less than normal for a boy of fourteen varying from 33.5 grains to 195 grains. Microscopically there were fine acid crystals, mesn. corporal.
Tabelas Report as to Alum.  
Date: 15th, 16th, 17th, 18th, 19th 

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On 21st day, the allumines removed from a portion of the mine and by boiling and filtration, and the mine pass then concentrated. Petalumines color precipitated with sugar and sulphuric acid and then drained, though the purple color was faint, but (3 due to this color to the pigment present.)
Case 30.

Case of Cystitis urica with symptoms of Renal Calculus; Liver somewhat small; Stomach dilated.

Professor G. A. Stewart read.

Patrick McBride, age 26, laborer in Corset and tailoring works. Admitted on 20th Nov. 1895, complaining of Pain in left loin, extending forwards and upwards, Duration six weeks before admission.

History. - When about fifteen years old he had an attack, he says of pleurisy, with pain in the shoulders and in the stomach. He has had good food but has had to eat it hurriedly. He has been temperance through out in abstaining. He has been found since he came to the Infirmary that he has a tendency to overeating. His work has been heavy and he has been exposed to alternations of temperature.

Present Illness. - He has complained of Pains in the stomach, from time to time for 2 or 3 years, with headache, heartburn and vomiting. He has only had three such attacks since the present illness commenced.

An apparent wish to feel better all over. Ten weeks before admission he thinks he got a strain whilst at work. He began to suffer from headache, dull, especially after noon; pain in the stomach, with heartburn and flatulence.

He omitted two or three times at the beginning of the illness, the vomited matter being tolerably clear. Blood he thinks. He had also pain in his left shoulder, and an inflamed gland in the left axilla which was cured.
by fulminating. He began also to suffer from pain in the left loin, extending forward to the left hypochondrium and at the pit of the stomach, upward to the lower ribs and downward to a little below the umbilicus on the left side. It has been most in the site of the lower part posteriorly. It has sometimes had sharp attacks of pain in addition, shooting from the left loin in the directions above mentioned, but never down to the testicle. The pain is generally worst in the left loin.

15th Oct. Height 5 ft 4 in. height 10 st 10 lbs well developed. No jaundice. Some semi-guts in each.

Face pale without much expression.Temporarily dilated.

Digestive System: Tongue large, moist with ereany fur in middle & prickle in center. Affection:
good. Frequent thirst. 2 degrees of mouth & throat.
Some unpleasant feeling in stomach before food. After
food, a dragging sensation and other symptoms as stated
in history. Bowels regular. Feces normal.

Dec 1871 Has not vomited since admission.

Pain not so bad now.

The Abdomen was several times examined. There was
considerable enlargement of the stomach, interfering
from below
with the percussion of the liver which appeared to
be somewhat diminished in size. On the middle
line the liver dulness extended from 3/2 inch above
the base of the xiphisternum downward for 1/2 inch.
In the right mammary line it extended from the upper
border of the 5th rib to 1 3/4 inches above the costal
margins, a distance of 3/4 inches. On the right
mid-axillary line, the breath sounds from the 6th
intercostal space downward for 4 1/2 inches.
Circulatory system fairly normal. - The 5th Dec.
24 P. had accentuated, occasionally palpitated.
Pulse 38 per minute, regular, rather small,
Other Systems normal.
The food was commenced on 2nd Dec. with the following
results:

Red corpuscles - 4,830,000 per c. millimeicr.
White - 20,870
Hemoglobin - 85 per cent.

The back severe pain, in the left loin, the 3rd and
5th 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 on the parts affected by the pain, over
about midway between the last rib and the posterior
part of the iliac crest.

The patient was discharged relieved on 8th Dec.

The urine was normal in quantity, sometimes
slightly alkaline, sometimes slightly acid, depositing
crystals of uric acid, and sometimes also crystals
of tricalcic phosphate. It contained no albumen, bile
pigment or sugar. The bile salts were diminished in amount. The indican was markedly increased. The pears was about normal, 667.6 grs., 427.6 grs., &c., usual of 49.7B. Quantity 50 ml. Yellow with slight greenish tinge. Almost quite clear with some shining crystals suspended in it as well as mucus. Deposit contains shining silvery crystals, some distinctly pent to be flat. Albumin acid. Its albumen, like pigment nor sugar.

Bile salts diminished. Indican was found on the occasion—possibly an error, (At this occasion or while it was collected for it was present in large excess. The other pigment were first removed by acetetic lead), usual 427.4 grms.

Microscope: Crystals of Biuret and triple phosphate.

The crystals generally formed a slight paving layer on the top of the deposit of mucus.
Case 31

Case of Acute Rheumatism with Albumen, a trace of bile pigments 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 astrocytic meningitis, the first period was reduplicated, and the second mild, was accentuated and occasionally reduplicated.

On the morning of 6th May, the temperature was 102.8°F.
On 7th May, it was 101° in the morning and 101°6 in the evening when the pulse-rate was 112 and the respirations 30 per minute. On 8th May, the highest temperature was 99.8° at 8 PM. On 9th May, the temperature was 99° at 4 AM, and on 10th May, the highest was 99.4° at 4 PM. After this the temperature was always normal or subnormal.

She was treated with Salts of Soda, and during convalescence with Salts of Bismuth and Iron.

The urine contained a large excess of bile salts at first with a trace of bile pigments and a little albumin. The largest quantity found was 52.52 on 4th May and 29.8 on 11th & 12th May. Microscopic - Urine and crystals. No.

It only once contained a doubtful trace of sugar, meaning of 4th May - High colored, deprent of urine, strongly acid, pH 10.5. Albumen in small quantity, bile pigments a trace, -Bile salts, 4 g required = 600 parts. That diminished the quantity produced by the fifth and sixth.
and in boiling the faculty appears increased, but did not become so dense as before heating. Potter's test gave a slight reaction for bile salt.

11th May (28 hours in wine) Quantity 52.92 g. Yellowish amber, turbid. Direct Zimmerman, Agy. 103.2 g. Alumen in trace. Chlorides a mere trace. Bile pigment a trace. Bile salt 17.10 or 12.10 g. required = 600 or 500 mg. With cold nitric acid, a

Precipitation of nitrates of iron. Urea 800 mg. 9th May Quantity 36.51 g. (contains menstruated blood) Agy. 102.9 g. Acid. Bile salts 17.20 or 25.00 g. required = 300 or 240 mg. Chlorides still in very small quantity.

Quantity 28.02 g.

11th May - Clear, much cleared, Agy. 102.4 g. Acid. No alumen. Bile pigment a trace. Bile salt 17.45 g. required = 150 mg. Chlorides in very large quantity. Urea 241.8 g. g.

12th May. Quantity 28.02 g. Agy. 102.5 g. Acid. Bile pigment, doubtful. Bile salt = normal maximum or very slight increase.

14th May. Quantity 44.02 g. Agy. 102.9 g. Acid. No alumen. No bile pigment. Bile salt 17.40 g. required = 166 mg.

16th May - No alumen nor bile pigment. Bile salt = 17.45 g. required = 150 mg.
Case 32.

Case of Many Disease of the Liver, Spleen and Kidneys in a patient who had Rheumatic Disease nine years ago and who is now suffering from Phthisis. Professor Graviss Stewart wrote.


On admission he complained of pain in the chest, cough, shortness of breath, and swelling of the feet. The first symptoms date back two months before admission, this helping for a week.

History. Family history unimportant. Died some 5 years past. Exposed to great heat at his occupation. Abode for nine years—has been in the East Indies, in the Mediterranean and off the Baltic.

Previous Illnesses—Measles, whooping cough when a child, heart disease doubtful. Nine years ago he was in the Old Infirmary under Dr. Rater with Dinner of this left hip joint. He was laid up for the greater part of a year owing to suppuration. The sanary was applied to the joint and led to the great improvement.
In July 1884, while at St. Petersburg, he had an attack of Haemophaesia or Haematemesis which occurred on three successive days—probably Haematemesis. It left him weak but he soon regained his strength. No history ofague nor of venereal disease. While in the East Indies he and most of those on board suffered severely from diarrhoea, due, he says, to the salted meat. He had not cholera. When 18 months old he had a severe attack of Bronchitis.

Recent Illness, commenced in January 1885 with pains in front of chest—particularly in 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 in breathing, worst during the night and in the early morning. The sputum was at first frothy and watery, after a lime-sticks and yellowish. It became gradually worse till his admission here. The stools 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 admission, 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 this New Year. He has been getting thinner since his illness commenced. He has not had much pain.

9th March.--Lower limbs slightly oedematous. Tongue somewhat pale, slightly furrowed. Little fever. Urine in epigastrium after food. After vomits to 9 p.m. after food.

Fluctuations. Bond regular.

Abdomen prominent. Liver much enlarged.

No tenderness. A right angular line, here delicits from upper brim of 6 to 1/2 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 6 1/2 inches. Percussion good over the rest of the free abdomen.

Haemorrhage System. Lymphatic glands normal.
tight across the stomach. The legs began to swell about the beginning of March and this gradually became worse. The swelling disappeared soon after admission 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 pain 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 perspiration.


He testicles. In right mammary line, below the clavicle, 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 antero-inferiorly it extends from the umbilicus inferiorly for a distance of 6 1/2 inches. Percussion sound over the rest of the abdomen.

Haemorrhage System. - Lymphatic glands normal
The spleen in the mid-axillary line extends
from the 9th to the 11th rib, a distance of 3½ in.
Circulatory System — nothing important.
Respiratory System — Emphysema of anterior
margin, — some consolidation at left apex.
Sensation & vibration present in whole chest.
Depressions over lower part of chest in front and
behind.

12th March — Edema of feet gone. Complains
of soreness over epigastrium and rightHyper-
chondria.

17th March — Some friction below left clavicle.
Impression detected at 3rd space — chiefly
behind with increased vocal resonance and
other signs as before.

24th to 28th July — Mucus nasalis pellucida.
Considerable emaciation. No jaundice, Deputy
appearance. Emaciation behind left clavicle
and over left groin, due to this emaciation. It has
been unable to lie on the right side since it turned
ill, but he can lie on the back and on the left
side. Temperature has varied from 97°-98° in
Alimentary System — Lips somewhat pale.
Tongue pale, slightly furred. Appetite good. No
thirst. No dyspeptic symptoms except gaseous
gaseous respiration and a bad taste in his mouth in the morning. No vomiting of 
emesis. Bowels regular.

Abdomen - slight prominence in epigastrium, and right hypochondrium, extending to the upper parts of the parietal and right lumbar regions. Abdominal walls of moderate thickness and tension. No tenderness except a little to the right of and above the level of the pubes.

(The pain used to be more severe and the loins of the lumbar vertebra were used for it. It is returning slightly and the treatment 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. Inflammation is felt in the right mammary line at the level of the 6th rib.

Measurements of Liver Dulness:

Left St. Membrane Line - 5 3/4 inches
Mid-Lumbar Line - 7 1/2
Right St. Membrane Line - 7 3/4
Right Mid-Anterior Line - 7 1/2
Right Scapular Line — 5 3/4 inches.
On the left side the dulness extends for 6 inches to the left of the mid-axillary line.

Dorsal of Abdomen at back of umbilicus 21/2 in.

Sphenoid above n — 31

Respiratory System — Enlargement and edema of glands in groins. Also some enlargement of glands in axillae and neck.

Gland above allow not felt.

Liver — In the mid-axillary line the dulness extends from the 9th to the upper border of the 10th rib, a distance of 4 inches.

In the left of the ribs it extends from about an inch behind the posterior axillary line and merges anteriorly into the hepatic dulness. This gives a measurement of 5 inches for the line of the ribs.

Circulatory System — Gently normal —

Often palpitation, chiefly in central. Slight accentuation of pulmonary second sound.

Pulse — 94 per minute, regular, moderately compressible. — Fairly well filled between the beats. — Wall not thickened.

Respiratory System — No pain now, cough not so bad. Hyperspiration minimal and chiefly
President - not so copious now.

The signs of consolidation have now become more marked and more extensive at both apices in front and behind. There is distinct coryza, with a dry, coughing fit. The flexible joint and at both spaces behind. Otherwise the consolidatory signs are much the same as before. There is no evidence of cavity formation.

Integumentary System - this day, but he has been sweating at night for the last week or two. Over the knees and elbows, and to a lesser degree in some other parts. There is a reddish purple color of the skin. There is a thickened, peal condition of the skin of the feet.

Urine System - no subjective phenomena.

Urine of 28th day. Quantity 300 + 1/2 be, slightly turbid, large deposit of mucus. After 60.20.

Acid. All emission between 1/2 and 1/4. Final with pepsin 6.0, reaction got 3.0, but has been taking glass of the iodide of iron, no sugar nor bile pigment.

Indica - normal. Urea - 175 grams.

Microscopic - mucus corporules.

Nervous System - headache in the morning of late, nothing further except what has been stated.

Locomotory System - nothing beyond what has been.
Stated. He ran more than left joint which
was diseased freely and without pain.
He was treated with coal bane oil,
syrup of the soda of boron, rectifiers,
Digitalis and stiata of caffeine, &c.
He was discharged on 9th June consider-
able improved, and he was readmitted
on the 13th Sept. The oedema of the legs
continued a few weeks before his readmission
and this caused him to stop work. He had
also a pain in the left side which was relieved
by quinine. There was some fullness of
the face, and the urine became much dimunished.
High-coloured & turbid.
1st Oct. - Legs & thighs very oedematous, the
oedema extending to the knees & feet.
Some fullness of the face. The tongue
covered with a whitish white fur.
The abdomen more prominent than before
in the regions occupied by the liver. The
liver is still larger than before. There is
some dulness on the left flank which disappears
by change of posture. Measurement of the
hepatic dulness:
- Middle line - 9 1/2 inches.
Right Mammary Line — 9½ in.
Med. Axillary Line — 10 in.
Scolic thickness — not much changed.

Cardiac action accentuated. — In the initial area the first sound has a thumping character. The second sound is accentuated, most markedly so at the base. Pulse — 107 per minute, regular, of medium size, normal and easily compressible. Asterisk wall not thickened.

Lungs — much the same as when last described, but little pleural & bronchial signs more marked.

The oedema extends to the neck & loins and as high as the upper arms over the lower ribs posteriorly.

3 Oct. — During peeling in epigastrium — lightness in abdomen. One foot tractions applied gave relief.

Abdominal Measurements:

- At level of xiphisternum: 34 ¾ in.
- Midway between xiphisternum & umbilicus: 36 in.
- At level of umbilicus: 35 in.
- At level of iliac crests: 34 ¾ in.

4th Oct. — Penc. tertium punctatum remaining.

Ordered Infusion of Digitalis.

4th Oct. — Oedema extending into abdominal wall.


Since this time he steadily lost ground, the oedema...
increasing, but being held in check to some extent by laudanum later inserted into the large, peritoneum and left flank from time to time.

The latter 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 3-quantities of fluid. The liver was more difficult to examine owing to the abdominal distension, the walls of peritoneum being superficial to the lower part of it.

On 29th Dec. it was some time subsequent to this that he had an inflamed gland in the neck.

He complained of a good deal of pain in the left side of the abdomen some distance above the navel prest. On 31st Dec. the middle of the esophagus was pushed into the abdomen but no fluid was got. Some time afterwards a sudden attack of pain in the left side of the abdomen some distance above the navel prest. The pain was severe, and at times accompanied by vomiting and nausea for some days. But this came all at once.

The stools were loose, and spilt a few formed about the month.

14th Dec. Shortly before it was decided with severe pain in the peritoneum, and pericardial friction present, and deep friction was then found to
be present. The pain was relieved somewhat by
a mustard leaf. At 8 P.M. the patient was heard
to cry loudly over the whole precesoria and beyond
it. There was some enlargement of the cardiac
bullae transversely. The lips became cyanotic
and the breathing more difficult. The pulse
became weaker and more collapsing. 1/6th grain
of morphia was injected to relieve the pain. This
gave relief and he was drowsy & slept for an
hour; then he woke up and spoke to his friends.
11th Nov. After 12. 30 all be passed into a
drowsy condition which gradually deepened till
he died at 5 A.M., To the last there
was no pain.
Post mortem examination refused.

The problem of the urine from day onwards
was that of the third stage of long diuresis - the
quantity being considerably diminished - falling
down to death as low as 18 or 20 ounces. The
specific gravity ranged from 1013 to 1024 -
Rencher's Acid - albumin in large quantity -
On one occasion (8th Oct.) as much as 9/9 of
the column of urine in the last tube. There was
no sugar, only a pigment not 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 alkalies, for they were found to be either sometimes normal, sometimes diminished in amount. There was no excess of iodine till near the termination of the case when it became much increased. The quantity of urea varied from 142 to 365 grains—usually considerably below 300 grains. On the day before death the quantity was 233 grains.

Rippled masses, containing a few granules and cells were frequently found. Towards the end granular and fatty casts and red blood corpuscles were also present.
Case 33.

Case of Persistent Diarrhoea with Inflammatory Bright's Disease; Enlargement and Subsequent Deminution of the Site of the Liver. Professor George Stuart Barlow.

Andrew Gilmore, aged 20. Admitted on 24th April, complaining of diarrhoea and general weakness of about fourteen months' duration.

He is a farm labourer 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. Has had no previous illness.

Present Illness. - About the first year before last he thinks he got cold. He had to go to the doctor frequently and got his feet wet. Had a bad cough with whitish mucous expectoration. Shortly after he had pain in the loins and diarrhoea commenced. The diarrhoea has never ceased, but has varied in severity, sometimes only two motions daily, sometimes five, six or eight. He never noticed his face or his feet swollen. He did not notice any change in temperature except that it was high formerly till about five weeks ago, when he noticed that it was shrunken and muddy. Since then it has been clear. The face and lips sometimes became very blue, but he never noticed the palms or soles yellow. He sometimes had 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 been
as a rule brownish coloured, sometimes darker, never
fares. The cough get better and remains away till
for some time last winter it again trouble him. He
has very little cough now.

Present condition (27th April). Well-developed,
clinches soft and flabby. No jaundice. Some
edema of feet and ankles and legs, most on the right.
No epigastria. Dull expression of face. Cheeks
flushed—this varying from time to time; when pale
round the mouth and eyes.

Alimentary System—Rips and gums somewhat
pale. Tongue clean, deficient in epithelium, fungous
papillae prominent; secretion of mouth deficient. Always
very thirsty. Appetite good. Sometimes a little taste
in mouth. Sometimes flatulence. Sometimes pain
a little above umbilicus after food—not much at
other times. Sometimes hiccough and gasous
emissions, no vomiting for a long time. The
vomit consisted simply of altered food. Bowels
still loose. — passed six times yesterday. Stools not-
formed, putrefactions, brownish coloured, with bad
odour.

Abdomen—Normal in appearance. Walls of
moderate thickness and tension. A little resistance
is felt about 2 1/2 inches above the level of the
umbilicus, between the right mammary and right
parasternal lines, slight tenderness upon raising
with respiration. Some indefinite resistance below this.
Percussion note good all over except in right
flank, increased in left flanks between ribs and
ribs below. Stomach dilated, this note extending
about 3 inches to the right of the middle line.
In the middle line, the liver dulness extends from
about 2 inches below the middle of the scapular cartilage
upwards for 3½ inches. In the right mammary line, it
extends from the 4th rib to slightly within the
posterior margin, a distance of 8¼ 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.

Hemopoetic System: In the mid-axillary line,
the splenic dulness extends from the 6th rib to the
9th intercostal, 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 groin and axilla are not enlarged.

Circulatory System: Sometimes palpitation. Some
dyspnea on exertion. Precordial normal. Cardio-
dulness normal. There is distinct inequality of the
first sound in the mitral and aortic areas. The
second sound is accentuated. There is no murmur.

Respiratory System: Chest square shaped. Flattening
under both clavicles. Right on the left side, marked
on the right side. Expansion a little delayed below
clavicles on right side. Vocal fremitus perhaps slightly
increased below right clavicles. The percussion note
is slightly prepared above the clavicles; most marked on right side. Very slight impairment below right clavicles. Impaired at apices posteriorly. Clear over rest of chest. The breathing approaches the bronchial in type below the right clavicles; there are expirations during inspiration and the vocal resonance is slightly increased. Below the left clavicles the breathing is harsh with prolonged expirations; occasional preparations with preparation. 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 at the apex and is accompanied by a few preparations. At the left apex the breathing is harsh, but not so markedly; there are a few preparations. Over the rest of the back the breathing is a little harsh with no accompaniments.

Except for this condition of the apex there is nothing important in the other systems which has not been mentioned.

*Treatment:* The patient was put up with milk, and after a time gravine water was given along with it. Various medicines were given, including lead and opium pills, subnitrate of bismuth, tincture of colts, ergotism and morphine suppositories, nitrate of silver permenta and carbonate acid pills, but none of them had any marked effect.

*Progress:* The patient became gradually weaker, the diarrhoea continuing. The liver enlargement some
demolition in price. On admission the serum was observed to be very lightly blue coloured, and it became more so, and continued so till the end.

Notwithstanding this, there never was any distinctly perceptible jaundice even of the conjunctiva.

16th May. Tongue dry, deficient in epithelium, papillae prominent. Gum spongy. Cheeks flushed. The line delineus in the right lateral temporal line extends from the 4 1/4 inch above the base of the orbit downward, a distance of 2 1/4 inches. In the right maxillary line it extends from the 4 1/4 inch downwards to 2 inches above the postal margin, a distance of 3 1/4 inches. In the mid-antral line it extends from the 5 1/2 inch downwards for 4 inches.

17th May. The following is the condition of the blood:

Red Corpuscles. 5,180,000
White. 16,000
Haemoglobin 5 1/2 per cent.
Proportion white to red 1 to 324.
Haemoglobin red corpuscles 8 1/4.

Corpuscles well formed; considerable variation in size.

18th May. The serum from a phial was examined. It gave a distinct reaction for bile pigment. Very little congealing was produced by the nitric acid, whereas with normal serum the congealing was very evident.

Rapidly becoming weaker. Tongue dry and glazed. Gum spongy. The stools are almost watery. Grammar yellow with some greenish colouration here and there. The
reaction with nitric acid is doubtful. Some masses could be felt of what appears to be mucus. Odour not very offensive. Temperature not elevated, Pulse 120, weak, compressible. 

Breathing 18 per minute, irregular and heavy.

19th May. He has been troubled with vomiting and has been losing fluid during the last few days.


Pulse 76, almost thready. Vomited again today and some blood discharged from mouth.

21st May. He was seated with acute pain in the lower part of the abdomen this morning. This was relieved for a little by stools and emetics. Motion of legs does not affect the pain. Tongue dry. Colloths pale, Cheeks pinkish, some cyanosis. In afternoon became unable to pass water.

In the evening he was very much pinkish, but the pain was less severe. Breath foul. Pulse 120, regular, but small. He almost already. Respiration 10 per minute. Pulse irregular, somewhat sighing, mainly costal. Feels a burning sensation in lower part of abdomen, pain on attempting to micturate. No obvious dulness over bladder.

Abdomen distended a little, especially at lower part, less tender. Some tympanite. No dulness in flanks.

22nd May. Patient digital. Pulse imperceptible. Breathing 21 per minute. Extremities cold. Régurgitation. Abdomen very tender Lying on back with legs drawn up. He died at 1:30 P.M. 

Pitcher had formed over the 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 20 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 had a slight
yellow colour, and this soon became much more marked
and persisted. The quantity was diminished to from
30 to 70 ounces. The specific gravity was normal, and
the reaction acid. Albumen was always present in
very large quantity. There was no blood nor sugar nor
lipoids. The tube cells were at first normal in
quantity, but at once began to be in excess and consisted
of - the excess commencing after the pigment had appeared.

Albuminuria, there were numerous casts, mostly
hyaline with granules and fat globules, some with epithelial
cells, also granular casts, cells from the renal epithelium,
meiosis & fans corporules. The urine was |diminished,
-varying from 217 to 167 grams per 24hr. A urine
of serum found near 10 lbs. had been tested
for Thankun, the latter pigments having been first removed
by acetate lead, and it was found it to be present in
very large quantity.

25th April - Deep amber color. Greenish yellow color
shaken up, forming a float with a slight greenish tinge.
Albumen = 1/2. After removal of albumen - slight reaction
for the pigment with nitric acid. Ith calls ---

by 60 quarts a quantity nearly equal to standard, no

fear for me.

28th April. - Hg y 1022. A little pigment in small quantity,

Salt - normal maximum.

30th April 2nd May. Hg y 1019. Albumen = 4/5. Ith calls a

little vernice. Ith salt. = 40 or 45 required or

1 or 150 pce.

1st May. Ith calls pigment in small quantity. Ith salt. = 40 pce. 4 pce.

2nd May. Ith calls pigment considerably. Ith salt. = 40 pce.

3rd May. Ith salt. between 40 + 65

required or between 1 and 250 pce. Hg y 1020. Albumen = 7/5.

4th May. Ith salt. = 267. 46 pce.

7th May. Quantity 18 k. Hg y 1026. Albumen = 7/5.

Ith calls pigment increased. Ith salt. = 40 pce. or 250 pce.

Ith salt. 152 415 pce.

10th May. Quantity 169. Ith salt. = 45 pce. or 250 pce.

11th May. Quantity 17 82. Ith salt. 163. 132 pce.

19th May. Quantity 20 72. Hg y 1029. Ith calls pigment considerably

increased. Ith salt. = 65 pce. or 600 pce.

20th May. Quantity 32 02. Less bile standard than yesterday.

Hg y 1012. Albumen = 1/4. Ith salt. 10 grammes per litre.

Ith calls pigment less but still considerable. Ith salt. = 725 pce.
or 240 pce. Ith salt. = 107. 616.

Ith May. Quantity 38 12. Hg y 1012. Ith calls pigment rather

less than yesterday. Ith salt. = 25 pce. 30 required, or 240 Hg y 200 pce.

Ith salt. 153. 816 pce.

22nd May. Quantity 94 ounces. Hg y 1019. Albumen between

1/4 and 3/4. Ith salt. 20 or 21 grammes per litre. Ith calls

pigment increased. Ith salt. = 63 6812 pce. +.