Biliousness and Lithaemia

Among the cases daily treated by the general practitioner there are none that recur with greater persistency than those of so called "Biliousness" and few that give less satisfaction to the practitioner for having no specific he can promise little relief unless through a line of treatment involving much self denial and however accurate the diagnosis and correct the remedies, his endeavours are too often nullified by the negligence and self-will of his patient. "The liver" says Faithom is like an Angusan Stable which demands equal zeal on the part of the patient as on that of the practitioner.

From the earliest times the liver has been the subject of continual experiment and speculation. Galen affirmed that it had other functions than merely the secretion of bile, and his theory that it was the centre of animal heat to which fuel was carried by the portal veins, was nearer the truth than that
of Bartolini long after, that it was simply an excretory organ. For a long time how-
ever this latter view prevailed as a solution of the problem; and disturbance of liver function were simply classified as (i) Diminished or arrested secretion, (ii) Increased secretion, (iii) Motile secretion.

It was only until the middle of the present century that [Claude Bernard] discovered that the sugar in the hepatic veins was much in excess of that in the portal system; and continuing his experiments, he demonstrated the glycogenic function of the liver; — a making and storing of glycogen from sugars, starches and proteins, and a power of again converting glycogen into sugar and distributing it over the body as required, without which last action the stored glycogen would be as useless as the raphides of the Cactus.

The second function is the reduction of albuminoid into less complicated bodies. The blood passing from the liver contains less fibrin than that entering it, and
C. E. Brown-Sequard estimated that 2690 grammes of fibrin are thus daily lost in the passage of the blood through the liver. It would seem also that the peptones of gastric and pancreatic digestion are more than are required to replace the nitrogenous waste of the tissues, and the surplus is broken up by the liver into glycogen and the products leucin and tyrocin. This last also appear during the actual process of protein digestion by the pancreatic and to a less extent by the gastric juice.

From leucin and tyrocin though probably not alone from these, we have strong evidence to show that the liver forms urea. (1) Leucin introduced by the mouth causes a marked increase in the quantity of urea excreted. (2) In acute yellow atrophy of the liver the excretion of urea ceases and we find leucin and tyrocin in the urine. (3) Meissoner has demonstrated that urea is not only normally found in large quantity in the liver; but that it is more abundant...
in the hepatic than in the portal veins.

In its third capacity the liver secretes the bile and it is this function that naturally attracted attention far back in the earliest days of physiology but even now it remains but a half solved problem.

M. Foster quoting from Arriekus states the composition of bile to be:

<table>
<thead>
<tr>
<th>Component</th>
<th>%</th>
</tr>
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<tbody>
<tr>
<td>Bile Salts</td>
<td>91.4 parts</td>
</tr>
<tr>
<td>Mucus and Pigment</td>
<td>29.8</td>
</tr>
<tr>
<td>Fatty</td>
<td>9.2</td>
</tr>
<tr>
<td>Inorganic Salts</td>
<td>7.8</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>2.6</td>
</tr>
<tr>
<td>Water</td>
<td>859.2</td>
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The significant fact of this analysis is the large quantity of bile salts and pigments. The mucus is not a primary constituent but is acquired in the gall bladder where the bile loses some of its water by absorption.

The acids are the well known glycocholic and taurocholic both being founded on Cholic Acid ($C_{24}H_{40}O_8$).
Which combines with Glycin (C₂NH₂O₂) and Tauroin (C₂H₇NO₃S). Neither of these two complex acids is found free in bile but always combined with Soda and the Glycocholate is far in excess of the Taurocholate.

The pigment of importance is Bilirubin (C₁₆H₁₈N₂O₃) in Carnivora; but in the Herbivora it is replaced by a higher oxydised form Biliverdin (C₁₆H₁₈N₂O₄).

Passing on to the derivation of these several constituents we note that both salts contain Nitrogen, which points to their source being tissue metabolism and the destruction of albuminoids; but whether the process in the Liver consists in the formation of Cholic Acid and its combination with Tauroin and Glycin, which two latter may be built up elsewhere as suggested by Foster, or whether these constituents are produced de novo in the organ yet remains to be decided.

We have good grounds for believing, however, that the bile salts as such take their origin from the liver and
are not merely withdrawn by it from the blood. Frezichs in his long series of experiments assert that bile acids are not normally found in the systemic blood, though delicate tests were repeated, applied and that even in the case of a portal thrombus the clot contained leucin but no bile acids or pigment. He further gives the researches of Molschevitz who extirpated the livers of frogs and found that though the animals survived for days and even weeks no traces of bile acids were found in their blood. (a)

As regards the origin of bile pigments our knowledge is rather more precise than in the case of the acids, whether we believe with Foster that “the spleen is the grave of many of the red corpuscles” or with Munchiez that their destruction goes on in the liver; there can be little doubt that Haemoglobin furnishes an important source of Bilirubin. If the former is injected into the blood bile pigment will appear in the urine, and the same occurs when dissolved red corpuscles
or even a substance capable of dissolving them such as bile acid, are introduced into the vessels. Bile pigment in its chemical composition and crystalline form seems to be identical with a derivative of haemoglobin, haematoxilin. The oxidation of bile acids furnishes another source of pigment, if a colorless solution of glycocholate of soda be treated with sulphuric acid a yellowish liquid is formed which on the addition of nitric and nitrous acids gives the play of color, green, red, and yellow characteristics of bile pigment.

Kühne objects to the statement of Frenck that bile acids are not found in jaundiced urine, and asserts that in cases of the common bile duct the urine always contains bile acids; but normally they are never present. Kühne further states that the acids are never decomposed in the blood that they are in health passed off in the feces and are not reabsorbed; that if they find their way into the vessels they are excreted unchanged by the kidneys.
and that though creatin appears in the urine it is due to the decomposition of blood cells and not to the metabolites of the acids themselves. Richet's views are supported by Harley; Val Ferich's experiments have been confirmed by many reliable observers notably Munchausen.

Passing to a third constituent of the bile Dr. Austin Flint jun. states that Cholesterin is formed in great part, but not entirely, from nerve tissue; it is washed out by the blood and merely extracted from that medium by the liver which has no part in its production. Its presence is constant in blood and nerve tissue but it is never found in the feces as on reaching the intestine it is changed into - Stéreoin.

The importance of a healthy liver to the system generally cannot be overestimated when we consider how a disorder of any of its functions reacts on nearly all the other organs; take for example Diabetes Mellitus; we know how commonly a life of general malaise ends in Phthisis.
and even in the case of the ordinary felon's attack, every organ from the sick stomach and palpitating heart to the aching brain seems unstriped.

Looking on the liver then as the purifier of the body, the substance removed by it and its auxiliaries must next be consigned. The blood in the veins contains more fibrin than that in the arteries but in passing through the liver so much fibrin is lost that the blood in the hepatic veins will not clot.

Fibrin appears to be unnecessary for the repair of exhausted tissues and from its constant destruction normally and its excess in inflammatory states it is doubtless a product intended for excretion.

Diet largely affects the production of fibrin, Lehmann found that his blood contained less fibrin on a vegetable than on an animal's diet, and under such a condition less bile is excreted.

Biddler and Schmidt estimated that a dog consuming 1/10th of its own weight of meat daily excreted about 1/1000 part
of its weight of bile, and they placed human secretion at 35° F. 76° F. in 24 hr of which only about 1/40 passes in the faeces. (a) The hundred parts of bile evaporated to dryness give only 7 parts solid, containing 273 parts nitrogen; the bile therefore that is passed in the faeces carries with it very little nitrogenous waste.

The second function of the liver must answer the question what becomes of the nitrogenous debris of the body, - it is undoubtedly passed as urea (H4 CON2).

Besides nitrogen there is another element that is contained in the majority of proteins viz. sulphur. It is a constituent of faeces but of the sulphur daily passes from the liver into the intestine not more than 1/8% is expelled in the faeces the rest being reabsorbed. (c)

The secretion of bile is most active soon after food is taken. In a case of biliary fistula, which I had the opportunity of examining some time since, the flow of bile was greatest from one to two hours after meals; during the
night though there was a constant oozing into the bandages the quantity passed was small.

Stimulation of the decedental end of the bile duct by the acid contents of the stomach causes a contraction of the gall bladder and a gush of bile into the intestine where it mixes with the chyme, neutralising its acidity and at the same time a white flocculent emulsion is produced by the acid setting free the ingredients of the alkaline bile. Should the bile pass back into the stomach it arrests digestion and causes nausea and vomiting.

Buflolini states that fresh bile has the power of transforming hepatic glycogen into sugar. (c)

In the duodenum, according to Wickham Legg, bile causes the albumin of the food to be thrown down and adhere to the walls of the intestine so as to obtain a longer digestive action; and the gastric juice being neutralised, the pancreatic juice, which requires an alkaline...
medium can then exert its action.

The pigment of the bile does emerge from the bowel as such, for in place of bilirubin we get stercobilin in the

(b) Murchison says that only a small proportion of bilirubin escapes reabsorption; and brings forward in proof of the fact that a calomel purge increases the amount of bile pigment evacuated though we know that mercury, at least the subchloride, has no action on the liver to increase secretion.

(c) The bile which is reabsorbed undergoes an immediate transformation in the blood and ultimately most of it is set rid of by the lungs. (d)

Widely different as its three known offices appear to be, the victim of a disordered liver soon finds out how one function overlaps the others and how a train of painful and serious symptoms is established; if his disease is allowed to remain and gain ground and to the question "is life worth living?" he will readily answer "it depends on the liver."
It has been remarked by Budd, that we have as a rule more liver cells than our ordinary state and habits require, but occasion may arise when the whole organ is hard pressed and even its entire strength is not sufficient to execute the work forced upon it; then when the liver energy has been excited in vain, the kidneys are called into action and the load may be disposed of, however without such bodily disturbance as shows act as a warning in the failure.

It cannot be wondered at that Bilious patients shows come to regard the bile as a waste product useless and even dangerous but its functions are really many and important. It has valuable antiseptic properties, it acts as an emollient, in connection with the pancreatic juice, it neutralises the gastric juice when the latter passes the pylorus, it assist the dialysis of oils and fats, and it acts as nature's aperient, especially, to the new born child.
When the bile duct is ligatured the chyle in the thoracic duct is thin and serous. (a) Bidder and Schmidt tied the common bile duct of a dog and found the fat absorbed was far below the normal and Legg continuing the experiment punctured the floor of the 4th Ventricule of the brain (after tying the bile duct) and found that diabetes did not ensue. (b)

When in excess the bile produces the disagreeable symptoms of the "Bilious Attack" — headache, sourness of tongue, disturbances of the stomach and bowels, loss of appetite, vitiated stools, a bitter taste in the mouth, fulness or pain over the liver and high colored urine. Very often too we have a yellow tinge over the skin or conjunctivae.

Such attacks are rarely found save in persons of a bilious constitution, which is thus described by Prof. Grainger Stewart — (c)

— The frame is large and vigorous, the complexion and hair dark, features irregular and characteristic. The alimentary system is the weak point and there is
Occasionally excess or diminution of the secretions. The urine is apt to be scanty and concentrated. The cerebral functions are powerful, the emotions well under control, the judgment sound and the disposition melancholic. The diseases to which such individuals are especially liable are those of the alimentary, circulatory and nervous systems. Depression of spirit, hypochondria.

Often in biliousness there is not only disturbance of liver but of gastric function. The food taken lies undigested and severe vomiting may ensue. The effort squeezes the liver and bile is forced out into the intestines and very often back into the stomach where its presence causes further discomfort and aggravates the vomiting. After such an attack is over however the patient feels much lighter and better than he has been for long before; due probably to the compressing and clearing of the liver.

It may be however that the bile enter the bowel freely enough; but accumulates there till Nature provides another remedy in the form of bilious diarrhoea.
- Very rarely does the belins patient possess a light complexion or clear skin, and rarely also is his disposition other than "Serious" a fact not to be forgotten in treatment. However, he may enjoy exceptionally good health in the intervals of the belins attacks; but naturally, the digestion is often at fault and the habitually melancholic disposition passes into morbid depression and sometimes into insanity, if not relieved by a change of diet and habits. No person with a belins temperament can ever hope that time or drugs will alter his constitution. Diet, exercise and in a lesser degree medicines may ward off the attacks, but the tendency is always in the system and overindulgence at the table is sure to call it out.

For days before a belins attack comes on, the patient has been feeling sleepy and low spirited. He gets up in the morning with a headache, the tongue is thickly furred and brown, the taste in the mouth is bitter, there is a load on the stomach, the eyes are dull and heavy
and the conjunctive tinged yellow, the urine is scanty and dark, and the spirit greatly depressed. He has no appetite for his breakfast and if he eat any it is soon vomited along with a quantity of mucus and bile that has been forced back into the stomach. The very idea of food now becomes repulsive and the enforced fast serves to clear the system and after a few days the patient is able to resume his occupation. In one case with which I am well acquainted an ordinary cold invariably brings on a bilious attack lasting about 24 hours and accompanied by slight delirium at night.

After a bilious attack the individual may go on for months in good health before another one comes on, or the intervals may be very short and the life made utterly miserable, and all only is the present discomfort to be considered but the foundations of permanent disease of the liver may be laid.

Not infrequently in bilious patients we get attacks of jaundice where the
Scalpel would reveal an obstacle to the outflow of the bile into the intestine.

Robert mentions ten conditions under which non-obstructive jaundice is said to occur. (i) In certain specific fevers (ii) When certain poisons are present in the blood, pyaemic poison, snake bite phosphorus, chloroform, ether. (iii) In chronic atrophy or destruction of liver tissue (iv) In congestion of the liver (v) In disturbed innervation (vi) Owing to insufficient aeration of the blood (vii) From excess of bile secreted (viii) Habitual constipation (ix) In certain states of the portal system as when it contains many pigment granules or is unusually empty after haemorrhage from the alimentary canal (x) As an epiphenomenon.

Harley believes that in obstructive jaundice the bile is abstracted from the blood and reabsorbed, and that bile acids can then be detected in the urine but in non-obstructive jaundice on the other hand the bile is never withdrawn from the blood and the bile acids are...
and to be detected in the urine as in the former case. These statements are contra-
dicted by Frenich's and Murchison.
Harley forms the blood itself, in jaundice
was viscid, the corpuscles large and
flabby and tending to adhere together
and the serum dingy yellow. (a)

The most simple causes of non ob-
structive jaundice are (i) Excessive secre-
tion of bile, and (ii) Excessive absor-
tion. Habitual constipation may cause the
latter, while congestive states of the liver
cause an increase in the secretion. (b)

If from any cause the pressure in the
bile capillaries be raised the tendency
is for the secretion to be reabsorbed.
Even when the secretion and absorption
of bile are normal jaundice may be
caused by defective metabolisms of bile
in the blood. (c) The bile acid which are
believed by Frenich to be reabsorbed in
the intestine and oxidised into taurin,
(which is eliminated by the lungs) only
undergo a partial oxidation and the
result is bile pigment, causing jaundice.
Frenchich states that in his analyses of jaundiced blood, no acids were found only pigments, cholesterol, and bilirubin and that in advanced cases a section of the kidney is seen to be stained olive green from the attempt to eliminate bilirubin.

Everyone is familiar with cases where there is plenty of bile evacuates with the feces, although the skin and conjunctive were at the same time pigmented. There being of course an excessive secretion and reabsorption; and the yellow tinge is easily removed by a purge. Habitual constipation may be the cause of troublesome biliousness and jaundice and only from retention and reabsorption of bile but through impeding the portal circulation and inducing a form of passive congestion of the Liver.

The experiments of Passe and Arnow show that a quantity of water taken with the food increases the secretion of bile, and Rohrig observed the same thing after injecting water into the small intestines, probably
this is due to a temporary raising of the blood pressure. (a) Rutherford found that active purgation did not increase secretion "whether or not from the depressing effect on the liver, due to the tendency to collapse from violent purgation, or from abundant abstraction of certain materials from the portal vein, is doubtful." (b)

In some individuals of a bilious temperament sudden terror will bring on well marked jaundice. Not long since I attended a young man, age 24, with a typically bilious constitution who had accidentally shot a companion the previous evening. The fright of the accident brought on jaundice which lasted about 30 hours and was succeeded by icterus.

Harley mentions the case of a lady who became jaundiced through seeing her child in a fit and Ferreus gives an instance of an abbé who was similarly affected on being attacked by a mad dog. The explanation is probably in the influence of the sympathetic, and consequent dilatation of the vessels of the liver.
then is rapid reabsorption of bile, and a diminished metabolism in the blood, owing to the action of the heart and lungs being affected. (a)

The enormous amount of blood in the liver during digestion may be gathered from the fact that in two cases recorded by Frenichs where the individuals had died suddenly soon after a meal, the relation in weight of the liver to the body was (i) as 1 to 26.5, and (ii) as 1 to 37. In two cases where death occurred after the patients had fasted 3 and 7 days respectively, the proportion was only (i) 1 to 40 and (ii) 1 to 50. (b) When therefore overload is thrown on the liver with consequent engorgement of blood it can be readily seen how this normal congestion may be turned into a disease and permanent damage ensue. The "Indian liver" is proverbial, the European resident who will readily adopt a costume suitable to the climate cannot see that his food changes be changed as well; consequently his persistence in a luxurious diet rich in albumin is followed
by excess of bile, a bitter taste in the mouth, 
burnt tongue, quick pulse, with perhaps 
bilious purging which may relieve for a 
time, or he may pass into a feverish 
condition with jaundice.
Budd draws attention to the fact that not 
only is there excess of bile; but there may 
be also "morbid" bile which may cause 
inflammation of the bile ducts and gall 
bladder, and bring about imperfect nutrition 
and the bad products of bad digestion 
are allowed to cause further trouble to the 
already diseased liver. Fibrin may be 
deposited in the vessels and cause an 
impediment to the portal circulation.

These bilious attacks are at first so 
easily recovered from that the patient is 
apt to think little of them till he finds 
his health every now and again more 
seriously broken by the attacks which 
follow every indiscretion in diet, and 
the results of persistence must be disasters.
A rich nitrogenous diet increases nit-
rogenous waste and so favors the 
production of bile; unfortunately, the
bilious patient as a rule shows a decided preference for meat, and attributes his suffering to fats and oils, such however is not the case, fats or sugars may impair the liver's action but the nitrogenous diet is the bilious one. "If the food be not rich in albuminous the patient cannot be bilious." (Fothergill) (a)

Liebig estimated the biliary secretion of an ox to be about 57 lbs per diem and argued that this was too much to be formed entirely from nitrogenous waste products as it was out of all proportion to the amount of albumin taken as food, and concluded that part of the bile must be derived from non-nitrogenous food. As a matter of fact however the secretion does not reach more than a quarter of Liebig's estimate and his theory cannot be sustained. (b)

In cases where there is a chronic state of true biliousness, where the blood seems constantly larn with bile, and the nutrition of the body seriously impaired by it, the headaches frequent, and the bilious
attacks neither fair nor far between; the
style of living must be attacked at once,
meat sparingly once a day especially in
summer should be insisted on, malt liquors
of all kinds prohibited, and plenty of John
vegetables, and fruit prescribed; but only a
limited quantity of milk for though of course
Easily digested it contains too large a supply
of albumen. Faithorn recommends a diet
of vegetables and light farinaceous food and
draws attention to the disorders state of
the stomach often requiring treatment at
the same time.

After regulating the diet, active Exercise
should be enforced, the sluggish portal
circulation and hepatic congestion which
are so often present must be stimulated by
fast walking or better still horse exercise
which latter was one of Sydenhams remedies
for every disorder save consumption.
Long hours in bed are not good, early rising
a cold or tepid bath and a walk before
breakfast will marvellously improve the
health, nor must the beneficial effects
of an occasional hot bath be forgotten.
The effects of unsuitable diet and sedentary habits were well illustrated in the case of a patient I attended in May 1886, a young man who took but little exercise and was impressed with the idea that he required a full nitrogenous diet. He ate meat usually three times daily and was subject to periodic bilious attacks which increased in frequency and severity till he was at last seized with more acute symptoms. Severe headache set in with vomiting and rigor marked jaundice over the whole body, tenderness in the liver region with slight enlargement of that organ. The tongue was covered with a thick brown fur, appetite lost, skin dry and delirium, urine high colored and coated with urates and containing a trace of albumin and abundant evidence of bile. Pulse quick and jerky, heart and lungs normal. Temp. 100°. Five grains of Calomel produced a copious bilious motion but the jaundice continued and the temp. rose to 104° at night. ½ gr. of pelocarpin was injected hypodermically but produced no effect and the patient was put into a hot bath and
afterwards packed in blankets, copious sweating resulted with relief from the intense itching and the temperature fell rapidly to 98°, but two or three times after rose at night to over 100°.

The diet consisted of beef tea, light farinaceous food and stewed fruit; an effervescent draught of Bicarbonate of Soda with Tartaric Acid was given two or three times daily with a pill of Colocynth and Hyoscyamus every other night. The jaundice and fever rapidly disappeared along with the albumin from the urine and the patient was speedily convalescent. Under an amended diet in which the quantities of meat, milk and sugar were largely reduced the bilious attacks became very few and when threatening were warded off by a wine-glassful of Carlsbad water.

Wickham Legg describes a species of jaundice similar in characters to the above which is often accompanied by gastric Catarh, which latter may not appear for three or four days after the jaundice is well marked. It is most
Common in the Spring and Autumn, and set-in with giddiness, headache, weakness, fever, a flushed tongue, quick pulse, and itching skin. There may be diarrhoea or constipation, the faces are colorless, and the appetite is lost. On percussion the liver is found a little enlarged and is tender under the hand.

These cases last usually only from seven to ten days, but may persist for three or four months. The prognosis is always favourable, and the first sign of resolution is an improvement in appetite. The cause is doubtful as there is no opportunity of examining the state of the liver in the post-mortem room. Spasm of the ducts has been suggested but it is not even known whether there are any muscular fibres in the ducts. Legg believes it is due to an extension of the gastric catarrh to the liver. Budd, however, who had noticed similar cases, attributed them to mucus plugs in the bile ducts.

The treatment recommended is a Calomel
Purge, or a Compound Colocynthis pile, followed by acid drinks and light diet. The gastritis should also be treated by 10 p. of the powdered Rhubarb and 10 p. of Bicarbonate of Soda every four hours.

(a) Harley distinguishes three varieties of Biliomnes - Acute - Sub-acute - Chronic, all of which are very largely influenced by improper diet.

The acute form occurs commonly in children and is in general hereditary with bad food, want of exercise, constipation &c as the exciting causes.

It is especially common in young brunettes, and the symptoms cannot be mistaken. The attacks last only about 48 hours and are accompanied by vomiting, frontal headache, pain or pressure over the eyeballs, sleeplessness, photophobia, dimness of vision, muscles volitantes, loss of appetite the taste in the mouth bitter, and the skin sallow or yellow. If no headache is present the patient is drowsy. These are in fact the symptoms of the ordinary bilious attack which Harley asserts does
not occur except in patients of a bilious constitution.

The Subacute variety is set up by continual use of improper food causing a chronic hepatic congestion leading at last to diminished bilious secretion. It is characterised by headache, giddiness, prostration and hypochondriasis, and the patient being often "bilious" without any apparent cause.

This species of biliousness occurs chiefly in youth, and both the Acute and Subacute are rare over 40.

The Chronic form is found in patients about middle life and is often spoken of as "Sluggishness of the Liver".

Feriets differs little from Starkey in describing the symptoms of deficient secretion, the abreact stools, the gurred tongue, the coldness and melancholy and the deposition of lithates in the urine, are well known signs. Feriets ascribes as causes, constipation, indolence anxiety, heart disease, and still more commonly, rich food in excess.
It can be readily understood how in a person predisposed to biliousness, injurious dieting or a surfeit of albuminous may cause a temporary capillary congestion of the liver, and precipitate an "attack" and how in hot climates the want of exercise to turn off the hydrocarbons of the food may induce the same condition. The bile is expelled from the liver partly by the pressure of the secretin itself; but chiefly by the respiratory act. Hilton describes the latter action as follows: "The liver is so placed as to have the additional advantage of pressure from without by its subjection to the contractile powers of the muscular walls of the abdominal parietes and the diaphragm, especially during exertion and active respiration. This no doubt explains the benefit of walking exercise in cases of torpid or congested liver, at which times the liver is compressed between the diaphragm and the respiratory part or upper half of the abdominal parietes."
An interesting fact is also noticed by the same writer, that occasionally in a strong healthy patient confined to bed by some accident, such as a broken limb, in no way affecting the liver directly, jaundice may appear after a few days due to the hepatic capillaries becoming somewhat congested through the recumbent posture, and the organ losing the active exercise that carries off the bile.

The "Edinburgh Committee" found that the dogs experimented on when let out of their cages and allowed to run about showed an increased secretion, or rather flow, of bile during the first half hour.

An increased flow may not mean an increased secretion. C. Bernard reports that secretion goes on only after digestion has taken place, and the bile fills the gall bladder. When food is not taken there is contraction of that organ and the bile is forced into the intestine.

Relying then on careful diet and proper exercise as our chief remedies
for the bilious condition. Considerable assistance can also be rendered by drugs of these none can surpass a moderate dose of Calomel. When the tongue is furrowed, the complexion muddy, the urine dark, and the spirits depressed, the great relief afforded, renders this remedy a dangerous one; for the patient is apt to resort to it again and again if unchecked till his very medicine originates a worse condition than biliousness. Used with caution however its value cannot be overestimated. Harley speaks of it as the "King of Remedies." Rutherford has proved its inability to act on the liver directly and the effort is to empty the duodenum rapidly if its accumulation of bile and so prevent reabsorption.

Rutherford found that Morphia - Hyoscyamus - Atropia - Soda of Potassium - Bicarbonate of Soda, and dilute Alcohol has no action on the liver, Senna, the great medicine of the nursery also seems to be inert.
Acetate of lead acts as a depressant to the secretion. (a)

The following substances increase the biliary secretion in the dog. (b)

Aloes - Podophyllum - Rhubarb, Salts
Colchicum - Colocynth - Ipecacuanha
Salicylate of Soda - Sulphate of Soda
and Phaenium - Phosphate of Soda
and Ammonia - Dilute Nitre -
Hydrochloric Acid - Eucalyptus
Balsam - Eucalyptin - Sanguinarin
Batin - Depletosis - Phyto lactin
Baptisia - Hydroastin and Deplastin.

Podophyllum it would seem has not only a power of clearing the duodenum but of stimulating the liver. It has the good result of rapidly clearing away any surplus of bile (b), but has the disadvantage of causing considerable griping.

The following makes a very excellent pill; but one that should not be often repeated -

Resina Podophylli $\frac{1}{8}$ - $\frac{1}{4}$

Extract. Belladonnae $\frac{1}{2}$

Fil. Colocynthi Co. $\frac{1}{2}$

Inf. Aloe (b) $\frac{1}{2}$

AnoC. Rosae $\frac{1}{2}$
When in spite of precautions in bed the patient still suffers from belch-  

omeness one of the best remedies is — Sulphate of Magnesia with  

Sulphate of Soda or Potash and Syrup of Ginger. The dose will of course  

vary with the individual; but it is  

superior to Calomel, in that Salines  

can be used more frequently without  

unfortunate aftereffects.  

Sulphate of Magnesia acts upon the  

bowel alone, producing a copious flow  
of water into the intestine which sweeps  

away the bile. Sulphates of Soda and  

Potash on the other hand has a distinct  

action on the liver.  

The Magnesia and Soda salts when  

combined have a less nauseous taste  
than when given separately, whilst the  

addition of Tinct. or Syrup. Ginger  

relieves the "coldness" so often complained  
of by old persons.  

Ringer in describing the action of the  

Natural Mineral Waters say: "In cases  

like the following Carlsbad Waters are
very useful - A middle aged woman accustomed to eat and drink somewhat too freely suffers from acidity, much flatulence, constipation with attacks of pain at the epigastrium, or over the Liver, or between the shoulders, the conjunctivae become rather jaundiced and the complexion sallow. In a case like this I have no doubt that the large bulk of water plays a prominent part in the therapeutical effects.

Water itself should by no means be omitted from the list of remedies in derangements of biliary secretion. It has been stated how a large quantity of water increases secretion and renders the bile more fluid, and in a torpid or sluggish liver this effect is a highly desirable one.

The use of warm water in evacuating the bile is no new one. Saunders writing in 1810 on the hepatitis of India warmly advocates it. "In general bile is a purgative sufficiently stimulating for its own discharge, and only requires the assistance
of warm water for facilitating its evacuation.

The natural mineral waters act as a rule far better than the dissolved salts. The well known Cheltenham, Carlsbad, Frederikshaf, Andernach, and many other waters owe their efficacy to the Sulphate of Soda and Magnesia contained in them being taken with a large bulk of liquid, and are still better when taken with half a tumbler of hot water.

Budd (a) speaks highly of the action of Calomel and Salines in solicitude and recommends cupping or leeching over the liver region if much pain is felt there. He also points out the injurious effects of sleeping directly after dinner and thus diminishing the respiratory action at a time when most bile is being poured out into the intestines. In addition to enforcing light diet, plenty of mild drinks exercise, cold baths, early rising and a cool climate Budd advocates a pit
a pint of Rhubarb and Specacumana.
To be taken just before dinner, and a
mild saline Early in the morning. (a)
Harley recommends an excellent mixture
which Shoud follow a dose of Calomel.
R. Succ. Paracæci ³Xv.
Soda Bicarbonatis ³ii
Sodae Sulphatis ³vi
Infus. Calumbae as ³vi

3f. To be taken in the intervals of meals
three times daily.

The Infusion of Gentian is I think
preferable in many instances to that
of Calumba. Small doses of Pure
Vomica often do great good in pump time to
the muscular flexes of the bowels and increasing
peristalsis. Strophanin with aloes is a
useful combination. (b)

In cases where the liver or gall bladder
require stimulation some little care must
be exercised in providing a suitable
remedy, and in ascertaining by caution
Experiment just the requisite dose.
Colocynth though an excellent drug
in many cases, cannot be tolerated in
others owing to the severe vomiting and griping that it brings on. It has a powerful action on the liver causing an increased flow of watery bile and at the same time raising the quantity of solids. (a)

Also injected into the duodenum of a fasting dog was found also to increase the several constituents of the bile. (b) Colchicum has the same action. Phosphate of Soda is especially useful as a cholagogue for children owing to its lack of taste.

When however a bilious attack is impending I have found nothing act as efficiently as giving first a mild saline purge, and after the bowels are evacuated following the saline by a moderate cholagogue such as Eucymarin, if as often happens there is indigestion the Liqueur Eucymarin et Pepsin (of Oppenheimer) is extremely useful.

It need hardly be said that the Autumn is the season when biliousness is especially prevalent, the head
And disinclination for exercise tax the powers of the liver & the stomach.
For those who can afford it a visit to a hydrophatic at one of the mineral watering places is a pleasant and certain means of relief. To the labourer however we can but repeat injunctions as to mode of living, which in too many cases we know will be utterly disregarded.

It now remains to mention a few of the more important of the complications that arise upon the bilious state, and the means of combating them.

Of these the first and commonest is constipation. The ill effects of constipation on the portal system have already been mentioned; it may be a cause of functional derangement, or it may be the effect. In either case it requires prompt treatment.

There are many persons whose bowels are perfectly regular; but who nevertheless do not pass more than a small quantity
of forces each day and require just the same remedies as those suffering from obstinate constipation.

Often mere neglect has been the cause and the constiveness becomes habitual, and the disturbances of the liver are dependent on it. On the other hand, deficient secretion may be the reason and by assisting the liver we cure the constipation. As a rule it is extremely bad treatment to resort continually to purgatives. Circumstances may render this imperative but most cases can be relieved by other means. Just as the "habit" of constipation has been established by neglect we may hope to bring about a "habit" of regular action. Mineral waters taken every morning early will sometimes do this, the doses must at first be large but should be gradually diminished till the patient gets to do without them.

The most efficient remedy, and indeed one that has been lauded as a specific is Cascara Sagrada. I have found the following answer well in several
Obstinate cases where other means has failed.

Tincturae Nucis Vom. 3⅓
Tincturae Carol. Comp. 3/3
Aqua 3⅓

If three times a day.

If possible use medicines whatever should be employed, let the patient discard white bread and substitute brown, with porridge and milk at his breakfast. At dinner a few stewed prunes or a fig should be taken.

Cold sponging over the bowels on rising in the morning, followed by a brisk rubbing with a coarse towel, and half a tumblerful of cold water drunk before food are powerful stimuli, and the shaking off of lethargic habits and late hours will in most instances render aperients unnecessary.

Very often associated with biliousness we have gastric catarrh or chronic dyspepsia.

Not infrequently the condition is one of
Chronic dyspepsia, and then it compels us to exercise greater vigilance than ever over the diet.

Sugar is almost certain to "sour" on the stomach, and should be reduced to a minimum. The craving for sweet substances can now be met by the new Coal tar product "saccharin" a perfectly harmless and pleasant substitute which is eliminated in the urine unchanged.

In treatment it should be remembered that Chronic Dyspepsia may depend on Portal Congestion, which may also be the cause of the disordered liver.

In Dyspepsia with "bitterness" we may get very good results from the use of Nitro-hydrochloric Acid which not only checks excessive secretion of morbid gastric juice; but has a good effect on the liver itself, more especially when in the torpid state.

Murchison however denies that Nitro-hydrochloric Acid has any effect on biliary secretion.
The distressing headache of a bilious attack is one of its worst features, and one that can be only relieved by clearing the bile out of the body as rapidly as possible. Liniment of Anisit has in a few cases given a little relief but as a rule local applications are useless. When vomiting occurs it should be encouraged rather than repressed as the bile must be ejected from the stomach as soon as possible. Copious draughts of warm water if the patient is able to take them wash out the stomach best, and as soon as the sickness ceases, the sufferer is often greatly the better for taking a little soup or jelly.

In the same way bilious diarrhoea should never be checked, sickness and purging are natural remedies and a sharp attack of diarrhoea often affords great relief.

Jaundice has already been mentioned when dependent on no obstruction to the outflow of bile; but in the case of obstructive jaundice there is no more
frequent cause than Gall Stones. The origin of these has been attributed to "Inspiration and Concentration of bile. — Excess of certain biliary ingredients — Abnormal chemical composition, e.g. Rantz of soda, excess of lime causing a separation of pigments. — Deposition of biliary ingredients around a plug of mucus."

Whatever may be the starting cause, predisposition must bear a large part in the formation of gall stones: the biliary constitution, with constipation, sedentary habit, and excess of animal food must in many if not most cases be at the root of the evil. One seldom hears of gall stones in those who are not subject to biliary attacks, save in instances where the victim is the subject of organic disease, or lithiasis.

When the stone is passing down the bile duct the symptoms are usually distinctive enough; the agony of pain commencing suddenly on the right side, the rigors, the distressing vomiting, the hiccups, and the exhaustion and faintness.
With it may be an interval of relief, followed by a return of the symptoms, afford good aid in diagnosis, which is further assisted by the absence of fever and the oncoming of jaundice soon after, though the latter symptom must not be always depended on, as the calculus may not altogether block the duct, or it may pass too rapidly to throw any very great amount of bile into the blood.

In old age, in debility, in repeated attacks, or in firm impaction the condition is a highly dangerous one, and the possibility in all cases of ulceration and perforation must be borne in mind.

In treatment we can do little more than relieve pain by injection of morphia, subcutaneously, inhalation of chloroform, and fermentation over the liver region, and treat such symptoms as may arise especially the vomiting and collapse. Chloroform has been suggested as a solvent, administered by the mouth; but no observer has reported favourably of it.
Large doses of alkaline solutions, especially soda salts, and mineral waters however do good in some instances. (a)

A serious complication which may arise subsequent upon jaundice is delirium. He cannot refer this to any poison that is in the bile itself, for Kereichs injects pure bile repeatedly into the veins of dogs and found no bad effects. Hence (b) if however the bile be stale and contain offensive numerous serious symptoms follow the injection. In practice also we may have severe jaundice for a long time and yet neither delirium, coma, nor convulsions make their appearance. In a patient I attended some time since a tumour obstructed the bile duct and jaundice was present for nearly a month. The body was uniformly of a dark citron color and though the patient was doleful, the mental faculties were not otherwise affected.

When delirium, tremors or coma are present, such cerebral symptoms are caused by the toxic products of the
disintegration of albuminoid circulating in the blood.

Perhaps also in some patients other organs may be affected at the same time and be really the cause of the nervous disturbance. I had an instance of this in the case of a Yorkshire coal miner, whose marked jaundice was followed by loss of vision, muscular twitchings, coma and death. The patient had been a heavy drinker and both liver and kidneys were in a state of advanced cirrhosis. The coma was undoubtedly uraemic.

In the impure condition of the blood that exists in the bilious state it is not remarkable that the skin shins become affected with eczema, boils, pigmented deposits and pruritus. Tilbury Fox states that children in whom the stools are white are subject to eczema.

A curious condition has long been associated with liver derangement especially jaundice, viz. Xanthelasma-
This was formerly considered a disease of the sebaceous glands, but its occurrence on the palm where no glands exist, and the microscopic structure show that it is really an inflammation of the cutis. (a)

Most commonly it affects the eyelids, and has the appearance of chamois leather. (X. Palpebrarum.) It occurs in patches and nodules and has a yellow or buff color. (X. Multiplex) may appear on any part of the body in the folds of skin.

Addison and Gull in drawing attention to the origin of this disease wrote "The connection of this affection with hepatic derangement is obvious and the exception which occurs in diabetes is of the more interest as Modern Pathology points to the Liver as the faulty organ in this disease." (b)

Roberts remarks "The subject of this complaint suffer often from sick headache and functional liver disturbance." (c)

As yet we have no treatment that affords any satisfaction, save such as can be rendered by the surgeon in removing patches.
In the blood, bilious disorders may produce a beneficent influence and cause anemia but however much the pallor and debility seem to require chalybeates, it is useless and even harmful to administer iron.

"There is one condition where iron is absolutely forbidden and that is the condition known as biliousness." (a)

As long as we have the liver in an unhealthy state we must persist with other remedies, calomel, salines and a tonic (Mars Venica) and when the tongue is free from fur, the bad taste no longer present, and the bowels freely opened, some easily borne chalybeate may be tried.

A very singular complication, catarrh of the fauces, also hangs upon the bilious temperament. It is not a common thing to meet with but occasionally the practitioner meets instances of sore throat which resist local remedies but disappear when the liver is relieved. (b)

Passing on to the Nervous System we find Neuralgia, Sciatica, Lumbago, etc. apt to appear just before the onset.
of a bilious attack. I have known cases where severe lumbago has come on when the liver has become congested. A neuralgia that Quinine and Gelom-rium have utterly failed to relieve, has yielded to a brisk dose of Carlisto water. Melancholia and hypochondriasis are well known attendants on a disordered liver. In the Bilious Diathesis the disposition is naturally melancholic but previous to one of the periodic disturbances the gloom becomes exaggerated, however the spirits rise as the bile is thrown out of the blood and on recovery the patient is more cheerful than at any other time.

In the torpid liver however where a sedentary habit, or constant worry, aggravate the condition, and dyspepsia, flatulence and constipation are present, the depression of spirits may be constantly felt and it is advisable not only to administer Canalol or salines and bland foods, but to prescribe cold baths containing Nitro-hydrochloric acid, and to send the patient away to a total change of scenery.
With Melancholia we have complex Hype-
chondriasis, the very name of which is
suggestive of its cause, and the condition
itself is one that will tax the patience and
energy of the Medical Attendant to their
uttermost limit.

He may subdivide the affection into-
Acute and Chronic. In the first are
placed those cases who imagine themselves
the subject of some serious ailment but
who can by treatment medically or morally
be persuaded ultimately that there is
very little wrong with them save imagination.

As an instance I may give the case
of a young man, age 28, hair dark
complexion sallow, of sedentary habits-
constantly suffering from the effects of inju-
dicous diet, and obstinate constipation.

He had been informed by his medical
man that he was in Consumption, he
had a hard dry cough, was anxious
and haggard, and pointed out to
me a spot on his chest where he had
been told the lump was Consolidated.

Failing to find any evidence what
ever of Phthisis, I administered two grains of Calomel at night and next morning gave a wineglassful of Stanyard's Jars of water in a tumbler of water an hour before breakfast. The mineral water was repeated several times every other morning, and the diet reduced in quantity with the elimination of at least half the meat usually taken and all the cheese and pastry. Active exercise and cold sponging were enjoined and the cough ceased at once. In less than three weeks the patient laughed heartily at the idea of his being in consumption.

I have also noted recorded of two examples of "hysterical affection of the joints" in men of this belino type where a very slight injury had drawn attention to the joint and imagination had formulated some serious disease in it. The first case was that of a well-educated intelligent farmer who had received a trivial blow on the knee; the other was that of a gamekeeper who had
twisted the ankle very slightly. Both men were singularly alike in build, age, and temperament, in neither case and there be the slightest suspicion of malingerer and both were firmly impressed with the idea that their joints were extensively diseased. However a brisk purge and active exercise soon dispelled this idea.

The explanation would be found I believe in Hilton's observation that an accident necessitating rest for a time will derange the liver through absence of customary exercise and stimulation.

The Chronic Hypochondriac is unfortunately a far more difficult patient to manage, his ailments are purely imaginary as a rule, and generally the phantoms raised by a neglected bilious nature. Nothing will ever persuade him of his folly, and though he may leave the consulting room partly reassured all his fears and despondency return ere he reaches home.

Such poor creatures read with eagerness every disperate leaflet that is handed
about the streets, consume with avidity every patent medicine they hear of, and pass on from hospital to hospital or from doctor to doctor, growing more and more hopeless, till they finally settle down into utter despondency or insanity.

The only treatment we can place any hope of even temporary improvement in is in sending our patient into general society where his attention can be drawn away from himself, in keeping the body actively exercised, and in maintaining as far as possible the functions of the liver.

Before leaving these conditions which depend more or less on derangement of Biliary secretion, there remain to be considered one or two rarer forms described by well known observers.

(a) Pront mentions a curious complaint in which there is excessive acidity of the caecum and retention of bile due to spasm of the common duct. Rectal headache commonly described as "torpor" houseea, and intolerance to light and sound are present. This condition goes
On for a variable time but suddenly there is a gurgling in the bowels heard and felt distinctly, the bile flows again into the intestine and the headache ceases at once. Front recommends the use of Compound Decoction of Alces, and Magnesia in this disease and lещeuses the use of drastic purgatives.

Another disagreeable complaint associated with hot climates, such as India is recorded by Budd, when much bile is secreted but does not readily pass out of the ducts and fall bladder, and becomes viscid.

The tongue becomes frot, the taste in the mouth is bitter, there is a feeling of weight and coldness in the stomach, aedit eructations come on after meals, objection is feeble, headache, ache in the knees, pain in the back and shoulders and over the liver come on, the complexion is "muddy", the conjunctivae, yellow, the urine dark with a brown sediment, the bowels constipated, the pulse slow, and at times a feeling of faintness.
appears. Such patients are liable to gall stones from the retention of bile in the channels, when however the accumulated secretin escapes in bulk there is purging with griping and spasms the pulse goes rapid and weak and there is a tendency to syncope.

The remedies that naturally suggest themselves are plenty of mild drinks to liquify the bile, and an occasional purge.

In a great many of the cases mentioned the stools are clay colored and this has naturally suggested the use of ox bile as a substitute for the natural secretin. Harley recommends its use in capsules each containing 6 - 10 gr. to be taken at the end of gastric digestion. Legg however points out that we cannot be sure the capsules will dissolve at the right time and places no faith in ox bile as a medicine.

Should the bile be liberated in the stomach it is easy to see that arrest of digestion and vomiting will be the only results.
Under the term "Biliousness" the general public are accustomed to include another functional disorder of the liver having little to do with the secretion of bile and yet akin to true biliousness in many respects. To which Murchison has given the name "Lithaemia".

It has been mentioned before that a constant destruction of Albuminoids is taking place in the liver, and from the waste materials so obtained are derived bile acids, pigments, and urea. This however can only be when food and function are well balanced; but when as often happens either of these factors is at fault the oxidation is not complete, it reaches merely to a half-way stage and lithates are excreted in the place of urea. These lithates, insoluble in cold urine are a sign of functional disturbance of the liver if deposited soon after the urine is voided, but the absence of a sediment does not show that Lithaemia is absent also, for in some instances a clear urine contains
More Lithic Acid than one in which there is a precipitate. (a)

The condition is no new one, probably it was far more common three hundred years ago than now, and when we read of the amount of beef and ale consumed by the maids of honor to Queen Elizabeth one cannot wonder that the gouty diathesis was so frequent in the court.

Graham in his work on the Nature and Treatment of Disorders of the Liver and Stomach, published in 1824, speaks in terms of great contempt of the popular idea of attributing every disorder of digestion to the Liver. — "A popular work appeared in Biliary Concretions and all the world became belious x x. It is an unhappy circumstance that the world still continues in this state and that the disease and its remedy have taken such a root in the professional mind that there is no appearance of a change to another fashionable malady." The same writer speaks of the liver as "dull" and "hum nervous" and accuses the man
who looks upon the liver as of more importance than the stomach and bowels, of "taking a strong backward in Physiological and Pathological Science."

The ready diagnosis "Kilimaines" and the reckless use of Calomel, too frequent even at the present day, well merits this vigorous censure; but the liver is now accredited with a Physiology and Pathology unknown in the days of Graham, and was after all the cause of many of the cases he describes and attributes to disorders of stomach.

The origin of uraemia is no longer the mystery it was, and the source of lithates also tolerably certain. But the latter cleopraed in the urine under the following conditions — (1) In fevers, when the liver is enlarged and congested and there is increased breaking down of nitrogenous material. (ii) In structural disease of the liver. (iii) In functional de-arrangements of the liver. (a) like bile acids and pigments, lithates
owe their origin to the albuminuous substances of the body. We have already noted how urea is believed to arise from the high oxidation of leucin, tyrocin, etc. But when the process is not complete, lithates are excreted, and as in one patient a rich meat diet produces "beliiness", in another it produces "lithaemia".

In the latter patient too it must be remembered that even a moderate nitrate diet may cause a copious deposit of lithates if too much sugar, starch, or fat be taken along with it, for the latter obstruct the oxidising of the albuminoids by requiring so much energy for their own combustion.

The lumbermen on the Canadian rivers subsist on an almost entirely meat and fat diet without suffering in health, for the enormous exercise required from them, and the absence of sugar, starch, and malt liquors from their food will leave the liver free to dispose of this large quantity of nitrogen.

In some of the healthiest individuals
A deposit of bile pigments may appear after an excess of food, and is merely of a temporary nature, passing as soon as the kidney have thrown out the half ox-ydised products. In others on the other hand, who seem to enjoy perfectly good health, this deposit is of daily occurrence either because they habitually overeat or because their livers are not active enough for the ordinary requisites.

Murchison remarks that such work of power is very often hereditary and that in some constitutions "the organism in its natural condition seems only just capable of performing its healthy functions under the most favourable circumstances."

When such is the case the liver cannot be overworked with impunity, and however well the health may seem for a time, heartburn, flatulence, loss of appetite, sick headache, and other symptoms will grow far too frequent to be mistaken.

In distinction to the dark, sallow,
Complexion of the helius temperament, the subject of lithaemia is usually florid, the body is well formed, with a tendency to obesity. The heart may become hypertrophied, the vessels atheromatous, and aneurism, and thrombosis are by no means rare. The respiratory system is frequently affected by bronchitis, and pneumonia, and the integumentary by eczema, acne, and urticaria. The kidneys may be attacked by one or other form of Bright's disease, and calculi frequently occur in the pelvis of the kidney, or in the bladder.

More common however than the diseases above mentioned is the attack of Gout to which the subjects of the lithic acid diathesis are exposed. "Numerous views have been advanced" says Roberts "at different times as to the pathological cause of gout but that which is at present generally accepted recognizes the disease as a manifestation of the lithic or uric acid diathesis, lithiasis or lithaemia being due to excess of uric
acid in the blood in the form of urate of soda. Functional disorders of
the liver are believed by many to have an considerable influence in developing
acidosis. However, in whom these functional disorders of the liver have
assumed a serious form and yet the patient has no appearance of yet his life notwithstanding is made suf-
fi ciently wretched by constant fits of indigestion, heartburn, flatness, a
weariness and aching in the limbs a sense of fulness and weight in the
region of the liver. The tongue has a thick fur, the taste is bitter in the
morning, the appetite varies. There is a tendency to sleep after meals, the
bowels may be constipated with attacks of diarrhea at times; palpitation,
headache, bad dreams, vertigo and dimness of vision are also present.
Such is "gouty dyspepsia" though the gout may never be manifest.
With such a condition the blood cannot be otherwise than charged with the
refuse of disintegrated albuminous material, the new matter supplied to the tissues will be poor in quality, and their proper nutrition will be impaired.

"Gout chiefly is merely one of the results of Anaemia" (Murchison) (a)

(a) Dr. Pont describes several varieties of lithic deposits. (a) The yellow amorphous which may be seen in the urine of nearly every person who has been exposed to an unusual degree of cold, or who has been incautious in regard to food. Some constitutions are of course far more liable to it than others. "Such persons appear to be naturally of an irritable, feverish habit and are apt to be affected by the slightest causes, as by toiling through of cold, a chilly nature of the atmosphere &c. They are often subject to Gout and Rheumatism in which disease more than in any others the sediments may be seen in their most marked forms."

(b) The red amorphous is seen in the urine of those affected by fevers and inflammations, whilst the "pink variety is
Said to indicate the presence in the system of certain chronic visceral affections especially those of the liver and spleen. It is a very rare form and Prout does not meet with a dozen cases in thirty years.

Lithic acid may appear in a crystalline form as "Red Gravel" or it may be deposited in the kidneys as an amorphous lithic concretion or occur as a calculus in the bladder.

The constitutional symptoms that make their appearance will vary with the age of our patient. In a very young child suspicion may be excited if he be in the habit of passing his water involuntarily at night. There may be no want of power over the sphincter but an irritability of bladder and urethra due to the lithates, and inquiry may elicit the fact that one parent, more probably the father, suffers from this form of hyperpexia, and that the urine of the child himself is very often clouded. 

(a)
It has been pointed out by Garrow that gently dyspepsia may be acquired and not hereditary even in very young patients.

It is at this time of life that we have most to fear the formation of calculi in the bladder; but should puberty be safely reached, there is little danger up to the period of middle life, after forty; however, it has been asserted that a second critical time comes in when concretions may form in the bladders of those who have before been subject to urinary deposits, but others who have never been troubled with these indications, but have inherited a family tendency, and indulged their appetites too freely may also be the victims of these formations.

The dyspeptic symptoms which accompany lithaemia, and are now most liable to appear, have already been alluded to; these, however, are not the only evils that harass the patient; he is troubled with frequent micturition
Accompanied by pains in the back about the region of the kidneys, and there is irritation in the bladder and urethra. In lithaemia also as much as in Biliousness we must be prepared to combat depression of spirits and hypochondriasis.

As age creeps on if the constitutional warnings have been neglected, other and more serious changes appear. It may be that the patient has escaped the agueies of gout and of stone in the bladder but he can scarcely hope to avert structural disease of liver and kidneys, whilst the dangers of apoplexy, heart disease and other critical affections are always in the foreground.

With the general public the appearance of these lithic deposits is looked on with anxiety, as indicating some disease of the kidneys, and it is not easy to persuade a patient that the latter are really only assisting an over worked liver.
All that has been said with regard to the influence of diet on the "bilious" may be repeated in relation to the "lithaemic"; but with greater emphasis, for the retrenchment after excess will in the latter case be more certain, speedy and unhappy than in the former.

There is little doubt but that most of those whose circumstances permit take far more food than the body requires, many an invalid has recovered health by reduction to poverty, and the following tables show how much less provision is absolutely required compared with what is usually taken.

I. Average daily diet of men in quietude

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuminates</td>
<td>2.5</td>
</tr>
<tr>
<td>Fat</td>
<td>1.</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>12.</td>
</tr>
<tr>
<td>Salt</td>
<td>5.</td>
</tr>
</tbody>
</table>

II. Average daily water-free diet for an adult man in very laborious work, or of a soldier on service and in the field

(a) "Practical Hygiene"
Parker 1878
July 193
Albuminates 6 to 7 oz.
Fats 3½ - 4½
Carbohydrates 16 - 18
Salts 1 2 - 1 5

(In these calculations however it must not be forgotten that some foods are slowly digested, though possessing a high nutritive value, and may be passed out of the body before their principles can be absorbed.)

How then does an excessive nitrogenous diet affect the Liver? (a) It appears that a proteid food supply increases the breaking down and rebuilding of the tissues, and therefore the system becomes loaded with debris which must be acted on by the liver, consequently increase the protein, and you increase tissue change and throw more work upon the liver, if the liver is not equal to the task then "lithaemia" is the consequence, and the blood is charged with excretory substances though its normal constituents may be little altered (b).
When large quantities of food are taken it often happens that much is passed unchanced in the faeces, and it has been suggested that some individuals may thus escape lithiasis by their imperfect mastication preventing the meat taken, from being absorbed. (a)

Those, however, who have long been accustomed to eat less largely are not the persons who will readily curtail their food or alter its composition.

Lithaemia is far more frequent among those of luxurious habits than among the labourers and artisans, and Garrod, quoting the remarks of Cullen says that gout is rare among those whose diet is largely vegetable and whose habits are active.

It is not often we meet with the little acute rheumatism in women, at least in its marked aspect, it has been suggested that the catamenia averts it but it must also be remembered that women are less frequent offenders in regard to food and drink than men.
Not only is the food of a dyspeptic patient often at fault, but his drink may be the cause of constant distress then the diet is perfectly wholesome. In some individuals a glass of beer is sufficient to bring on headache, indigestion and a deposit of lithiates in the urine.

Bristowe gives little credit to the prevailing opinion that malt liquor and wines provoke lithiasis, but the evidence bears strongly in favour of the popular theory. In Scotland where little beer is drunk, and the chief beverage is whisky, gout is not frequent, and in France where the lighter wines are drunk on the other hand in London, Berlin and Munich it is exceedingly common.

Pure alcohol does not appear to bring on lithic deposits; but when taken with sugar, as is often the case, the mixture is essentially bad. Port, Madeira, Champagne, Stock and Sherry are considered the worst for a gouty constitution; amongst the wines and Bredy speaks of porter as the malt liquor most liable to establish gout or
Stone in the bladder, Anxiety is a frequent cause of lithiasis. I have noticed more than once a patient who has been greatly troubled by the imperfect action of his liver when worried or when living alone, has got rid of the unpleasant symptoms when in cheerful society.

Another feature in excitamp lithaemia is the condition of the atmosphere. Pint
tmentions that a cold moist air is far more likely to bring on a disturbance of the system than a warm dry one. Garrod mentions this fact and states that gout is not known in Africa; but considers further evidence is required as Poland and Russia are also comparatively free.

Want of Exercise, and want of activity diminish the activity of the liver, and prevent the expulsion of the waste products. Arrow is so & speak the antiseptic necessary for the destruction of a "materia mortis" - lithic acid - which is produced by the imperfect oxycyation of albumin. Gastritis when chronic may react on the
Liver and set up functional disorders and even degeneration. (a)

A widely different cause from any of those mentioned is "Pyrexia," when the liver becomes enlarged and congested and lithates are deposited in quantity derived from "the imperfectly assimilated chyle," the deteriorated albuminum principles of the blood, and from the "deranged secondary assimilation of the albuminum tissues of the body." (c)

In Diagnosis we have often some difficulty. Family history may assist; and the habits of the patient point to the probability of a diseased liver; but the presence of lithates in the urine must not be looked for in all cases, and the absence of guaiac does not prove the absence of a gouty constitution. An interesting fact is recorded by Papel (d) that if Arnica produces conjunctivitis with pain, redness, and desquamation, a gouty diathesis is indicated.

The presence of many of the symptoms recorded must be looked for, as one or
This alone may be no indications of "lithaemia.

Such a constitutional evil cannot be eradicated by any efforts of the patient or his doctor and the endeavors must be to place the individual in such circumstances as shall be most favorable for the weak, or deranged liver to carry on its work.

Many of these cases have complained that their symptoms are always worse when they are exposed to an evil mind, and it is well to see that lithaemic patients are warmly clad during cold weather. Yet this should be avoided as in these advances in years attacks of bronchitis or pleurisy are very readily acquired and very slowly cured.

Worry, grief, overwork, all are factors in exciting this functional disturbance, and no effort should be spared to remove these potent "irritants" to the liver. No doubt the summer holiday means a respite to the hepatic cells, quite as much as to the brain.
Coming then to the subject of food, the oils, fats, and sugars must be abandoned, and the diet made as light and digestible as possible, as rigid rule can be laid down for all persons for one may digest easily what is simply poison to another.

Plenty of light farinaceous food, however, seldom disagrees: fruit and milk, fish, chicken, rabbit are also to be recommended, and soup in which a little rice, sago, or barley is boiled is a particularly wholesome and useful article.

Meat well cooked in moderation and not followed by pasty, cheese, or any quantity of hydrocarbons will probably not disagree with the majority of our patients, but salt meat, dried tongues, or any more cooked a second time are to be avoided.

In very hot weather, or in hot climates the diet should contain very little heterogyn. In most tropical countries the dietary is very free from albuminoids: it is when the European takes with him
his craving for albuminoids that his liver in time becomes the seat of disease. When the diet consists exclusively of carbohydrates the second function of the liver is not overstressed in a hot climate where oxydation is imperfectly performed." (a)

These statements are confirmed by Parker when alluding to the relative value of food: "In India the ill fed people on rice and a little milled or pea may indeed show less power; but take the well fed corn eater, or even the well fed rice and pea eater, and he will show when in training no inferiority to the meat eater."

Then again if the system has been neglected, and the food constantly of an irritating character, it is well for a time at least to reduce the meat, or rather albuminoids, taken as a minimum: after a time we may hope to improve the condition of the liver, though we cannot restore it to full vigour or obliterate a transmitted tendency; and then revert..."
in anyway relaxing our vigilance we may make the diet more liberal.

There are other points in connection with the foods that should not be over-
looked, variety in food is highly necessary (a) whilst the clerk or student
affected with lithaemia and dyspepsia will often find his health improve if
instead of taking his meals alone he is surrounded by cheerful society.

The effects of malt liquors, wines and
sweetened alcohol have been allowed to
and in cases where a stimulant
is required, whisky with seltzer or
soda water is probably the best.

The remarks of Murchison on this
subject are well worth bearing in
mind (b) - that though our patients
find themselves at first compelled to
relinquish malt liquors and to
confine themselves to spirits, yet eventually,
they will discover that they are better
without even these and enjoy better
health on water than on any form of
alcohol.
The medicinal treatment is but of secondary importance when compared with the regulation of the diet. The bowels should be kept open, and the kidneys assisted in their efforts to expel the waste products. For both these actions we may employ the Natural Mineral Waters well diluted. Sulphate of Magnesia and Nitrate of Potash is an excellent though unpleasing remedy, whilst Pront recommends an effervescent draught, or an alkali with Spiritus Aetheris Vitrioli or Spiritus Juniperni. The alkalis are useful also to correct the usual acidity of the stomach, or we may administer an acid preferably nitric, before food.

Alkalies are said to promote digestion and increase the breaking down of albumin; but Carbonate of Soda should be given with caution as it decreases the amount of bile. Bromide of Potash is also said to increase the amount of urine, and Chloride of Ammonium has the same
reputation. Calomel also may be very beneficial, both from its purgative action and as an alternative, for the great relief which often follows its use is more than can be attributed to its action on the bowels. Two or three grains of Calomel given at night and followed by a dose of Carlsbad water in the morning will act on the liver and flush the kidneys. Bicarbonate of Soda, and Carbonate, Citrate and Acetate of Potash have all a useful action in dissolving lithates in the system when the latter tend to be deposited and have been recommended in doses of 20-30 grs three or four times a day in a little water.

If tonics are required the best are Gentian and Cascarilla, or if there is much flatulence mix Vomica. Quinine is said to lessen the lithic acid passed in the urine but in practice it is of no use; in fact bark as a tonic in lithaeemia is to be avoided.

Opium is contraindicated as it impairs the working power of the liver, and produce...
Constipation. In children no one remedy can be ascribed to constantly, the system is subject to constant variations that the more settled temperament of the adult is not subsequent to Bicarbonate of Soda, or Bile in doses of half each after food with one or other of the nursery aperients then required, may prove all that is necessary if the food itself is moderate in quantity wholesome in quality, and taken often, whatever be the line of treatment that is found necessary, no sudden cure is to be looked for, and in the words of Pont (2) "It is absurd to look for permanent relief in these complaints by attention to regimen and medicines for a few days or weeks. In obstinate cases, an adherence more or less strict, according to circumstances to the principles above stated should be adopted for months or even for years to ensure success. This will be scarcely thought of by those who affix a just value on health. By a few Sensualists it may be considered a species of slavery and sacrifice of enjoyment too great to be endured.
for any future good whatever. That seems and but this frequent manifestation of lithaemia - Gout - is very with a subject to be considered in this short sketch; one interesting point may however be briefly mentioned, that now and again when a patient has been suffering from headache, flatulence, dyspepsia and other discomforts attendant on his unfortunate constitution, these symptoms may disappear at the onset of an attack of gout, a case is mentioned by Marchionn founders of Trousseau where violent vertigo ceased after an attack of Gout. (a)

Catarh and Acidity of the Stomach are especially frequent and troublesome in lithaemia, the dyspepsia may become chronic and the kidneys after eliminating the imperfect products of digestion for years are especially liable to degeneration. (b)

I do not know any better remedy for the treatment of this acidity than the old formula. "Bismuth, Soda and Gentian."

Constipation is nearly always present and should be met with the same means as when
accompanying Bilioueness. Piles also are often very distressing and our local applications are usually of no avail till we have relieved the portal congestion that may be cause of the trouble.

Palpitation is frequently present, depending on dyspepsia, and Anaemia is far from rare. What has been said concerning the use of iron in biliousness applies quite as much to Anaemia.

Debility and Prostration may call for special treatment and Murchison recommends Phosphorus, 1/30 gr. three times daily.

The nervous complications that occasion much distress are: Neuralgia, Cramps, Vertigo, Noise in the ears, Insomnia and Atropine. For these we must lessen the work of the liver and render the conditions of life as easy as possible. Relieving the concurrent dyspepsia and keeping the bowels well opened.

The condition of Gouty dyspepsia affecting the bile ducts is one that demands more than a passing notice. It is commonly hereditary though the patient may never have had a.
Symptom of Gout. The condition lasts about three weeks and is very distressing. Nausea and often vomiting, flatulence, pains in the joints, and after food in the epigastrium, jaundice appearing a few days after the onset, and clay colored stools, are present. The treatment consists in applying hot fermentations and mustard over the liver, warm baths, and putting our patient on light diet, with medicinally a blue pill or saline purge. Citrate of Bichromate with Vinum Colchici is a useful remedy. and in most cases a returning appetite, with dark stools and cessation of pain show that the attack is soon subsiding.

Gairdner has expressed his disbelief in the theory that gout is dependent on the Lithic Acid Diathesis; but most of the modern authors are against him, and Diseases, Gout, and Biliousness are essentially functional diseases of the Liver.

In the proper discharge of its threefold duties depends in great part our peace of body and mind, and "as soon as the
Liver functions return to the normal state
groundless fears, melancholy foreboding
imaginary anxieties, one by one divide
into shadows become fainter and fainter
and finally entirely disappear.

I hereby declare that I have been
engaged in General Practice since Aug. 1st
1885, and that this thesis has been written
by me alone.

Wm. Brendan T. Cribbin
222 Sydenham Road
 Nunhead, London
April 26, 1888.