The
Liver
and its
Diseases.

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Greater difficulties have been experienced in the study of the diseases of the liver than of any other important thoracic or abdominal organ. Modern research, with improved methods of physiologic exploration and chemical analysis, has enabled physicians, with a great degree of exactitude, to arrive at a knowledge of the functions and to diagnose the various diseased conditions of the kidneys, lungs, heart &c. By collecting, estimating the quantity and chemically examining the urine, a very correct idea may be obtained of the state of the kidneys. By listening to the sounds produced in the lungs during respiration, by percussion, vocal resonance, the presence and character of cough and expectoration, and by various other means, the different pulmonary diseases may in the great majority of instances be recognized. In diseases of the heart, by percussion and auscultation, we can observe any alteration in the size of the organ and ascertain the condition of the valves in its interior. But in hepatic
Diseases, though tremendous does inform us whether the liver is of its normal size and no, no physical examination can disclose the condition of its various structures during the life of the patient.

Much has been done of late years with regard to the anatomy, physiology, and pathology of the liver. But much still remains to be done before either the function or diseases are properly understood.

The value of different therapeutic remedies in the various hepatic diseases is still but imperfectly known.

Before discussing the various hepatic diseases it may be as well to give a short account of the anatomy and what is known of the functions of the liver.

Anatomy

The anatomy of the liver, since the researches of Greenman and Bowman in this country, and Muller and Haeke in Germany, has been pretty well understood.

The liver consists essentially, like other secreting glands, of vessels bringing blood; secreting cells which separate from the blood the materials out of which
their secretion has to be formed; a duct communi-
cating in some way with the cells to carry off the secreted
matter; and means to remove the blood which has
been acted on. But as in the liver the blood brings
to the gland, from which the bile is secreted in
bileous; an artery is added to nourish the coats of
ducts and vessels.
The secreting cells of which the great mass of the tissue
is formed are arranged in masses or lobules closely
packed together, presenting on section a more or less
hexagonal form. The lobules are from half a line
to nearly a line in diameter, and, according to some,
(Hermaud, Malphigi, Müller, &c.) separated from each
other and held together by a layer of fine areolar
tissue. Other observers deny the existence of this
tissue, and say, that the appearance of lobules is
caused only by the presence of fine passage to the differ-
ent vessels; that the lobules are not completely isolated,
and that at different points on the surface of each
they are continuous. O'Brien in his treatise on liver
diseases holds this latter opinion.
The lobules are all arranged around the branches of
the hepatic veins which return the blood from the liver.
Each lobule rests, as it were, on an hepatic vein, and
is connected with it by a twigs proceeding from the centre of the lobe to join the vein. These veins join others to constitute the hepatic trunks which pass on through the substance of the gland, closely connected with and not separated from it by any connective tissue so that on a section of the liver being made their divided ends appear as round open orifices, they open directly into the vena cava inferior as it lies on the spine on the posterior surface of the liver.

The vena portae and hepatic artery follow a different course and have an entirely different destination. Entering at the transverse fissure along with the biliary ducts they pass together into the portal canals. These canals are tubular passages, commencing at the transverse fissure, which divide and subdivide throughout the whole organ. Each however minute contains a branch of the vein, the artery, and the duct, the vein being much the largest. In these canals the vessels are surrounded by a sheath of areolar tissue, the capsule of Glisson, which separates them from the hepatic substance; and as the portal vein enters the hepatic, it is found collapsed on a section being made of the organ. The portal veins while lying in the canals send off lateral branches which ramify and form a plexus.
in the surrounding areolar tissue, from this plexus branches are given off, interlobular veins, which pass between the lobules; and after anastomosing and ramifying on the surface enter the substance of the lobules themselves, where they break up into a network of capillaries which again unite to form the intralobular veins, the radicals of the hepatic veins. The smaller portal vessels give off interlobular veins directly without any intermediate plexus.

The hepatic artery accompanies the portal veins and gives off vessels to supply the walls of the veins and of the gall ducts; the latter are abundantly supplied. It also supplies blood to the gall bladder, to the ligaments, capsules, and areolar tissue of the organ. The veins which receive its blood empty themselves into the portal vessels thus contributing to the secretion of bile, the blood returned from the other abdominal vessels.

The radicals of the hepatic arteries after emerging from the lobules anastomose with one another forming an interlobular plexus, like the portal venous plexuses. Larger branches proceed from these and join the Auret in the portal canals.

Each lobule, besides the bloodvessels, consists of flattened irregular cells of various sizes, whose diameter
averages 1,000 or an inch. Each cell contains a nucleus with one or more central points or it the nucleoli. They also contain fine granular matter and often one or more oil globules. They have a faint yellowish colour when seen under the microscope, which is owing to the bile which is secreted in their interior.

Various opinions have been held by anatomists regarding the mode in which the ducts communicate with the secreting cells. Mr. Freeman supposed that the duct commenced by a pleura within the lobules. Others think that the bile is secreted by the cells in the centre of the lobule, and then passes from cell to cell till it reach the circumference, when it passes into the biliary ducts. Another opinion is, that the cells, especially towards the margin of the lobule, assume a linear arrangement, through the interstices of which the bile flows and so reaches the extremities of the ducts. Different modifications of this latter theory seem to find most favour with anatomists.

The hepatic ducts, however, they originate, pass through the portal canals, as has already been described; and at the transverse fissure from one vessel to another communicate with the gall bladder by the cystic duct, passes on, joins the pancreatic
and pierces the wall of the duodenum, to enter from the pyloric orifice of the stomach.

The liver is surrounded by a fibrous capsule which is continuous with its various ligaments and, at the transverse fissure, with the capsule of Glisson. This is covered over the greater part of its extent by peritoneum and is sometimes the seat of inflammation.

**Functions**

The principal function of the liver is the secretion of bile. Some hold that bile always exists in the blood and is merely separated from it by the liver, as water is by the kidneys (Gregory). Others say that bile has never yet been discovered in the blood of healthy persons and that the cells of the liver really form it out of matters they extract from the blood. However this may be, the hepatic cells continuously discharge bile into the ducts; but during the intervals of digestion, it does not pass in any quantity into the duodenum, it ascends by the cystic duct into the gall bladder. During digestion, the gall bladder contracts and expels its contents, which, along with the bile flowing down from the liver, pass on to join the pancreatic juice and enter the intestine with it. While in the gall bladder the bile is modified.
to a certain degree by the absorption of its more watery parts and by the addition of the secretion of the mucous membrane of that cavity.

The Bile is of a yellowish green colour and has very little odour when fresh. Its taste is very bitter, with a sweetish after-taste. When rubbed between the fingers it feels viscid and amnunctuous. It mixes with water in all proportions and foams when stirred like soapy water. It readily mixes with oil. Its reaction is alkaline.

The chemical composition of the bile was long a puzzle to chemists, but the researches of Stieber show that it consists essentially of two organic acids combined with soda and a varying small proportion of potash and ammonia. These acids, called Cholic and Choleic, both contain nitrogen in addition to carbon and hydrogen, and the latter also contains sulphur. Their formulae are

Cholic acid $C_{52}N_{10}H_{43}O_{12}$

Choleic acid $C_{52}N_{2}S_{2}H_{45}O_{15}$

Besides the salts of these two acids the bile contains a minute quantity of a peculiar crystallizable fatty matter, Cholesterolina which is frequently found in biliary calculi.
The remaining important constituent of the bile is its colouring matter, which Berzelius thinks, if not identical with, chlorophyle, the green coloring matter of plants. Dr. Jones thinks the colouring matter of bile the same as that of the urine.

The proper principles of the bile are the products of the secondary not of the primary digestion. In cases of starvation and restricted abstinence, bile continues to be secreted. In hibernating animals and in the human foetus bile is also secreted, which can only be obtained from matter which has already formed part of the tissues of the body and has entered the blood for the purpose of being excreted.

The quantity of bile secreted has been differently estimated by various observers. Burdach and Wahlen daily from 17 to 24 ounces per diem, and a case recorded by Dr. Budd shows that fully that amount may be secreted for a considerable time.

The purposes served in the economy by the bile are two-fold, two different and opposite objects are attained. The blood on the one hand is purified by being deprived of the bile while the bile itself when formed and secreted, has important functions to perform.
in the alimentary canal.

When no bile is secreted persistent jaundice necessarily follows which ultimately, if not relieved, cuts off the patient. Some noxious or poisonous matter that may be taken along with the food are thought to be detained and gradually eliminated by the liver, as arsenic, mercury, and many others. This function is said to cause many bilious disorders. Other important changes are said to take place in the blood while passing through the liver. M. Bernard has discovered grape sugar in considerable quantity in the blood of the hepatic veins while the portal contained little or none. This discovery has been confirmed by Lehmann, who found, in horses, sixteen times as much sugar in the hepatic blood as in that of the venous portal. M. Bernard found that sugar no longer existed when the blood had reached the arteries it having all been burnt in the lungs. From this experiment he concluded, that the liver was the true seat of diabetes mellitus, that in that disease sugar was formed there in greater abundance than could be consumed in the lungs and was excreted by the kidneys.

Other changes are said to take place in the blood, while passing through the liver, as in the number of blood-cor

* There are insuperable objections to this theory.
muscles, the proportion of fibrous and fatty matters; but much remains to be done before these changes can be properly understood.

The Uses of the Bile in the Alimentary Canal have been variously estimated by different writers; some holding it to be equal in importance with the gastric juice; others considering it mere an element of no value whatever. Some physiologists even at the present day hold the latter doctrine. But it enters the intestinal tube near its commencement, and in greater quantity during digestion, which would lead one to suppose it does so for some purpose — from its alkaline reaction it is held by some to be useful in neutralizing the acid of the gastric juice — upon which, all, or many, of the different classes of aliment the bile acts in various degrees to determine. By experiment and otherwise, it has been proved that each and all of the ordinary constituents of the food may be digested by one or other of the different secretions formed into the intestinal canal, without requiring the assistance of the bile. Dr. Budd relates a case where a woman was deeply pregnant for eight months from stoppage in the common duct; she gave birth to a child while in this condition and suckled it for five months. Thus the bile can hardly be absolutely ne-
cessory to digestion. Some experiments of Bernard seem to show that it increases the solvent power of the other secretions. By its bitter antiseptic properties it prevents fermentation and putrefaction in the intestines; when it is absent as in jaundice the stools are observed to be unusually fatty. It promotes secretion from the intestinal mucous membrane acting as a natural aperient; if it is deficient in quantity the bowels are constipated.

After having served its purposes in the intestines what becomes of the bile? Seventeen to twenty-four oz of it are poured into the duodenum daily, which, according to Liebig, are equivalent to from 816 to 1152 grs of dried bile. Berzelius says that only 2 parts in the 1000 of faces are composed of bile. The average amount of faces passed by a man in twenty-four hours being 5½ oz (dry) they can therefore contain only 24 grs of dried bile. Thus 24 grs only of dry bile, out of 816 secreted are passed by stool, that is about 1/36 part. This may be too small a proportion; the quantity of bile secreted may be estimated too highly, but still the greater part of the bile must be absorbed into the system again. Considering the composition of the bile, what is taken up must ultimately be excreted chiefly as carbonic
acid and water from the lungs. A due supply of oxygen is thus obviously necessary to unite with the highly carbonaceous constituents of the bile. This explains how air and exercise, combined with a judicious regulation of the diet, especially the moderate use of highly carbonaceous matter, are of so much importance in many hepatic disorders. Many medicines are held to have the power of increasing the secretion of bile. The principal are Mercury, Iodine, Chloride of ammonium, the salts of soda, and tanacenum. All these are understood to act by their being excreted by the liver and thereby stimulating it and increasing its natural secretion; as we know that neutral salts when excreted by the kidneys increase the flow of urine. Ginger, pepper, and hot spices are also held to increase the biliary secretion; which accounts for their prevalent use in hot climates. Purgatives, especially senna and rhubarb, have been found serviceable.
Diseases

Disorder of the liver may be occasioned by mere congestion, either active or passive.

A most important class of diseases in the liver, as in all other organs, is the inflammatory. They have been variously divided. The most common mode of classification is according to their duration into acute and chronic.

Dr. Budd, however, who has written the latest and most able and comprehensive work on hepatic diseases, would prefer an arrangement solely having reference to the cause. But as our present knowledge does not admit of this, he divides inflammatory diseases according to their effects and the tissues they attack, viz., into...

Inflammatory, leading to suppuration and abscess; gangrenous, causing effusion of lymph; adhesive, causing effusion of lymph; inflammation of veins; and inflammation of gall bladders and ducts.

But the classification of diseases according to their termination and effects is not one that appeals to the practical physician. He has to treat disease...
not when it has arrived at its termination, but while it is in progress when the termination may possibly be averted. So the old division into Acute and Chronic is, as yet, perhaps the best.

Then there are diseases arising from faulty nutrition, softening, fatty deposit, and tubercle.

The secretion of the bile may be excessive, deficient, or in an unhealthy condition, which may produce gall stones.

Lastly, morbid growths or parasites, animals may be found in the liver, Cancer, Hydatids, & Liver flukes.

Hepatic Diseases may be thus divided

I Congestion 1 passive 2 active.

II Inflammation
1. Of Tissues and Capsules (a) Acute (b) Chronic
2. Inflammation of the vessels
3. Inflammation of Gall bladder & Acets

III Faulty Nutrition and Secretion
1. Suppressed secretion
2. Excessive or defective secretion
3. Unhealthy secretion tending to produce gallstones
4. Fatty deposit
5. Aerophilous disease
IV Morbid growths and parasitic animals
1. Cancer
2. Hydatids
3. Liver Flukes

I Congestion

Congestion of the liver is of two kinds, active and passive.

1. Passive congestion is a mere undue accumulation of blood not arising from any faulty condition of the liver itself, nor of the blood circulating in it, but merely the result of some obstruction to the return of its blood. It is rather a symptom of some disease elsewhere than a disease itself. The most common cause of this form of congestion is valvular disease of the heart; this by impeding the passage of blood through the heart, obstructs the venous return, and so causes pressure on the vessels and capillaries of the liver. The current of blood becomes slower, the vessels dilate; the liver increases in size from the accumulated blood, its edges become more rounded. The slowness of the circulation and the distended condition of the capillaries interfere with the secretion of...
bile. The dilated vessels compress the ducts and impede the passage of bile, sometimes even prevent it altogether and cause jaundice. Should the congested state continue for a length of time, the cells lose their power of reproduction; their functional activity diminishes; and the secreting elements are thus permanently injured.

Passive congestion causes little or no pain, merely a sense of weight and fulness in the right hypochondrium. From the impediment to the secretion and passage of the bile the complexion acquires a dusky, sallow tint.

The treatment is obvious. Palliate the primary disease in the heart or lungs as far as possible; take blood generally or locally, as the case may require; and give such medicines as will cause a drain from the portal vessels, the hepatic, and portal veins. Small doses of mercury may be given to increase the secretion of bile. These medicinal remedies must be accompanied by a sparing unstimulating diet.

II. Active congestion like passive consists essentially in an undue accumulation of blood. But here there is no obstruction to the venous return; the
Distension of the Capillaries is due, either to an excited condition of the tissues of the head, or to the depremar.

condition of the blood.

The former is either a part of an inflammatory process, or the result of the irritation caused by the presence of cancer, hydrates etc., and will be considered elsewhere.

The latter may arise from various conditions of the blood. Various fever poisons, malaria, the scarlatine poison, and others, may cause hepatic congestion. Other poisons as mercury produce a similar effect—But the most common and most important form of this disease is that caused by a continued excess of the natural elements of the bile, and the absorption from the intestinal canal of noxious matters the result of faulty digestion. This arises from excess of eating and drinking in persons of sedentary or indolent habits which prevent a due supply of oxygen being furnished to the blood. Bile or its constituents are thus present in large quantity and for want of oxygen are not removed from the system as they ought to be. Congestion is the result which ultimately leads to impairment of the vitality and fibrous tissue power of the secreting cells.
The symptoms referable to the liver are the same as in Passive congestion. The same sense of fulness and weight, increased dulness on percussion, and dullness of the percussion; but by tracing the chain of causation achroponia may easily be accomplished.

The best means of relieving the congestion are saline purgatives with occasional small doses of mercury. But the most important point in the treatment is the removal of the cause. Hay restricted diet with plenty exercise in the open air.

II. Inflammations

1. Of Capsule and tissues
   (a) Acute
      Acute Hepatitis may arise and be chiefly seated in (I) The lobular substance; (II) The capsule of liver; (III) The external fibrous capsule.
      Acute inflammation of the liver almost always commences in the lobular substance. By extension it may implicate the external capsule or the zonal tissue in the portal canals, but it seldom arises in either of these tissues.
The local phenomena of acute inflammation of the liver do not differ materially from those of inflammation in other organs. The inflamed part becomes overloaded with blood; exudation is forced out which hardens rapidly into pus. Suppuration often occurs in a few days from the commencement of the disease. As the case progresses pus is formed in greater quantity, the hepatic tissues are infiltrated with it, they soften, break down, and mingle with the bireptant fluid, and an abscess is formed.

This is the usual order of events. But the inflammation may terminate before suppuration is established, and the effused matter be absorbed. When suppuration has occurred the matter may permeate the entire tissues of the liver unrestrained by any limiting membrane; or what is more usual a distinct serous membrane is formed.

As the abscess goes on increasing, and approaches the surface, inflammatory action is usually set up in the capsule; lymph is forced out and adhesions formed with neighbouring organs. Should this not happen the bireptant matter
will sooner or later cut its way into the cavity of the peritoneum and set up acute peritonitis which is almost always fatal. But when adhesive inflammation has formed connections with neighboring parts the abscess ultimately opens either externally through the abdominal parietes, into the intestinal canal, or through the diaphragm into the pleural cavity, or lung.

Acute Hepatitis has been known to be so severe and of so asthmatic a type that the parts attacked passed rapidly into gangrene. Dr. Budd mentions one case where a man was attacked with this form of the disease while suffering from mortification of the toes. Dr. B. supposes the hepatic inflammation to have been caused by the absorption of gangrenous matter from the toes.

The Symptoms of Acute Hepatitis are said to be "inflammatory fever, with pain and a sense of tension in the right hypochondrium, inability to lie on the left side, difficulty of breathing, a dry cough, vomiting, hiccup." Other symptoms are met with occasionally, as pain in the right shoulder and permanent rigidity of the right rectus muscle; the latter however has been met with in
other hepatic diseases, in cancer, inflamed gall bladder, and also from closure of the common duct.

Jaundice may or may not be caused by acute hepatitis. If the whole substance of the organ be attacked, secretion can no longer proceed; but if only a part be affected, and that not in a position to implicate a stress upon the main trunk of the excretory duct, the remaining healthy portion may carry on the secreting function.

By the presence of some of these symptoms, a case of Acute Hepatitis Dependent on Direct Injury or some other cause immediately applied, (and not a secondary result of some primary disease elsewhere) may readily enough be detected. But in the great majority of instances pre-existing disease causing more or less disturbance to the system is the source of the hepatic inflammation. The symptoms of the secondary are thus mixed up with and masked by those of the primary disorder, and often are not sufficiently marked to arrest the attention of either patient or practitioner.

Causes. Acute hepatitis may arise from mere exposure to cold in tropical climates, or any other
produce mechanical injury. But hepatic inflammation arising from these causes is very rare. The most common cause is the contamination of the blood by the absorption of morbid matter produced by unhealthy inflammatory action elsewhere. Thus it is frequently a result of pyemia, a complication of the veins after a surgical operation. The moribund matter flows or from the inflamed vessels with the circulation, and lights up inflammation in various parts of the body, especially in the liver and lungs, where it causes circular serpiled abscesses.

It was at one time supposed that the moribund matter found in these abscesses was deposited directly from the blood as pus; but microscopic examination clearly shows that the essential organic elements of pus could not be deposited from the blood without the escape of the blood globules along with them, as the pus corpuscles are larger than those of the blood.

The most common theory of the formation of these abscesses is, that the pus corpuscles formed in the inflamed vein are carried on by the circulation and are deposited or rather mechanically...
arrested in the capillaries of the different organs; and
there acting as foreign bodies, they excite inflammation of the surrounding tissue. But it has been proved by experiment on the lower animals, that when healthy, as it is called, lacerable pus, is injected into the veins of a living animal no evil result is produced; and as it is undoubted that these secondary abscesses do follow suppuration phlegmata in distant parts of the body, we must find some other explanation than the mere presence of pus corpuscles. It will generally be observed that the purulent matter bathing the seat of a severe surgical operation has a most offensive odor and plainly contains matter in a highly putrid condition. Now these putrid matters seem a much more likely cause of secondary inflammation than the bland unoffensive pus corpuscles, which, when viewed under the microscope, are, according to the best observers, not distinguishable from the white corpuscles of the blood. When the blood arrives at the minute capillaries of the lungs and liver an active interchange goes on between it and the air on the one hand and the hepatic cells on the other. We can understand how, where this activity of function is going on in organs intended to remove various impurities from the blood
besides furnishing materials to it, the presence of these fluviaceous substances should cause more irritation than in other tissues; and therefore secondary abscesses be more frequent.

The systemic circulation is not the only or indeed the most common channel by which venous matter is carried to the capillaries of the liver. Dr. Budd has shown that each of the veins whose junction forms the vena hepatica may convey from the textures whose blood it collects the material cause of hepatic abscess.

The operation for strangulated hernia; the returning of a prolapsed bowel have both caused phlebitis in the mesenteric veins followed by hepatic abscess. A very frequent cause is ulceration of the stomach or intestines associated or not with dysentery; in nine out of thirteen cases recorded by Dr. Budd this was the cause; in seven out of eleven cases collected by Andreel & Louis "in which the abscesses were not caused by a blow or general phlebitis, there was ulceration of the stomach small intestine or gall bladder. Numerous physicians have remarked the frequency with which hepatic abscess is conjointed with dysentery; Dr. Abercrombie says "dysentery is often accompanied by diseases of neighbouring organs, especially the liver in which are found in some cases"
abscesses"; Amosby in India was much struck by the frequent occurrence of these two diseases together, but he had some difficulty in determining which disease preceded the other. Dr. Budo experienced the same difficulty, but some cases he gives clearly prove that the hepatic abscess, sometimes at least, was preceded by the dysentery. He says when the hepatic symptoms preceded dysentery he supposes they were due to some chronic affecting the bladder so common in warm climates where this has chiefly been observed. As when hepatic abscesses were formed in the course of an attack of dysentery, the symptoms of the chronic disease were supposed to indicate that it had existed previous to the dysentery.

Ulceration of the gall bladder and ducts also cause hepatic inflammation. A number of cases are recorded by Dr. Budo.

Inflammation of the spleen and of the splenic vein may also cause hepatic inflammation. Dr. Budo relates a case where a large portion of the spleen was ulcerated, the splenic vein filled with purulent matter, and a great number of abscesses in the liver. He thinks that in this case the disease must have originated in the spleen.

The different causes now considered all act in the same way by poisoning the radicals of the portal vein.
Treatment. Acute hepaticoc occurring as a primary disease must be treated actively. Our object must be to prevent the formation of pus, before it arrives at that stage to cut short the disease. This the majority of our best written authorities say may be accomplished by general bloodletting associated with free irrigation by the saline cathartics, the latter besides its antiphlogistic value draws the portal system and relieves the congestion of the liver. Some eminent authorities of the present day deny the efficacy of the antiphlogistic plan especially bloodletting, and would (I suppose, judging from the treatment they recommend in other cases of acute inflammation) treat this disease on the expectant plan, obviate the distressing symptoms and leave the rest to nature. Local bloodletting and blistering are also recommended.

When however hepatitis is a secondary not a primary disease and results from prevalent contamination of the blood, all agree that heroic antiphlogistics cannot be of much avail. Our treatment must be adapted to the condition and extent and will alleviate much in the primary disorder. Most authors unite in condemning mercury in acute hepatitis as it tends to stimulate the functions of the liver and so to increase the inflammation.
When abscesses have fairly formed, and are surrounded by their hygienic membranes, active treatment is no longer admissible. We must endeavour to keep up the standard of health as well as possible, by regulating the diet and exercise; and if possible removing the patient to an equable temperate climate.

It has been a matter of dispute whether an hepatic abscess should be opened or not. Many dangers beset the former course. A distended gall-bladder has been mistaken for an abscess (Dublin Hospital Reports Vol. V) and been opened; the bile escaped into the peritoneum and the patient died in a few hours. It may be distinguished from an abscess by being seldom adherent to the walls of the abdomen and by altering its relative position in different postures of the body; while an abscess usually is the opposite. Besides the feel of the tumour is different; the distended bladder is *globular, circumscrited*, hard, and equally resisting in every part, while the tumour from abscess is more diffused and is soft and fluctuating at its summit while the base is hard and resisting.

But a much greater source of danger is, that in some cases, the inflammation does not involve the fibrous capsule; some adhesions are formed, and if the abscess be opened its contents must escape into the peritoneum.
If the abscess be left to itself these adhesions will likely form before it bursts, whereas by making an artificial opening we run the risk of finding them not formed at all or but imperfectly. To guard against this mistake it is usual before opening the abscess to observe whether the liver alters its position in different positions of the body. The appearance of inflammatory action in the skin over the liver is conclusive that adhesions have been formed and that the abscess is making its way to the surface. Dr. Graves proposed to produce adhesion by exciting inflammation of the peritoneum over the abscess. He divided the abdominal wall down to the peritoneum and inserted a piece of lint beneath it till inflammation was set up. But this plan has not succeeded in practice.

Dr. Budd thinks that an hepatic abscess ought never to be opened under any circumstances. The unyielding nature of the hepatic substance prevents the collapse of the sac, so one must almost necessarily cut and take the place of the abscess drain off; this causes fresh inflammation perhaps gauze or of the walls of the abscess with de composition of the fluid within it. He says that the abscess should be allowed to open of itself and the matter to escape gradually and peacefully. He quotes in support of his opinion a case where an hepatic abscess of large size
was allowed to open of itself, matter continued to ooze from the small aperture up to the time remote 200 years and a half afterwards without causing more general disturbance to the system or more inconvenience than would be caused by a small issue.

When an hepatic abscess bursts into the lung or bowel no treatment can be of any service unless attention to the general health.

(ii) Acute inflammation occurring in the cellular tissue surrounding the portal vessels is very rare. Scurrah describes a case which is quoted by Dr. Budd. It has no practical interest.

(iii) Acute inflammation of a severe character, ending in suppuration, very rarely originates in the fibrous capsule. When it does so it causes rapidly fatal enteritis. Andrews mentions a case (Clin Med. iv. 310) that peculiar modification of inflammation the rheumatic articular may attack the capsule of the liver in these respects. it is not dangerous it does not tend to the formation of pus and must be treated diagnostically.
Chronic Hepatitis

Chronic inflammation of the liver may be merely the remainder of the acute form, or may be excited by the presence of tuberculous deposits. The former need not detain us, and the latter will be considered hereafter. The term of chronic hepatitis has been given to the disease already considered as active congestion.

But the most important form of this variety of inflammation is cirrhosis. This is an inflammation of the cellular tissue of the capsule of Glisson contained in the portal canals and between the lobules of the liver. In this disease, lymph is forced out around the vessels which abound, and may almost say, never advances to suppuration. At the commencement, the liver is enlarged while the ligamentum teres is being excised. As the disease progresses, the fluid portions of the lymph are absorbed while the fibrous remains as firm fibrous tissue. This in process of time gradually contracts more and more. By doing so, it necessarily compresses the lobules, vessels, and ducts, interfering with secretion, impeding the passage of blood and the return of bile; while it completely closes many of the smaller branches,
which causes atrophy of the parts to which they lead.
The impairment to the passage of blood through the
organ produces more or less ascitic effusion in advanced
cases,
The obstruction to the secretion and elimination
of the bile causes a dusky yellowish hue of the
complexion. In advanced cases the lobules are emaciated
pale from the want of blood and yellowish from the
retention of bile, others are completely atrophied.

These changes in the structure of the liver produce
consequent alterations in its size and appearance
as a whole. It is usually much smaller than normal
in the advanced stages of the disease, but the amount
of diminution depends altogether on the extent and
severity of the disease, and varies in every case. From
the contraction of the fibrous tissue and greater atrophy
of one part than another, the exterior of the liver pre-
sents a characteristic irregular nodulated appearance
which has received the name of "holnailled." If cut
into when the disease is of long standing, the liver
is found to be pale containing little blood; the cut
surface presents a mottled appearance -- thickly
studded with roundish bodies varying in size from
the smallest, susceptible to that of a pea, and contrast-
my in color with the intervening substance— the
color of the round bodies being yellow in various shades
from pale yellow to brown, while the intervening sub-
stance is white without any yellow tinge. In the milder
forms of the disease the pathological changes are not
so well marked and though the same in kind are
less in degree.

The external capsule sometimes participates
in the inflammatory action and forms adhesions
with neighbouring organs.

**Symptoms** In the earlier stages of the disease
the symptoms are slight and obscure. Slight en-
largement of the liver, a dull pain in the right
hypochondrium, and disorder of digestion are the chief
but even these are not always present, and are not such
as to attract much attention. After the lapse of weeks
months, or, it may be, years a different class of symp-
toms show themselves. Percussion demonstrates that
the liver has decreased in size, and its hoovered ex-
terior may sometimes be felt through the abdominal
muscles. Ascites develops the abdominal cavity and
after the fluid has accumulated in considerable quantity,
by pressing on the veins causes oedema of the lower
Extremities: The face and superior extremities do not suffer unless there be coexisting disease of heart or kidneys. The ascites is caused by obstruction to the passage of the portal blood, which also produce enlargement of the superficial abdominal veins from the setting up of a collateral circulation.

The patient becomes scrawny with a rough dry skin.

The tongue is furrowed, the appetite bad with occasional thirst. The urine, scanty and dark colored, often deposits a sediment composed of urates. There is sometimes a tendency to hemorrhage.

The leading symptom then of the advanced stage is obviously ascites not preceded by anæmia in any other part of the body. But this may also be caused by enlargement of the spleen, which is distinguished by percussion revealing a large tumour in the left side and the absence of hepatic symptoms. Any disease that causes obstruction to the portal vein may produce ascites, as cancer of the head of the pancreas, the pylorus, or of the liver. Any other tumour that invades the portal vein may also cause it, as tumefarious deposit in the mesenteric glands. But in all these cases the liver is either unaltered or enlarged but diminished as in cirrhosis.
Chronic peritonitis may also cause ascites, but it is not so persistent nor so extensive as in cirrhosis, while the liver is unaltered. Ovarian disease may be mistaken for ascites; but the history of the case and the manner in which the swelling commenced differ in each: ovarian disease does not occur more frequently in spirit drinkers: in ovarian disease the tympanitic note given out by the intestines when percussed remains fixed above the sac, while in ascites it shifts in the various positions of the body: a vaginal examination in ovarian disease may sometimes discover the firm elastic surface of the tumour.

**Causes**

The causes or rather cause of Cirrhosis is the continued immediate use of alcoholic drinks. The modus operandi is said to be this: The alcoholic poison is absorbed from the intestines by the radicles of the portal veins, and, passing to the liver, traverses through the walls of the portal vessels in the canals, and so directly excites inflammation of the ovarian tissue.

Dr. Percy in his inaugural dissertation showed that when animals are poisoned with alcohol, it could be recovered in larger proportion from the urine.
than from any other cause.

Various circumstances predispose the liver to suffer from the alcohol or increase the effect of the poison, as a hot climate; a congested state of the liver; a feverish state of the system. An attack of acute hepatitis is apt to be followed by cirrhosis in persons addicted to habitual overindulgence in intoxicating drinks.

Other causes have been suggested as hot spices and various errors in diet, but there is not yet enough proof to establish any of them.

**Treatment.** Unless the disease be diagnosed and treated early, before lymph has been effused in any quantity and become organized, a cure cannot be expected. In the early stages local bledding, blisters, saline purgatives with alternative doses of mercury, and iodide of potassium to assist in the absorption of any effused lymph, are recommended. Along with this medicinal treatment, the patient must, if possible, be induced to give up his drinking habit, without which no medicine can be of any avail.

When the disease has advanced and ascites fairly
been fairly established, the treatment can only be palliative; keep the patient as well as possible by diet and regimen. Any attempt to reduce the ascitic effusion by diuretics and hydrostatic cathartics will likely fail and merely weaken the patient (Dr. Budd). When the breathing is seriously interfered with by the extent of the effusion, the only resource is tapping; but this ought never to be performed unless absolutely necessary, as the fluid rapidly reaccumulates and the loss of so much serum hastens the fatal issue. In the advanced stages red amalgam may sometimes be required.

I. Inflammation of the Vessels

Inflammation of the vena portae and the hepatic veins is more a subject of curiosity than of practical importance. It may arise during acute hepatitis from the extension of the inflammatory process to the vessels, and all the phenomena of interrupted circulation be produced. As a primary disease it very rarely occurs. Dr. Budd has collected some instances in one of which the inflammation was caused by a fish bone injuring the portal vein. But the extreme rarity of the disease, its difficulty of diagnosis, and the little likelihood of any treatment being
effectual, all render it a matter of little interest to the practical physician.

3. Inflammation of the Gall-bladder and ducts

Inflammation of these parts is certainly important especially as they are of frequent occurrence. If inflammatory action close the cystic duct the function of the gall-bladder is suspended or abolished, while closure of the common duct prevents the secretion of bile.

Dr. Budd divides inflammation of the gall-bladder and ducts according to their effects into:

- **Catarhhal**, which causes an increased and altered secretion of mucus.
- **Suppurative**, in which pus is formed.
- **Croupous**, which produces a fibrous cast of the diseased tissue, as in Cynanche tracheali, and
- **Ulcerative**, where the inflammation produces ulceration.

**Catarhhal**. Inflammation of the mucous membrane of the gall ducts of mild character is probably very common. It may cause effusion into the cellular tissue beneath the membrane and thereby diminish or entirely obliterate the tube; this is thought to
be the most common cause of acute jaundice occurring in young, healthy, robust subjects. In the effusion may be found out on the epithelial surface of the mucous membrane and constitute what is more properly the catarthial form of inflammation. The mucous may be so viscid as to obstruct or close the tube and produce jaundice as in the other form; but generally, the only symptom is slight feverishness with a little pain in the hepatic region.

In the suppurationic form, which is merely a higher degree of the other, the symptoms are the same, local pain with general fever, only developed with a greater degree of intensity. Jaundice may also occur from viscosity of the secretion.

The Grouvald form is very rare. Pokotamshi observed it in persons dead from cholera and typhoid fever.

Ulceration of the gall bladder and ducts has been observed in the bodies of persons who had died of various fevers. In the Waleheran fever, (Dr. Blane). The prevalent fever of Eirea Leone and in yellow fever, (Boyle). It is supposed that the acidity of the bile in these diseases was
the cause of the ulceration.

The presence of gall stones may cause sufficient irritation to produce ulceration. It may also result from direct injury (Dr. Budd).

If the inflammatory action continue it must lead to perforation. Before this happens adhesions may be formed and thus a fistulous communication established but if not then the bile must escape into the peritoneal cavity and cause fatal inflammation there.

Ulcers may be injurious in another way. The blood returning from the mucous membrane may become contaminated by the inflammatory products, and, as in the analogous case of intestinal ulceration, produce acute hepatitis.

The cystic or common duct may be permanently closed by the effects of inflammation. When the cystic duct is closed the function of the gall bladder is at an end, but this does not cause any appreciable disorder; and in the cases that have occurred has only been discovered after death. When, however, it is the common duct that is rendered impervious, the effect is very different. No bile can now pass from the liver. hectic jaundice
occurs, with dilatation of the gall bladder and hepatic ducts. The lobular substance of the liver becomes loaded with bile and acquires a deep olive color. The liver increases in size from the retained bile. When the retention has continued for some time a curious change comes over the substance of the liver; the capillaries become atrophied, the secreting cells are destroyed; a microscopic examination reveals only fatty particles floating in amorphous granular matter. In truth, the liver has undergone fatty degeneration. Delirium and coma sometimes come on, as they do more frequently in jaundice from suppressed secretion.

Treatment. The inflammation of the gall bladder and ducts, local antiphlogistics to subdue the inflammation, action are useful, leeches, blistering, and ligatures to drain the portal system. Mercury, soda, chloride of ammonium, and tannin are also held to be beneficial by excreting their specific action on the liver and restoring its secretion to the healthy standard. When the inflammation has subsided and its organized effects above remain median, is of little use and avail. When the common duct is closed
we must endeavour to keep up the activity of the stomach, bowels, kidneys, and skin, to make up as far as possible for the want of the liver, and so protract the patient's existence.

III Faulty Nutrition and Secretion

This class of diseases has to do with the secretory element of the liver. The hepatic cells may more or less suddenly cease to perform their function or they may perform it in an altered and improper manner. The bile may be altered in character and quantity, and solid concretions may form in it. The nutrition of the gland may be so altered that fatty and tubercular matter may be deposited in and around the cells. Thus we have—

I Suppressed secretion—II Excessive and defective secretion—III Unhealthy secretion leading to gallstones—IV Fatty deposit—V Scofulous disease.

I Suppressed secretion. Suppression of the biliary secretion is caused by the hepatic cells becoming no longer capable of performing their function. This may occur under a variety of circumstances.
Inflammation of the hepatic substance or its vessels, as mentioned above, may produce it. It may be the consequence of other hepatic disorders. But we are now considering it as a primary disease, as arising here, without preceding hepatic disease sufficient to account for it.

In the earlier stages, anatomical observers have discovered no change in the secreting apparatus, but as the case progresses, the liver undergoes a species of fatty degeneration. No longer performing its function, it is regarded by the organism as an effete and useless structure; and, in accordance with a general law, fatty degeneration is set up as the first step towards its removal.

The stoppage of the biliary secretion produces deep jaundice. After the jaundice has continued some time, cerebral symptoms, generally but not always, appear; the patient becomes delirious, he is seized with convulsions and sinks into profound stupor and in this comatose condition dies.

But this disease has not always a fatal termination; the liver may resume its function.
before it structures are materially altered; but when this occurs we have no means of telling that the case has actually been one of dyspepsia. This disease belongs chiefly to youth and adolescence, and usually occurs in persons suffering from grief, anxiety, dissipation, or other depressing conditions.

It is usually attended with slight pain in the hepatic region, symptoms of exhaustion, and some degree of jaundice or intestinal disturbance, along with jaundice: thus, until the head symptoms appear, there is not much to alarm the physician.

The treatment which seems to have been most serviceable is active perspiration.

2. Excessive or defective secretion

There is undoubtedly a great latitude allowed in the amount of the biliary secretion during a state of health. In the analogous instance of the kidneys, there is very much in the amount of its various constituents, while the person is in perfect health. The secretion can therefore only be considered morbidly excessive or defective, when it
45.

produces secondary disorders disturbing the
health of the patient.

Excessive secretion usually causes bilious
furring, thickening, a bitter taste in the mouth,
with but little or no fever; these symptoms
are easily removed by an emetic and purgatives.

Sometimes the symptoms are more severe, there
is a considerable amount of fever, with pain
and tenderness in the region of the liver besides
the furring or; in this form, leeches over the
liver with calomel and saline purgatives are
recommended.

This complaint is common in this country
among persons of sedentary habits, who have
arrived at middle age, and have long lived freely.
It is still more common, and is more severe in
tropical climates, where exercise is often much
neglected, and the rarified atmosphere affects
but a small supply of oxygen.

These bilious attacks, as they are called, occur
frequently and are thought little of by those
who are subject to them; but if they are allowed
by a continuance in the habits which produce
them, to return again and again for a number
of years, the liver may and often does become the prey of serious organic disease. To prevent this a change in the habits of the patient must be enjoined. He must sleep in a well-ventilated apartment, rise early, and take regular exercise. His diet must be light and of such materials as will not overburden the liver; spirituous liquors, fat, and any excess of rich carbonaceous matter must be forbidden. Heavy suppers are very injurious. The bowels should be kept regular, by medicine if necessary.

**Defective Secretion.** There are two ways in which the bile may be so defective as to injure the health. There may be too little bile formed for the requirements of digestion in the intestinal canal, although all the constituents of the bile in the intestinal canal blood are removed. Or the liver, while supplying enough bile for digestion, may not remove all the bile matter from the blood.

The first form of this disorder, where there is too little bile for the digestive process, sometimes results from the flesh diet, to which weakly
persons with painful difficult digestion, subject themselves.

The want of bile renders digestion slow and imperfect and impairs nutrition; the bowels become irregular, usually constipated; though sometimes from the want of the alkalinity of the bile, the intestinal matter may be come so acid as to cause diarhoea, with headache and depression of spirits.

The treatment must be to remedy the faulty digestion and diet which were the original causes of the disorder: give mild laxatives to remedy the constitution and if diarhoea supervene: bran, chalk, or magnesia.

The other form of this disease, when the blood is imperfectly purified, is usually the result of cirrhosis or some other organic disease, and is best treated by such hygienic measures as lessen the amount of materials out of which the bile is formed.

3. Unhealthy Secretion

When the bile contained in the gall bladder after death is examined it is found to vary
much in different cases. It may be thin and watery, or viscid and tenacious; light yellow, reddish, or dark olive; it may be acid. And it sometimes contains some or none of the medicinal actions above during the life of the patient.

The viscerity of the bile is often the cause of bilious disorders in India (Chemesley). The bile may be so tenacious as to obstruct the ducts and cause temporary retention.

A more interesting result, to practitioners in this country, of viscerity of the bile, is the impression of some of the bilious matter, which forms the most common nucleus of bilious calculi.

Sometimes, though rarely, gall stones are formed entirely in this way, from deposition of the ordinary bilious matter; but the great majority of calculi are formed of cholesteric variegated mixed with the coloring matter of the bile, and deposited around a nucleus of concrete bilious matter. They are usually found in the gall bladder and the ducts leading from it; obviously from the concentration the bile undergoes in that cavity.
The form, size, and appearance of biliary calculi vary much; they have been found of the size of a hen's egg, almost entirely filling the gall bladder. They have all gradations of color, from the pure white of cholesterin, to the umber or black of copra-saturated bile. They may be smooth or angular. The large and solitary ones are usually smooth and rounded; but when they occur in numbers, each has usually different faces which have been in opposition with other stones. When a large stone is seen through it sometimes presents the appearance of concentric laminae of different shades of color, from the amount of coloring matter mixed with the cholesterin being less at some periods of its growth than at others.

Gall stones when dry are usually lighter than water, but when fresh from the gall bladder they generally sink in water. This fact shows how to look for them when passed by stool.

Gall stones are sometimes composed of other substances. There different salts of lime, the acetate, the phosphate, and the carbonate have each formed the chief ingredient of calculi. Then
has also been found forming calculi (K. Lojan). That Belchey Calculi must result from some morbid condition of the bile is evident; but we cannot well determine what that condition is. But though the link in the chain of causation is wanting, we can observe what diseases, errors in diet, &c., produce this altered state of the bile, and so lead to the formation of gallstones.

The Cancerous Nucleus has often been associated with gall stones.

Persons afflicted with calculi are usually above fifty; women are more liable than men. Habits, want of exercise and free living, which so often precede different hepatic diseases, tend to the deposition of gall stones. They are said to be associated with the biliary acid calcareous nucleus (Pout).

Gall stones may remain (when formed there) in the gall bladder. They may pass on and become fixed in the cystic or common duct, or what is more common they pass on into the duodenum and are voided by stool. If the stone be large the duct is much dilated by its passage and it remains so, and thus renders the passage of future stones easy.
Should the stone lodge in the cystic or common duct, it produces the same effects as closure of the ducts by inflammation. It may cause ulceration around it and find its way into the peritoneum, or some neighbouring adherent organ.

Gall stones may exist a long time in the bladder without causing any inconvenience. Sometimes however they produce inflammation and ulceration; when this is the case there is weight and uneasiness in the region of the full bladder; with tenderness on pressure, or during such movements of the body, or acts of digestion as tend to press upon it.

A stone may lodge in the ducts without causing any uneasiness. But blocking the passage of a large calculus the pain is intense, as we may easily conceive from the obstruction the duct sometimes undergoes. The pain usually comes on two or three hours after eating. It is not constantly the same, though always present. It is aggravated by hemorrhages so exegeticating that the patient bends himself double a rolls about the floor with his hands firmly pressed
against the but of his stomach." These pains usually cause great exhaustion. During the interval, the pain continues of a dull gnawing character generally in an hour or two, though sometimes not for several days; the pain suddenly ceases, the stone having passed into the bladder. Hysteria may simulate the passage of a gall stone; but the previous history of the case, and the diffused tenderness may distinguish it from the symptoms of a gall stone.

The passage of undigested food through the pyloric orifice of the stomach may give rise to symptoms which cannot be distinguished from those caused by the passage of a gall stone. So the stone ought always to be looked for among the causes to confirm the diagnosis and enable the physician readily to detect a second attack.

The treatment is threefold, to relieve the pain and chasm during the attack; to dissolve if possible any stones remaining in the gall bladder; to prevent the formation of new stones.

To relieve the pain and chasm, opium in the form of pill, in large doses, is the best remedy. Hydro
Cyanic acid, sulphuric ether along with it, have been sometimes found useful. Dr. Petit recommends large draughts of warm water, slightly alkaline to neutralize the acidity in the stomach, with the view of, as it were, directly fomenting the heart. Warm baths and hot fomentations are also of service.

After the stone has reached the duodenum, purgatives with copious injections of warm water should be given to dilute and remove the accumulated bile and the stone.

Many remedies have been held to possess the power of dissolving gall stones, but few now give any medicine with the hope of attaining such an object.

To fulfill the third indication, to prevent the formation of new stones, the bowels must be kept regular and the hygienic treatment so often mentioned above enforced.

4 Fatty Deposit in the Liver

The nutrition of the liver may be so altered that fatty deposits may accumulate in large quantity.
in and around the cells. The liver becomes larger, paler, softer and more greasy.
In some cases, this is merely a part of general corpulence in persons whose constitution predisposes to deposit of fat under the skin and in other parts, and whose habits are such as to favour it.
But usually the most marked cases are found in persons labouring under phthisis or some other diseases causing a wasting albuminous discharge. In these persons there is rapid emaciation; the fatty and albuminous constituents of the tissues are absorbed; the albumen is deposited in the liver, while the fatty matter forming mucin are deposited in the liver.

The first class of cases may be cured by removing the cause, free living and incontinence; the latter is only a symptom of some disease elsewhere and must be treated accordingly.

5. Sarcoptic Disease. Tuberculosis may attack the liver as well as other organs. The albuminous tubercular deposit is usually found in connection with some long standing sarcoptic disease elsewhere, often carries of the bones. The treatment must be directed
Against the primary disease, with such constitutional remedies as will counteract the chronic atheromatous

IV Morbid growths and parasitic animals

1 Cancer  2 Hydatids  3 Liver flukes

1 Cancer—occurs more frequently in the liver than in any other organ (O'Brod) : not that cancer usually appears first in the liver, but it sometimes does attach the liver primarily, and very often cancer else where is followed by secondary cancer of the liver.

The most common form is the encephaloid, though all are occasionally met with, sclerous, collloid, hematox and melanemic.

Cancer renders the liver larger, and often nodulated. It gives rise often to adhesive inflammation of the hepatic tissue and capsule in contact with end thus may cause adhesions with the parts around it. It may implicate the veins and cause ascites or the ducts and produce jaundice.

It usually excites severe pain, with more or less interruption of the hepatic functions. Sympathetic pain
In the right shoulder and a short dry cough are sometimes present. Digestion is disordered and there is considerable fever. In the advanced stages there is profuse perspiration and diarrhoea till the patient dies of exhaustion.

Treatment can be only palliative. All the specifics that have been successively landed as cures for cancer have been tried and found wanting. No means, either for its prevention or cure are yet known. In Diseases that occur but once in a lifetime, we may hope, perhaps, that small pox will not always be the solitary instance of the severe form of the disease being prevented by the artificial induction of a milder one. But cancer is quite different. It has been proposed to depurate cancer cells of the essential requisites of cell growth (nourishment, heat, and moisture) and to delay the fatal termination, perhaps cure the disease. But the difficulty of applying this treatment to the cancer and the cancer alone precludes any hope of a cure by this means. Analogy and experience alike give no clue to a remedy, if one exist. Empirical observation may perhaps one day discover a cure. But to return, noodynes to relieve the pain with proper regulation of the diet and bowels is all that can be done.
Hydatid cysts, like cancer are more common in the liver than in any other organ.

They consist of a sac lined by a friable laminated membrane of the consistency of coagulated albumen filled with a limpid colorless fluid holding in solution little else but common salt. This membranous bag is called by Aenome the acelbalovzyst; flowing in this fluid there may be a number of smaller acelbalovysts. Each of these contains a number of oechenococi colorless transparent amebulae. The structures of these minute organisms and the speculations regarding their history are curious and interesting but they do not properly belong to our present subject.

Acelbalovysts usually grow very slowly and cause little inconvenience except from their size and weight. But if they are ruptured and the fluid escapes into the peritoneal cavity it causes as much irritation as the bile itself. This may occur from mechanical injury, or from inflammation and irritation being set up in and around the sac. If the fluid makes its way into the vessels it gives rise to numerous abscesses throughout the liver.

Natural cure may take place in two ways:
1. The acelbalovysts may die.
2. Or the tumor may...
then into the long-intestinal canal, or through the walls of the abdomen, adhesions having first taken place.

The physician must assist nature. It is known that iodide of potassium and more especially common salt have the power of destroying the vitality of the bacteria. If these remedies fail, it may be advisable to puncture the sac through the abdominal wall, every care being taken, as in the case of abscess, to prevent the escape of the fluid into the peritoneal sac.

3 Liver Flukes. The distoma hepaticum and D. caneculatum, which cause such distinction, among which, have been found in man, but the cases are rare occurrences and have no practical interest.

Jaundice. Jaundice is usually considered as a separate disease of itself though probably it is merely a symptom of many diseases. Its constituent features are, "yellowness of the skin and eyes; whitish or bluish-coloured faces; urine having the color of opaline, and communicating a bright yellow tinge to white
liver. The evident cause of this is the presence of the colouring matter of the bile in the blood, which gives the yellow colour; while the paleness of the faces is due to the bile not entering the intestines. This however is not invariable as shown above.

Jaundice may be caused by any disease that prevents the secretion of bile, or by any obstruction preventing its passage into the duodenum. A great variety of diseases conditions may lead to one or other of these results; but they have already been considered.

Its treatment varies according to the cause, no single plan will answer all cases not even the pleasant one recommended by the old Latin author for this. ‘Morbus regius” Per omne vero tempus utinam est evacuare nosce, secernere: si hie ens est, balneo; si accidit, fugiendus, mutatioibus, lecto aeternae et concubini cultura, luna, foco, tubis, castoria, hujusque viris et helminthes. Et quae regius morbus et us violae.”

Thomas Jameson