

the sigmoid flexure). Below the obstruction the colon is empty, and the rectum may be "ballooned." Perityphlitis may arise from the irritation of some foreign body lodged in the cæcum, and it is frequently associated with impaction of fæces. Primary appendicitis does not produce obstruction; but the secondary perityphlitis may interfere with the action of the bowel. The subjects of appendicitis have usually a history of antecedent constipation; and the symptoms may resemble those of typhoid intestinal obstructions, pelvic peritonitis, and ovaritis (as regards pain). A psoas abscess may require to be differentiated.

Intestinal hæmorrhage is a symptom of many conditions. When occurring high up, the stools are tar-like, and the blood is mixed with the fæces; when from the descending colon or rectum, the blood appears unchanged. The causes are rupture of a blood-vessel in ulcerations of the bowel from the duodenum downwards—or even from a gastric ulcer when the blood has not been vomited; obstructive diseases of the heart, lungs, and liver—the latter causing increase of the blood pressure within the portal system; rectal ulcers; cancer; hæmorrhoids; typhoid fever; purpura, scorbutus, and other blood diseases.

When the rupture is sudden, and the blood effused is great in quantity, there is sudden paleness, noises in the ears, faintness, and loss of consciousness. The pulse is weak and rapid, and it may become imperceptible at the wrist. In typhoid, the temperature falls.

Ascites is also a symptom of many diseases. The beginning is usually obscure, and it is often only detected when a causal affection suggests an examination of the abdomen. There is increased fulness of the abdomen, and the fluid extends the iliac and hypogastric regions when the patient is in the erect, and the flanks when in the recumbent position. In extreme cases, the umbilicus is forced outwards. Tapping the abdomen with the hand excites a characteristic wave motion; and percussion reveals a tympanitic note over the distended bowel, and dulness at the flanks. Fluctuation is marked when the fluid is in sufficient quantity. The breathing may be much embarrassed when the abdomen is full. The urine is diminished in quantity. The lower extremities and scrotum become much swollen. The differential diagnosis of ascites from ovarian tumours and pregnancy is discussed in gynecological works; but chronic peritonitis, a distended bladder, enlarged spleen, tumours, and cysts are also possible sources of error. In ascites there is no tenderness, and the abdominal walls become thin, while the contrary is the case in peritonitis. The other conditions require careful palpation and percussion—with attention to the history and mode of development—to distinguish them.

CHAPTER IX.

DISEASES OF THE DIGESTIVE SYSTEM.—Section III.

Contents.—Jaundice—Catarrhal jaundice—Biliary calculi (gall-stones)—Cirrhosis of the liver—Cancer of the liver—Hydatids—Inflammation of the liver and abscess—Acute yellow atrophy—Congestion of the liver, cyanotic atrophy, pigment liver, fatty liver, syphilitic diseases of the liver, waxy disease, and perihepatitis—Thrombosis of the portal vein—Suppurative pylephlebitis—Diseases of the pancreas—*Differential diagnosis of the more important diseases of the liver*—Murchison's table of the causes of jaundice.

Jaundice, or Icterus, is a symptom common to many diseases of the liver, or of the liver and blood—*hæmo-hepatogenous jaundice*. (See *Diagnosis*, p. 193.)

Catarrhal Jaundice.—*Catarrh of the Bile Ducts, &c.*—The common duct is the part most affected, the initial change being hyperæmia of the mucous membrane. The duodenal end of the duct suffers most, and the mucous membrane soon becomes swollen and covered with tenacious mucus. The endothelium proliferates, and the *abris*, with the mucus and swelled membrane, all serve to occlude the duct and to obstruct the flow of the bile. These changes generally end in subsequent liquefaction, and recovery within a few weeks; but continued or repeated attacks may lead to fibroid degeneration of the liver and atrophy of the cells.

Catarrhal jaundice may arise from malarial influences, but more frequently it is produced by the extension of catarrh from the duodenum. The latter arises in connection with gastric catarrh, and over-eating and drinking; and the slighter forms of it are associated with the hepatic dyspepsia already described.

The **symptoms**, in the malarial form, may begin suddenly with pain or discomfort in the right hypochondriac region. There is usually constipation. The tongue becomes coated, the appetite is lost, and there is fever and general *malaise*. In two or three days the conjunctivæ become yellow, and soon afterwards the whole skin becomes tinged. The pulse is slow, and the heart weak.

The most common form, however, is the jaundice which follows gastro-duodenal catarrh. For some time previously the patient complains of the state of his stomach. A furred tongue, bad taste in the mouth, flatulence, nausea, and vomiting, with depression of spirits—the latter being very marked in cases of jaundice—is the usual history and course of a case. The jaundice gradually appears. The urine is high coloured, and exhibits a re-action to nitric acid when a few drops are placed upon a white porcelain slab and allowed to come in contact with the acid. A play of colours—green, blue, violet, red—is then observed. The stools are clay-coloured and offensive. As digestion is imperfect—especially of the fatty constituents of the food—there is much flatulence. The skin is often itching; and the

vision may be affected so that objects appear yellow. The liver increases in size, and it may be tender. The case may run a course of six weeks, and then recover; but chronic cases sometimes lead to organic changes in the liver, as already mentioned.

The treatment consists of limiting the patient in his diet to skim-milk and beef-juice for a time. Fresh meat and fish may be allowed later. Minute doses of calomel ($\frac{1}{2}$ to $\frac{1}{4}$ of a grain) thrice daily, are useful to allay irritation of the mucous membrane. Quinine, in antipyretic doses (ten grains), may be used in the early stages of the malarial forms. Effervescent saline aperients, occasionally, or sixty grains of phosphate of soda, thrice daily, well diluted—should be ordered. Euonymin (two grains) or iridin (four grains) may be given at night, followed by the aperient in the morning. Sulphate of magnesia is a useful saline to use in gouty patients. Bitartrate of potassium (as a lemonade) is a useful diuretic in the later stages. Sometimes a dose of jalap powder acts well in relieving obstruction of the ducts. Salicylate of soda may be prescribed as a *cholagogue*.

Biliary Calculi.—*Gall-stones (Cholelithiasis).*—Gall-stones are composed of mucus, bile pigments, carbonate of lime, and phosphates, with cholesterine—the latter being the chief substance. Mucus generally forms the nucleus around which the other materials aggregate in concentric layers. They vary from a small pea to a large size, so as, occasionally, almost to fill the gall-bladder. They are yellow-brown or dark-coloured, very light in weight, and they may be found in any part of the biliary passages, sometimes in great numbers. Ulcerations of the mucous membrane, hypertrophy of the walls of the gall-bladder, and peritoneal inflammation are common results of the irritation by gall-stones. Sometimes they become impacted in the cystic, hepatic, or common duct, and the ulceration which ensues may end in perforation.

The cause of the formation of gall-stones is some interference with the normal composition of the bile by which cholesterine is precipitated. The mucus which is poured out in catarrh of the biliary passages, is believed to re-act upon the glycocholate of soda, which keeps the cholesterine soluble in the bile. Gall-stones are more common after middle life, and in the obese, and they occur most frequently in those who lead sedentary lives. Females seem to be more liable to this affection than males.

The symptoms vary somewhat with the position of the calculi. They may be present in large numbers in the gall-bladder without symptoms; but generally there is slight and intermittent pain, in the right hypochondrium, in such cases. Nausea and feverish chills may also be present. Small stones in the ducts may only irritate them without producing the urgent symptoms of occlusion. When there is impaction, the pain is intense and commanding—so much so, as sometimes to culminate in epileptiform convulsions. The pain is described as burning or boring, and it radiates to the shoulders and back. It is most intense in the region of the gall-bladder and it shoots towards the umbilicus. The vomiting, which

is invariably present, does not relieve the symptoms. When the hepatic duct is occluded there is jaundice and enlargement of the liver. When the stone passes from the gall-bladder into the cystic duct the pain is intense, and it is only relieved when it either falls back again, or passes into the common duct, when a fresh paroxysm soon takes place, especially when the duodenal orifice is reached. Jaundice is not usual in impaction of the cystic duct, but it is present in occlusion of the hepatic or common duct. The pain suddenly ceases when the calculus passes into the duodenum. Peritonitis may be excited around the seat of impaction. In chronic cases of impaction, the liver undergoes degenerative changes (fibroid conditions, with atrophy of the cells).

The fæces should be diluted with water, and a careful search made for the calculi. After the passage of the stones, the health, as a rule, is restored, and the tenderness over the right hypochondrium, and the jaundice, gradually disappear. An acute attack may last two to five days, but if the stones be numerous the period is indefinite. Peritonitis and perforation are possibilities; and sometimes a cure results from discharge of the calculus externally, or into the stomach or intestine—a fistulous communication being established. A calculus sometimes forms a nucleus in the bowel for aggregations which may produce obstruction of the bowel (ileus).

The prognosis is generally favourable; but the possibility of a grave termination must always be remembered. (*Diagnosis*, p. 193.)

The treatment of hepatic colic, consists of the use of morphia hypodermically—as much as half a grain being sometimes necessary. Smaller doses may suffice. In extreme cases, chloroform inhalations must be given to tide the patient over the agonising pain, until the morphia take effect. Hot fomentations or turpentine stupes should be applied to the hepatic region; or a hot bath may do much to relieve. Prophylactic treatment should be advised. This consists of the avoidance of all starchy, saccharine, and fatty foods—lean meat, eggs, fish, fruit, and succulent vegetables being allowed. Wine may be allowed, but malt liquors and spirits are forbidden. Regular exercise should be inculcated. Olive oil is now recommended; and phosphate of soda, in drachm doses, thrice daily, well diluted. Cholecystotomy may be necessary, in suitable cases.

Cirrhosis of the Liver.—The organ is at first hyperæmic and increased in size. It is brown-red in colour, denser, and has a granulated appearance. These changes are due to the increased formation of connective tissue. This subsequently contracts, and the liver becomes harder and assumes the “hob-nailed” appearance—the surface being unequal, nodulated, and traversed by bands of connective tissue. These compress the cells, which undergo fatty and amyloid degeneration. The blood-vessels of the liver are also compressed, and hence there is stasis of the blood in the whole portal system, leading ultimately to ascites. The bile-forming and glycogenic functions of the liver are interfered with. The peritoneum is opaque and much thickened locally, and often there are

adhesions to the neighbouring organs. Two forms of cirrhosis are described—(a) multilobular, in which *ascites* is the prominent physical sign; and (b) unilobular or “biliary cirrhosis,” in which *jaundice* is the earlier symptom.

The causes of cirrhosis of the liver are the abuse of alcohol; syphilis; and malaria.

The symptoms in the early stages are generally referred to other organs—gastric and gastro-intestinal disorders being the fore-runners of cirrhosis of the liver. Slight pain and tenderness over the liver, with perhaps some appreciable enlargement, may be present. The skin may have an “icterode hue,” but rarely is there actual jaundice. The appetite is poor, vomiting and pyrosis are common, while flatulence and attacks of diarrhoea are frequent. These symptoms, however, may all be due, or they may be referred to alcoholic excesses or catarrh, and ascites often is the first symptom pointing definitely to liver disease. The area of liver dulness is diminished; but sometimes when the development of connective tissue is great, it remains enlarged. As a result of obstruction of the portal circulation, the spleen may be enlarged, and the superficial veins of the abdomen stand out clearly. This latter symptom is due to the attempt of a collateral circulation to compensate for the internal venous obstruction. As a result of the stasis, hæmorrhages are common—from the stomach (hæmatemesis) and intestines. Ulcerations of the stomach are frequent. The stools are often black and offensive. Hæmorrhoids are invariably present, and bleeding from them relieves the portal system. Hæmorrhages are also frequent into internal organs, and from the lungs, and particularly from the nose (Epistaxis). The digestion of fat, owing to the diminished secretion of bile, is very imperfect, and hence the fetid eructations and offensive stools. There is much emaciation, the face being pinched and looking out of all relation to the size of the abdomen. The nose is very frequently red—the small blood-vessels being very prominent. The urine is diminished in quantity. The urea is diminished, and urobilin pigment increased. Œdema of the ankles and genital organs occurs with the development of the ascites.

The course of cirrhotic liver is a very chronic one. The early symptoms often escape detection. The fibroid changes may affect other organs, as the heart, lung, and especially the kidneys. Brain symptoms, as delirium and coma, may supervene; or intercurrent maladies—pleurisy, pericarditis, or pneumonia—may terminate a case. Gradual failure by exhaustion from hæmorrhages, is another termination.

The prognosis is always unfavourable, except when detected early, and the patient is amenable to proper treatment.

The treatment can only be palliative. Bartholow recommends the use of sodium phosphate. Chloride of sodium, chloride of gold, perchloride of mercury, arsenic, and phosphorus are drugs which are sometimes prescribed with apparent benefit. Purified ox's bile, in pills, may sometimes be of value (B 53). If there be a syphilitic

taint, iodide of potassium, with perchloride of mercury, should be given. The diet should consist largely of milk. If the ascites be great, the abdomen may require to be tapped.

Cancer of the Liver.—The liver may be affected by cancerous nodules, or by one large isolated mass. When the nodules are scattered and small, their size may be very minute; when few the size may be that of a large orange. Fatty changes take place in the centre, and in the larger nodules there is a central umbilication which can often be appreciated, on palpation, through the abdominal walls. A cancerous nodule may sometimes be felt at the umbilicus during life. The liver is much enlarged and hyperæmic, and if the cancer be sufficiently advanced, the portal veins, lymph spaces, and bile ducts, may be compressed. Hæmorrhages sometimes occur into the peritoneum when the nodules reach the periphery. There is often local peritonitis. The majority of cases of cancer of the liver are secondary to cancer elsewhere—chiefly from the stomach; but the gall-bladder, pancreas, or rectum may be the primary source.

Heredity is the chief factor known in the causation; and it occurs between the ages of forty and sixty, as a rule.

The symptoms are often not characteristic, and there is only uneasiness in the right hypochondrium, indigestion, and gradual development of the cachexia, with emaciation. If the stomach be the primary seat of the disease, the more prominent symptoms will be referred to that organ. When the liver is affected, pain is usually present, and on palpating the hepatic regions, there is tenderness, and the nodules—with sometimes their umbilication—may be detected. The organ is enlarged, irregular, and indurated, and the dulness may extend to near the umbilicus, in a case well advanced. Jaundice, with distention of the gall-bladder, occurs, if the common duct be compressed. Ascites is present in about half the cases; and often it is the result of secondary peritonitis, and not always caused by compression of the portal vein, nor by portal thrombosis. Gastro-intestinal catarrh, with diarrhoea, piles, and intestinal hæmorrhages, are common. The skin is dry and harsh, and the complexion “fawn,” or earthy, in colour. The emaciation is rapid, and the debility great. The progress of a case is not uniform. Death may take place in a few weeks, and sometimes a case extends to a year or longer.

The treatment can only be palliative, consisting chiefly of morphia for the pain. Tapping may be necessary in ascites with extreme abdominal distention.

Hydatid Disease of the Liver.—Echinococci frequently affect the liver, and chiefly the right lobe. When they reach the liver, they become embedded and surrounded by a firm, tough capsule, composed of the neighbouring connective tissue. The membrane of the embryo is a sac composed of concentric layers, and containing numerous daughter vesicles, varying in size from a pea to a large egg. The fluid of the sac is milky in appearance, and is slightly

alkaline. The scolices, or immature tænia, spring from the inner lining membrane of the daughter vesicles, and they are possessed of a head, four suckers, and a row of hooklets. Usually there is but one cyst present in the liver; but there may be two or three. The hepatic tissue becomes atrophied by the pressure.

The embryos reach the liver from the intestines, by the portal vein or bile duct. The ova are discharged with the excrement of the dog, and the drinking water or vegetables consumed by man may be contaminated, should no precautions be taken to guard against such a possibility. Hydatid disease is common in Ireland and Australia.

The symptoms manifest themselves only when the cystic tumour becomes large enough to disturb the functions of the liver by pressure. It often, however, simply causes an enlargement of the liver, and sometimes it forms a projection from that organ. A feeling of weight, uneasiness, or slight dragging pain in the right hypochondrium, accompanied by disorders of digestion, may be complained of. If the portal vein or bile ducts be compressed, ascites or jaundice will be present. The diaphragm and heart may be displaced, causing dyspnoea and exciting cough. If the tumour be large, the intercostal spaces and the right side may bulge considerably. The tumour may often be felt as globular and elastic, with fluctuation; and a feeling of tremor ("hydatid purring") may be communicated to the fingers. Percussion reveals the liver or tumour enlargement. If the vena cava be compressed, the feet and ankles become œdematous. Should the cyst burst into the stomach, there is pain, and vomiting of the parasites; if the intestine be perforated, they are passed in the stools. They may also burst into the pleura, and cause an acute pleurisy; and they may perforate into the pericardium or peritoneum with fatal results. A cure sometimes takes place when they ulcerate into a bronchus, and are expectorated. Another termination is by *Calcification*.

The usual duration is one or two years—sometimes even longer. They sometimes cure spontaneously; or if they ulcerate into the bile duct they are destroyed by the action of the bile. Death may occur in one or other of the methods mentioned above; or from gradual failure of the strength, if they are not diagnosed and relieved by aspiration.

The prognosis is always grave when they are large, or when aspiration is impossible. They often end favourably when discharged by the stomach, bowel, or bronchi.

The treatment is to aspirate the cyst—the result being almost invariably a cure, unless a number of cysts be present. The milky fluid should be examined by the microscope for the hydatid hooklets. Electrolysis is also a successful method of treating hydatids. The injection of bile or iodine is often recommended.

Inflammations of the Liver: Suppurative Hepatitis: Abscesses.—This group of diseases more properly belongs to the domain of surgery. Abscesses consequent upon general pyæmia, or

septicæmia, are discussed in surgical works. The *amœbic* form of abscess of the liver may also be placed in the same category, inasmuch as the treatment is purely surgical. It is of interest, however, to the physician, on account of its relationship to dysentery and tropical abscess. It is, as yet, unknown whether amœbic abscesses of the liver occur independently of dysenteric affections of the bowel, as the latter are sometimes latent, or of mild description. The same theoretical considerations hold good in the liver affections as in the diseases affecting the bowel and peritoneum. The amœbic abscess of the liver (which may be single or multiple) may extend to the lungs, and it then gives rise to cough and expectoration—the sputum invariably containing *Amœba*. The pathological condition is that of a necrosis, with liquefaction of the necrotic tissue. In *tropical* hepatitis, the liver must be deemed the organ primarily at fault—the condition being probably due to climatic influences, and the liver thus rendered more susceptible to invasion by micro-organisms. The abscesses are usually single, but there may be two or more. They are, or they become, superficial, usually. In hot climates, blows, miasmatic influences, and errors in diet (abuse of stimulants and condiments) are exciting causes of hepatitis, &c. An impacted biliary calculus may set up inflammation and abscess of the liver.

The symptoms are ushered in by a feeling of chilliness, headache, and fever. In some cases, even of large abscesses, the symptoms are very obscure, or there may be none, and it is often difficult or impossible to recognise their development during the course of a dysentery which masks the symptoms. In a typical case, pain in the back and right shoulder, a coated tongue and bilious vomiting, with increased frequency of the pulse—soon follow. Pain and tenderness in the hepatic region may be made out on palpation.

The liver may be enlarged, and in large abscesses it may extend as high as the fourth rib; and downwards, for a few inches below the level of the false rib. Jaundice is not invariably present, unless the cause be impacted calculi, when this symptom occurs early. The rigors are usually severe, with pus-formation, especially in the pyæmic forms; and vomiting also becomes more constant. If the abscess become encysted, the liver gradually diminishes in size. Fluctuation can rarely be made out, and only when the abscess is large, or superficial. The pain and tenderness diminish, and the urgent symptoms disappear with the absorption or discharge of the pus; but if the abscess continue to enlarge, there is increased pain with movement and coughing, &c., and the breathing becomes embarrassed. The heart may be displaced. A right pleurisy and pneumonia frequently co-exists; and ultimately adhesions form, and the abscess burrows through to a bronchus and the pus is discharged. Death may take place by discharge of pus into the pericardium or peritoneum, &c.

An abscess of the liver may form in about a week; and the case may run on for three months and then terminate favourably by absorption or discharge of the pus. Convalescence is very slow, when fistulous openings are established. The cases associated with dysentery are very fatal.

The prognosis must always be guarded. Pyæmic forms are always fatal. Discharge through the lungs is the most favourable result next to natural absorption and cicatrization. The effects of treatment and early aspiration must also be observed, in giving an opinion.

The treatment consists of quinine in large doses (twenty grains) in the early stages (of the malarial form). Ipecacuana is given in full doses. Antiseptics may be tried. Warm fomentations and turpentine stupes should be applied to the hepatic region. As soon as pus can be made out the aspirator should be used; an exploratory puncture seldom does harm. The diet should be regulated. The treatment of the dysentery (when present as the causal affection) is mentioned elsewhere. The sooner an abscess is opened the better.

Acute Yellow Atrophy of the Liver is an acute diffuse parenchymatous inflammation produced by causes as yet unknown. It occurs most commonly in women during the state of pregnancy. The organ is very much diminished in size. It is soft and tears easily, and it is of a uniform yellow colour. Microscopically, the cells are seen to be replaced by fatty granular matter, fat globules, pigment, bacteria, and acicular crystals of leucin and tyrosin. The kidneys are also yellow, and the endothelial cells are infiltrated with fatty granular matter. Ecchymoses are found in the peritoneum and elsewhere.

The symptoms begin insidiously as a simple gastric catarrh, with vomiting and slight jaundice. An extreme state of wakefulness, with intense headache, is a common condition. The jaundice gradually deepens, and the liver percussion is much diminished. The fever is of the remittent type. Convulsions and coma usually terminate the case. The urine is normal in quantity and in specific gravity, and acid in re-action. The urea is much diminished, and leucin and tyrosin are present in quantity. Death takes place in about a week. There is no rational treatment known. Phosphorus may be tried. Purgatives and mineral acids may be given.

The following affections of the liver need only a brief mention, as either they are already considered with diseases in which they arise as secondary conditions, or they are of minor importance from a clinical point of view:—

Congestion of the liver may be active, and due to excesses in eating or drinking; or it may arise from malarial causes. The liver is enlarged and tender, and the other symptoms are the same as already described under the hepatic form of gastric catarrh. The passive form (nutmeg liver) is that which is due to mechanical obstruction of the circulation—as in valvular disease of the heart. Congestion, with jaundice, may arise, also, from violent emotions. Chronic congestion leads to chronic (cyanotic) atrophy, with degeneration of the cells and increase of the connective tissue. This condition resembles cirrhosis in its pathology, and, like that disease, ultimately leads to ascites, &c.

Pigment liver is a malarial disease, usually running a chronic course. There is anæmia, and pigment granules from the spleen are found in the blood. Ascites and hæmorrhages, and ultimately brain disturbance and death, is the usual course. *Fatty liver* occurs in tubercular diseases, and as a result of chronic alcoholism. The organ is enlarged, and the edges are rounded. The long continued use of cod-liver oil in phthisical conditions accounts for many of the cases. *Waxy disease of the liver* arises also in tubercular affections; but also as a result of syphilis and chronic wasting diseases and suppurations. The liver is usually enlarged, and the sharp edge is characteristic. *Syphilis* may also cause *perihepatitis*, *interstitial hepatitis*, and *gummatous hepatitis*. The liver in very chronic cases is shrunken and nodular. Cicatrices are common. *Perihepatitis*, or chronic inflammation of the liver capsule, is not always due to syphilis; but it may arise with any inflammatory condition of the liver, and from unknown causes. The liver loses its sharp edge and becomes rounded, by the contraction of the capsule. There is pain over the hepatic area, and if there be much contraction, ascites follows. The kidneys are usually diseased (cirrhotic).

Thrombosis of the portal vein is caused by cirrhosis, chronic atrophy, cancer, and tumours. The symptoms are apt to come on suddenly during the course of these chronic diseases. Sudden ascites, diarrhœa, scanty urine, vomiting sometimes, and gradual enlargement of the superficial abdominal veins,—are the important indications, if death do not take place, for a time. No treatment.

Suppurative pylephlebitis, or suppurative inflammation of the portal vein, is always a secondary disease. Ulcerations, suppurations, and abscesses in the immediate neighbourhood of the portal vein, may spread to it. There is abdominal pain, rigors, and sweats. The attacks are paroxysmal, and the temperature may rise to 105° Fahr. The liver and spleen enlarge, and there is usually jaundice. Pyæmic abscesses develop in the liver. The abdomen is tender and it soon enlarges. Vomiting and diarrhœa are present; and soon delirium and coma terminate the case. There is no treatment possible. Morphia may be injected for the pain. The average duration is about two to three weeks.

The diseases affecting the pancreas are chiefly of pathological interest, and the treatment of them can only be symptomatic. They are inflammation, cysts, calculi, and cancer. The latter is the commonest. In all there is radiating pain in the epigastrium and back. In cancer, the pain is worst in the erect posture. The tumour is not readily felt. Fatty stools are suggestive. Jaundice commonly follows.

The differential diagnosis of the more important diseases of the liver may now be considered shortly.

Jaundice is produced by absorption of the bile, consequent upon obstruction to its outflow. The old classification of *obstructive* and *non obstructive* jaundice is no longer necessary, as it has been

proved that all forms are truly hepatogenous. *Hæmo-hepatogenous* forms (toxæmic jaundice) are produced by the action of special or specific poisons upon the blood, in the destruction of which the liver is supplied with an excess of hæmoglobin, and other products, from which there follows increased formation of bile pigments. The bile acids are diminished. The *obstruction* in the toxæmic forms of jaundice arises from the increased viscosity of the bile, and catarrh (probably descending) of the bile ducts (*W. Hunter*). It is important for the practical physician to remember that cases of jaundice may not primarily be due to liver affections. "Epidemic" jaundice and "Weil's disease" (believed by many to be of the same character as the epidemic form) are probably due to organisms. The symptoms of these diseases are as described under acute yellow atrophy and yellow fever. There is more constitutional disturbance in the toxæmic forms of jaundice than in those due to the mechanical obstructions mentioned in group A of Murchison's Table.

[The *surgical* diseases of the bile ducts and gall-bladder may be mentioned briefly. *Suppurative catarrh of the gall-bladder* (empyema) is characterised by tenderness or pain in that region. Palpation reveals a rounded swelling, but later it becomes more diffuse. An abscess may form under the ribs, &c. There is usually a history of gall-stones. It is a much more serious disease when occurring along with *suppurative catarrh of the bile ducts* (*Suppurative cholangitis*). There is then intense jaundice, and enlargement of the liver. Abscess, pneumonia, pleural empyema, and endocarditis are common complications. Gall-stones commonly are the cause of suppurative cholangitis, but it may be a sequel to typhoid, hydatids, cancer, or influenza (?). The immediate cause is the invasion of the bile ducts by pyogenic organisms. A milder form is described as *infective cholangitis*—of the nature of a catarrh of the bile ducts. It is due to chronic and intermittent attacks of gall-stones, extending over many years, and associated with the entrance of organisms. *Acute phlegmonous cholecystitis and gangrene* is an acute progressive empyema of the gall-bladder, usually fatal in a few days.

In all the diseases of the gall-bladder and bile ducts, the theory of causation is the same as that discussed under peritonitis. The colon bacilli present in the intestine are innocuous in the healthy; but they assume virulent powers whenever there is lower vitality of, or injury to, these organs. Other organisms may be present; but in simple catarrh, bacilli are often not found.

Tumours (enlargements) of the gall-bladder are known by their position, direction of enlargement, and by the detection of the sulcus between it and the liver.

Gall-stones may lead to numerous secondary complications, such as abscess, ulceration and perforation, fistula, stricture, &c. A chronic form of catarrh is sometimes induced—without jaundice, but with distention of the gall-bladder, which is probably almost always due to antecedent attacks of gall-stones. It may, however, be secondary to cancer or hydatid disease, &c.]

MURCHISON'S TABLE OF THE CAUSES OF JAUNDICE.

A. Jaundice from Mechanical Obstructions of the Bile Duct.

- I. *Obstruction of foreign bodies within the duct.*
 1. Gall-stones and inspissated bile.
 2. Hydatids and Distomata.
 3. Foreign bodies from the intestines. } rarer.
- II. Obstructions by inflammatory tumefaction of the duodenum, or of the lining membrane of the duct, with exudation into its interior.
- III. *Obstruction by stricture or obliteration of the duct.*
 1. Congenital deficiency or obstruction of the duct.
 2. Stricture from perihepatitis.
 3. Closure of orifice of the duct in consequence of an ulcer of the duodenum.
 4. Stricture from cicatrization of ulcer in bile ducts.
 5. Spasmodic stricture (?).
- IV. Obstructions by tumours closing the orifice of the duct, or growing in its interior.
- V. *Obstructions by pressing on the duct from without, by*
 1. Tumours projecting from the liver itself.
 2. Enlarged glands in the fissure of the liver.
 3. Tumours of the stomach, pancreas, kidney, ovary, or uterus; and post-peritoneal or omental tumours.
 4. An abdominal aneurism.
 5. Accumulations of fæces in the bowel.
 6. A pregnant uterus.

B. Jaundice Independent of Mechanical Obstruction of the Bile Duct.

- I. *Poisons of the blood interfering with the normal metamorphosis of bile.*
 1. The poisons of the various specific fevers:—Yellow, remittent and intermittent fevers; relapsing, typhus, enteric, and scarlet fevers; and "epidemic jaundice."
 2. Animal poisons:—Pyæmia, and snake poisons.
 3. Mineral poisons:—Phosphorus, mercury, copper, antimony (arseniuretted hydrogen), &c.
 4. Chloroform, ether (and toluylendiamin).
 5. Acute atrophy of the liver (?).
 6. Cirrhosis, and other forms of chronic atrophy of the liver.
- II. *Impaired or deranged innervation interfering with the normal metamorphosis of bile.*
 1. Severe mental emotions, fright, anxiety, &c.
 2. Concussion of the brain.
- III. Deficient oxygenation of the blood interfering with the normal metamorphosis of bile.
- IV. *Excessive secretion of bile, more of which is absorbed than can undergo the normal metamorphosis.*
Congestion of the liver—(1) Mechanical, (2) active, (3) passive.
- V. Undue absorption of bile into the blood from habitual or protracted constipation.

Hepatic colic has already been referred to, and *enteralgia*, *hepatalgia*, and *gastralgia*, *nephritic colic*, *lead poisoning*, &c., have been considered under the diagnosis of *enteralgia* (p. 182).

Cirrhosis, cancer, hydatids, abscess, acute yellow atrophy, and congestion, are diseases of the liver—the more important, or more striking diagnostic symptoms of which may usefully be contrasted. *Cirrhosis of the liver*.—There is a history of alcoholism, and frequent attacks of gastric catarrh, with much flatulence. The jaundice is very slight and is slowly developed. The liver is almost always diminished in size, and no globular tumour or nodules can be felt. The early symptoms are generally attributed to congestion, and later, the development of ascites—with the other symptoms associated with cirrhosis—confirms the diagnosis. The spleen is enlarged, and the urine is deficient in urea, but may contain leucin and tyrosin. In *cancer of the liver* the age, cachexia and emaciation, with enlargement of the liver and development of nodules, and absence or diminution of hydrochloric acid, are differential points. *Hydatid disease of the liver* produces enlargement, and sometimes a globular tumour can be felt. The development is slow, without fever, and it is generally painless. Palpation of the tumour reveals the characteristic, elastic fluid feeling, and possibly “thrill.” It is quite different from the hard nodules of cancer. It is more like an abscess; but in the latter case there will have been great fever and rigors. An enlargement of the gall-bladder may simulate a hydatid closely; but the seat, and the history, should suggest the diagnosis. An aneurism of the hepatic artery gives rise to a heaving expansile pulsation. A hydatid cyst pushing up the diaphragm simulates, very closely, a pleuritic effusion, but in such cases the use of the aspirator can at once clear up all doubt.

Inflammation and abscess of the liver is distinguished by the history of rigors, tenderness on pressure, and the presence of some causal affection—as dysentery or malaria. It may be confounded with *hydatid disease*, *enlargement of the gall-bladder*, *cancer*, *abscess of the abdominal wall*, and *purulent pleuritic effusions*. The first three have been already considered. An abscess of the abdominal wall does not disturb the liver functions. In empyema the history at the commencement of the disease is important. The use of the aspirator will clear up many doubtful cases. In *acute yellow atrophy* of the liver, the extreme wakefulness and headache, the sudden rise of the temperature, jaundice, and diminution of the size of the liver—are the striking features of the case. It occurs most frequently in pregnant women.

Congestion of the liver may be mistaken for catarrh of the bile ducts; but in the former disease the jaundice follows the liver symptoms, while in the latter it is usually preceded by the symptoms of gastro-duodenal catarrh. The passive forms of congestion due to heart and lung disease, have also to be noted.

CHAPTER X.

DISEASES OF THE NERVOUS SYSTEM.—Section I.

Contents.—Neuralgia—*Tic-douloureux*, *Sciatica*, *Herpes zoster*—**Neuritis**—**Raynaud's disease**—Peripheral paralysis—*Paræsthesiæ*—*Causalgia*, &c.—**Electricity**—*Ziemssen's motor points*—Paralysis of the cranial nerves—Facial paralysis—**Scheme of the brain and spinal cord**—Paraplegia, hemiparaplegia and hemianaesthesia—**Acute and chronic myelitis, and softening of the cord**—*Compression paraplegia*—*Secondary degenerations of the spinal cord*—*Spastic spinal paralysis*—*Combined scleroses*—*Alcoholic, syphilitic, hysterical, and reflex paraplegia*—*Spinal weakness, irritation, anæmia, and congestion*—Landry's acute ascending paralysis—Locomotor ataxia—Acute and chronic spinal meningitis—*Poliomyelitis anterior acuta* (infantile paralysis)—*Poliomyelitis anterior sub-acuta vel chronica*—*Progressive muscular atrophy*—(*Sclérose latérale amyotrophique* and *pachyméningite cervicale hypertrophique*)—*Pseudo-hypertrophic paralysis*—*Bulbar paralysis*—*Multiple sclerosis*—*Paralysis agitans*.

Neuralgia.—The changes which take place in the nerve trunks or within the nuclei of the cerebro-spinal centres, in cases of neuralgia, are still unknown. Pains of all kinds—as pleuritic and cardiac pains, renal and hepatic colic, peritonitis, &c.—are conveyed to the cerebral centres by the sensory nerves; but these are not considered as neuralgic pains, clinically, although some of them are really of that nature. Neuralgia is a pain, usually periodic, connected with a nerve, and which may arise from obscure changes within the spinal or cerebral centres, and be associated with a nerve trunk; but it is not easy to define it accurately, although a very common clinical entity. The pain may also arise from a peripheral irritation, and it is then a “reflex neuralgia”—e.g., caries of the teeth. Pressure upon a nerve trunk by growths, tumours, or bony excrescences, gives rise to severe pain—the pain being often referred to the peripheral extremities of the nerve. Neuralgia usually affects one side only. It is very rarely bilateral; and a characteristic symptom is the presence of “painful points” in the course of a nerve, aggravated by pressure, and generally found where the nerve issues from a bony canal, or pierces the fascia. A certain amount of anæsthesia of the skin supplied by the nerve affected, is almost invariably present in