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Compliments.

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PRIMARY CANCER OF THE GALL-BLADDER AND BILE-DUCTS.

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Stimulated by the unfortunate but unavoidable result of laparotomy in the last of the cases about to be reported, with a long-time interest in the success of surgical measures for the relief of obstruction of the biliary passages, the writer was led to the study of the recorded cases of the forms of cancer indicated in the title.

One hundred cases of primary cancer of the gall-bladder and eighteen cases of like disease of the ducts have been analyzed. In addition, a brief note is made of three cases of sarcoma of the gall-bladder, abstracts of which are added. The cases of Burridge and Tyson, referred to by others, have been excluded because of the strong probability of their secondary nature.[1] The two cases of Hayem and one each of Chassaignac and Boucherau,[2] included in Villard's table, are not in this list. Heschl, in the report of a case, speaks of two cases with gall-stones which he had seen; Fagge summarizes twelve cases; Marchand reports one, and Fazio refers to another in his report. Moore has studied ten cases, four of which only are placed in the present collection. In the St. George and St. Bartholomew Hospital Reports descriptions of lesions in two cases may be found. The five cases of Prof. Stiller were secured too late for classification. The five cases of cancer of the bile-ducts reported by Prof. Delafield are not included in the second tables because they were reported collectively. Finally, no attempt has been made to include any of the cases referred to in a more or less general manner by the systematic writers on pathology or internal medicine—Rokitansky, Förster, Klebs (two

[1] Burridge: Cancer of breast some years previous. Tyson: Epithelioma of lips; last removal one year before death.

[2] Hayem: Female, æt. 52; male, æt. 56. No detailed account of cases of C. and B.

cases), Birch-Hirschfeld, von Schueppel, Frerichs, Bartholow, Loomis, Murchison, and others.

It is thus seen that, in addition to the cases tabulated by the writer, thirty-three cases of primary cancer of the gall-bladder and five of the ducts have been placed on record in a more or less tangible form, while doubtless a large number have been observed in our large hospitals that were never publicly noted.

A collection of 159 cases disabuses one of the idea of an affection being rare, and yet systematic writers always refer to the great rarity of primary cancer of the biliary passages. Ranvier and Fagge declare it to be much more common than it is usually considered, and that its presence is mistaken for carcinoma of the liver. One source of fallacy is mentioned by the latter writer, viz., that cancer of the gall-bladder growing into the hepatic tissue is called cancer of the liver, because the gall-bladder, in the centre of the tumor, is overlooked on account of its small size. Again, we fear it is not customary to explore the ducts with that accuracy which is essential to determine the presence of small new growths.[1]

The frequency of this form of primary cancer, compared with its frequency in other organs, may be inferred from the statistics of Norman Moore, in the latest Bradshawe Lecture.[2] He details the results of the examination of one hundred and twenty-nine cases of new growths in the internal organs of the body, studied during a period of several years. Ten cases in which the gall-bladder and large bile-ducts were the seat of new growth are noted. Compared with the number of cases of like affection in other organs, collected during a similar period, it is not an insignificant number. The internal organs which are the common seat of primary new growths are the stomach, the œsophagus, and the uterus. Twenty-nine cases of cancer of the stomach and fifteen of the œsophagus were observed by Moore. Eleven new growths in the lung, eleven in the pancreas, nine in the colon, eight in the rectum, and fewer numbers in other organs, show that primary cancer of the biliary passages is much more frequent than we have been led to believe. Uterine cancer was not studied by Moore.

[1] See also Orth, Diagnosis in Pathological Anatomy, Boston, 1880, pp. 307 and 330. Orth says it can be easily overlooked, and that so-called primary cancers of the liver are frequently secondary to cancers of the biliary passages.

[2] On the Distribution and Duration of Visceral Growths. Bradshawe Lecture, London Lancet, vol. ii. No. 9, 1889, p. 415.

It is not without interest to refer to the fact that the literature of primary cancer of the biliary passages is quite recent. Villard, in 1872, published the most complete paper on the subject. He was unable to collect more than twenty-five cases up to that time. Since then Kohn, Kraus, LangHeinrich, Zenker, Bernheim, and Stiller have made the most important contributions. Prior to 1872, the subject seemed to attract the attention of the French writers chiefly; since then the Germans have taken precedence, although Fagge and Moore, Habershon and Murchison, in England, have made careful studies of it.

The following cases were observed by the writer; one of them was previously reported, but the interest of the case warrants a reprint of it:

CASE I.[1] *Primary cancer of the gall-bladder. Pain in the right hypochondrium; jaundice; enlargement of the liver; absence of tumor; fever; vomiting; diarrhœa; death from exhaustion.*—Mrs. McM. was under my care from the 9th of March until the 4th of May, 1881. Her illness dated from the middle of December, 1880, and continued until the 18th of May of the following year. The history previous to my attendance was apparently that of an intermitting fever, with hepatic and gastric complications. The symptoms referable to the liver were paroxysmal lancinating pains in that region, at times so severe as almost to cause collapse. The gastric symptoms were epigastric pain, loss of appetite, flatulence, acid eructations, and, at variable intervals, attacks of vomiting. She had not been jaundiced.

I found her suffering from an intermitting fever with daily paroxysms, each beginning about 1 P. M., and continuing until 7 or 8 P. M. The chill lasted a half-hour, and was moderately severe; the fever lasted four hours, at its height the temperature being 103°. She was emaciated; her features indicated exhaustion, and were somewhat pinched; her complexion was sallow; she was anæmic. She suffered from severe paroxysmal pains in the epigastric and hypochondriac regions. The areas were tender on pressure, but no tumor was noticed. The liver-dulness extended three inches below the ribs in the nipple-line. The spleen was twice its natural size. The appetite was lost. She had nausea, acidity, and flatulence. The bowels were constipated. Urine contained neither albumen nor sugar. Urates and uric acid were in abundance.

During the course of her illness the symptoms may be detailed under three headings: febrile, gastric, and hepatic. There seemed to be no relation between the different sets of symptoms, except the febrile and hepatic. The fever was more continuous when the jaundice was deepest. At the risk of some repetition, I will note them.

[1] Trans. Path. Soc. Phila., vol. x., 1873, p. 81.

Gastric.—Tongue covered with a dark-yellow, heavy fur, moist, tremulous; later, dry and brown. Bitter taste in the mouth, secretions viscid; loss of appetite; thirst; acidity; flatulence; weight and fulness after meals; epigastric pain and tenderness, nausea, and vomiting. The latter, of all the gastric symptoms, was especially independent of any other symptoms. It occurred once in two weeks, once a week, or twice a week. Each paroxysm lasted from two to four days. The fluid vomited varied from a clear-white, sour, to a greenish-yellow, bitter liquid.

Hepatic.—Pain in the right hypochondriac region, paroxysmal, sharp, and lancinating, radiating to right and left shoulders and to epigastrium; tenderness on deep palpation, absence of tumor or irregularity of edges; enlargement as noted above. On account of liver derangement, there was marked jaundice, with clay-colored stools and bile in the urine. The jaundice occurred four times while the patient was under my care. The first attack was light, lasting three days; the second and third each lasted a week; the fourth, beginning on the 25th of April, continued till death. Each attack was preceded by hepatic colic. With the second and third attacks the fever was remittent in character; with the last it was continuous. As the jaundice improved, the fever changed from the remittent to the intermittent type.

Febrile.—As may be inferred from the previous notes, the fever was irregular. At first it was intermitting, then remitting, and, finally, it became continuous. At no time was the temperature higher than 104°. With the rise in temperature there was a corresponding pulse-rise. The increased pulse was not as great, by twenty beats, as a pulse at the height of a paroxysm of intermittent fever. The last month of illness it became rapid, feeble, compressible, and dicrotic. When the fever was remitting or continuous, in the evening there was delirium. The "typhoid" state developed the last ten days of her life, and death took place from cardiac failure. The use of antiperiodics prevented the paroxysms at first. As soon as the drug was suspended they recurred. Finally, in spite of my remedies, the fever continued.

The following facts also bear upon the case: The patient was a married woman, who had not lived with her husband for several years, on account of his brutality. She was thirty-seven years old, a nurse by occupation. She had always been in poor health, and had had several attacks of biliary colic. The family history was good, save that a maternal aunt died of cancer. Her mother and brothers were living; her father had been killed.

Autopsy.—Rigor mortis had set in early; the body was greatly emaciated, and all the tissues were stained with bile. With the exception of the liver and spleen, the organs were normal for a person who had died of heart-failure. The spleen was about twice the normal size, of a dark, greenish-brown color, and of about normal consistence. Unfortunately it was not examined microscopically.

The liver was of peculiar shape. The right lobe was eight inches long, the left the same. Curiously, however, the lower edge of the lower lobe did not extend as low down as that of the right lobe, but its upper edge was three and

one-half inches beyond the same edge of the right lobe, while the lobe was doubled on itself to conform to the concavity of the diaphragm. Transversely, the right lobe measured five and one-quarter inches; the left three and one-half. The former was two and one-half inches thick, the latter one and one-half. The gall-bladder was in the normal position and of the normal size. It was adherent to the duodenum. The color of the outer portion was pure white, not bile-stained. It was not collapsed, and was of firm consistence. A portion of the bladder underneath the liver, not quite as large as a walnut, was of natural color, and exhibited fluctuation.

On section of the gall-bladder, it was found that the white appearance of the exterior was due to cancer, which involved three-quarters of the organ. The growth encroached upon the cavity so that the walls were from one-half inch to one inch thick. The mass had the appearance of a soft cancer; the inner surface had a ragged, ulcerated appearance, and in the centre of the mass was found a gall-stone the size of a filbert, with a rough surface looking like a mulberry calculus. The stone was lying against the mouth of the gall-bladder; behind the stone was a cavity about the size of the stone filled with a thick, greenish-yellow fluid. From the appearance one would infer that the stone acted as a ball-valve to the duct, and its presence was the cause of the attacks of hepatic colic during the course of the disease. The hepatic duct was enlarged, its walls thickened, its calibre much increased. The branches extending into the upper half of the right lobe were greatly dilated, even almost to the periphery of the liver, terminating in saccular dilatations. The ducts contained a thick, grayish-green matter; the walls were of a slate-gray color, dotted with dark points. The liver substance traversed by these ducts was dark and soft, not unlike gangrenous tissue. A part in the centre, about three inches square, was especially of this appearance. The remainder of the structure of the organ was slightly stained with bile and fatty in appearance. On microscopic examination the malignant mass was found to be of the nature of a medullary cancer. The cystic and part of the hepatic duct were involved. The transition from the cancerous to the catarrhal process in the ducts was well marked. In the liver catarrhal inflammation of the ducts was very distinct. In the lymphatic spaces around the ducts there was an abundant infiltration of epithelioid or indifferent cells. The cancer of the gall-bladder was no doubt primary, from the ragged appearance of the mass and the absence of nodules.

CASE II. *Primary cancer of the common gall-duct. Jaundice; vomiting; fever; epigastric pain; tumor. Laparotomy. Death from peritonitis. Cancer of the bile-ducts; secondary cancer of the liver and pancreas.*—M. H., aged forty-nine, male, family history and habits good.

Previous history.—One year ago, in July, 1887, he was taken sick with cramp in the stomach and vomiting; jaundice, associated with intense itching, gradually developed, and reached its height in December. In January he had an attack with all the signs of "typhoid fever." The jaundice continued during the latter part of the winter and spring. During the spring there was

epigastric tenderness and soreness, and the same sensations in the region of the gall-bladder.

Treated in the Presbyterian Hospital from May 17 to June 13, 1888, for cirrhosis of the liver. At that time he was extremely jaundiced, fairly well nourished, abdomen swollen, appetite poor, bowels constipated, and he had paroxysmal pain in the region of the gall-bladder. He improved while in the hospital, but took cold on his way home in June, and had chills and fever with a return of the jaundice and epigastric pain. On August 17th he had chills, beginning about 3 P. M. and lasting sometimes until midnight. Had fever, no pains, but constipation; after the relief of the latter he affirms that the chills disappeared, and that their occurrence was sometimes preceded by distention of the abdomen.

October 3, 1888. On readmission to my wards in the Presbyterian Hospital the following notes were taken: Slight emaciation, general jaundice, no œdema, no itching, anæmia; no general distention of the abdomen but distention of the epigastrium to one and one-half inches above the plane of the umbilicus; right hypochondrium fuller than left; a rounded prominence the size of a dollar, movable with respiration, is opposite the umbilicus in the right nipple line. Its lower border is well defined on the left side, smooth and tense, and its upper and right border is continuous with the liver, which is full two and one-half inches below the margin of the ribs. The edges of the liver are smooth and somewhat thickened. Inside and to the left of the previously described tumor the liver border runs parallel with the ribs, and two and one-half inches below it, to the median line. Upper border of hepatic dulness in right nipple-line at fifth rib; in axillary line, at seventh rib. No gastro-intestinal symptoms.

8th. On aspiration of tumor, serum containing albumen withdrawn; gradual loss of appetite.

15th. Laparotomy. Death from peritonitis in forty-eight hours.

Autopsy (abstract).—Thickening and occlusion of the common and hepatic ducts by carcinoma, which is undoubtedly primary. Secondary nodules in liver, especially on under surface; chiefly peritoneal. No other secondary nodules except two in the head of the pancreas.

Gall-bladder enlarged and contained sero-purulent fluid, but no gall-stones. All organs presented an appearance due to chronic jaundice.

Résumé.—Chronic jaundice, epigastric pain, improvement; relapse, with intermitting fever, enlarged liver and gall-bladder containing serum. No gall-stones.

Part I. Primary Cancer of the Gall-bladder.

One hundred cases form the basis of these studies. In sixty-four cases the variety has been clearly indicated. Twenty-three were of the encephaloid, nineteen of the scirrhous, six of the colloid, and four

of the villous form, and twelve were cylindrical epitheliomas. In thirty-six cases the type was not noted.

Morbid Anatomy.—The gall-bladder has been described as reduced in size (eighteen), or of normal size (two), enlarged (ten), dilated (six), or enormously dilated (seven).[1] The terms used to describe the size represented the objects—hazel-nut, pear (three), apple, goose-egg, two fists, hen's egg, two eggs, child's fist, man's fist or hand, child's head, turkey's egg. The changes in size depend on the variety and seat of the new growth. The well-known appearance of each variety need not be detailed. If the fundus or the walls are involved, as a whole or in part, a nodular mass or masses—small and contracted if scirrhous, large if encephaloid; hard and dry if the former, soft and juicy or pulpy if the latter—are seen. The usual secondary changes, softening, etc., were noted frequently. When the growth invades the neck of the bladder as an annular ring or an outgrowth or a node, causing stenosis of the orifice, the remainder of the organ may be either atrophied or much dilated. A growth situated at the neck was particularly detailed six times, and at the fundus an equal number of times. Nine times the mass was said to be hard, or firm and rough, or nodulated. The gall-bladder was "destroyed and replaced by new growth" in twelve cases; inclosed in the growth in three; not distinguishable in one; a soft, whitish pulpy mass in one; and destroyed by cancerous ulceration in one instance. Presumably in these instances the growth was of least firmness. Certainly in the following cases the firmness or hardness was undoubted—when the walls were infiltrated (four), or thickened (nineteen), or "converted into a solid mass" (one). In three instances the mass was composed of pouches, and in many instances one or more pockets, the remains of portions of, or the entire gall-bladder, are described. In one case a membrane subdivided the sac into two portions.

Six times simple ulceration of the interior of the gall-bladder is described; twice ulceration with perforation into the peritoneal cavity; six times with perforation into the duodenum; and ten times with perforation communicating with the colon.

Adhesions to surrounding organs are common, and, excluding adhesions with perforation, are as follows: to the duodenum (five), the

[1] The numbers represent frequency of occurrence of each condition.

colon (four), the stomach (four), the round ligament (one), the liver (two), the liver and stomach (one), the vertebral column (one), aorta and vena cava (one). General adhesions were noted in one. In one instance the growth turned the vena cava out of its course, and in one compressed the hepatic artery and vein.

The contents of the gall-bladder or its pouch varied. Gall-stones were present in sixty-nine cases, and noted as absent in three. In twenty-six cases the contents were fluid, mucus (seven), pus (seven), bile (two), blood (one), liquid-like serum, thin watery fluid, green watery fluid, clear white, thick fluid, thick, gray fluid, encysted fluid, one each (all mucus or mucoid); once each sanious, grumous, or meat-broth-like, and once it was simply noted as "fluid;" in one case "plaster-like" contents were found.

The extraordinary frequency with which gall-stones are found has been mentioned by all writers, while many believe they are often present but overlooked. They are seen free in the cavity of the affected bladder; free or fixed in pouches or diverticula, so called, the walls of which are normal or the seat of disease; imbedded in the malignant mass, or filling the lumen of the ducts. In one instance one was found in the fistulous communication between the liver and the colon. They have been distinctly referred to as old stones by some of the writers. Ord alone reports a calculus which, from its chemical nature, could be inferred to be of recent and non-biliary origin. It was composed of carbonate and phosphate of lime and altered mucus, and did not contain bile elements. The relation of the calculi to the new growth will be discussed later.

Liver.—One would naturally look for secondary changes in the liver proper, and yet, save by metastasis, its structure was but infrequently changed.

Size noted as normal (five), small or atrophied (four), enlarged (fourteen), double the natural size (two). It was the seat of secondary deposits fifty-four times, in two of which the invasion was particularly stated to be by contiguity.

In a large proportion of cases the invasion undoubtedly was by contiguity, and the progress along the ducts has been particularly described. In Willigk's case the induration about the ducts extended "tree-like" into the structure of the liver. Multiple hepatic abscesses were present in two cases.

Bile-ducts.—The changes in the ducts are due to the presence of secondary growths, or to the "growth of continuity" (a term insisted upon by Moore) of the neoplasms, to obstruction of their lumen, or to secondary catarrhal or purulent inflammations.

Hepatic Duct.—Noted normal in five, dilated in twenty-one, the seat of secondary disease in thirteen, and of purulent inflammation in three instances. Obstruction and compression were each present in one instance, and a gall-stone was found in one.

Cystic Duct.—Normal four, and dilated thirteen times. In one exceptional instance it was dilated to the size of the transverse colon, and contained gall-stones. Six times it was obliterated, once each narrowed, closed, or impermeable, and four times obstructed. Twelve times it was the seat of secondary growth, twice indurated and thickened, and three times inclosing gall-stones.

Common Duct.—Normal eight, dilated eleven, the seat of secondary growth seven, and obstructed seven, times—by pressure four, not known two, stone one. The duct was obliterated three times, was thickened once, and contained calculi three times, and pus and blood and "fluid" once each.

Metastasis.—This was noted as present in fifty-five cases; in every instance but one the liver was one of the affected organs. The cases in which the growth in other organs—the duodenum, colon, lesser omentum, and peritoneum—took place by direct continuity are not included.

The cases of extension by continuity include the ones in which ulceration and perforation of the hollow viscera—the duodenum and colon—took place, and of ulceration and fistulous communication of the gall-bladder with the abdominal walls—the only one of the kind reported.

The frequency with which the various organs were found to be the seat of isolated secondary growths is as follows: Abdominal lymphatics (sixteen), mesentery (four), omentum (five), duodenum (four), colon (three), peritoneum (three—two if omentum and mesentery are included), stomach (six), pancreas (three), lungs and pleura (ten), supra-renal bodies (two), and once each in the mediastinal glands and the ascending colon. In one case, in addition to secondary growths in the stomach, liver, pancreas, and peritoneum (included in the above),

they were found in the navel, rectum, uterus, and kidney. It was the only case of the almost universal presence of the disease.

It is thus seen that secondary growths are not common, and are not universal or found in distant parts. It is impossible from this series of cases to prove the first conclusion of Moore (*loc. cit.*) that carcinoma of the gall-bladder and large ducts usually grows directly into the liver. The second proposition, that secondary deposits are not widespread, is supported, but the order of frequency must be reversed in the third conclusion. In the following, named in the order of greatest frequency from the first, metastasis occurs—to the liver, the abdominal lymphatics, the peritoneum, the lungs, the stomach, the duodenum, and to the pancreas. These estimates, as all that are made in this paper, of course are relative only, and subject to the same valuation that one gives to any collection of facts the correctness of which depends upon various judgments and observations. Care has been taken to prove the facts in each case.

To conclude: In primary cancer of the gall-bladder one finds the organ most frequently diminished in size and hard, or of normal size; sometimes (in 20 per cent. of the cases) it is enlarged. The enlargement is generally due to dilatation, and then the mass projects beyond the margin of the liver. Gall-stones are found in 69 per cent. and fluid contents in 26 per cent. of the cases. Extension by continuity or by secondary deposition takes place in about 75 per cent. of the cases, although it is never widespread. Adhesions form in 20 per cent., and adhesion with ulceration and perforation takes place in 18 per cent. of the cases.

Etiology.—No facts can be deduced from these cases to aid us in the formation of a theory of the etiology of cancer. Certain positive relations of probable cause and effect can be pointed out, while in this particular location of carcinoma its greater frequency in the female sex is established.

Of the influence of heredity or occupation, or hygiene, food, drink, or personal habits, climate or country, nothing can be learned. The cases occurred almost entirely in hospital practice, and thus a general notion of the character of the individuals can be formed. The frequent reports of cases from this class are due to the fact that private cases are never so well studied, from the nature of things.

Age.—In ninety-one cases the age is recorded. An average of the

ages would not be strictly accurate; a statement of the frequency in different decades gives the best notion of the period in life when the disease is most frequent:

1 to 10 years	1
10 to 20 "	0
20 to 30 "	1
30 to 40 "	9
40 to 50 "	19
50 to 60 "	27
60 to 70 "	19
70 to 80 "	14
80 to 90 "	1
Unrecorded	9
	100

The largest number of cases occur from the fifth to the eighth decade inclusive, and in the sixth decade the largest number in any one similar period is found.

Of sixty-four cases, in which the variety is recorded, the ages of sixty are given. No variety preponderates in any particular decade. Some (five) of the encephaloid type occur a decade sooner (30 to 40) than the scirrhous, but they continue as late in life as the latter (70 to 80), and one was found as late as past eighty. Five of the six colloid carcinomas were found between sixty and seventy. The youngest case, reported by Dr. Moxon, was in a patient aged four years. It was a villous carcinoma. Curiously, the earlier cases reported occurred after sixty, and hence the conclusion arrived at and adopted by systematic writers was, that the disease occurred late in life. Thus, in Villard's table, of twenty cases in which the age is given, nine patients were over seventy, and five between sixty and seventy. Of our cases 57 per cent. of the entire number were under sixty years of age. The average of Kohn's cases was 57.7 years. Hess states the average age of carcinoma of the liver to be 45.4 years. Cancer of the gall-bladder probably occurs frequently later in life than carcinoma of other organs, but not so late as formerly thought; and, indeed, when one compares this table with the one of Welch, in his article on Cancer of the Stomach (*System of Medicine*, Pepper, 1886), one sees not much difference in the age of patients with the two forms of cancer under consideration.

Sex.—The sex of ninety-eight of the entire list is given—twenty-three males and seventy-five females. The ratio of males to females

(eleven females to seven males) is more nearly equal in the scirrhous variety than any other. All of the colloid variety occurred in females. Otherwise there is no significance in the sex of the persons in which the respective varieties occurred.

The enormous preponderance of females has always been recognized and commented upon, and, in connection with the frequent association of gall-stones, is considered a marked etiological factor. Certainly it is a valuable clinical index.

Gall-stones.—One school of pathologists believes that the stones precede and are the exciting cause of carcinoma of the gall-bladder in a predisposed individual—Durand-Fardel, Klebs, von Schueppel, Villard, Murchison, Frerichs, Kraus, Ranvier, Zenker, Stiller, Fagge, and others.

Another believes that the stones are formed secondarily to the new growth—Lutton, Förster, Davaine, LangHeinrich, etc.

Calculi were found in sixty-nine cases; they were noted as absent in three. Zenker believes they are often overlooked. Their absence at the autopsy does not indicate necesarily that they had not been present in life; they may have escaped by ulceration. Scars or ulcers often are found, which indicate that stones had been present before death. A single stone with facets was found in Wiggleworth's case, without perforation. The others must have escaped during life. In one of Zenker's cases fragments of calculi were found.

Because calculi are so common in females, and cancer of the gall-bladder largely in excess in that sex, it was thought by the early observers that the former induced the latter. Gall-stones undoubtedly occur more frequently in persons who die from cancer of internal organs than in persons who die from other causes. The diathesis favors their formation, and Kohn particularly urges the fact that the cancerous diathesis creates such relaxation of the tissues as to favor the stagnation of bile. He believes the two conditions are in progress at the same time.

If the calculi are an exciting cause, they must precede the formation of the carcinoma. Three cases of carcinoma are reported in persons who had been the subjects of hepatic colic for a long time previously. Klebs found an old stone, with commencing carcinoma, in the neck of the bladder. He thinks it positive evidence that the foreign body was the exciting cause.

Some anatomical evidence seen at the autopsies throws light on the subject. Stones are found in the bladder, the duct of which is and has been obliterated for some time. They are often in large numbers, surrounded by mucus and old lymph, bathed in pus, or covered with serum. No traces of bile have been found in the same sac. They are found in pouches surrounded by healthy walls cut off from the bile-duct, or fixed in the new-growth structure. The gall-bladder cavity usually diminishes in size so that it is not a large enough reservoir for calculus formation, while shrinkage is seen in cases where the cancer does not contract. In a number of cases the cystic duct was obliterated, and yet stones were in the gall-bladder. Gall-stones are found in the ducts outside and beyond the seat of disease, and yet must, from their appearance, have formed in the gall-bladder and passed out. The case of Quetsch shows that gall-stones preceded the carcinoma, for they had been discharging from a biliary-cutaneous fistula for three years.

In the remarkable case of Goodhart, in which the cystic duct was enormously dilated and contained a great number of calculi, which developed with the cancer, the evidence seems to favor the idea that gall-stones form most rapidly in cancerous subjects. No facts have been brought forward to prove the formation of gall-stone after cancer. Ord's case alone shows the presence of a post-cancerous calculus which, however, was not biliary. The problem seems to stand about as follows:

Gall-stones are found in cancer of the gall-bladder. The clinical history and the anatomical appearances appear to show that they formed prior to the formation of the cancer.

Cancer occurs without gall-stones, and, *vice versa*, gall-stones occur without cancer. The frequent association of calculi and carcinoma, and the undoubted fact of their formation prior to the morbid growth, warrant the belief that their presence is as much a causal factor as are irritants in other situations, *e. g.*, in the lips, etc.

In objection to the view that gall-stones have a causal relation to carcinoma, some urge that such relation does not exist under like circumstances with calculus of the kidney and urinary bladder. One must remember, however, that the mucous membrane of the gall-bladder is richer in glands than the same structure of the pelvis of the kidney or the bladder, and hence more likely to invite an irritation

resulting in carcinoma. Zenker believes an adenoma develops by irritation and that it changes into an adeno-carcinoma, which is the primary atypical growth. Then again, the irritation of a gall-stone may continue silently for years, while a calculus in the kidney or urinary bladder is soon the cause of such deleterious secondary changes that the health is impaired before a carcinoma can arise.

Among other causes considered are local external injuries, as by a blow (Robinson and Fitzgerald), or a fall (Moxon's case), or the irritation produced by tight lacing. Marquand reports a case of the latter. The depression of the ribs crosses the liver and ducts, and in the illustration accompanying the report of his case, the bladder is seen to be constricted. In this constricted portion the disease began. The patient of Robinson and Fitzgerald had been kicked seventeen years before death. From then until his final illness he was subject to pain in the right hypochondrium. The local peritonitis and inflammation was no doubt a predisposing factor. In Martin's case, after a fall on the right side, symptoms of biliary obstruction and carcinoma began.

Symptoms.[1]—The most frequent symptoms and signs observed in the course of carcinoma of the gall-bladder are pain, jaundice, emaciation, cachexia, and the presence of a tumor. Digestive troubles, vomiting, constipation, diarrhœa, fever and ascites occur in a considerable number of cases, and are worthy of detailed study.

Pain.—This is a symptom the presence of which was noted sixty-two times. It was located in the right hypochondrium twenty-five times; in the epigastrium, seventeen times; in the abdomen, nine times; in the hepatic region and the right side, four times; in the right shoulder, three times; in the back, twice; in both hypochondria, and at the umbilicus, once each. It was associated with tenderness in the right hypochondrium or liver, nine times, and was increased by movement or position. In nine instances it was colicky; in three, lancinating; in four, paroxysmal; sixteen of varied character; in three instances, dull; and in four constant. In two instances pain unqualified was noted, and in two it was noted as

[1] It should be remembered that in a small percentage of the cases, particularly those of Zenker, there is no record except of the autopsy. It may be assumed, therefore, that the symptoms noted below occurred more frequently than the numbers I have given indicate.

absent. In a very large proportion of the cases the pain was preceded by a sense of weight or uneasiness in the right hypochondrium. Certainly the pains increased in frequency and severity as the disease progressed. The abdominal pain above noted was due in nearly every instance to peritonitis, so that practically pain in the right hypochondrium or epigastrium of a colicky or lancinating nature is seen in the larger number of cases of cancer of the gall-bladder.

Jaundice.—Reported in sixty-nine cases. Characterized as slight in six cases; transitory, in one; recurring, in one. In fifty-eight instances, however, the jaundice gradually increased in severity until it presented the characteristic olive-green or deep yellow appearances of chronic icterus. In a few instances it developed less than one month before death, and in three less than three months. The jaundice was due to the new growth in the ducts, the presence of enlarged glands, or to catarrhal or purulent inflammation, or the results thereof, *i. e.*, adhesion of the walls. In two instances stones were impacted in the common or hepatic duct, and in one instance the hepatic ducts were dilated on account of the passage of a gall-stone a few days before death (Kohn). Accompanying the jaundice in its final stages, delirium in three, and coma in five instances were observed. Itching is noted three times.

Emaciation.—Distinctly noted forty-four times, but no doubt much more prevalent, as will be seen later. Death often took place from acute complications before the disease had progressed very far. In Wagner's case the flesh was preserved; the patient (a woman) died of peritonitis. In twenty-two cases debility, weakness, or exhaustion are recorded.

Cachexia.—Noted in fourteen cases. The deep jaundice prevented the recognition of the characteristic cachexia very frequently, no doubt.

Vomiting.—Due to catarrhal gastritis, to pressure of external growths, or to secondary growths in the viscus, occurred in thirty-nine instances. Usually of the ordinary character, in three instances it was bloody, in one stercoraceous (LangHeinrich's, perforation of gall-bladder and colon, peritonitis). In Pepper's case there was bilious vomiting, no jaundice, and no bile in the stools. Pressure on, and occlusion of, the duodenum by the enlarged gall-bladder caused these phenomena. In two instances nausea without vomiting, and in five with it, took place.

Diarrhœa was present in fifteen cases, *constipation* in twenty-three. Diarrhœa occurred more frequently from other causes than perforation of the colon, as intimated by some.

The *appetite* was lost in fifteen instances, and *indigestion* marked in thirteen cases. These figures are small, no doubt, for these symptoms. Hiccough is recorded four times, ptyalism once, and dysentery once.

Fever. — The temperature was subnormal, or more frequently normal; eighteen had marked fever, in some a few days before death only, in others as long as one to four months. In three instances it was distinctly intermitting In every instance it was due to some complication, either inflammation of the bladder or ducts, peritonitis, or ulceration. If, therefore, this symptom arises in the course of the suspected disease, it is due to one of these causes. It could be due to a calculus impacted in the duct, no doubt, although such circumstance was not reported.

Ascites was noted in eighteen cases, and was almost always due to pressure on the portal veins, either by the primary growth or the lymphatic glands. In twelve instances there was œdema of the legs, and in two anasarca.

Hemorrhages were noted in seven instances. The hemorrhages were due to passive congestion from local obstruction, or to secondary growths, or were of the nature of such discharges in chronic jaundice, and occurred from mucous surfaces remote from the disease.

Tumor.—Sixty-eight times a tumor was discovered.

The following numbers represent the frequency of location in the positions indicated:

In the right hypochondrium or gall-bladder region	27 times.
Attached to the liver	10 "
In umbilical region	12 "
In the iliac fossa	4 "
In the flank	2 "
Near the pylorus	1 "

The positions of most frequent occurrence are, therefore, the right hypochondrium and the umbilical region. All the tumors that occurred in the umbilical region were thus placed because of enlargement of the gall-bladder, or enlargement of the liver. If the latter organ is en-

larged, a tumor in the umbilical region, particularly to the right of the median line, is probably an enlarged gall-bladder.

The size of the tumor was noted only thirteen times. From the descriptions one concludes that the organ was seldom larger than normal. It was said to vary in size from a hazel-nut to a child's head; of the latter three instances are recorded. In the course of the disease it may change. This is especially true if fluctuation has been previously detected. By ulceration the contents are discharged and the tumor disappears. One disappeared after a copious emesis of mucus and bile, the temporary occlusion having been removed. Sometimes they disappear temporarily on pressure (one case).

The tumor was movable as above or with respiration (two), movable on palpation (six), fluctuating (three), fixed (six), elastic (two), solid (eleven), smooth (three); in twenty-two instances hard or firm; in twenty-one painful or tender; in nine irregular, three of which are noted above among the "hard," and the remainder are presumably hard. Practically the tumor was movable in eight instances and fixed or firm in about fifty cases in which the character is recorded.

The shape was noted ten times: round (five), oval (one), pyriform (two), cylindrical (one), oblong (one). Two of the tumors are described as growing rapidly.

We may conclude, therefore, that a tumor in the right hypochondrium, or occasionally in the umbilical region, about the size of the fundus of the gall-bladder, hard and painful, and of indifferent shape, is found in cancer of the gall-bladder.

Liver.—During life the liver was found to be enlarged twenty-nine times, five of which times it was irregular or nodular, and four times it was of the same character, the size not being stated. The border was thickened (one), smooth (four), hard (three), and the surface tender (four). No significance attends change in the liver except enlargement. This is due to secondary growths or to dilated channels.

The clinical picture, therefore, of cancer of the gall-bladder is about as follows: The patient, usually a female past forty years, suffers for an indefinite time with a sense of weight or of uneasy sensations in the right hypochondrium or epigastrium. This is followed by pain, intermitting generally, for a variable period not sufficiently marked to call for local examination, but gradually increasing in frequency and intensity. Jaundice then develops, usually gradually, and upon its

occurrence examination is made of the hepatic region. A tumor is generally detected, the presence of which had not been suspected probably, occupying the region of the gall-bladder in health, or found below that region and to the right of the umbilicus. The tumor is usually small and hard, and painful on pressure. With the onset of jaundice, the symptoms of indigestion, which were present from the first, become more aggravated. Loss of flesh and loss of strength are then noted, and with the persistence of the jaundice its usual deleterious secondary phenomena are induced. In the larger majority of cases these symptoms continue with the final termination of the case, and death is caused by exhaustion or by cholæmia, or by intercurrent disease. In quite a number of cases, however, other phenomena may occur in the course of the disease, the symptoms above noted being essential. Thus, in some cases, the fever commences at first about the middle period of the disease and continues to the end, either being intermitting or of continuous character, and always due to the presence of inflammatory complications. Vomiting may be one of the important and persistent symptoms, particularly if there is noted marked increase in the size of the tumor. Constipation, often present throughout the course of the disease, is naturally expected. Diarrhœa attends quite a number of cases, and its onset after an attack of increased pain and local tenderness in the gall-bladder region, associated with fever, is often caused by the occurrence of ulceration between the colon and the gall-bladder. In a few cases ascites is noted and its occurrence as an accidental complication must be remembered. Throughout the course of the disease the liver usually remains about the normal size.

Diagnosis.—The diagnosis of this affection presents the same difficulties that arise in an attempt to recognize any chronic affection of the organs and tissues in the upper central half of the abdominal cavity. Early in the history of the case it is impossible to make a positive diagnosis, while even in its full development the difficulties often are not much lessened. But by attention to the perfect evolution of the disease, as indicated in the symptomatology, coupled with a consideration of its frequent etiological associations, and with exclusion (by the customary means, and by recent methods of clinical research in gastric diseases) of disease of the surrounding viscera, carcinoma of the gall-bladder can be more than strongly surmised.

Not much can be learned from the pardonable errors of writers or

the difficulties that they encountered in their observation of this disease. One can readily appreciate their difficulties, however, and easily understand how the disease can be confounded, as it has been, with cancer of the pylorus, with cancer of the liver, and with an ovarian tumor, when one remembers the extraordinary changes of position and structure which malignant growths of the gall-bladder may undergo. Even in the light of the clinical history with the autopsy, one can scarcely see how anything but the diagnosis of an ovarian tumor could have been made in Case XII. of the Table accompanying. In this instance, the gall-bladder was enormously distended, and adherent to the round ligament, occupying the position which ovarian tumors usually take in the abdominal cavity. In some few instances the tumor was mistaken for a floating kidney; the methods of differential diagnosis we will refer to again.

As aids to the diagnosis, we must first bear in mind the age and sex of the individual, and the prominent relation of gall-stones to this affection. They appear to be more striking factors in carcinoma of the gall-bladder than in carcinoma of any other organ in this neighborhood. Another minor, but important, fact in the differential diagnosis is the short duration of the case—the average duration, between six and seven months, is certainly shorter than in cases of carcinoma of the pancreas and carcinoma of the stomach.

Before attempting a differential diagnosis of the various affections with which this disease may be confounded, let us consider the prominent symptoms of cancer of the gall-bladder, and determine, if possible, if there are any characteristics of them that pertain particularly to this affection. Pain is the first and most prominent of these, but does not differ from pain due to any other disease in this neighborhood, and is especially allied to the pain of carcinoma of other organs; of itself, therefore, save in location, it is not a valuable diagnostic factor. Nor is jaundice of itself of much value. It indicates that there are obstructions in the biliary passages, but of the nature of these its occurrence gives no clew. Emaciation is common to most of the affections of a chronic nature here found, and it, too, is not of any value. The occurrence of fever is only an index of the occrrrence of processes secondary to the malignant growth—processes, too, which may occur secondarily to any obstruction of the biliary passages. In it, likewise, we see no positive value from a diagnostic standpoint. The cachexia,

which is insisted upon by so many authors as presenting a valuable aid to diagnosis, simply indicates, if its presence can be determined, that there is malignant disease, the exact nature of which, however, it does not, of course, determine. Indigestion, loss of appetite, the vomiting that possibly occurs, are likewise of small diagnostic value. The occurrence of the tumor is certainly the only distinctive condition of this affection which may be studied independently or without association with the other symptoms. Singly, therefore, the symptoms just enumerated are of no value whatsoever; but grouped together, observing their association in the proper relationship which we indicated under the symptomatology, they are of value, and only in that way.

A word further, however, regarding malignant tumor of the gall-bladder and tumors with which it is confounded. The size and shape and the position of the former tumor must be borne in mind. It frequently changes in position as adhesions form, and sometimes in shape, as when perforation takes place. Thus, a tumor found early in the right hypochondrium, may later be found in the epigastrium or about the umbilicus. At first smooth and fluctuating, it may diminish in size and become hard and irregular. Usually noted as fixed, it is sometimes quite movable. It may contain bile or calculi, or simply the clear fluid, the accumulation of which is known as hydrops vesicæ felleæ.

If the tumor is believed to be the gall-bladder, one must distinguish between enlargement from an accumulation of its contents, and enlargement of the organ from disease of its walls. The tumor due to the accumulation of fluid occupies a similar position, but is generally much more movable than tumors due to cancerous disease. Their characters have been frequently dwelt upon. They are usually painless, and the nature of the fluid can be determined by the aspirator. Dropsy of the gall-bladder occurs from obstruction of the cystic duct, which may be due to a stone or to the inflammation that follows the passage of a calculus, or to an adherent inflammation which attends some forms of chronic catarrh of the ducts. It may attain a large size, and, indeed, is usually of larger size than in cancer, is painless, and is generally, although not necessarily, associated with the symptoms of obstruction of the hepatic and common ducts. A history either of gall-stones, or

in the writer's experience, more frequently of catarrh of the ducts, antedates the development of the tumor.

The exact nature of a tumor of the gall-bladder can be more definitely ascertained by means of aspiration, and by determining the nature of the fluid contained in the viscus an idea can be formed of the morbid process. The presence of stones can be ascertained, if the gall-bladder is enlarged from that cause, by means of the aspirating needle, too, or by a probe introduced through a canula, as has been previously described by various writers. One must remember, however, that calculi are present in cancer of the gall-bladder in the various relations previously described, and, therefore, the presence of a stone, as detected by a needle, does not necessarily exclude carcinoma. Moreover, one can readily be deceived by this means of exploration, for the hard scirrhous masses very frequently give to the hand the same sensations of hardness, and even the same character of sound, that one gets with stone. The calculi often by palpation move upon themselves, causing a peculiar grating sensation, and even a rubbing sound can be created, and the tumor caused by their accumulation is hard and rough. The enlargement of the gall-bladder due to an accumulation of fluid is usually progressive, and more rapidly increases in size than a carcinoma.

One cannot possibly, from the physical characters of the tumor, determine the nature of the obstruction; for a carcinomatous mass small in size may obstruct the outlets of the flow of bile and cause this tumor formation. A clear fluid would indicate obstruction of the cystic duct, and, other symptoms being latent, such obstruction is in all probability due to inflammation with adhesion of the canal. Tumors containing bile indicate obstruction of the common duct, as by a calculus or by external pressure, the exact nature of which can only be ascertained by the history of the case and by the order of development of the different phenomena. Tumor of the gall-bladder may be due to purulent inflammation with accumulation of pus. The aspirator would reveal the nature of the tumor, while the phenomena of inflammation would contribute to its recognition. Of course, just such condition takes place in cancer of the biliary passages, is frequently an epiphenomenon, and, therefore, the presence of symptoms indicating it are weighed with the previous symptoms indicative of malignant disease of the gall-bladder. Just as in the other conditions indicated, the

nature of a tumor of the gall-bladder cannot be determined without studying also the general symptomatology and etiology in each individual case.

Having considered the characters of tumors of the gall-bladder, other affections which are associated with or are the cause of a tumor in the right hypochondriac or umbilical region must be excluded.

Jaundice from cancer of the pancreas is most common; the differential diagnosis between the two affections is of importance. On the whole, the presence of a tumor of the character of cancer in the region of the gall-bladder or to the right of the median line, would exclude cancer of the pancreas; in both a tumor is possible. In cancer of the gall-bladder its position is somewhat different; it is certainly superficial and is movable with respiration or with the movements of the liver. The tumor of cancer of the pancreas is deep-seated, in the median line more particularly, and fixed absolutely. Cancer of the pancreas is attended with fat in the stools in many instances, and is more frequently associated with ascites than is malignant disease of the gall-bladder. In both affections there is jaundice, emaciation, and cachexia. In both there is abdominal pain, but it is more commonly present in cancer of the gall-bladder. Dyspeptic symptoms appear, however, to be more marked in cancer of the pancreas, and particularly is vomiting of more frequent occurrence.

Cancer of the pylorus presents some symptoms in common with cancer of the gall-bladder. In cancer of the pylorus, however, jaundice is rare, while the tumor is likely to be in a different position, possibly more frequently near the umbilicus than in cancer of the gall-bladder, while it does not attain great size without much more marked gastric phenomena than occur in cancer of the gall-bladder. Pain attends both. In cancer of the pylorus it possibly has a more definite relation to the time of taking food. Usually dilatation of the stomach supervenes upon cancer of the pylorus, while chemical examination of the gastric juice or the matters washed out of the stomach may indicate the presence of cancer of that organ, or at least of organic disease.

Disease of the lymphatic glands in the portal fissure, the symptoms of which simulate cancer of the gall-bladder, may be determined by recognizing disease of these structures in other parts of the body, or of distant disease, as carcinoma or tubercle, which may lead to secondary disease in these glands. The tumor due to disease of the

lymphatic glands, which simulates the enlarged gall-bladder, of course only is of the same character as an enlargement on account of accumulation of fluid. The glands themselves cannot be made out by palpation. We can only suspect their presence, therefore, by the means just indicated. This presumption is made more probable by the absence of pain or of local tenderness. Tumors of the omentum and mesentery rarely, if ever, assume the position that tumors of the gall-bladder occupy. A tumor of the mesentery, for instance, does not occupy as limited an area, but will fill the umbilical region and extend into the epigastric or hypochondriac regions, while tubercular disease of the omentum causes a transverse tumor of the abdomen. They rarely produce jaundice, and are likely to be secondary to processes similar to disease of the lymphatic glands in the fissure. If tubercular, ascites is always present, and the general phenomena of tuberculosis, fever, sweats, etc. Tumors of the omentum, non-tubercular, are usually found in a lower position in the abdominal cavity, and if cancerous are associated with bloody effusions in the abdominal cavity. Cancer of the transverse colon may cause symptoms very much like those of cancer of the gall-bladder. Symptoms due to stenosis of the bowel would arise, however, early in the course of the former disease, while they do not occur in the latter. Then, too, the phenomena of each usually differ.

The enlarged and movable gall-bladder may be taken to be a floating kidney. Landau refers to such a case. Mears has recently had a case of tumor of the gall-bladder which was mistaken for a floating kidney; and once in the writer's experience a large, rather firm, rounded tumor in the gall-bladder region, movable on pressure, and after some prolonged pressure disappearing entirely for hours or even a day, when the patient was kept at rest, was thought to be a floating kidney. The tumor had all the characteristics of a solid tumor, but was due to an extremely distended bladder filled with bile, the duct being obstructed by a small secondary carcinoma. One can conceive considerable difficulty, however, in certain instances in the differential diagnosis, particularly in those cases of floating kidney which are attended with colic. The general condition of the patient, and the evidences of alteration in hepatic structure or function are to be considered.

For practical purposes, cancer of the gall-bladder need not be distin-

guished from *primary cancer* of the *liver*. It can, however, generally be so distinguished by the absence of enlargement of the organ, by the almost constant occurrence of jaundice, by the absence of general hepatic pain, and by the absence of the irregular outline or masses over the surface of the liver. In all probability primary cancer of the liver is of much rarer occurrence than cancer of the gall-bladder and bile-ducts. Ascites occurs more frequently in cancer of the liver than in cancer of the ducts. *Hydatid disease* of the *liver*, with or without rupture into the gall-bladder and ducts, presents no features in common with carcinoma of the gall-bladder. In both, it is true, the disease is chronic, in hydatid disease eminently so; in both there may be jaundice, in hydatid disease less frequently than in cancer; in both there is a tumor, in cancer more localized, smaller in size, and more painful. In cancer, emaciation, cachexia, and loss of strength go hand in hand, while in hydatid disease these conditions are absent. The associated etiological conditions are far different from those of cancer, while exploration with aspirator or trocar shows the presence of an encysted fluid which has the characters of a hydatid cyst. Hydatid disease of the gall-bladder or of the gall-ducts is usually accompanied by jaundice, by attacks resembling biliary colic, and is frequently associated with fever and with diarrhœa. After an attack of colic in hydatid disease the tumor lessens because of communication with the biliary passages, and the discharge of its contents into the intestinal canal. In cancer, the tumor lessens after a period of pain and fever similar to a local peritonitis. In hydatid disease the tumor usually returns; in carcinoma when it disappears it never returns.

In that peculiar disease known as multilocular hydatid disease there are symptoms very like the disease we are studying. There is found a hard nodulated tumor with intense and persistent jaundice, rapid emaciation and prostration, and ascites. The tumor of a multilocular hydatid does not occupy the region of the gall-bladder usually, but has the other characteristics of cancer. In almost all cases, however, this form of hydatid disease is associated with enlargement of the spleen, a condition always absent in primary cancer of the biliary passages. Of course, in this disease the age and sex and the evolution of the disease must be remembered.

The occurrence of fever, associated with a tumor or swelling in cancer of the biliary passages, might lead one to suspect the presence of ab-

scess of the liver. The absence, however, of jaundice in abscess of the liver, its rarity in this climate—except after ulceration in some portion of the portal area, which can frequently be determined—the enlargement of the liver, the different character of tumor, its increase in size, the entire disease progressing more rapidly, are points in favor of abscess of the liver.

Duration and Course.—The duration of carcinoma of the gall-bladder appears to be about six and two-thirds months. The shortest case was seven weeks, the longest alleged to be four years. It was not included in making up the average.

The course of the disease is uniformly and progressively downward, generally; in some its course is intermitting. The symptoms abate for awhile. The progress is modified by complications. Jaundice hastens the end, while the accidental occurrence of peritonitis is always fatal. In two instances death took place from perforation of the bladder into the peritoneal cavity, and in ten instances from peritonitis, and in two from perforation into neighboring organs. Cholæmia was the cause of death in eight instances, exhaustion in twenty-four, marasmus in two. Shock, dysentery, œdema of the lungs, acute pleurisy, and asthma complicated the affection, and were the immediate cause of death once each.

Conclusions.—1. Primary cancer of the gall-bladder is not as rare a disease as we have been led to believe.

2. It occurs in females nearly three times as often as in males.

3. The larger number of cases occur before sixty. It is not a disease of as late life as has formerly been taught.

4. Gall-stones are a possible exciting cause, especially in a person predisposed to carcinoma.

5. The organ is not generally much enlarged, save occasionally by the secondary process of dilatation.

6. Metastasis is not widespread, and by continuity of structure neighboring organs are involved.

7. Adhesion to adjacent organs, and ulceration and perforation are not common.

8. Pain, jaundice, emaciation, cachexia, and tumor are present in the largest number of cases; while indigestion, vomiting, constipation or diarrhœa, and ascites are of more frequent occurrence than most

persons think, and are important associate phenomena by means of which the disease is recognized.

9. Pain occurs in about 62 per cent. of the cases; at first ill-defined, it soon becomes localized to the right hypochondrium, and is lancinating in character.

10. Jaundice in about 69 per cent. of the cases; it gradually increases in intensity.

11. Tumor in about 68 per cent. of the cases.

a. Situated in:

1. The gall-bladder region.
2. To the right of the umbilicus.

When it is in the latter location the liver is usually enlarged.

b. Character:

1. Hard or firm.
2. Painful and tender.

12. The progress of the disease is almost always progressive, and toward a fatal termination.

13. Complications are due to:

1. Occlusion of the ducts and secondary effects on the liver and gall-bladder.
2. Ulceration and perforation of gall-bladder.
3. The symptoms that arise by metastasis in other organs.

14. Duration is short, the average being six and two-thirds months.

15. Death due to:

1. Exhaustion.
2. Peritonitis.
3. Metastasis to other organs.
4. Biliary obstruction.

Part II. Primary Cancer of the Bile-ducts.

Eighteen cases of carcinoma of the biliary passages confined to the ducts have been collected. In the series an actual history of hepatic colic was present in two, and in three a problematical one.

Age.—The average age of fifteen cases was 56.3-5 years. In three cases the age was not given. The oldest was 81; the youngest 35. Four occurred between 44 and 50, three between 51 and 58, three between 62 and 68, two between 72 and 74.

Sex.—There were 9 males and 9 females.

SYMPTOMS.—*Pain* was noted present in twelve cases, the duration of which continued, in individual cases, from one month to two or three years. In one case the patient was said to have had epigastric pain extending to the shoulder for ten years. Pain is one of the earliest symptoms observed. It is usually located in the epigastric region (six cases). In five the pain was present in the hepatic region or the right hypochondrium, and was either spontaneous or developed by pressure. The character of the pain varied. In one it was described as bilious colic; in another as cramp-like in the stomach; generally the pain occurred in paroxysms. It varied in intensity. In some only slight sensitiveness on deep percussion could be elicited. In one instance the pain varied at different periods of the disease (see Musser's case). Usually, however, while the most persistent, and the most frequent of all symptoms, it never created much disturbance. Of the five cases Dr. Delafield described, two had attacks of severe epigastric pain, the onset being accompanied with jaundice, and one had pain throughout the course of the disease. Paroxysmal pain, occurring particularly about the time of the development of jaundice, appears to be the most common symptom of this affection.

Jaundice is the most frequent symptom (seventeen times). In most instances its duration practically indicated the duration of the disease. The duration in twelve cases occupied the following number of months: 5, 6, 4, 5, 24, 6, 3, 15, 7, 3, $2\frac{1}{2}$, 18, 24, and 36 months. It usually deepened in intensity, and in four instances it was attended by itching. It terminated in coma in two cases, and delirium in three. In eleven instances in which the stools were described, ten presented the characters usual in jaundice, and one was black from blood. In Delafield's cases the jaundice developed rapidly, and progressed throughout the course of the disease, and it was the first symptom in all the cases. In three of his series the usual hemorrhages that attend chronic jaundice were present.

Tumor.—The statement of the occurrence of a tumor was made in 8 of the cases, and the position described to be as follows: in the right hypochondrium, in the region of the pylorus, in the right iliac region, opposite the umbilicus, in the right nipple line, and in the remaining instances in the gall-bladder region. It was described as hard, rounded, painless, twice, and three times it was stated to have the characteristics of an enlarged gall-bladder. In one it was first

found to be as large as a pigeon's egg, and then grew to that of a hen's egg, and was painful; in another it slowly increased in size while under observation. In two instances the tumor was only described as painful. In Delafield's cases a tumor could not be detected during life, and the autopsies showed that the infiltration of the bile-duct was not sufficiently large in any case to have been detected before death.

The liver was noted to be enlarged in eight cases, with pain and tenderness on pressure. In four the liver was not enlarged and its edge not felt. In three cases the surface and edges of the liver were particularly described as free from any nodulation.

Gastro-intestinal symptoms were marked in all the cases, as follows: Loss of appetite occurred in five of the cases; marked dyspeptic symptoms in four; vomiting in nine; nausea without vomiting in two; diarrhœa in two, and constipation in the same number. Hemorrhages from the gastro-intestinal tract were noted in two instances. As associated phenomena, in one case each, the following gastro-intestinal symptoms were noted; catarrh, bloody stools (due to jaundice probably), choleraic attack, and the symptoms of strangulation of the bowel. In two cases the abdomen was found to be much distended. The gastro-intestinal symptoms were the most marked in all of Delafield's cases, loss of appetite, nausea and vomiting occurring in each. In one instance hemorrhages took place from the stomach, but the three symptoms indicated, jaundice, pain, and particularly vomiting, are the most prominent symptoms of this affection. In seven of the recorded cases fever was present some time throughout the course of the disease; in four it was intermittent; in one irregular, "associated with phthisis"; in two the characters were not described, in one of which, at least, there was an intermitting form of fever, as it was described as occurring in the evening only. In the five cases of Delafield, febrile movement was noted in one only, and in that it was probably due to suppurative inflammation of the bile-ducts.

Pathological Anatomy.—In fourteen instances the common duct was involved in the disease—once with the cystic duct; in three instances the hepatic duct, and in one the hepatic and cystic together. In three of these cases the growth was seated at the duodenal orifice. The bile-ducts were dilated in nine cases. In brief detail the pathological anatomy of each case was as follows:

1. Common bile-duct distended and obstructed by medullary cancer growing from internal surface. Bile-ducts dilated.

2. Common bile-duct has encephaloid cancer near spur formed by union of cystic and hepatic ducts. Obstruction of canal.

3. Common bile-duct closed by a tumor. Bile-ducts dilated.

3. Common bile-duct at duodenal orifice obstructed by a cherry-sized tumor. Cylindrical carcinoma (?).

5. Common bile-duct at beginning has walnut-sized tumor surrounding portal vein and hepatic artery. Bile-ducts dilated.

6. Common bile-duct at duodenal orifice is surrounded by an irregular fungous growth. Bile-ducts dilated.

7. Hepatic duct and common duct thickened, firm walls, uniform yellow-gray. Common bile-duct collapsed but unaltered.

8 and 9. Common bile-duct carcinoma.

10. Dense whitish mass, no secondary deposits, occluded common and cystic ducts. Bile-ducts dilated.

11. Common bile-duct blocked by a soft, whitish, sprouting encephaloid cancer just below junction of cystic and hepatic ducts. Duct above enormously dilated.

12. Hepatic duct constricted by a cancerous growth. Ducts greatly dilated.

13. Common bile-duct entirely replaced by a soft whitish growth. Hepatic duct dilated. Bile-ducts enveloped by cancerous matter.

14. Common bile-duct has cancer at duodenal orifice, size small nut—a softened scirrhus. Bile-ducts enormously dilated.

15. Common bile-duct has, near junction of cystic and hepatic ducts, a cherry-sized tumor; walls infiltrated and contracted. Another hard tumor in track of hepatic duct.

16. Primary cancer bile-ducts with constriction of hepatic duct by scirrhous infiltration. Bile-ducts considerably dilated.

17. Scirrhus of hepatic and common ducts. Bile-ducts dilated.

18. Common bile-duct primary carcinoma, walls thickened, lumen occluded, secondary nodules in liver and head of pancreas. Cystic duct closed by cancerous mass.

Delafield states that in two of his cases the walls of the duct were the seat of cancerous infiltration alone; in two the new growth had extended to that portion of the pancreas immediately beneath the bile-duct, infiltrating its tissue to a moderate extent. In all the new

growth seemed to have originated in the mucous glands in the walls of the duct and had the characters of an epithelial cancer with cells of the cylindrical variety. In one of the cases there was catarrhal inflammation of the bile-ducts with suppurative inflammation of the adjacent liver tissue, producing small abscesses.

Gall-bladder.—The gall-bladder was dilated and distended in eight cases, and contained calculi in seven. It was atrophied in one; occluded in one; and adherent to the pancreas in one, and the seat of some suppurative inflammation in two. Delafield found dilatation of the gall-bladder in only one of his cases.

Liver.—Gall-stones were found to be present in four cases. The organ was enlarged in eight of the cases and the seat of secondary deposits in seven. This enlargement was most common in Delafield's cases (four out of the five). The changes in the ducts have been mentioned.

Metastasis.—As just indicated, in seven instances secondary growths were found in the liver, in one each in the mesenteric glands, the peritoneum, and the pancreas. It is worthy of note that metastasis to distant organs does not take place save rarely. In the combined lists of cases, in one only were secondary growths found outside of the abdomen. In this instance, a case of Delafield's, the growth was found in the lungs.

The Cause of Death.—Death usually takes place from exhaustion, one-half of the cases being thus recorded. Jaundice, as previously noted, was of course the cause of the fatal termination in two cases by coma, and the effects of the jaundice, namely hemorrhages, caused death in one. Accidental complications, as pneumonia, pericarditis, œdema of the lungs, and ascites were noted to be the cause of death in four of the cases.

The symptoms of primary cancer of the gall-ducts are the symptoms of obstructive jaundice. It is seen that jaundice is the symptom common to all. Vomiting is next in the order of frequency. Pain, a tumor containing bile, and gastro-intestinal symptoms occur in all forms of obstructive jaundice and are not significant. No general symptoms arise to lead one to suspect the presence of a malignant tumor, or they are masked by the jaundice.

Hence it is difficult, in fact well-nigh impossible, to recognize the disease. By exclusion, obstructive jaundice due to external pressure may be eliminated. But jaundice, after a cicatrix in the bile passage,

or in cases of adhesive inflammation, has common symptoms. Practically, jaundice due to calculi is the most important form to recognize. Attention to the previous history and to the mode of onset of the disease is important, as well as attention to the well-known phenomena of impacted gall-stone.

Conclusions.—The conclusions regarding the disease are more striking when compared with similar conclusions from cases of cancer of the gall-bladder.

1. Carcinoma of the bile-ducts is less frequent than cancer of the gall-bladder.
2. Unlike cancer of the gall-bladder it occurs equally in both sexes.
3. The age of both is about the same.
4. Gall-stones are less frequent when the ducts are the seat of the disease.
5. The gall-bladder is not much enlarged and only by dilatation.
6. Metastasis is not common and not distant.
7. Adhesions and ulceration and perforation do not occur.
8. Jaundice, vomiting, pain, and gastro-intestinal symptoms are the most common.
9. Jaundice is more frequent in the second than in the first series of cases.
10. The last symptom mentioned contributes largely to a cause of the short duration of the disease.
11. The sequelæ of jaundice and accidental or intercurrent diseases are the cause of death.
12. A tumor is present in a smaller ratio of cases than when the gall-bladder is the seat of disease. It is never as large as in cancer of the gall-bladder.

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APPENDIX.

Abstracts of Cases of Primary Cancer of the Gall-bladder.[1]

Case I.—Female, age seventy-two. Encephaloid. Colic and diarrhœa; after a fall a painful tumor in flank; pains in right hypochondrium; slight jaundice. Course indefinite. Duration two months. Shock and debility. Gall-bladder large, hard, rough. An encephaloid mass adherent inside. Twenty calculi. Durand-Fardel, *Archiv Gén. de Méd.*, Paris, 1840.

Case II.—Female, age seventy-one. Encephaloid. Slight jaundice. Round, indolent, slightly movable tumor at lower border of liver in the region of the gall-bladder. Course latent. Death from acute pleurisy. Encephaloid growth at the fundus of the gall-bladder. Small black calculi in gall-bladder, which was of the size of a hen's egg. First case quoted by Villard (op. cit.). Duthier and Notta, *Bull. Soc. Anat.*, Paris, 1847, xxii. 335.

Case III.—Female, age sixty-one. Encephaloid. Darting and wandering pains; sensations in right hypochondrium; anorexia; emaciation; vomiting; constipation; jaundice one month. Painful smooth tumor sixth rib to crest of ilium. Pulmonary symptoms. Œdema of feet. Several months' duration. Death from marasmus. Liver olive-green; numerous secondary nodules; ducts dilated. Walls of gall-bladder thickened. Cavity containing dark liquid and fungous growth. Walls ulcerated. Cystic duct involved; canal obliterated. Second case of Villard. Icery, *Bull. Soc. Anat.*, Paris, 1853, xxviii. 73.

Case IV.—Female, age seventy-four. Encephaloid. Pain in right hypochondrium; slight jaundice; liver enlarged three fingers below short ribs. Tumor in cæcal region of great mobility. Duration less than one year. Debility. Liver filled with secondary nodules size of walnut. Walls of gall-bladder thickened and involved in the disease. Formed by fungoid growth which constituted tumor in life. Mobile; two calculi in gall-bladder. Obstruction by pressure of a lymphatic on duct. All the ducts pervious. In the discussion MM. Lebert, Durand-Fardel, and Maillot thought that calculi cause carcinoma, and Deville, Broca, and Demarquay opposed this view. Rippoll, *Ibid.*, 1849, xxiv. 359.

Case V.—Female, age thirty. Encephaloid. Tumor hard, round, irregular, slightly movable in right hypochondrium. Jaundice two months. Vomiting greenish fluid. Diarrhœa after constipation. Œdema of legs. Emaciation; debility. Duration indefinite. Under observation three months. Death from debility. Gall-bladder infiltrated; cavity reduced to pouch 0.5 inch long, containing gall-stone. Inner surface ulcerated. Adherent to duodenum with perforation. Secondary deposits in liver. Ducts dilated; cystic, cancerous; hepatic and common normal. Paulicki raises the question of relation of carcinoma to gall-stones. Paulicki, *Berlin. klin. Wochenschrift*, 1867, p. 348.

Case VI.—Female, age forty-eight. Encephaloid. Pain in abdomen and right hypochondrium. Tumor elevated, fixed, not knotty, attached to the liver. Rigors, fever at first, jaundice second; ascites, œdema; œdema of feet; albuminous urine. Vomiting occasional; constipation. Duration two and a half years. Death from peritonitis. Œdema of lungs; acute peritonitis. Bile-ducts in left lobe dilated; few in right. Gall-bladder the size of an apple; adherent to colon and communicating. Fibrous and soft semi-liquid red-gray textures and twenty stones in bladder; one in intestine. Coraza, *Schmidt's Jahrbücher*, 1873, Bd. 160.

Case VII.—Female, age forty-nine. Encephaloid. Increasing debility; pain violent and acute; tenderness in right hypochondrium. Bilious vomiting; jaundice; constipation; anorexia; rigors; fever; coma. Duration eight months. Death from cholæmia. Liver hypertrophied and infiltrated with bile. Gall-bladder destroyed and replaced by encephaloid growth which invaded cystic, hepatic, and common ducts and adjacent liver, pancreas, stomach, and duodenum; latter perforated. Henrot and Chatelin, *Bull. Soc. Méd. de Rheims*, 1874, xiii. p. 22.

Case VIII.—Female, age thirty-eight. Encephaloid. Emaciation; pain in lumbar region and end of right floating ribs. Tender in these locations. Vomiting; jaundice; liver normal; fever one month. Duration three months. Death from exhaustion. Liver green color; ducts dilated, secondary masses. Gall-bladder replaced by a tumor adherent to duodenum and communicating; in centre of which a cystic pouch containing mucus and calculi, adherent to vertebral column, turning vena cava out of course. Lymphatic involvement; common duct destroyed. Remy, *Bull. Soc. Anat.*, Paris, 1875.

Case IX.—Female, age thirty-four. Encephaloid. Emaciation; pain in hepatic region and tenderness; weakness; pallor; some fever; at first severe diarrhœa and vomiting. Smooth

[1] In the arrangement of the abstracted cases, the following order is observed when the appropriate facts are indicated in the original: sex and age, character of carcinoma, symptoms, duration, and cause of death, record of autopsy, reporter and reference. The cases had been arranged in tables and when changed to this form the headings of the columns were omitted.

tumor in right hypochondrium; liver enlarged. Duration four months. Death from exhaustion. Gall-bladder enclosed in an encephaloid growth; atrophied; reduced to a cylindrical canal the size of a little finger; ducts normal; liver enlarged; secondary deposits. Cowy, *Bull. Soc. Anat.*, Paris, 1878.

Case X.—Male, age fifty-six. Encephaloid. Emaciation; jaundice; hepatic pains; vomiting and purging. Liver enlarged; tumor painful, immovable, in region of gall-bladder connected with liver; ascites; œdema; color of feces restored before death. Duration three months. Death from exhaustion. Liver enlarged; secondary nodules; gall-bladder destroyed by cancerous ulceration; communication of resulting cavity with transverse colon. Murchison, *Dis. of Liver*, second edition, 1877.

Case XI.—Female, age forty-nine. Cylindrical carcinoma. Three years before, while in good health, suddenly had cramp-like pain in gall-bladder region, which was frequently repeated. Painful swelling in right hypogastrium, redness of skin, perforation. Over one hundred gall-stones evacuated. After persisting a year opening closed, but soon two new ones opened and discharged stones. Repeated colicky pains. Latterly pain changed in character, and became more continuous, dull, and boring in character; then epigastric pain and vomiting, jaundice, etc., stools white and dry. On admission a carcinomatous ulcerated surface upon the skin, and beneath a lumpy tumor in gall-bladder region; cachexia. Contracted carcinomatous gall-bladder containing a gall-stone the size of a cherry-stone. Secondary carcinomata of pylorus, abdominal walls, and inguinal glands; dilated stomach; ductus choledochus occluded but not obliterated; epithelial biliary fistula. Quetsch, *Berlin. klin. Woch.*, 1885, xxii. 672.

Case XII.—Female, age fifty-eight. Encephaloid. Tumor fourteen years in right inguinal region; pains in back, right side, and epigastrium. Liver dulness continuous with tumor in right lower side of abdominal cavity; immovable; fluctuating. Emaciation; jaundice; itchiness; anorexia; constipation; fever. Tumor seemed attached to uterus by pedicle; irregular in outline and tuberous, soft, crackling on palpation; sudden diminution in size, but mass in right hypochondrium again enlarged. Duration actually seven months. Death from exhaustion. Diagnosis before death—ovarian tumor. Cancer of neck of gall-bladder, and lymphatic glands in portal fissure. Hepatic ducts compressed; secondary deposits in liver; enormous distention of gall-bladder and hemorrhage into it; adhesions to colon and round ligament; gall-stones. Osler and Bell, *Canada Med. and Surg. Journ.*, April, 1877; *Path. Rep. Mont. Hosp.*, 1877.

Case XIII.—Female, age sixty. Encephaloid. Pains in right hypochondrium; jaundice indigestion; ascites; œdema. Liver not enlarged; surface irregular. Peritonitis. Emaciation; cachexia. No previous biliary colic. Duration three months. Death from peritonitis. Diagnosis before death—cancer of the liver. Gall-bladder replaced by a pouch the size of a turkey's egg; adherent to colon with perforated walls containing pus and gall-stones. Cystic duct closed; others permeable. Secondary deposits in liver and mesentery. Leroux, *Prog. Méd.*, 1880, viii.

Case XIV.—Age sixty-three. Encephaloid. No history. Gall-bladder size of a man's fist; thickened; composed of two pouches, one containing calculi, the other carcinomatous partially liquefied masses. Chiari, *Bericht der K. K. Krankenanstalt*, Wien, 1879, p. 484.

Case XV.—Female, age fifty-nine. Encephaloid. Increasing abdominal swelling for five years; troublesome only for two months. Gall-bladder infiltrated and surrounded by a mass of medullary carcinoma. Cystic duct obliterated; gall-stones. Duodenum compressed and walls infiltrated. Lumbar glands and liver by contiguity only secondarily affected. Stomach dilated. Peritoneum and pleura affected. Moore, *Trans. Path. Soc.*, London, 1880, xxxi. p. 138.

Case XVI.—Female, age thirty-seven. Encephaloid. Long-continued intermitting fever epigastric and hepatic pains; jaundice; liver and spleen enlarged; emaciation; nausea; vomiting green-yellow fluid; constipation; exhaustion; no tumor. Death from exhaustion. Liver normal size; ducts dilated and seat of purulent inflammation. Gall-bladder normal size; the cystic end involved in disease; wall three-quarters of an inch thick; gall-stones; no obstruction in common duct. Musser, *Trans. Path. Soc. Philada.*, 1881.

Case XVII.—Female, age seventy-eight. Encephaloid. Symptoms of internal strangulation. Death from ulceration and perforation of gall-bladder. Gall-bladder cancerous, adherent to duodenum and colon and communicating; gall-stones in gall-bladder and in ulcer. Cruveilhier, *Anatomie Pathologic.*, 1852, ii. 547.

Case XVIII.—Female, age seventy-two. Encephaloid. Jaundice; intermitting fever; tumor; liver enlarged; vomiting; hemorrhages. Walls of gall-bladder thickened, cancerous, adherent to duodenum, containing pus, gall-stones, and cancer débris with gall-stones in it. Charcot, *Obs.* XVI., of Villard; *Cancer primitif des voies biliares.*

Case XIX.—Female, age fifty-six. Encephaloid. Emaciation; weight in abdomen on exertion for two or three years. Tumor in right hypochondrium opposite navel the size of a goose's egg; movable; hard; tender; rapid growth. Pain increased by any movement; peculiar ptyalism. Gall-bladder adherent to duodenum; posterior wall very thick, firm, but not hard; light yellow. In contracted cavity ninety-nine friable gall-stones and a creamy fluid. Cystic and pancreatic ducts obliterated. Pancreas, liver, and duodenum secondarily diseased. Stokes and Foote, *Dublin Quart. Journ. of Med. Sci.*, 1865, xxxix. p. 218.

Case XX.—Female, age seventy-five. Scirrhus. Vomiting red liquid; nausea; no jaundice. Liver large; outline regular. Tumor in epigastrium. Adynamia from catarrhal pneumonia. Course like gastric cancer. Liver healthy; epigastric tumor a mass in left lobe of liver. Gall-bladder made of pouches adherent to colon; tumor in it; grumous fluid and gall-stones. No cystic canal. Hepatic duct had bile. Durand-Fardel, *Archiv. Gén. de Méd.*, Paris, 1840.

Case XXI.—Female, age seventy-six. Scirrhus. Pain dull and also lancinating; increased by pressure. Tumor size of a chicken's egg in right iliac fossa; hard; irregular; continuous with liver; immovable; jaundice. Duration four months. Death from peritonitis and marasmus. Tumor size of two eggs, formed by gall-bladder, a smooth, hard surface; irregular,

immovable. Contents thick gray fluid and twenty calculi. Cystic duct narrowed; hepatic and ductus choledochus normal; secondary deposits in liver near gall-bladder. Early in the case the tumor felt on certain motion and by pressure only. Durand-Fardel, *Ibid.* Case IV. of Villard.

Case XXII.—Female, age sixty. Entered hospital August 27, 1879, for pronounced icterus, digestive troubles, and cachexia. Had been sick only two months; pain in right hypochondrium, local for one month, and then extended to whole belly, which swelled. Three weeks ago (August 1st?) jaundice; later œdema of limbs, digestive troubles, great emaciation. Liver enlarged, surface uneven, great ascites. Death September 14th. Duration two and a half months. Scirrhus of walls of gall-bladder; calculi; secondary deposits in liver. No alterations in stomach, duodenum, or colon. Cystic duct impermeable. Cancerous infiltration of omentum. Purulent and fatty matter in common duct. Scirrhus. H. Leroux, *Progrès Méd.*, 1880, viii. 390.

Case XXIII.—Female, age fifty-eight. Scirrhus. Emaciation; ascites; jaundice. Pain all over abdomen then in right hypochondrium and epigastrium. Tumor; constipation. Death from exhaustion. Gall-bladder normal size; walls infiltrated; contained liquid like serum and gall-stones. No trace of bile. Ductus choledochus obliterated; hepatic ducts dilated. Case XI. of Villard. Corvisart and Broca, *Bull. Soc. Anat.*, 1848.

Case XXIV.—Female, age sixty-nine. Scirrhus. Exhaustion; jaundice; vomiting; diarrhœa; hemorrhages, intestinal chiefly. Pain in right hypochondrium; delirium. Duration three months. Death from cholæmia. Walls of gall-bladder thickened and indurated, white-colored; scirrhous; gall-stones and mucus in gall-bladder. Mahieux, *Ibid.*, 1853, xxviii. 180.

Case XXV.—Female, age fifty. Scirrhus. Cachexia; emaciation; vomiting; constipation; pain in epigastrium. Tumor immovable, indurated; tender; midway between ribs and umbilicus. Duration nine months. Death from exhaustion. Gall-bladder converted into a mass 4 inches long and 1.5 inch thick; mucus in contracted cavity; liver normal; pancreas indurated. Pepper, *Amer. Journ. Med. Sci.*, 1857, p. 18.

Case XXVI.—Male, age sixty-five. Scirrhus. Fourteen days before death abdomen swollen and painful; peritonitis. Pain in right hypochondrium, paroxysmal; vomiting; delirium. Peritonitis. Death from exhaustion. Gall-bladder replaced by an elongated oval body rough and uneven, in cavity of which gall-stones. Enlarged spleen; liver small; intestines slightly affected. Wagner, *Archiv der Heilkunde*, Leipzig, 1863.

Case XXVII.—Female, age twenty-eight. Scirrhus. Pain one-quarter hour before taking food. Vomiting of blood. Tumor hard, near pylorus. Jaundice six weeks. Diagnosis—cancer of pylorus. Duration four months. Gall-bladder size and shape of a pear; hard; cavity contracted on eight gall-stones; adherent to duodenum; stomach dilated. Case XVII. of Villard. Markham, *Trans. Path. Soc. London*, 1857, viii. p. 243.

Case XXVIII.—Female. Scirrhus. Cachexia; anæmia; jaundice, not in conjunctiva, lancinating pain in right hypochondrium; constipation. Tumor in region of gall-bladder, size of a fist, attached to the liver. Gall-bladder contained mucus and 167 calculi; walls of gall-bladder and cystic duct thickened and indurated; bile-ducts and ductus choledochus contained gall-stones; liver cystic and secondary deposits in epiploon. Case IV. of Villard. Prompt, *Bull. de Soc. Anat.*, 1866, xi. pp. 374–5.

Case XXIX.—Female, age fifty-three. Cylindrical epithelioma. Admitted March 16, 1886. Past two months began with pain in the stomach, lost appetite, and emaciated; skin dry; no jaundice; cachectic, emaciation; no vomiting, but nausea, anorexia, constipation. Stomach uniformly enlarged and sensitive; pain most intense at and under umbilicus. Liver enlarged and tumors; one felt in right flank, painful, hard; one felt under umbilicus. Rapid increase of cachexia; sudden death. Duration two and a half months. March 29th: Liver, weight 2 kliogrammes 750 grammes; encephaloid tumor in right lobe corresponding to gall-bladder; numerous smaller ones throughout liver. Gall-bladder enormously distended; calculi at origin of cystic duct; calculi in cavity; cylindrical-celled epithelioma. Blocq, *Prog. Méd.*, 1886, 25, iv. p. 638.

Case XXX.—Female, age sixty-five. Cylindrical epithelioma. Emaciation; epigastric and renal pains; vomiting; constipation and diarrhœa; jaundice. Tumor in right hypochondrium, painful, hard, irregular movable; attached to liver; pulmonary symptoms. Duration seven and a half months. Lower portion of gall-bladder adherent to liver and the seat of encephaloid; contiguous portion of liver affected, but other parts free; gall-stones; tight-lacing liver. Mulot, *Bull. Soc. Anat.*, 1882, vii. p. 171.

Case XXXI.—Female, age fifty-six. Cylindrical epithelioma. Anorexia; vomiting occasional, then persistent; pain in epigastrium, then in right hypochondrium constant; emaciation; anæmia. Tumor rounded, firm, tender; attached to liver; delirium. Duration nine months. Death from exhaustion. Site of gall-bladder occupied by a mass the size of a cocoanut, with a cyst on the surface containing calculi and mucoid fluid. Liver and peritoneum affected by contiguity; no other deposits. Coupland, *Trans. London Path. Soc.*, 1880, xxxi.

Case XXXII.—Male, age sixty-three. Cylindrical epithelioma. Intermitting fever at the beginning and latter two months; anorexia; constipation; enlarged and tender liver; jaundice; emaciation; enlarged veins over liver. Intermitting pain at first. Duration fifteen weeks. Death from debility. Extremity of gall-bladder and neighboring tissues cancerous; gall-bladder contained green watery fluid and gall-stones. Hepatic ducts dilated; abscesses in their walls; two secondary masses in right lobe. Heart, lungs, spleen, and kidneys normal. Salisbury, *Chicago Med. Journ. and Exam.*, 1879, xxxix.

Case XXXIII.—Female, age forty-two. Cylindrical epithelioma. Cachexia; anorexia; vomiting; diarrhœa; then constipation; jaundice; ascites. Nodular tumor to right of navel, later fluctuating; atrophied liver; tumor softened. Coma; Bright's disease. Duration thirteen weeks. Cause of death cholæmia. Gall-bladder dilated and filled with mucoid fluid; gall-

stones. Toward cystic duct malignant infiltration ulcerated inside; cystic duct not found. Lumen of common duct obliterated by pressure of glands. Kraus, *vide infra*, No. 61; *Deutsches Archiv für klin. Med.*, Leipzig, 1883.

CASE XXXIV.—Female, age forty-seven. Cylindrical epithelioma. Pain first right side of abdomen; then right hypochondrium and right shoulder. Cachexia, abdominal swelling, and three tumors: first, region of navel; second, to right and above; third, region of gall-bladder; solid, firm, attached to liver; vomiting; constipation; jaundice; coma. Duration seven months. Cause of death cholæmia. Liver double size; brown-red and parts green; several nodules; gall-bladder size of a goose's egg, filled with gall-stones and thin fluid; ductus choledochus dilated and filled with stones and fluid; at fundus of gall-bladder tumor size of an apple, ulcerated inside. Kraus, *Ibid.*

CASE XXXV.—Male, age thirty-five. Cylindrical epithelioma. Began Christmas, 1887, with great pain in stomach and liver regions, shooting to back, and soon associated with meteorism and constipation. Admitted March 1st: Emaciation, icterus, no œdema, but cachexia. Digestive disturbances. No tumor demonstrated, but palpation of stomach and liver regions painful. Constipation, hard brown stools, acid eructations, hiccough. Death March 4. Duration two and half months. Flat ulcer on vocal bands; communication between colon and common duct; gall-bladder adherent to right lobe of liver and much shrunken; walls ½ cm. thick, dense, ulcerated over inner surface; gall-bladder goose-egg size, plaster-like contents; dense cancerous tissue in ring-shape encircling the cavity of the gall-bladder; numerous secondary abscesses in liver. Philipp, *Inaug. Diss.*, Greifswald, 1888.

CASE XXXVI.—Female, age fifty-two. Cylindrical epithelioma. Sudden onset, icterus first two and a half months. Pain in right side; then both hypochondria; and, finally, in right hypochondrium; urine tinged. Liver not enlarged—irregular. Tumor in right hypochondrium, hard and tender; aspirated three times, fifteen quarts removed. Emaciation, ascites. Duration five months. Death with cancerous cachexia, pallor, emaciation, pain, apyrexia. Gall-bladder distended, forming a soft, whitish, pulpy mass, containing several irregular cholesterine calculi. Gall-duct free; secondary epithelioma of liver and peritoneum with cysts. Kidneys slightly atrophied. Heart and lungs normal; spleen small; ascites. Lermoyez, *Le Progrès Médical*, 1884, p. 1095.

CASE XXXVII.—Female, age seventy-two. Colloid. Bilious vomiting and diarrhœa over one year; jaundice one month. Tumor irregular, under border of ribs; size of an hen's egg; pains in right hypochondrium. Jaundice rapidly developed; tumor. Diagnosis—hepatic cancer. Duration one year. Death from marasmus. Gall-bladder a rough, firm tumor, size of a child's fist, filled with colloid cancer, adherent to colon and communicating; no cystic duct; calculus in gall-bladder. Liver normal; ducts dilated. Durand-Fardel, *Op. cit.*

CASE XXXVIII.—Female, age sixty-three. Colloid. Jaundice rapidly developed. Tumor. Gall-bladder carcinomatous and adherent to colon, which is similarly affected. Fistula between colon and gall-bladder. Cruveilhier, *Op. cit.*, p. 543.

CASE XXXIX.—Female, age sixty-six. Colloid. Emaciation; jaundice; anorexia; hiccough; nausea; scanty and ashen dejecta; pain in right hypochondrium, intermitting, then constant. Rapidly growing tender tumor in right hypochondrium. Slight fever. Duration about three months. Gall-bladder as large as a man's hand, rigid, nodulated, thickened walls; interior gelatiniform cancer, gall-stones; light yellow, velvety vegetations; bile-ducts "in their totality" similarly affected; other viscera normal. No hereditary disease. Case VI. of Villard. Villard and Bourneville, *Bull. Soc. Anat.*, Paris, 1869.

CASE XL.—Female, age sixty-eight. Colloid. For six weeks anorexia; constipation; pain. Irregular nodulated tumor, tender, at lower border of liver; abdominal distention; jaundice. Duration one year. Gall-bladder enlarged; walls thickened; contents mucous fluid and gall-stones; part of mucous membrane healthy; ducts obstructed; colloid masses over surface of liver. A few deposits in lungs and kidneys. Cornil and Charcot, *Mém. de l'Acad. de Méd.*, t. xxvii. p. 349.

CASE XLI.—Female, age sixty-six. Colloid. Seat in gall-bladder and bile-ducts. Personelle, Villard's Table.

CASE XLII.—Female, age sixty-two. Villous. No clinical history. Gall-bladder enlarged five inches, pear-shaped; walls infiltrated; cauliflower excrescences, white or vascular; gall-stones, one in ductus choledochus, obstructing it; ducts dilated. Heschl remarks that he has observed two other cases of villous cancer of the gall-bladder with gall-stones during the year. Heschl. *Zeitschrift der K. K. Gesellschaft der Aerzt zu Wien*, 1852, p. 251.

CASE XLIII.—Male. Encephaloid. Jaundice, which disappeared; emaciation; vomiting. Tumor, size of a child's head, in umbilical region to right of median line, soft, then hard. Liver enlarged. Symptoms followed a fall. Gall-bladder enlarged, communicating with colon, and fecal peritoneal abscess; villous excrescences from inner surface of gall-bladder. Secondary deposits in liver. Moxon, *Trans. Path. Soc.*, London, 1867.

CASE XLIV.—Male, age four. Villous. After a fall, one year previous, abdomen began to swell. Vomiting; emaciation; tumor about gall-bladder; tapped and pus and blood drawn off. Duration one year. Cyst size of a child's head, due to dilatation of gall-bladder, cystic and hepatic ducts. Villous growths. Communication with the duodenum. Habershon, *British Med. Journal*, 1872.

CASE XLV.—Female, age fifty-nine. Symptoms of diabetic phthisis. At the neck of the gall-bladder the mucous membrane had formed a patch of thick, bulbous-ended papillæ, white and fleshy-looking; ducts normal. Two gall-stones and fragments in gall-bladder. Goodhart, *Op. cit.*

CASE XLVI.—Male, age fifty-six. Cylindrical epithelioma. From September 20th began to lose appetite and strength, gradually developed jaundice. The liver was large, without bosses;

no vomiting; constant pain radiating from epigastrium to abdomen; slight continuous fever; profuse perspiration; no ascites or œdema; great emaciation. January 31st; Liver very large and painful on pressure. Tumor at seat of gall-bladder; ascites. Death February 14th. Duration five months. Cause of death exhaustion. Secondary cancer of lungs; gall-bladder very large and full, walls formed by gelatinous tissue; colloid masses (small) in liver; microscopical examination of walls of gall-bladder: cylindrical cells and alveoli. Bertrand, *Thèse*, Paris, 1870.

Case XLVII.—Female, age sixty-six. Colloid. In September, 1869, pain in belly for first time, and some days later a painful tumor noticed in right hypogastrium. For one month intense jaundice; gradual loss of appetite and progressive weakness; hiccough; frequent eructations; no vomiting; stools decolorized; urine bile-stained; pain in right hypogastrium, not acute but persistent; tumor projecting in right hypogastrium, not rough but painful on pressure; some fever. Duration two months. Death from exhaustion. Large mass compressing liver, pancreas, and duodenum; liver very large in right lobe; ganglionic mass in hilum; gall-bladder much distended, walls thickened, yellowish-white; calculus in gall-bladder, and mucus and puriform matter; vegetation *en plaque* seen on removing calculus, situated near cystic duct, a little to right; tissue around it colloid; hepatic canals dilated; small fatty nodules on mucous membrane; similar nodules along bile-ducts of liver; small nodules in interior of ductus choledochus; pancreas healthy. Colloid vegetation. Bertrand, *Ibid.*

Case XLVIII.—Male, age fifty-eight. Pain in abdomen in December, 1855, followed by jaundice, and then paroxysm of pain stimulating gall-stone colic supervened. Diarrhœa. Moderate appetite. Emaciation. Ascites. General tenderness over abdomen. Duration nearly six months. Death from exhaustion. Healthy heart and lungs. Ascites. Dense white mass, hard, distended, size of ordinary gall-bladder, in position of gall-bladder. Gall-stones in cavity in centre of mass. Cystic and common ducts occluded. Adhesions to organs and contraction of mass. Bile-ducts dilated. Secondary growths on peritoneum, and in pancreas and mesenteric glands. Contracting mass pressed on vena portæ, and involved right semilunar ganglion, colon, duodenum, and gall-bladder. Habershon, Some Diseases of the Liver, Lettsomian Lectures, Philadelphia, 1872.

Case XLIX.—Female, age not given. Pain in right hypochondrium; vomiting; constipation; anorexia; somnolence; coma; icterus one week. Liver enlarged and painful on pressure. Duration seven weeks. Death from cholæmia. Cancerous degeneration of gall-bladder, cavity filled with many large stones; liver double normal weight; secondary nodules. Carpenter, *Pres. Med.*, 1876, xxviii. p. 12.

Cases L. and LI.—Sex and age not given. Ulceration and perforation of gall-bladder. Primary carcinoma of gall-bladder with gall-stones in both cases. Haas, *Prager Vierteljahresschrift*, cxxxii. S. 131.

Case LII.—Female, age fifty-seven. Emaciation; cachexia; icterus three months; dyspeptic symptoms, vomiting; constipation; liver enlarged; tumor in gall-bladder region; ascites; ovarian tumor; pain on palpation; dysentery. Diagnosis—cancer of gall-bladder; ovarian tumor from rapid progress and cachexia. Duration one year. Death from dysentery. Gall-bladder enlarged; cancerous in one part, normal in the other; gall-stones and fluid; nodules in hepatic duct; mucous membrane of gall-bladder inflamed, not infiltrated; liver filled with nodules; glands about portal vein involved; ductus choledochus impervious. Kohn, Case XI., *Der primäre Krebs der Gallenblase*, Thèse, Breslau, 1879, p. 60.

Case LIII.—Female, age forty-five. Emaciation; cachexia late; icterus increasing; tumor hard, but at first elastic, movable, at gall-bladder; liver slightly enlarged, smooth; pain like colic; ascites; no gastric symptoms; diarrhœa late; spleen enlarged; pulmonary symptoms. Diagnosis—cancer of gall-bladder and cholelithiasis. Duration ten months. Death from exhaustion due to peritonitis from perforation. Gall-bladder at the fundus normal; the remaining half and the cystic and choledochus duct seat of cancer; gall-stones and pus in gall-bladder, with ulceration and perforation; dilatation and purulent infiltration of hepatic ducts; secondary deposits in liver, lungs, and glands. Kohn, Case XII., *Ibid.*

Case LIV.—Female, age fifty-two. Scrofulous; emaciation; cachexia; fever four months; hepatic colic and pain in tumor, which was of the size of a child's head, fluctuating at apex in gall-bladder region, attached to liver. Diagnosis—cancer of gall-bladder and ulceration; hepatic abscess eliminated. Duration five months, from hepatic colic. Death from exhaustion due to fever. Gall-bladder replaced by a cancerous mass, in centre of which a cavity communicating with the colon by ulceration; gall-stone in cystic duct; common duct dilated by passage of gall-stone; secondary deposit in liver. Kohn, Case XIII., *Ibid.*

Case LV.—Female, age forty-one. Scrofulous; cachexia; emaciation; slight icterus late; began with vomiting and pain in right hypochondrium and epigastrium; tumor growing from right lobe of liver; painful, uneven, hard; constipation; ascites; slight œdema. Diagnosis—hepatic cancer. Duration three months. Death in collapse. Gall-bladder enlarged and dilated; cancer toward the cystic duct, with small nodules about the fundus; part of cystic duct involved, part dilated and containing gall-stones; clear white thick fluid in duct and gall-bladder; secondary carcinoma in peritoneum, lung, pleura, and liver. Kohn, Case XIV., *Ibid.*

Case LVI.—Female, age fifty-one. Eight days before admission, hepatic colic, diarrhœa, and jaundice; emaciation; slightly enlarged liver; pain in hepatic region; thickening of border of liver, especially about gall-bladder and of spleen; diarrhœa and hemorrhages. Diagnosis impossible at first. Duration five and a half months. Death from hemorrhages. Gall-bladder walls replaced by new growth; bile passages dilated to periphery; liver green in color; carcinomatous deposit at junction of cystic and hepatic ducts; hemorrhagic nephritis. Kohn, Case XV., *Ibid.*

Case LVII.—Female, age seventy-seven. Debility, jaundice; liver enlarged and hard; in region of gall-bladder hard, painless, pyriform tumor of long duration; spleen normal; diarrhœa; ascites; œdema of lungs. Diagnosis—cancer of gall-bladder. Duration nine weeks.

Death from œdema of lungs. Gall-bladder and duodenum and colon attached; fistulous communication of gall-bladder and colon; fundus cystic, and choledochus duct affected; purulent fluid and cancerous débris in gall-bladder; ducts dilated; secondary nodules in liver and glands. Kohn, Case XVI., *Ibid.*

Case LVIII.—Female, age forty. No clinical history; ascites; œdema of the legs; emaciation; no jaundice; no Addison's disease. Gall-bladder replaced by an indurated mass, cavity in centre containing gall-stones and pus; all organs in that region united; stone in common duct; ducts dilated and thickened; liver and lower supra-renal capsule containing secondary deposits; multiple hepatic abscesses. LangHeinrich, Case I., *Vier Fälle von Gallenblasen carcinom.*, Inaug. Dissertation, Halle, 1881, pp. 36.

Case LXIX.—Male, age seventy-two. Vomiting six weeks before death. Debility; pain in abdomen; œdema of lungs; emaciation; dirty hue of skin (noted at autopsy). No diagnosis. Duration of active symptoms six weeks. Death from œdema of lungs. Gall-bladder hard and small, in cavity gall-stones, and in separate pocket a white fluid; liver congested; ducts bile-stained, also common and hepatic ducts; carcinoma of right adrenal; adhesion of gall-bladder to pylorus, liver, and vertebral column. LangHeinrich, Case II., *Ibid.*

Case LX.—Female, age seventy. Icterus slight for some time; vomiting, the last week, stercoraceous with some continuous pain in right hypogastrium; vomiting abated; stools became bile-stained. Death after severe abdominal pain; peritonitis. At fundus of gall-bladder a new growth adherent to colon; perforation of gall-bladder, no gall-stones; spleen and liver enlarged; the latter and glands in fissure infiltrated; ulceration and stricture of transverse colon. Purulent peritonitis. LangHeinrich, Case III., *Ibid.*

Case LXI.—Female, age forty-eight. Emaciation; cachexia; pain in abdomen; fever; jaundice; tumor above and to right of navel, size of a fist, uneven, firm, movable, tender, continuous with liver; œdema; dyspnœa; vomiting; exhaustion. Duration five months. Death from exhaustion. Liver enlarged and infiltrated with cancerous nodules; cancerous abscess, or degenerated cancer, between stomach, small intestine, transverse colon, and abdominal walls, in which gall-bladder is included; gall-stone in centre. Kraus, Case I., *Ein Beitrag zur Casuistik und Symptomatologie des primären Gallenblasen Krebses.* (Leipsiger Dissert.) *Deutsches Archiv für klinische Med.*, Leipsig, 1883.

Case LXII.—Female, age forty-three. Cachexia; slight icterus; tumor occupying half of right side of abdomen, extending two fingers below navel; liver enlarged and nodulated; pain severe; ascites; diarrhœa. Duration two months. Death from cholæmia. Gall-bladder walls thickened; gall-stones, ducts free; gall-bladder adherent to colon; secondary affection of lungs, liver, and glands in hepatic fissure. Kraus, Case II., *Ibid.*

Case LXIII.—Male, age forty-five. Emaciation; exhaustion; jaundice after one month; liver small; tumor below and to right of navel, extending upward, hard, uneven; ascites; œdema; constipation; no pain. Duration sixteen months. Cancer of gall-bladder extending to cystic duct; thirty gall-stones; common and all other ducts dilated; liver small; gall-bladder and colon adherent; secondary deposits in stomach, liver, pelvic and lumbar glands. Kraus, Case III., *Ibid.*

Case LXIV.—Age and sex not given. Emaciation; tumid abdomen; anxious expression; constipation; vomiting. Death from peritonitis. Gall-bladder replaced by a cancerous tumor; entire contents of lesser omentum being one cancerous mass, in the posterior surface of which are nodules and contained gall-stones; cancer of ascending colon. Belcher, *Dublin Quarterly Journ. Med. Sci.*, 1861, xxxi.

Case LXV.—Female, age forty-eight. Encephaloid (?). Emaciation; jaundice; hemorrhage, hematemesis; vomiting; hard tumor, painful on pressure, in right hypochondrium; painful digestion. Duration five months. Place of gall-bladder occupied by a cavity in the liver, with irregular rugous walls, holding a sanious fluid, containing cholesterine and fat globules, and in a pouch a gall-stone; adherence to transverse colon and stomach, and intercommunication. Calmettes, *Bull. Soc. Anat.*, Paris, 1868.

Case LXVI.—Male, age fifty-five. Scirrhus. Admitted September 26th. Five months before admission, began with epigastric pain; dull pain, especially after eating, with weak and painful digestion. Anorexia; no vomiting. Two and a half months later, noticed jaundice; stools decolorized, constipation; for five weeks color became darker; urine almost black. For three weeks diarrhœa, œdema, and emaciation. No fat in stools in a notable degree. Painful hardness at level of ribs (margin). Emaciation, and general anasarca. Death, October 29th, from anasarca and exhaustion. Duration, six months. Gall-bladder not distinguishable. Cystic duct enveloped in a mass, and, opening it up, came upon a small cavity at border of liver, surrounded by hard pale tissue, and containing twelve calculi. Scirrhous carcinoma of gall-bladder, local. Oettinger, *Prog. Méd.*, 1885, 25, i. 414.

Case LXVII.—Female, age thirty-nine. Villous (?). Emaciation, jaundice, ascites, and anorexia. Liver hard and irregular; hard tumor on the anterir border size of walnut. Liver enlarged and yellow-green, soft, and granular. Gall-bladder size of a pear; in a pouch a mucoid fluid. Tumor at base and neck of gall-bladder. Hepatic artery and vein and common duct obstructed by tumor. Hepatic and cystic ducts dilated. Lymphatics dilated. Planteau, *Bull. Soc. Anat.*, 1875.

Case LXVIII.—Female, age fifty-five. Colicky pain, emaciation, jaundice, anorexia, and ascites; no fever; peritonitis. Tumor in right hypochondrium, hard, size of walnut. Right lobe of liver enlarged. Diagnosis—cancer of liver. Duration six months. Death from peritonitis. Gall-bladder cancerous, dilated, forming various diverticula containing gall-stones; wall thickened. All ducts dilated. Liebman, *Rosoconto Sanitano dell' Osp. Civ. di Trieste*, 1876, 1-4, p. 211.

CASE LXIX.—Male, age fifty-seven. Anorexia, insomnia, anomalous symptoms, œdema of legs. Hard, indolent tumor in abdomen, reducible by pressure. Duration one year. Gall-bladder ulcerated internally; cancerous tumor of the walls, adherent to the aorta and vena cava. Liver enlarged and infiltrated. Ramon, *Medica Quirenzia*, Habana, 1879, v. p. 81.

CASE LXX.—Female, age thirty-eight. Hepatic colic; jaundice recurring and permanent. Tumor pyriform, size of child's head, elastic, attached to liver, movable with respiration. Liver normal; hemorrhages; emaciation. Death from peritonitis. Gall-bladder enlarged, cancerous, pear-shaped, adherent to stomach, and perforated; gall-stones in cavity. Koch, *Berlin. klin. Wochenschrift*, 1882, xxi. 299.

CASE LXXI.—Female, age seventy-four. Jaundice, and enlarged and nodulated liver. Ill six months. Gall-bladder enlarged. Cystic duct dilated to size of transverse colon, and contained 240 gall-stones; entrance occluded by one. Walls of gall-bladder thickened by new growth. Goodhart, *Atlas of Illust. Pathology*, Fasc. V., Sydenham Soc. Pub., 1882.

CASE LXXII.—Female, age sixty-six. Scirrrhus. For three weeks suffered with jaundice. Stone was felt for four weeks in gall-bladder. This disappeared, and in its place occurred an oblong, smooth, hard mass. Surface of liver uneven. Death from scirrhus of gall-bladder. Heitler, *Wiener med. Woch.*, 1883, No. 32.

CASE LXXIII.—Female, age seventy. Encephaloid. Feeling bad for eight months. Jaundice for two months. Pain severe in abdomen; latter enlarged; liver extending to crest of ilium; nodulated. Emaciation. Duration over eight months. Death from asthma. Gall-bladder enlarged, long. Walls about the neck about two centimetres thick. Eighteen gall-stones, one in a pouch. Gall-bladder adherent to stomach and colon. Liver cancerous, containing a hard nodule. Spleen normal. Leuf, *Proc. Med. Soc. Kings County*, Brooklyn, N. Y., 1883, viii. 291.

CASE LXXIV.—Female, age fifty-three. Onset sudden, two months before admission. Pain in epigastrium, liver, and shoulder. Rigors, vomiting; jaundice, after which pain and vomiting ceased. Fulness and tenderness over gall-bladder. On admission stout; a little ascites and flatulence, which increased. Lost strength. Duration, twelve weeks. Death from exhaustion. Body well nourished. Gall-bladder imbedded in a cancerous mass three inches across. Hard, yellow, mottled. Nodules in liver and lungs. Liver not much enlarged. Gall-bladder dilated and twenty gall-stones and pus within. Common duct enlarged. Cystic duct nearly obstructed. Two gallons of abdominal fluid. Murchison, *Brit. Med. Journal*, 1872, ii. p. 684.

CASE LXXV.—Female. History of gall-stones. Diagnosis—hepatic cancer. At first simulated ovarian cyst. Eighteen hundred gall-stones found. Gall-bladder thickened with cancer. T. Spencer Wells, "Lectures on Abdominal Tumors," *London Med. Times and Gazette*, 1878, i. 671.

CASE LXXVI.—Female, age fifty-one. Poor appetite, dyspepsia. Lancinating pain in right hypochondrium. Slight jaundice; fever. Tumor on right of umbilicus size of pigeon's egg; superficial, fluctuating, nodulated, and painful. Emaciation, anorexia, constipation, and cancerous cachexia. An incision to introduce a trocar showed nodular cancer of gall-bladder containing abundance of gall-stones. Duration about one year. No post-mortem examination made. Eustache, *Journ. Med. Sci. de Lille*, March 20, 1884, anne 7, No. 6.

CASE LXXVII.—Female, age sixty-nine. Scirrhus. Jaundice; enlarged liver; hard tumor, size of hazel-nut, movable with respiration; stools at first normal; later, no bile; no vomiting. Meteorismus forty-eight hours, with abdominal pain. Death from exhaustion. Scirrhus of gall-bladder and bile passages. At vertex of gall-bladder a "four-kreutzer" tumor. Metastatic knots in lymphatics—portal, hepatic, and mesenteric. Schrotter, *Bericht des K. K. Allgemeinen Krankenhauses zu Wien*, 1881–82, p. 23.

CASE LXXVIII.—Male, age thirty-eight. Encephaloid. Pain in back and over liver; jaundice. Tumor in region of gall-bladder, oval, immovable. Emaciation. Urine bile-tinged, dark. Feces light. Cachexia. Tumor size of walnut moved with respiration. Duration three months. Death from exhaustion. Gall-bladder dilated with bile, containing gall-stones. Coats thickened: serous coat not cancerous. Cystic duct obstructed at its origin by a stone. Liver and omental glands carcinomatous. Diaphragm adherent. J. W. Ogle, *St. George's Hospital Rep.*, 1868.

CASE LXXIX.—Female, age fifty-six. Well up to November, 1877, when she fell and struck the right side of belly. For some days afterward there was sensitiveness to pressure on right side. She then became aware of a lump in the right side over which the skin was bluish-green. Pain subsided, but the tumor remained, and grew steadily though slowly. Loss of strength and sleep. Some fever, vomiting, and hemorrhages. In latter days nausea. Deep jaundice. Prominent swelling in right side below navel. Tumor size of child's head, hard, round, uneven. Percussion between tumor and liver dull-tympany; over tumor abscess dull. First seen in May, 1878. Duration from occurrence of accident, about seven months. Death, June 22d, from collapse. Carcinoma of gall-bladder. Intestines lying between tumor and liver. Gall-bladder contained foul-smelling, dirty-colored fluid and a gall-stone. Tumor size of two fists. No recognized secondary deposits. A. Martin, *Berlin. klin. Woch.*, Nos. 22 and 23, 1879.

CASE LXXX.—Female, age sixty-seven. Cylindrical epithelial cancer. For three weeks pain in the belly, loss of apetite, and constipation. No fever. Abdomen slightly swollen. Liver dulness increased. Anterior border hard, knobby, extending in middle line to navel. No albumin in urine. Duration six weeks. Death from gradual failure in nutrition, with œdema and ascites. Cancer of gall-bladder, extending to liver. Metastases into the lungs, pleura, and lymph-glands. Adhesions to duodenum and transverse colon. Emphysema of lungs. Myocardium degenerated. Chronic endocarditis. Infarcts in spleen. Gall-stones from sixty to seventy. Zenker, *Archiv f. klin. Med.*, Bd. 44, Hefte 2 und 3, March, 1889.

CASE LXXXI.—Female, age fifty-six. Medullary cancer. Biliary calculi, secondary dilatation of bile-ducts, atrophy of liver. Numerous secondary deposits of cancer. Zenker, *Ibid.*

CASE LXXXII.—Female. Medullary cancer. Gall-stones. Ring-shaped growth. Zenker, *Ibid.*

CASE LXXXIII.—Female. Medullary cancer (?). Gall-stones. Zenker, *Ibid.*

CASE LXXXIV.—Female, age seventy-eight. Scirrhus. Scirrhus of navel, gall-bladder, head of pancreas, peritoneum, pylorus, ileo-cæcal valve, rectum, and uterus. Cancerous stenosis of the hepatic and common ducts. Gall-stones. Circumscribed cancer of left kidney, etc. Zenker, *Ibid.*

CASE LXXXV.—Female, age seventy-three. Scirrhus (?). Cancer of gall-bladder; cancerous degeneration of liver; purulent inflammation of gall-bladder, and abscess; gall-stones, etc. Liver atrophic. Zenker, *Ibid.*

CASE LXXXVI.—Female, age fifty-four. Scirrhus (?). Cancer of gall-bladder, liver, and mediastinal, epigastric, and retro-peritoneal lymph-glands. Gall-stones. Zenker, *Ibid.*

CASE LXXXVII.—Female. Cylindrical epithelial carcinoma. Gall-stones. Zenker, *Ibid.*

CASE LXXXVIII.—Female, age forty-seven. Pain lancinating, continuous, increased by pressure, or by lying on left side. Digestive disturbances. Intense jaundice. Nutrition very bad. Abdomen enlarged, on right side especially. Tumor size of pigeon's-egg, smooth, hard nodular, and painful. Grew worse, and died cachectic. Death from exhaustion. Primary carcinoma of gall-bladder and ducts; secondary deposits in liver, testicle, pancreas, and mesentery; hemorrhagic ascites, entrorrhagia, and jaundice. F. Fazio, *Giornalle Internaz. delle scienze Mediche*, 9, 1887, 385-397.

CASE LXXXIX.—Male, age forty-nine. Taken suddenly, June, 1886, with epigastric oppression, and became jaundiced. Stools decolorized. No pain in hepatic region. Digestive symptoms nearly five months. Later, some colic, much itching. December 1, 1886, apyrexia, jaundice, emaciation, bile pigment in urine; sub-umbilical region tumefied; no ascites. Ascites developed in a few days. December 25th, coma, and death from cholæmia. Duration about five months. Liver much enlarged; weight 2180 grammes; surface yellow. About a dozen small white points penetrate surface. Organ hard. At neck of gall-bladder tumor size of large chestnut, which encloses the cystic and common ducts Gall-bladder very small, contains no calculi. Bernheim and Simon, *Revue méd. de l'est*, Nancy, 1887, xix. 492-500.

CASE XC.—Male, age fifty-six. Scirrhus. Entered hospital April 6, 1885. Three years before he noticed a tumor size of egg just below false ribs on right side of mammary line. Grew steadily, always painless. Patient felt no sickness until three months ago (February, 1885), when health began to decline; digestion painful and disturbed; vomiting, emaciation; scanty urine, constipation. Never had hematemesis, pain over liver, or colic. On admission, jaundice; some small glands in groin on each side. Below liver large tumor, painless, round, fluctuating. Sudden death, April 12th, from syncope. Liver and gall-bladder weighed 2 kilogrammes 200 grammes. Gall-bladder size of cocoanut, walls flabby, degenerated, scirrhous; contained 200 grammes of liquid holding in suspension clot size of egg. No calculi in gall-bladder. Secondary granulations in liver. Scirrhus tumor size of walnut in pylorus. No dilatation of stomach. Heart pale and flabby; right auricle very notably dilated. Cénas, *La Loire médicale*, 1888, 6, 141-146.

CASE XCI.—Female, age sixty-eight. Scirrhus. Gall-bladder converted into a solid mass of new growth, of irregular pyriform outline four inches by one and a half inches. At larger end a cavity about size of a shelled walnut, and containing a single faceted gall-stone. This cavity is all that is left of gall-bladder. Secondary nodules in liver, left lung, intestines, and mesenteric and retro-peritoneal glands. Wigglesworth, *Medico-Chirur. Journal*, 1887, vii. 217.

CASE XCII.—Male, age forty-two. Scirrhus. Dull, aching pain, increased by pressure and unaffected by food, at intervals for years. Admitted to Melbourne Hospital January 19, 1887. Six months before felt a "nasty sickly sensation" come over him. Next day icterus. In a few days nagging pain in right hypochondrium, "shooting, and taking his breath away." Lost fourteen pounds in six weeks, and then entered Melbourne Hospital. Then deeply jaundiced, weakness, debility, dyspeptic symptoms. Bowels open, stools pale-drab and putrid. Kicked in liver region seventeen years before. Pain since then. Exploratory operation February 26th. Death March 1st. Gall-bladder converted into a scirrhous mass. Stomach held a large quantity of dark fluid like coffee-grounds. Deposit of new growth in walls of stomach near pylorus, but pylorus quite patent. Hepatic ducts greatly distended. Numerous small, pale, secondary deposits in liver. No mention of gall-stones. No marked disease in other organs. Robertson and Fitzgerald, *Austral. Med. Journal*, 1871, n. s., 9, pp. 221-23.

CASE XCIII.—Female, age fifty. Encephaloid. Acute pain in right side for five or six months. Shortly afterward swelling in epigastrium and right flank, which increased. Flesh preserved. Loss of strength, digestive troubles. Only since a year frequent vomiting, especially after food. Liver enlarged, prominent, hard, woodeny, especially at xiphoid; elsewhere smooth and even. No trace of jaundice, slight earthy hue. No trace of pigment in urine. In last days tongue coated, black; temperature raised; at times cerebral excitement and delirium. Death in coma, from cholæmia. Encephaloid of gall-bladder. Secondary nodules in liver, which weighs 5 kilogrammes 190 grammes. Gall-bladder enormously distended, and filled with calculi—forty counted. Examination of other organs negative. Lancereaux, *Sémaine médicale*, 7, 1887, 334.

CASE XCIV.—Male, age fifty-five. Scirrhus. Five months before death, began with digestive troubles, characterized by epigastric pain and a special slowness of digestion, eructations, and constipation. Later, intense jaundice, liver increased in volume; no ascites; diffuse induration at right false ribs. Rapid progress of disease, progressive weakness. Duration, five months. Gall-bladder only attacked; shrunken, filled with calculi, walls scirrhous, forming a characteristic hard mass which compressed hepatic duct. Lancereaux, *Sémeine méd.*, 7, 1887, 334.

Case XCV.—Male, age forty-five. Admitted September 18, 1888, with well-marked jaundice and swelling of abdomen. Had been well up to preceding May, when he began to get yellow, and then became steadily more so. No pain. Three weeks before admission felt pain in epigastrium following food, and lasting three hours afterward. Bowels costive. No hepatic colic. On admission, in addition to above symptoms, he was ascitic; temperature normal, no pain or tenderness on pressure over liver; stools clayey, almost white. Urine dark reddish-brown, and containing bile pigment; no albumin, acid. On October 5th, vomiting coffee-grounds. Hiccough distressing. Death October 6th, from exhaustion. Duration about five months from appearance of jaundice. Gall-bladder hidden by mottled condition of adjacent organs. Section of whole mass discovered a cavity representing the gall-bladder, filled with twenty-six gall-stones, one blocking commencement of common duct. Secondary deposits in liver, head of pancreas, and pylorus. Garstang, *Lancet*, 1888, ii. 963.

Case XCVI.—Male, age sixty-four. Medullary. Six weeks before second admission, jaundice, swelling and pain of liver, and much distended gall-bladder. At second incision, in site of gall-bladder, a deeply-contracted spot. Believes there were gall-stones, which were subsequently discharged. Died after eight days' treatment, October 19, 1869, much exhausted, and extremely jaundiced. Gall-bladder shrunken to size of hazel-nut, thick-walled, adherent to surrounding indurated capsule. Connected with ductus choledochus by a short, moderately wide passage, and contains thick, broth-like, yellowish-brown contents. In fissure of liver ducts surrounded by a very thick, clear, yellow-colored induration, which extends tree-like into parenchyma of liver, and also into neighborhood of cystic duct and gall-bladder, to the convex surface of liver. No cancer elsewhere. A. Willigk, *Virchow's Archiv*, Bd. 48, 524.

Case XCVII.—Male, age fifty-five. Pain in abdomen, vomiting, jaundice, and emaciation. Liver tender, not enlarged. Bradbury, *Lancet*, London, 1886, 1, 788.

Case XCVIII.—Female, age thirty-six. Epigastric pain, and swelling in abdomen. Tumor —apparently movable kidney—beneath right lobe of liver, remarkably movable. Increase in size, health broke down. Three months later, persistent pain, jaundice, and emaciation. Duration, three months. Death from exhaustion. Cancer of gall-bladder, variety not mentioned. Landau, "Movable Kidney," Syd. Soc. Pub., 1889, cx. 325.

Case XCIX.—Male, age sixty-five. Brother said to have died (æt. seventy-two) from "cancer of bile-duct." One year before death, fever, unable to work, loss of flesh, pain in liver region; later, jaundice, debility, emaciation, and anorexia. One week before death, vomiting. Tumor in region of gall-bladder, which disappeared a day or two before death, after copious emesis of mucus and bile. Duration, one year after symptoms. Death from exhaustion. In gall-bladder hard tumor attached to posterior surface of common duct. Gall-bladder scirrhous. No disease of other viscera. N. Bridge, *Chicago Med. Journal and Examiner*, 1887, xxxiv. 330.

Case C.—Male, age forty-nine. Scirrhus. Some months before admission, sudden pain. Ten weeks before, acute pain in right shoulder, right side, and body, and vomiting. Jaundice one week. Said to have been a gall-stone. When admitted, intense jaundice, emaciation, and xanthopsia. Liver extended to umbilicus, surface smooth and tender. Gradually sank. Duration some months. Death from exhaustion. Liver weighed eight pounds. Cancerous mass of gall-bladder. No gall-stones. Liver invaded. Common duct pervious. Soft villous growth occluded common and hepatic ducts, extending along common duct to gall-bladder. Numerous secondary nodules in liver and kidney, but no where else. R. E. Carrington, *Trans. Path. Soc.*, London, 1884, xxv.

Abstracts of Cases of Primary Cancer of the Bile-ducts.

Case I.—Female, age seventy-two. Bilious colic, vomiting, followed by jaundice. Death ten days after admission. Common duct closed by tumor. Ducts dilated. Gall-bladder contained calculi, but no bile. Said to be a "case of alveolar cancer of liver." Choupée, *Bull. Soc. Anat.*, Paris, 1872, 2 s., xvii. pp. 53–55.

Case II.—Male. Cylindrical carcinoma (?). Admitted October, 1863. Up to four months well. At that time gastro-intestinal catarrh (apparently) and jaundice. Later, anorexia, weakness, increase in jaundice. Abdomen slightly sensitive on deep pressure in epigastric region. Slight œdema. Stools colorless. On November 16th, first fever, preceded by chill. Stools bloody. Two days later, death with symptoms of œdema of lung. Duration, five months. Liver moderately large. Gall-bladder distended. Cherry-sized red swelling, covered by unchanged mucous membrane, projecting into duodenum at mouth of common duct. Beyond duodenum, common duct dilated. Abscess foci along smaller bile-ducts. Tumor "cancroid, with cylindrical cells." S. Rosenstein, *Berl. klin. Woch.*, 1864, No. 34, pp. 336, 337.

Case III.—Female, age forty-four. Mother died from cancer of uterus. Patient, about seven years before, had hepatic colic, which ceased three or four years, and recurred two years ago with greater intensity. Jaundice, anorexia, nausea, vomiting; stools fatty in color; urine deep-colored. Pain and weight in hepatic region. Emaciation, cachexia, ascites. Death six weeks after admission. During last days of life, intermittent fever. Round tumor below costal border painful—a distended gall-bladder. Gall-bladder distended and filled with calculi; adherent at neck to pancreas. At beginning of ductus choledochus, tumor size of a walnut surrounding portal vein and hepatic artery, and adhering to head of pancreas, tissue of which was normal. Liver very large; secondary growths; enormous dilatation of bile-ducts. Two large abscesses: one in right lobe, other under phrenic centre. Microscopical examination: dilatation of bile-ducts, some containing epithelioid cells. P. Segond, *Progrès Méd.*, 1880, 8, 811.

Case IV.—Male, age sixty-eight. Itching for one week, followed by jaundice in one week. Intermittent fever for three weeks. Sharp rigor, lasting one hour, followed by fever, but no sweat. Improvement. Recurrence from slight causes. Last few days of life, fever constant.

Coma. No physical signs. Duodenum inflamed. Orifice of duct in duodenum surrounded by an irregular fungous growth. Hepatic and bile-ducts dilated. Gall-bladder distended with bile. Stokes, *Dublin Quart. Journal*, 1846, ii. 505.

Case V.—Male, age thirty-five. Cylindrical epithelioma. Dyspeptic symptoms April 1st. Jaundice during April and May. October 2d, liver enlarged; urine contained bile pigment, feces black; hemorrhagic tendency great, especially subcutaneous. Evening fever. No tumor, and no evidence of cancer. Duration, six months. Liver enlarged and firm. Dilated ducts, ceasing near porta; here both hepatic and common ducts have thickened walls, firm, hard, uniform yellow-gray. Common duct and gall-bladder collapsed, but unaltered. Key and Wising, *Med. Rec.*, London, 1881, ix. 464, from *Hygeia*, 1880.

Case VI.—Male, age forty-nine. Scirrhus (?). Dyspeptic for fifteen years. Pain in stomach, possibly biliary colic. Three months ago, cramp in stomach, vomiting; next day jaundice. July 17th, deep jaundice, emaciation, itchy; pain in epigastrium, extending to right shoulder; loss of appetite; stools colorless. Tumor in region of pylorus. Carcinoma of gall-duct, which contained gall-stones. Liver not enlarged. Secondary sarcomatous nodules in liver. Gall-bladder contained nineteen gall-stones. No carcinomatous nodules found in the other organs. J. Krause, *Prager med. Woch.*, 1884, ix. 483–485.

Case VII.—Female, age sixty-two. Jaundice, ashen stools; later, ascites and œdema, emaciation. Liver enlarged, smooth, only slightly painful on palpation. Abdomen distended, walls thin. Pneumonia, and death. In common duct, near junction of cystic and hepatic ducts, cherry-sized tumor, and walls infiltrated; calibre contracted. Another hard tumor in track of hapatic duct, imbedded in liver. J. Schreiber, *Berl. klin. Woch.*, 1877, 445–447.

Case VIII.—Male, age fifty-one. August, 1866, choleraic attack, followed by jaundice. December, liver enlarged downward; some pain on percussion or palpation. Stools grayish. January 25, 1867, profuse hematuria, lasting two days. February 17th, hemorrhage from gums. February 24th, profuse hemorrhage. March 18th, epistaxis, arrested on the 20th. Death on the 25th, from exhaustion. Duration, seven months. Lower edge of liver presented a lardaceous induration, of cancerous appearance. Ducts greatly dilated, and liver full of bile. Stricture of hepatic duct. Gall-bladder doubled in size. Microscopical examination of stricture shows that tissue is cancerous. Secondary cancers of liver. Laugier, *Bull. de la Soc. Anat.*, 1867, 277.

Case IX.—Female, age fifty-seven. Entered August 12, 1838. Eighteen months before, following an attack of pneumonia, she perceived a large tumor in right hypogastrium, pretty deep, not at all painful. In the winter of 1837–38 apex pneumonia; tumor in right hypogastrium hard, size of pigeon's egg, rounded, not nodular, not painful. Liver not enlarged. No jaundice. On August 12th, had had jaundice for fifteen days; no taste for food; thirst, constipation, stools decolorized. Tumor size of hen's egg, very slightly painful. Irregular fever, great emaciation. Jaundice deepened, and emaciation increased. About six weeks after admission vomiting increased in frequency. Progressive emaciation and feebleness. Pain in paroxysms. Symptoms of tuberculosis of lungs. Death, Nov. 12th, from exhaustion. Duration, twenty-one months. Tuberculosis at apex of left lung. Liver large, nodulated, soft, yellowish. Cancerous tissue, especially at base, around bile-ducts. Gall-bladder distended, contained calculi. Bile-ducts enveloped by cancerous matter. Ductus choledochus entirely replaced by a soft, whitish matter. Hepatic duct dilated, and contained calculi. Durand-Fardel, *Archives gén de Méd.*, 1840, viii. 179.

Case X.—Female, age eighty-one. January 31, 1838, she entered for symptoms of strangulated bowel. There was no jaundice. She died in June, extraordinarily emaciated. Skin had been dry and earthy, never covered with sweat. Ate little, but no vomiting. Gradual and profound failure of the vital forces, and extreme anæmia. Duration, four and a half months. Death from exhaustion. Enormous dilatation of bile-ducts throughout liver. Gall-bladder contained calculi. Fungous cancer at duodenal orifice of ductus choledochus, size of small nut, appearing like softened scirrhus; occupied almost the lower fourth of it. At the upper part of this tumor was a small stone like those of the gall-bladder. Dilatation of hepatic canals. No organ had a vestige of cancerous degeneration. Durand-Fardel, *Archives gén. de Méd.*, 1840, viii. 187.

Case XI.—Female, old. Scirrhus. Chronic jaundice for one and a half years. No hepatic colic, but frequent vomiting at beginning of disease. No tumor revealed by palpation. Liver large. Urine deep in color, frothy, contained albumin and bile. Stools decolorized. Duration, one and a half years. Gall-bladder contained a large number of calculi. Large calculus obliterated cystic and common ducts, walls of which are seat of a hard tumor—scirrhus. Intra-hepatic bile-ducts dilated. Secondary growths in peritoneum and mesenteric glands. Glorie, *Bull. de la Soc. anatomo-clin. de Lille*, 1887, ii. 201.

Case XII.—Female, age sixty-six. Scirrhus. Toward age of fifty-seven had, for about five years, epigastric pains radiating into shoulders. Subject, for two years, to digestive troubles. Entered hospital, April, 1886, for jaundice dating back fifteen days, accompanied with decolorization of stools, and followed by progressive enlargement of liver. Twelve days afterward daily attacks of fever—intermittent. Weakness; tumor toward edge of liver; deeper jaundice, nocturnal delirium, watery vomiting, profuse diarrhœa, marasmus; death from exhaustion more than two months after appearance of first symptoms. Duration, two and a half months. Primary cancer of bile-ducts, with constriction of hepatic duct by scirrhous infiltration of walls. Gall-bladder atrophied, intra-hepatic bile-ducts considerably dilated; consecutive biliary cirrhosis. Profuse hemorrhage into pericardium. Bernheim and Simon, *Revue méd. de l'est*, Nancy, 1887, xix. 492–500.

Case XIII.—Male, age thirty-six. Medullary. In June, 1857, attacked with vomiting and purging. No history of gall-stones. On July 17th hepatic pain, anorexia, thirst, lassitude, chalky stools; urine loaded with bile; liver enlarged and tender. August 4th, jaundice bad. September 1st, intense jaundice, pain in hepatic region, tenderness. No irregularity of liver. September 15th, tumor in right iliac region, tender, dulness continuous with that of liver. One

week afterward sudden coma and delirium. October 21st, death from exhaustion. Duration, four months. Liver, sixty ounces. Gall-bladder distended. Common bile-duct distended, size of man's thumb. Ducts in liver dilated, containing fluid like barley-water. Common bile-duct obstructed by medullary cancer growing from internal surface. Large cancer (orange-size) in head of pancreas, pressing on, but not obstructing, common duct. Growth in duct did not arise by continuity from that in pancreas. Van der Byl, *Trans. Path. Soc.*, London, ix.

CASE XIV.—Male, age seventy-four. Encephaloid. Abdominal pains for two or three years, principally in right hypogastrium, several times followed by jaundice. Entered March 9th. Four days afterward, pain in right hypogastrium and icterus, loss of flesh. Tenderness over liver on pressure, dulness increased, stools grayish. Deepening of jaundice, diminution of strength. Death in marasmus, and ascitic, April 24th. Ductus choledochus has fungoid excrescence—encephaloid cancer—near spur formed by union of cystic and hepatic ducts. Growth obstructs canal. Thrombosis of portal vein. Numerous cancerous "stones" on surface of liver. No other growths. Heart fatty and flaccid. Boucheret and Cossy, *Bull. de la Soc. Anat.*, 1873.

CASE XV.—Male, age forty-nine. Was taken sick in July, 1887, with cramp in stomach and vomiting; jaundice gradually developed, and reached its height in December, 1887. Jaundice accompanied by itching; epigastric pain. Improvement; relapse, with intermittent fever, enlarged liver and gall-bladder, which contained serum. Gall-bladder tumor, distention of abdomen, emaciation, gradual loss of appetite. October 15, 1888, laparotomy, followed by death. Primary carcinoma of common duct, with diseased walls and occluded lumen. Secondary nodules in head of pancreas and in liver. Gall-bladder contained sero-purulent fluid and bile. Cystic duct closed by cancerous mass. J. H. Musser.

CASE XVI.—Male, age forty-seven. Jaundice began about June 12, 1886. Had none before, nor any serious illness. Jaundice came on after a few days' pain in epigastrium, after taking food, and without any colic. Said he had been losing flesh slightly for two years. Edge of liver not felt when admitted, July 22, 1886. Became better, but returned worse, and was readmitted October 8th, much thinner and deeply jaundiced. Gall-bladder distinctly felt, and it slowly increased in size. Duration, from appearance of jaundice, about five months. Entire duration, two and ahalf years. Carcinoma of common duct, starting from large epithelial cells of common duct. No infiltration of liver, and no secondary deposits in liver or any other organ. Dilatation of gall-bladder. N. Moore, *Trans. Path. Soc.*, London, 1888, xxxix. 142.

CASE XVII.—Female. Pain in epigastrium at intervals for two years, and after losing flesh for two months became jaundiced June 15, 1886. Admitted to St. Bartholomew's July 6th, when she was deeply jaundiced, but edge of liver not felt. Some weeks later, jaundice deeper, and gall-bladder felt as a hard lump. More and more jaundiced, weaker. Death December 4, 1886. Duration about two and a half years. From appearance of jaundice, about six months. Carcinoma of common bile-duct. Dense whitish mass occluded common and cystic ducts. Gall-bladder occluded, adherent to walls of a small hydatid cyst. No secondary deposits in liver. Bile-ducts dilated. Liver cirrhotic. N. Moore, *Trans. Path. Soc.*, London, 1888, xxxix.

CASE XVIII.—Female, age fifty-eight. Encephaloid. Jaundice, preceded by loss of flesh, nausea, and vomiting, had developed gradually in October, 1887. Died at St. Bartholomew's, February 14, 1888. No history of biliary colic. Had pericarditis, febrile symptoms, and delirium before death. Duration, four months. Just below junction of cystic and hepatic ducts, common duct was blocked by a mass of soft, whitish, sprouting new growth. Duct above enormously dilated. Gall-bladder distended with a puriform fluid, and contained several gall-stones. No stones in ducts. No new growths in liver. J. A. Ormerod, *Trans. Path. Soc.*, London, 1888, xxxix.

ABSTRACTS OF CASES OF SARCOMA OF THE GALL-BLADDER.

CASE I.—Female, age sixty-two. Sarcoma. Emaciation, exhaustion, jaundice, nausea, and vomiting at times; ascites; liver six inches below ribs. Tumor, fluctuating, in iliac fossa. Duration, several months. Cystic duct infiltrated; calibre increased twelve times; common duct and abdomen involved. Ducts in liver dilated. Retention cysts; no stones. Boutwell and Ford, *St. Louis Med. and Surg. Journ.*, 1879.

CASE II.—Female, age fifty-five. Spindle-celled sarcoma. Pain; liver enlarged. Emaciation, exhaustion, constipation. Tumor hard, round, fixed, extending from inferior surface of liver to umbilicus. Duration, three months. Gall-bladder buried in a mass, oval, whitish, in epigastrium and right hypochodrium, invading right lobe of liver, pancreas, and colon. Hepatic and cystic ducts involved, but pervious; gall-stones. Ingalls, *Boston Med. and Surg. Journ.*, 1878.

CASE III.—Male, age fifty-two. Sarcoma. Gastric disturbance for several months; anorexia. Tumefaction over hepatic region rapidly increased. Death from peritonitis. Gall-bladder involved in a spongy, dirty mass, size of a man's head. In a cavity one hundred gall-stones. Disease primary; no metastases. Seibert, *Med. Record*, N. Y., 1882, xxi. 299.