THE RELATIONS OF PHTHISIS AND ALBUMINURIA.

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THE supervention of albuminuria in phthisis is far from rare; and, until recently, no attempt has been made to explain its pathology. It has always been regarded, and justly, as a very serious complication, which, if it do not immediately terminate life, places the patient in the category of the condemned; the patient lingers on, but some of the most promising cases of arrested phthisis have succumbed to this lesion. It is difficult to predict beforehand the kind of case likely to be associated with albuminuria, though our histories show that there has generally been some exhausting discharge, as diarrhoea, or profuse expectoration. Nevertheless, it also arises in patients in whom neither of these symptoms exists; and some observers have connected it especially with fibrosis of the lungs. The approach of this lesion is so gradual that it is frequently overlooked; and often the first indication which the patient has of the mischief is oedema of the ankles or of the shins. The urine is then tested, and for the first time found to contain albumen. Sometimes, however, the preliminary symptoms of renal mischief are present, such as nausea, and pain in the region of the kidney. Careful palpation will discover tenderness in the loin, as was noted in some of the patients whose cases are here given; but in most cases the symptoms are so obscure as to be overlooked.

When albumen has appeared in the urine, it is rare for it wholly to disappear; and though it may escape a superficial examination, it will generally be found, by carefully testing the *urina sanguinis*, i.e., the urine passed on rising in the morning, and also that passed late at night. In two private cases, where very careful nursing was carried out, I remember the albumen disappeared from the urine for a period of some months, but later on returned, when both patients soon sank.

Another feature is, that it rarely occurs except where cavities have formed; in all of these sixteen cases, there were distinct signs of excavation in one or both lungs. It by no means followed that the discharge from the cavity was large, provided such discharge existed, and that the cavity was one of long-standing.

The following sixteen cases are given to show the influence of albuminuria on the temperature of phthisis. The patients were twelve males and four females, of ages varying from 16 to 46, and, with one exception, they were all hospital cases. Hereditary predisposition was present in three, syphilis in three, diarrhoea in eleven, and dropsy, either in the form of anasarca or of ascites, or both, in fourteen. The first three cases are especially interesting, from the albuminuria having supervened while the patients were under observation in the hospital. The temperature was always taken in the mouth for a period of five minutes.

CASE I.—Edward G., aged 18, single, a worker in stained glass windows, was admitted into the Hospital for Consumption, December 31st, 1878. He had had measles and purpura some years ago, but of late enjoyed fair health till nine months previously, when cough came on, with night-sweats, followed by diarrhoea, the latter lasting two weeks. Cough and night-sweats had continued up to admission, and in the last three months he had lost much flesh. He had never had any swelling of the legs. On admission, his aspect was pale; his cough hard and troublesome; expectoration greenish and copious; tongue red; he had slight diarrhoea; purpuric spots were visible on the thighs; the urine was acid, of specific gravity 1020, and contained no albumen or sugar.

Physical Signs.—On the right side there were some dulness and coarse crepitation from the clavicle to the fourth rib, and above the scapula; on the left were loud cavernous sounds, audible over the upper third of the front and back. There was tenderness on pressure in the left iliac fossa. During the three weeks following admission, the diarrhoea continued, being only partially controlled by medicine, the number of stools varying from three to four. He also had epistaxis, and some discharge from the ear. From January 31st to February 13th, a careful record of the temperature was taken five times a day, and was kept, with the number of stools, to ascertain the natural course of the pyrexia. Line A in Diagram I gives the curve of the averages of these fourteen days. The diarrhoea gradually subsided, reaching an average of one stool a day on February 12th; and while the 8 A.M. record of temperature varied from 97.8° Fahr. to 99°, the 11 A.M., 2 P.M., and 5 P.M. records ranged from 100° to

103°, on only three occasions falling below 100°. The 8 P.M. notes show the time of daily subsidence.

February 13th. He was improved; the cough was easy; the bowels were open once a day; there was no tenderness of the abdomen. As the fourteen days' temperature-observations had clearly shown the pyrexial characters of the chart, the record was discontinued.

March 6th. Yesterday, some oedema of the lower extremities was noted, which to-day diminished. The patient complained of nausea, and of pain in the region of the left kidney, and some tenderness. The abdomen was somewhat distended. The urine was acid, of specific gravity 1023; it contained albumen (about one third). Observations in temperature were resumed five times a day on March 7th, and were continued up to the patient's death.

He became more and more dropsical. Ascites was detected on March 19th, and two days later there was general anasarca. On March 20th, fine crepitation was audible over the base of both lungs, in addition to cavernous gurgle at both apices. The patient died April 3rd.

The time during which the temperature was taken after the appearance of the albuminuria up to the death was twenty-seven days; and for the purpose of comparison with the pre-albuminuric period, it has been divided into two periods of fourteen (B) and thirteen (C) days each, and the subjoined are the means of the three periods

	8 A.M.	11 A.M.	2 P.M.	5 P.M.	8 P.M.	Max.	Min.
From Jan. 31st to Feb. 13th, 14 days (pre-albuminuric)	98.1°	101.1°	101.4°	101.4°	99.4°	103°	97.2°
March 7th to 20th, 14 days (albuminuric)	97.6°	99.5°	98.8°	98.8°	98.1°	100°	96.8°
March 21st to April 2nd, 13 days (albuminuric)	96.8°	96.9°	97.1°	97.1°	97.3°	100.2°	95.6°

Diagram I.

The fall after the albuminuria appeared is very striking, and this feature of temperature is well seen in the maximum and minimum columns, but it appears to affect the temperatures taken at all times of the day. The third period, when the dropsical symptoms were fully developed, showed still further lowering; the minimum, 95.6°, being reached shortly before death. The urine varied in quantity from 15 ounces to 28 ounces, the specific gravity from 1018 to 1024, and the daily excretion of urea from 135.5 grains to 337.6 grains, the amount apparently depending on the amount of urine passed; in other words, the more urine, the more urea. The total quantity of urine was small; the amount of albumen was generally about two-thirds of the test-tube.

The diarrhoea, consisting of two to three loose stools, accompanied the pyrexial period. In the second period, it increased, once reaching five stools a day, and averaging two stools. In the third period, it almost subsided.

Necropsy, on the day following death, showed both lungs to con-

tain large ragged cavities, of comparatively recent origin, at the apices. The rest of these organs were thickly disseminated with recent tubercle. The liver was small, weighing three pounds, and soft. The spleen was soft and lardaceous. The kidneys were in the early stage of lardaceous degeneration, giving marked reaction with iodine. The intestines were unfortunately not examined. Dr. Ewart kindly made a microscopic examination of the kidneys, and reports as follows. "A very plain reaction was obtained with solution of iodine. The Malpighian tufts and the peripheral zones of the secreting tubules were the parts mainly affected by the reagent. The tubes were somewhat enlarged, and choked by the proliferation and the swelling of their secreting cells. Fatty granular degeneration had made some progress, but it had not reached an extreme degree, such as to mask the presence of the lardaceous state; in many places, the cells were fused into long lardaceous lumps, which assumed a mahogany-colour with iodine."

REMARKS.—This case is of interest as illustrating the relations of tubercular disease and lardaceous changes, and their relative influence on the temperature. The patient was suffering from acute tubercular phthisis of the lungs, and probably of the intestines. The lungs were rapidly undergoing tuberculation with accompanying excavation, and the temperature-chart gave the usual curve of acute third stage. The lung-changes seem to have proceeded unchecked up to death; but the sudden supervention of kidney-disease, which, owing to the early examination of the urine and the marked symptoms, was immediately detected, caused a cooling of the body; and from that time forth normal and subnormal temperatures appeared. The lardaceous disease was due to the extensive discharge from the lungs and intestine, and appears, from Dr. Ewart's report, to have already, to some extent, been succeeded by fatty degeneration.

CASE II.—William W., aged 16, a copper-smith, was admitted, on May 11th, 1880, with the following history. He had enjoyed good health till eighteen months ago, when, after a chill, cough with expectoration came on, which persisted up to the present time, the expectoration being occasionally tinged with blood. Shortly afterwards, night-sweats and rapid emaciation supervened, and for the last two months there had been diarrhoea.

On admission, cough and expectoration were moderate. The tongue was red and irritable. The bowels were relaxed—two motions a day. The breath was short on exertion. Pulse 104. Temperature 99° Fahr. The urine was acid, of specific gravity 1015; it contained no albumen. His weight was 6 stone 8 lbs.

Physical Signs.—There were dullness and cavernous sounds on the right side, from the clavicle to the third rib, and some dullness above the right scapula.

May 19th. The diarrhoea was checked by bismuth; the night-sweats were profuse; the voice was affected.

May 25th. The patient had improved till May 24th, when he vomited four times. His face was flushed; his skin hot; pulse 120, small and compressible. Temperature (evening) 103.1° Fahr. The pupils were slightly dilated; the tongue was coated white in the centre, with red irritable edges.

May 27th. Vomiting had ceased. The urine contained albumen. The bowels were open once a day. The physical signs had increased. Crepitation was audible over the lower third front and back of the right side, and also in the scapular region. Three days later, the diarrhoea returned; and on July 10th a careful record of the temperature, the quantity of urine, and the amount of urea and albumen, was commenced and carried out up to the patient's death, on August 30th, with a short intermission, by my clinical assistant, Mr. Wickwick. It is too long for insertion, but an abstract will be given.

The diarrhoea had been continuing more or less since admission, on May 16th, and was treated successively by bismuth; bismuth and opium; opium pill; opium and sulphate of copper; enema opii; enema opi, with acetate of lead; turpentine enema; by combinations of glycerine of gallic acid with tannic acid; by cupping (dry); and finally, by injections of half a pint of decoction lini, and twenty minims of laudanum. All of the remedies failed to check it, with exception of the last mentioned, which for a short time reduced the number of stools to two a day. The patient never had pains in the abdomen till August 4th, when he complained of some at the region of the umbilicus; neither was there any oedema till August 18th, when it appeared on the feet and ankles, although for a considerable period there had been as much as seven-eighths of albumen in the urine. The pupils throughout the illness were much dilated, in spite of the large quantities of opium he was taking, till the day before death, when they became remarkably contracted.

The patient died August 30th.

The record of the temperature was omitted for twelve days

between August 7th and 19th, which enables us to compare the two periods of the temperature. The last gives somewhat lower records than the former. The first period of twenty-nine days, from July 10th to August 7th, gives as averages, at 8 A.M., 98.5° ; at 11 A.M., 99.2° ; at 2 P.M., 100° ; at 5 P.M., 99.6° ; at 8 P.M., 100.6° ; maximum, 102° ; minimum, 98° . The second period of twelve days, from August 19th to 30th, is as follows:—at 8 A.M., 98.3° ; at 11 A.M., 98.9° ; at 2 P.M., 99.6° ; at 5 P.M., 99.4° ; at 8 P.M., 99.5° ; maximum, 100.6° ; minimum, 98° . All these temperatures were taken when albuminuria was present; but the lowering of the later ones was no doubt partly due to the supervention of uræmia, and partly to the general sinking of the temperature at the approach of death.

The quantity of urine varied very little, averaging from thirteen to twenty ounces, a very small amount. The albumen steadily increased up to the patient's death. At first (July 10th), it was only one-fourth of the test-tube, then one-half, then three-fourths, gradually increasing to seven-eighths; and, on August 19th, the urine was quite solid on boiling, and the determination of urea had to be relinquished. The urea, on the other hand, diminished from 201.4 grains on July 10th, to 54.2 grains on August 7th, a reduction of nearly three-fourths; the quantity of urine remaining the same. The specific gravity increased in the same ratio as the albumen, and in the inverse ratio to the urea. It rose gradually from 1014 to 1035. The diarrhoea steadily persisted, varying from three to ten motions a day, increasing, on the whole, as death approached.

Necropsy, on the following day, by Dr. Ewart. The abdomen contained a small amount of fluid. The intestines were largely ulcerated, the ulcerations extending high up to within six inches of the duodenum, and consisted of two kinds: (1) small and round, the result of simple softening; and (2) some situated lower down in the intestine, of good size, with a thickened floor, in which miliary tubercles were visible through the peritoneal coat. The neighbourhood of the ileo-cæcal valve was severely attacked, and the colon was one continuous ulcer. The liver weighed 2 lbs. 13 ozs., and showed signs of fatty, fibroid, and lardaceous changes. The spleen weighed $4\frac{1}{2}$ ounces, and was lardaceous. The kidneys weighed $13\frac{1}{2}$ ounces; they were smooth, pale, and with pink pyramids. The changes of chronic tubal nephritis were well marked. The Malpighian capsules gave the iodine reaction. The heart weighed 5 $\frac{1}{2}$ ounces. The tricuspid valve was dilated. The pleuræ were closely adherent on the right side. The right lung contained abundance of grey tubercle, either isolated or in small groups. In other parts, small cavities were forming from the gradual disintegration of these groups, and some collections of pus were visible. The upper lobe contained a large smooth-walled cavity, of the size of a small orange, and a smaller one lined with a glistening membrane. The left lung had cicatrices at the apex, but was otherwise healthy. The bronchial glands were enlarged, and contained miliary tubercle. The larynx, trachea, and bronchial tubes showed extensive ulceration from the top of the œsophagus to the commencement of the bronchi, with some thickening of the mucous membrane. Ulcers were also present in the pharynx and epiglottis (buccal surface), and at the base of the tongue. The tonsils were hollowed out by caseation.

REMARKS.—In this case, during the last two months of the patient's life, acute tuberculation and excavation were proceeding in the right lung, and tuberculation and ulceration throughout a considerable portion of the intestines, a combination which, as I have shown elsewhere (*Lancet*, 1881), causes a high pyrexial chart of a fitful character. Nevertheless, the maximum was only 102° Fahr.; the average hardly reached 100° Fahr., and in the last period sank below it, showing the marked influence of the blood-poisoning in cooling the system.

From the symptoms, the nephritis appears to have come on about May 24th, a fortnight after admission, so that the whole series of clinical phenomena arising from it occurred under observation, and a great part are contained in our records. These consisted of 1, steady increase in the diarrhoea; 2, a constant quantity of urine secreted; 3, a rapid increase in the amount of albumen, and apparently, 4, a proportionate decrease in the amount of urea; 5, a steady increase in the specific gravity. Considering the small amount of urea excreted in the twenty-four hours (54.2 grains), and the absence of coma, we may conclude that a great part of the urea was excreted through the bowels.

The *post mortem* examination showed lardaceous changes in the liver, spleen, and kidneys; though, in the latter organ, there was superadded much blocking of the tubes from nephritis, and to this were no doubt due the diminished quantity of water and urea, and the large amount of albumen.

CASE III.—Alfred B., aged 26, a coach-builder, was admitted into the Arnott Ward of the Brompton Hospital December 31st, 1878. His father and mother had died of chest-disease. Eight years ago he had syphilis, but had been free from symptoms since. Two years ago cough came on, accompanied by wasting and night-sweats, and persisted, the patient losing two stone and a half in two years. Three months before admission, he had hæmoptysis to the extent of half a pint, repeated three times to a lesser amount. The cough was troublesome, expectoration copious, and mucopurulent; the tongue clean; bowels regular. His weight was eight stone five pounds; his aspect was pale; the urine contained no albumen. The patient had a syphilitic scar on his forehead, but stated that his legs had never been swollen.

Dr. Tatham, who admitted him in my absence, found contraction of the right chest, and signs of a cavity in the upper lobe posteriorly, and crepitation at the base. The left lung was apparently drawn across the median line to the right of the sternum. Tubular sounds were audible under the left clavicle.

The patient continued in much the same condition till March 2nd, 1879, when diarrhoea came on, followed one week later by œdema of the feet.

On March 19th, a careful examination of the urine showed it to be of specific gravity 1015, with albumen to one-third of the test-tube, the diarrhoea having ceased. Observations were made under my direction by Dr. Griffiths, my clinical assistant, to ascertain the temperature, likewise the amount of urine passed, its specific gravity, and the proportion of albumen and urea. The record was carried out for thirty-one days. The temperatures were subnormal in the mornings, with a slight rise at 8 P.M., the averages being—At 8 A.M. 97.9°, at 11 A.M. 97.9°, at 2 P.M. 98.3°, at 5 P.M. 98.9°, at 8 P.M. 99.9°; maximum 101.2°, minimum 97°. The maximum was only reached once, and the records of 100° were limited to the last period, viz., 8 P.M. The urine varied in quantity from 17 to 36 ounces, giving a daily average of 21 ounces; the specific gravity was from 1023 to 1043, averaging 1031, and the albumen from one-third to two-thirds of the test-tube. A deposit of urates was often present. The urea varied in amount from 197 to 123 grains during this period.

April 26th, 1879. The bowels were open twice. He had œdema of the penis, and urine was passed with difficulty. General dropsy was present. The urine was 20 ounces in quantity, of specific gravity 1030. Urea 107.8 grains.

Physical Signs.—On the right side, cavernous sounds were audible from the first to the fourth rib. There was very coarse crepitation in the suprascapular fossa. On the left side, cavernous sounds were audible to the third rib. There were crepitation below and over the whole posterior surface.

May 5th. He had general œdema of the body; the bowels were loose, and the stools sometimes offensive. Friction (double) was audible over the cardiac area. The urine was 19 ounces, of specific gravity 1030; urea 73.9 grains, albumen two-thirds of the test-tube.

On May 6th he died.

Necropsy, on the following day. The right pleura was universally adherent. The upper lobe of the lung contained a large cavity. Tubercle was scattered throughout the lower lobe. The left pleura was adherent at the apex, where there was a large cavity. Tubercle was generally present, isolated and scattered. The heart weighed 8½ ounces. The pericardium contained fluid. The left ventricle was hypertrophied. The intestines were lardaceous. The liver weighed 3½ pounds. The spleen weighed 7 ounces; it was firm, hard, and lardaceous. The kidneys weighed 17 ounces; they were large and white. The Malpighian bodies were large; the capsules adherent.

Dr. Ewart reported of the microscopical examination of the kidneys: "the existence of lardaceous disease could be clearly recognised under the microscope, without the assistance of iodine. Some of the loops of Henlé were converted into columns of bright hyaline beads. A similar appearance was also presented in small patches by the epithelium of the tubuli contorti. In addition to these changes there existed distinct evidence of fatty degeneration, and of the conditions commonly observed in the large white kidney. The lumen of most of the tubes was obliterated."

REMARKS.—Here syphilis was present, as a predisposing cause to lardaceous disease; but no albumen was detected in the urine until the patient had suffered considerably from diarrhoea, when albuminuria and the attendant œdema came on, about two months after his admission into the hospital.

The physical signs during life, and the *post mortem* examination, indicated that the lungs during the period of the thermometric ob-

servations were undergoing rapid excavation, and fresh tuberculisation, such as ordinarily give rise to considerable and obstinate pyrexia. Nevertheless, the average temperatures were subnormal in the mornings, and scarcely exceeded the normal in the evenings.

The diarrhoea was evidently due to lardaceous changes in the intestine, no ulceration being detected. From the succession of the symptoms the intestines were apparently attacked before the kidneys, the diarrhoea preceding the albuminuria, and both being brought about by long continued discharge from the lungs. The small amount of urea towards the end of life is worth noting, as it reached as low as 73.9 grains contained in 19 ounces of urine.

CASE IV.—Mary Ann P., aged 46, a housemaid. Her father died of phthisis at 48, her mother of the same disease at 28, her sister of the same at 27. Nine years ago, she had inflammation of the lungs, and in 1876 was admitted into the hospital with consolidation of the upper lobe of the right lung, and improved during her stay, gaining 8 lbs., and the consolidation diminishing. She had hæmoptysis to the amount of half a pint in December 1875, and since then the cough had been continuous, and accompanied by night-sweats and wasting. On January 6th, 1880, she was readmitted in a greatly emaciated condition, with diarrhoea and œdema of the lower extremities. The urine was highly albuminous. The tongue was red and furred along the dorsum.

Physical Signs.—Cavernous sounds were audible over the upper portions of both sides of the chest, extending as low down as the fourth rib, and crepitation was heard below. Hepatic dulness was considerably increased, and the liver could be felt an inch below the last rib as far as the median line.

Observations were taken from January 27th to February 5th (ten days) on the temperature, and the averages were as follows: At 8 A.M. 97.3°; at 11 A.M. 97.4°; at 2 P.M. 97.2°; at 5 P.M. 97.8°; at 8 P.M. 98.2°. Maximum, 99.2°; minimum, 96°.

The quantity of urine gradually fell from fifty-one to twenty-one ounces, the specific gravity varying from 1020 to 1028: the albumen occupied from two-fifths to three-fifths of the test-tube; the urea varied from 165 to 196 grains.

On January 30th, the diarrhoea, which had somewhat subsided, returned, the patient having four or five motions daily; and on February 1st she had peritonitis, and fluid was detected in the abdomen. On February 3rd, the fluid had increased, and there was more œdema of both legs. On the 5th, she passed her motions unconsciously; the pupils became dilated, she lost sensibility, and died of coma on the 6th.

At the necropsy, twelve hours after death, the right lung had an adherent pleura, and a large trabeculated cavity in the upper lobe, partly gangrenous. The lower lobe was studded with caseating patches interspersed with pneumonia. The left lung had the pleura adherent and a cavity at the apex, with cretaceous masses scattered through the rest of the upper lobe; the lower lobe was congested and œdematous. The heart was pale; its tissue was flabby; the coronary arteries were calcareous. The aorta was atheromatous. The abdomen showed signs of recent peritonitis, and contained a pint and a half of serum. The intestines displayed numerous ulcerations, especially in the ileum and large intestine, but no perforation was detected. A great portion of the intestines was lardaceous. The liver was enlarged and lardaceous. The kidneys were large and lardaceous; the capsules were adherent, and the surface granular in parts.

Dr. Ewart kindly examined sections of the kidneys under the microscope, and reported: "A thin section steeped in a weak solution of iodine gave a marked lardaceous reaction. The brown colour appeared in isolated spots with great intensity—viz., in short lengths of the tubuli contorti, and in most of the Malpighian tufts. A fainter staining was noticeable throughout the cortex at the periphery of the epithelium of the tubules. The tubuli contorti were of large size, and were the seat of cell-proliferation and of advanced fatty degeneration. Owing to the high degree of fatty granular change, the free surface of the cells was eroded, and a clear lumen resulted at the centre of the tube, in spite of the cell-proliferation which had obviously taken place."

REMARKS.—This was a well-marked case of lardaceous disease supervening on advanced tuberculosis of the lungs and intestines, and ending in dropsy and peritonitis, with uræmic poisoning, and death by coma. The temperatures were subnormal, the minimum reaching 96° Fahr. The quantity of albumen was large, that of urea below average. Hyaline casts were also present.

CASE V.—Thomas T., aged 35, was admitted under the care of Dr. Douglas Powell, who kindly placed the case at my disposal. One sister died of phthisis.

He had always been delicate, and was at one time subject to abscesses in the submaxillary region. Some years ago, he had his testicles removed for a fungoid growth, which made its way through the scrotum. He had also had an extensive abscess above the left scapula, and effusion into the right knee-joint. He had been confined to bed, more or less, for two years before admission, on account of constant headache and occasional epileptic fits.

Cough began eight months before, with very abundant expectoration, and rapid loss of flesh. He had slight hæmoptysis three months ago, repeated some weeks later, and again three weeks before admission.

Physical Signs.—The left chest was dull to the nipple, with diffused, scattered, moist crepitation. There was dullness with humid crepitation above the scapula; exaggerated breathing was heard below the spine of the scapula. On the right side, harsh breathing was audible in the subclavicular and supraspinous regions, dullness as far as the middle of the scapula, with subcrepitant râles posteriorly.

August 12th. The cough was severe; pulse intermittent.

August 21st. (Edema of the feet was noticed for the first time.

August 30th. He had pain in the perineum on coughing. Micturition was painful. The prostate was large, tender on pressure. The patient had hæmorrhoids.

September 1st. Pain in micturition was increased.

September 3rd. Humid crepitation was heard all over the right side, posteriorly to the angle of the scapula. The sounds were less moist anteriorly, except below the fifth rib on the left side. The patient stated that he had had five severe shivering attacks, with dyspnoea, obliging him to sit up, and have blankets, hot water, etc., to restore warmth. He had but little coughing during the attacks.

September 6th. He had two shivering fits yesterday, at 11 A.M. and 5.30 P.M. A fit of dyspnoea came on at 8.45 P.M. The patient was very livid; pulse rapid and jerky. He died at 9.45 P.M.

Observations on the temperature were carried out from August 26th to September 6th, the day of his death, with the following average results: at 8 A.M., 98.6°; at 11 A.M., 99.1°; at 2 P.M., 99.2°; at 5 P.M., 99.6°; at 1 P.M., 100.1°; maximum, 102.4°; minimum, 98°. The quantity of urine varied from 22 to 53 ounces, with an average of 40 ounces; and the specific gravity from 1012 to 1024, with an average of 1018. The albumen ranged from three-fourths to one-third of the test-tube, averaging one-half; the urea from 130.2 grains to 334.8 grains.

Necropsy, on the day following his death, by Mr. Hugh Smith, the clinical assistant, showed cicatrices in the neck and above the scapula, and a discharging abscess in the left submaxillary region. The left testicle had been removed, and a large scar extended from the scrotum to the external abdominal ring. The intestines contained enlarged solitary glands and numerous ulcers, especially near the ileo-cæcal valve. The liver weighed 4 lbs. 9 ozs., it was enlarged, and of flabby consistence. The spleen weighed 14 ozs., and was pulpy and gave lardaceous reaction. The kidneys weighed 23 ozs., were unequal in size, pale, and the capsules were adherent. On section, the cortex was found increased, and gave marked lardaceous reaction. The larynx was much ulcerated, and the vocal cords thickened. Both pleuræ were adherent. The right lung contained greyish-yellow and hard nodules of various sizes in the middle lobe. The left lung had a smooth-lined cavity at the apex, and a mass of greyish-yellow tubercle at the root of the lung. The heart was thin-walled and dilated.

REMARKS.—The temperatures in this case were rather higher than in the preceding ones; and the albuminuria, though it exercised a lowering influence, seems to have reduced them less than in other cases. The necropsy showed the kidneys to be lardaceous, but the specific gravity of the urine and the amount of urea exceeded the general run of lardaceous cases. Death appears to have occurred from apnoea, and not from toxæmia.

CASE VI.—J. B., aged 29, was admitted October 30th, 1879. He had phthisis eight months; diarrhoea lasting some weeks; cedema fourteen days. There was a cavity in the left upper lobe, with active tuberculation proceeding, the right lung being attacked and excavated during his stay in hospital.

The temperature-averages were as follows: at 8 A.M., 97.4°; at 11 A.M., 99.8°; at 2 P.M., 99.5°; at 5 P.M., 99.1°; at 8 P.M., 98.2°; maximum, 100° Fahr.; minimum, 97° Fahr. The urine averaged forty ounces a day, 1015 specific gravity, containing one-half albumen and 228 grains of urea. Death occurred on April 29th, 1880, from

ascites and diarrhoea. *Post mortem* examination showed cavities in both lungs, with recent tubercle-formation and ulceration of the small and large intestines. There was lardaceous disease of the liver, kidneys, spleen, and pancreas.

CASE VII.—George M., aged 38, a waiter, was admitted into the Hospital on August 5th, 1879. He had lost a sister from phthisis. Five years ago, he had a fissure of the tongue, which healed of itself. Cough commenced in November, 1878, accompanied by expectoration, which had lately increased, and occasionally been streaked with blood. In the last four months, his voice had become affected. He had wasted considerably from the beginning of his illness.

On admission, cough was very troublesome, inducing vomiting. Expectoration was muco-purulent. Night-sweats were troublesome. The bowels were costive. There was some cedema of the feet and ankles. In the right chest, fine crepitation was heard from the clavicle to the third rib; in the left chest, crepitation was audible over the whole side, coarse over the upper third posteriorly, with tubular sounds. Laryngoscopic examination showed large ulcers in the larynx.

On September 5th, my clinical assistant, Dr. George Gulliver, commenced observations on the temperature and urine, which were continued to within a week of the patient's death, on October 12th. This was caused by severe diarrhoea, lasting about three weeks. The temperature-observations were continued one month, and give the following averages. At 8 A.M., 97.4°; at 11 A.M., 97.8°; at 2 P.M., 98.1°; at 5 P.M., 98.5°; at 8 P.M., 98.9°; maximum 100.8°; minimum 96.4°.

The urine varied in quantity from 18 ounces to 36 ounces; the albumen was about one-half the test-tube, and of specific gravity 1012. Unfortunately, no determinations of urea were made. The urine contained hyaline casts, with epithelial cells and some oil-globules.

Necropsy, October 13th. The body was emaciated. There were adhesions at the upper parts of both lungs, most marked over the left. The left lung had numerous well-defined cavities, rather thin-walled, and containing purulent matter. The right lung was in a similar condition, but somewhat more advanced. Emphysema was present, and tubercle was found at the base of the left lung. The larynx showed a large ragged ulcer on the posterior surface of the epiglottis. There was extensive ulceration between the vocal cords at the base of the arytenoid cartilages, leading to complete erosion of these cartilages. The kidneys weighed twenty-one ounces, and were typical large white mottled ones. The heart, liver, and spleen were healthy, and no lardaceous reaction could be found in the last two organs or in the kidneys. The small intestines showed ulceration over the lower two-thirds, for the most part follicular, but some patches were visible, a large one at the ileo-cæcal valve. Several ulcers were present in the large intestine. There was no scar on the penis nor enlargement of the lymphatic glands, but scars of old buboes were present in the left groin.

REMARKS.—In this case, the usual low temperatures prevailed accompanying intestinal ulceration and excavation-processes in the lungs. The kidneys weighed twenty-one ounces, and are described as white and mottled; but it is remarkable, considering the presence of constitutional syphilis, and the exhausting discharges from the intestinal ulcers, that no lardaceous disease was detected. Unfortunately, no microscopic examination was made, which might have discovered some commencing in the Malpighian tufts. In the absence of such evidence, we must conclude that the disease was chronic nephritis, supervening on old syphilitic phthisis.

The remaining cases are given in brief abstract.

CASE VIII.—Frederick G., aged 19, was admitted under the care of Dr. Reginald Thompson, who kindly allowed me to take observations of the case. He had always suffered from severe cough, and two years and a half ago began to lose voice. Expectoration was streaked with blood the previous winter. He was an in-patient of the Victoria Hospital from January to March, 1881, and improved; but, on leaving the hospital, the cough became more troublesome, and the expectoration profuse. The breath was shortened. He lost flesh rapidly, and, when admitted into the Brompton Hospital, had cedema of the feet. The bowels were open once a day, but the motion was loose and watery. A day or two later, diarrhoea came on, and varied in frequency from two to six motions a day. He died, exhausted by this symptom and his great weakness, on October 3rd. During the last ten days of his life, observations were made on the temperature, which gave the following results: at 8 A.M., 97.7°; at 11 A.M., 98.4°; at 2 P.M., 99.1°; at 5 P.M., 99.4°; at 8 P.M., 99.9°; maximum, 101.8°; minimum, 96.8°.

* As this patient was made the subject of a number of dietary experiments, the full notes are reserved for a future communication on this subject.

The urine was scanty, varying from eleven to twenty-one ounces; it contained two-thirds of albumen and 166.5 grains of urea. The diarrhoea doubtless was the cause of the diminished quantity of urine.

Necropsy, October 4th, 1881. The body was very emaciated. The lower half of the ileum, and the whole of the large intestine, were occupied by extensive ulcers of well-marked tubercular form. The spleen (11 ounces) contained numerous sago-bodies, and some tubercle, as well as lardaceous material. The liver (3 lbs. 7 oz.) was apparently lardaceous. The kidneys (10 ounces) showed a wide cortex, and were markedly lardaceous. The lungs had large cavities at the apices, with foul contents, each cavity being of the size of an orange. The left lung also had a cavity in the axillary region. The lower lobes of both lungs contained caseous tubercle and purulent infiltration. The larynx was ulcerated.

REMARKS.—This was undoubtedly a case of lardaceous disease following on the exhausting discharge of expectoration and diarrhoea. As it came under notice only shortly before death, the observations taken were few; but, as far as they went, they indicated the presence of moderate temperatures where, considering the extensive ulcerative processes, we should have expected high pyrexial ones. The quantity of urine and urea excreted was decidedly small; this may have been due to the profuse diarrhoea.

CASE IX.—James R., aged 27, was admitted May 14th, 1878. He had cough and yellow expectoration, occasionally streaked, fourteen months, caused by exposure to cold and wet, followed by night-sweats, and emaciation. Since November, 1877, he had shown rapid emaciation and loss of strength. His cough was troublesome; expectoration was yellow, and copious. The tongue was furred. In the right chest, tubular sounds and crepitation, were heard in the first interspace. In left chest, undue resonance and cracked-pot sound were heard, with distant cavernous breathing from the clavicle to the fifth rib. Crepitation was audible over the lower third. There was dulness above the scapula.

Temperature-observations were taken nine days after admission, in consequence of rigors coming on and occurring daily, generally about 11 A.M., accompanied by a quick pulse (110 to 120), and hurried respiration. Vomiting occurred generally after breakfast for a week. Later on night-sweats appeared, and the rigors ceased. On June 20th, he complained of pain in the back; slight cedema of the legs was noted, and the urine was examined, and found to contain albumen occupying one-third of the test-tube. The temperature-averages of twenty-seven days were: at 8 A.M. 100.2°; at 11 A.M., 101.6°; at 2 P.M., 101.8°; at 5 P.M., 102°; and at 8 P.M., 102.4°. Maximum, 104.2°; minimum, 98.2°.

The urine varied in quantity 16 ozs. to 44 ozs., containing one-third albumen, and some granular casts. The pains in the back (renal region) continued, the vomiting and shivering having ceased, till June 28th, when they subsided. Unfortunately, the patient quitted the hospital two days later, and was lost sight of.

REMARKS.—This case is included, as the temperature-observations were carried on steadily for twenty-seven days; but the height and range of these were not explained by anything occurring in the lungs, or in any other organ, and as the patient left the hospital and was lost sight of, the cause of the pyrexia was not explained.

CASE X.—John T., aged 30, groom, was admitted December 22nd, 1874. Five years ago, being chilled by sleeping in a damp bed, he occasionally had cough and expectoration since, which had become constant in the last three years. He had severe hæmoptysis twice, each time lasting two weeks. He had lost three stone in weight. Scattered crepitation was audible over both lungs. He had cedema of the feet and ankles. The urine contained a considerable amount of albumen, was of specific gravity 1027, and averaged one and a half pints daily.

Observations on temperature were carried on from January 8th to February 4th, by Mr. H. L. Bernays. During five days, diarrhoea had prevailed. The following were the averages of nineteen days: at 8 A.M., 98.1°; at 11 A.M., 98.6°; at 2 P.M., 99.4°; at 5 P.M., 100°; at 8 P.M., 100.2°; maximum, 101.6°; minimum, 96°.

The patient became more and more dropsical, there being general cedema and effusion into the right pleura, and he sank on March 3rd.

The **necropsy** on the following day showed general anasarca. The right lung contained a large cavity at the apex, and tubercle scattered through the upper lobe. The left pleura contained a pint of serous fluid; the left lung showed a small cavity at the apex, and tubercle scattered through the lower lobe. Both cavities were of old date, and had cartilaginous linings. The right cavities of the heart were dilated. The kidneys were large, mottled, and their cortical structure was much increased.

CASE XI.—J. M. W., aged 28, was admitted in February 1875, with a history of phthisis, of two years' standing, and of diarrhoea of some months' duration. Cavernous sounds were audible over the greater portion of both lungs, with crepitation at the base of the left lung. The urine (in quantity forty-four ounces), loaded with albumen, contained a large number of casts, epithelial, hyaline, and granular, with much loose epithelium. There was considerable cedema. The patient gradually sank, and died on March 2nd, twenty days after admission. During the last five days of his life, Mr. Bernays took temperature-observations, which gave the subjoined results as the average: at 8 A.M., 100.6°; at 11 A.M., 99.3°; at 5 P.M., 101°; at 8 P.M., 101.8°; maximum, 103.8°; minimum, 94°.

The **necropsy** showed both lungs to contain large thin-walled cavities, with scattered tubercle in the lower lobes. The liver was pale and large. The kidneys were very pale; their cortical structure was greatly increased; the capsules peeled easily (chronic nephritis).

REMARKS.—The shortness of this case precludes any decided deductions being made from it, the temperature being only taken for five days. The course was a very fitful one, such as often accompanies the termination of destructive lung-disease. Unfortunately, no account is given of the kidneys being tested with iodine, and we must accordingly accept them as instances of chronic nephritis though the description is more that of lardaceous.

[To be continued.]

THE ÆTIOLOGY AND PATHOLOGY OF SPORADIC PUERPERAL SEPTICÆMIA.¹

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In the year 1878, I published in the columns of the *Lancet* two papers on the subject of puerperal septicæmia. The principal point, amongst others, aimed at in those papers, was to establish the entire independence of true puerperal fever of the contagion of the specific zymotic diseases, such as scarlet fever, measles, small-pox, etc.; believing, as I then did, and do now, that the specific zymotic diseases, such as those above named, always breed true; and that, therefore, although the virus of any of those diseases may be introduced to a parturient woman, the disease which results will not be true puerperal septicæmia, but modified scarlet fever, measles, or small-pox, as the case may be.

This is a point in the etiology of puerperal septicæmia which is, however, still much mooted, and, by many, considered to be still *sub judice*; and, as such, it will fall to be considered in its proper place.

Since the publication of my former papers, it has fallen to my lot to be called upon to attend, and to attend regularly, in consultation, many fresh cases of this dire disorder, than which no disease to which flesh is heir spreads greater dismay among our patients and their friends, causes more anguish to the medical attendant, or extinguishes more hopes.

I do not propose to say anything in regard of that horrible form of contagious or endemic puerperal fever which, more often formerly than at the present day, decimated the parturient women gathered together in our lying-in hospitals. Also, I discard from present consideration those cases which are primarily due to an inflammatory process, set up, after parturition, in the peritoneum, or in the uterus, or in some of its appendages. The causes of these are well known, and their course is pretty definite, and they have little or no true pathological analogy with such cases as those with which we are now concerned.

By sporadic puerperal septicæmia I mean a form of disease, cases of which every now and then arise to perplex and astound the medical attendant, as frequently amongst the healthy and well-to-do as amongst the poorer and more sickly classes of the community, as well in the palace as in the cottage, in the country mansion as in the squalid court or alley. Neither can air or drainage be subjected to suspicion in many cases, nor can fatness or poverty, or anxiety of mind. Our text-books inform us that puerperal fever often seizes upon those unfortunate women who, at the time of childbirth, are under a cloud, whether from poverty, sickness, or mental anxiety. Yet the healthiest, happiest homes are not proof against the invasion of this horrible destroyer, as most of my own cases would show.

¹ Read at a joint meeting of the Worcestershire and Herefordshire and Gloucestershire Branches.