

In the course of eight, ten, or twelve days, the return of the conjunctiva to the healthy state takes place, and the swelling of it becomes lessened. As soon as this is observed, I again make the attempt to replace the eyelid; for the sooner the changed surface is withdrawn from the action of the air, the sooner will it return to the healthy state. The use of the precipitate ointment should be continued until the eyelid has completely regained its healthy appearance and functions.

When the mother nurses her child and the leucorrhœal discharge continues, I have given her the cubeb pepper with the view of communicating its beneficial influence to the child. We often see this medicine have a very speedy and decided effect in stopping this discharge, and perhaps it might in the same way arrest the discharge from the eyes in the infant. The number of my trials do not enable me to draw any positive conclusion, but I consider it perfectly safe, and would recommend any practitioners who have an opportunity for doing so to give it a trial.

Edin. 43, York Place, August 1829.

ART. IV.—*Observations on the variety of Dropsy which depends on Diseased Kidney.* By ROBERT CHRISTISON, M. D. one of the Physicians to the Royal Infirmary and Fever Hospital, and Professor of Medical Jurisprudence and Police in the University of Edinburgh, &c.

THE dependence of some cases of dropsy on a peculiar organic disease of the kidneys was lately pointed out for the first time by Dr Bright of Guy's Hospital, London, in his valuable Hospital Reports.* Since then I am not aware that any other physician has publicly noticed this discovery, or endeavoured to confirm or extend the statements of Dr Bright. Nevertheless his statements are of great interest; for according to my own experience and that of my colleagues in the Infirmary of this place, the dropsy which appears to originate in organic derangement of the kidneys is one of the most frequent of the varieties of that disease. In the course of a twelvemonth prior to May last, no fewer than about twenty cases have occurred in the different wards of our Hospital; and at the present moment five cases of the kind are under treatment.

The chief interest possessed by the instances to be detailed in the following remarks is derived from the circumstance, that they furnish the fullest confirmation of a great part of the novel observations and ingenious views of Dr Bright. In this re-

* Reports of Medical Cases, selected with the view of illustrating the Symptoms and Cure of Diseases, &c. 1827.

spect they will not, it is hoped, be found unworthy of receiving publicity. Some of them, however, are also interesting, as they show more clearly than that gentleman succeeded in establishing,—the occasional presence of urea in the blood of persons labouring under the disease in question. Others are important in a strictly practical point of view, as they afford strong presumption that the pathognomic sign laid down by Dr Bright may present itself to the attentive search of the practitioner at a time when the organic derangement of the kidneys may be,—if not cured,—at least prevented from interfering with the right performance of their function.

CASE I.—*Robert Irving*, an out-pensioner of Chelsea Hospital, 58 years of age, of robust make and short stature, was admitted into the Infirmary on the 12th July 1828, on account of extensive œdema of the legs, and considerable enlargement of the abdomen. The legs pitted on pressure, and in the abdomen fluctuation was distinct. This affection was of three weeks standing. He was unable to assign any cause for it except general exposure to vicissitudes of temperature at his employment as a porter in the butcher-market. The œdema was not preceded by any pain in the loins or belly, or by nausea or vomiting; neither was there any such symptom at the time of his admission. The pulse, tongue, appetite, and bowels were in the natural state.

He had been at Walcheren in 1809, and after his return was attacked with ague, which made him an invalid for a twelvemonth. In 1814 a large abscess formed in the pit of the stomach, and about four pounds of matter were withdrawn by a puncture, the scar of which was at his admission evident three inches above the navel. His liver was at that time believed to be affected. He had a battered, dissipated appearance, and allowed he had led a very intemperate life.

The urine was natural in quantity, being 40 ounces daily at the time of his admission; and it yielded a copious flocculent precipitate when heated nearly to the temperature of ebullition. During the first seven days the urine was increased somewhat by the use of squill pills and a little mercury; but as the patient appeared to be making no progress under that treatment, digitalis was substituted for the squills on the 20th July. In a few days the urine increased to 100 ounces, and for at least three days after the 24th became merely hazy when boiled.

On the 15th August the œdema of the limbs was materially diminished. On that day I examined the urine with more care, and found it wine-yellow in colour, of a strong urinous odour, of the specific gravity 1014.5, again loaded with albumen, but

evidently containing also a good deal of urea. In quantity it generally amounted to 110 ounces daily. The same treatment being continued, the swelling of the limbs had on the 22d greatly subsided, and that of the abdomen had also become materially less, although fluctuation was still perceptible. As the mercury had begun to affect his mouth, it was discontinued; but the digitalis was persevered in. From this time the urine increased rapidly to 130 ounces daily. On the 25th, the abdomen being then quite flaccid, and admitting of a careful examination, it was found that no local hardness or fulness existed in either hypochondrium. On the 30th the urine was 140 ounces, had a specific gravity of 1011.8, and, after having been for some days subsequent to the 22d rather less coagulable, had again begun to yield a very copious flocculent precipitate when heated. The œdema was so completely removed that he was able to do without bandages on the limbs, which he had never wanted till then from the time of his admission. Two days afterwards fluctuation was no longer perceptible in the abdomen.

On the 8th September he had a slight attack of dysentery, which at that time prevailed in the hospital in a very malignant form. It was easily checked in his instance, however, by opium. The urine was still about 140 ounces daily, and gave a copious precipitate when heated. The digitalis was continued. Subsequently the urine began to diminish slowly in quantity, so that on the 12th it was 110, and on the 16th 96 ounces; but the œdema and ascitical swelling were all this time hardly perceptible. On the 12th the urine was examined with care. From the particulars stated below* it will be seen that the specific gravity had increased, and that it contained only half the natural proportion of urea and salts, and a large proportion of albumen.

Hitherto his progress was steady, though very slow. But

* On the 30th August, when the quantity was 130 ounces daily, the specific gravity was 1011.8.

On the 12th September, the quantity being 110 ounces, the density was 1013.4, the solid contents 29.8 per thousand, of which 20.4 were urea with a small quantity of animalized acetates, 3.7 were alkaline muriates, sulphates and phosphates, and 5.1 dry albumen, the rest being water. The quantity of earthy phosphates was inappreciable.

As a point of comparison for this and other experiments, the following analysis of healthy urine may be given. When the quantity was 35 ounces daily, the average specific gravity was 1029, and the solid contents 67.7 per thousand, of which 55.2 were urea and animalized acetates, 11.1 alkaline muriates, sulphates and phosphates, 1.0 earthy phosphates and sulphates, and 0.4 vesical mucus. The urea with the associated acetates is separated by strong alcohol; the alkaline muriates, phosphates, and sulphates are obtained from the residue by means of the action of water; and from what then remains the vesical mucus is removed by potass, after which nothing is left but insoluble earthy salts. A more refined analysis appeared to me unnecessary.

from this time his state retrograded. On the 22d the œdema had returned in the thighs, and the abdomen was again somewhat enlarged and indistinctly fluctuating. Nevertheless the urine continued to be passed in the quantity of 90 ounces daily. Its specific gravity was increased; and although this was partly owing to an increase in the proportion of urea and salts, the albumen had increased in a much greater proportion.* On the 29th the dropsical effusions had increased still farther, the urine had been for some days only 48 ounces daily; and although its density had not increased, the proportion of albumen was sensibly greater.† For three or four days he had also been affected with cough, which had become harsh, loud and husky, and attended with scanty, difficult expectoration of clear and not particularly viscous mucus. This was the first occasion on which he had any pectoral complaint in the hospital. The pulse was natural. A squill mixture was prescribed as an expectorant, and two days afterwards the digitalis was discontinued, squill pills and supertartrate of potass being ordered instead of it, the latter in the dose of two drachms in half a pint of water three times a-day.

This plan was commenced on the 30th. The urine, however, continued scanty, varying from 30 to 40 ounces. On the 6th October, as he complained of weakness and want of appetite, he got at his own particular request some bark powder. But on the 11th it was discontinued on account of symptoms of a head affection, which those, who have perused Dr Bright's reports, or had personal experience in this disease, cannot fail to regard always with a suspicious eye. He had gradually increasing dimness of vision and a sense of weight and pain in the forehead on coughing or stooping. The dropsical swellings had also greatly increased, and his cough was not any better. The specific gravity of the urine was 1018.3. His diet was immediately reduced; the squill and supertartrate of potass were at the same time omitted, and the digitalis and mercury resumed; and as the pulse was 84 and firm, twelve ounces of blood were taken from the arm. The blood was buffy, not cupped, and its serum had a specific gravity of only 1019.2, and merely gelatinized when heated. Although the urine was not increased next day, the swelling of the abdomen was much reduced. On the 15th, his headach continuing, and the dimness of sight having increased, twelve

* On the 22d September, the quantity being 93 ounces, the density was 1016.4, and the solid contents 36.9 per thousand, of which 23.7 were urea and acetates, 4.4 alkaline muriates, sulphates and phosphates, and 7.9 dry albumen.

† On the 29th September, the quantity of urine being 48 ounces, the density was 1016.3, and the solid contents 38.6 per thousand, of which 24.7 were urea with acetates, 4.2 alkaline muriates, sulphates and phosphates, and 9.1 dry albumen.

leeches were applied to the forehead, with much relief to the headach. On the 16th the dimness of sight continuing, and the pulse being firm, venesection was repeated to sixteen ounces. The blood was not buffy, the crassamentum was loose, the serum of the specific gravity 1020, and holding only 68.3 parts per thousand of solid matter dissolved. Before the bleeding the urine was 36 ounces, and nearly in the same state as on the 29th September; after the bleeding its quantity was not augmented; but its density was considerably increased, and the albumen had increased in a greater proportion than the other ingredients.* Both the abdominal swelling and oedema were much diminished; and the cough, headach, and dimness of sight were also relieved. On the 19th the digitalis was increased.

From this time till the 26th no material amendment took place; and on that day he began to complain of nausea and increased dimness of sight, and the pulse became feeble. The digitalis and mercury were therefore discontinued, and instead of them he was directed to take supertartrate of potass as formerly. In four days the urine under this system was increased to 60 ounces; and at the same time the dimness of the left eye was diminished; but that of the right eye remained the same as before, and the pupil was distinctly dilated. Half a drachm was added on the 30th to each dose of the supertartrate.

On the 2d November the urine was 80 ounces daily, and almost free of coagulation when heated, a faint haze only being caused. His cough and dyspnoea, however, had been gradually getting worse for two days previous, and I found on carefully examining the chest, that both lower dorsal regions were dull on percussion, and the respiratory murmur inaudible, while in the upper dorsal and whole anterior regions the sound on percussion was natural, and the respiratory murmur distinct and sonorous. As his cough excited pain under the sternum, a large blister was applied and an opiate mixture given with marked advantage. On the 5th the urine was 90 ounces daily, but again very coagulable. On the 10th the pectoral symptoms were much less troublesome; the respiratory murmur was heard in both lower dorsal regions, was puerile in the right lateral and indistinct and crepitating in the left lateral region, the latter being the side on which he commonly lay. By this time the oedema and ascites were somewhat diminished, and he passed 100

* The quantity of urine being 36 ounces, its density before the bleeding was 1016.3, its solid contents 39.3 per thousand, of which 23.3 were urea with acetates, 6.5 alkaline muriates, sulphates, and phosphates, and 9.2 albumen. After the bleeding the density was 1019.1, and the solid contents 46.5, of which 27.2 were urea with acetates, 8.4 alkaline muriates, sulphates, and phosphates, and 10.3 albumen.

ounces of water daily. On the 11th the urine was again not coagulable by heat, but merely rendered hazy. On the 17th the dropsical swellings had subsided very considerably. After this the urine gradually decreased to 60 ounces daily, which continued to be its average till his dismissal. His diet was now extended. After the 28th, the dose of supertartrate of potass was gradually lessened, and on the 27th of December it was discontinued altogether.

On the 2d January 1829 he was dismissed at his own desire. At this time he had been three weeks without any oedema and a fortnight without any swelling of the belly. For some days after the 11th November the urine continued free of albumen; after that its state was lost sight of till the 28th, when it was again found to coagulate as copiously as ever; and it was of the same nature at his dismissal. His head affection had entirely disappeared, except the dimness of the right eye and dilatation of the pupil, which were little altered after the 30th October. His pectoral complaints had been very trivial for five weeks before he was dismissed.

On the 26th of February, seven weeks after leaving the hospital, this man was readmitted, and became a patient of Dr Alison in the clinical ward. I am indebted to Dr Alison for the account of the sequel of the case, and of the appearances found on examination of the body.

At his readmission the oedema and ascites were considerable, but not so great as when he was under my charge. He had severe pain of the head, much confusion of thought, squinting to the right side, dimness of sight, dilatation and sluggishness of the pupils, impaired power of motion in the limbs; also pain in the epigastrium increased on coughing and pressure, and pain and tenderness in the region of the fifth dorsal vertebra. The pulse was frequent and feeble; the tongue clean; the bowels slow; the urine moderate in quantity, and coagulating abundantly by heat.

He was reported to have been suddenly seized three weeks after his dismissal with headach, pain in the stomach and bloody vomiting, followed by loss of memory, impaired motion of the extremities and imperfect articulation.

The treatment adopted by Dr Alison consisted in the frequent administration of laxatives, the employment of powder of digitalis, and a trial of depletion to a moderate extent the day after he was admitted. Under this method his headach and pain of back were much relieved; and on the 1st of March the urine was somewhat increased. The dropsical swellings, however, were not materially lessened; and although he was at

times more collected, he generally passed his evacuations unconsciously, and was drowsy and confused.

On the 10th March he was attacked with a fit of convulsions and increased stupor and dilatation of pupils. A blister was applied to the head, and ten ounces of blood were taken by cupping from the temples. The convulsions ceased, but he then became delirious at intervals. On the morning of the 10th the delirium increased, and was followed by spasmodic contraction of the arms and increased stupor. The pulse became slow and feeble; the spasms returned several times in the course of the day; and at one next morning he expired.

Inspection.—In the head there was slight effusion between the arachnoid and pia mater; the substance of the brain was unnaturally hard, and when cut showed more bloody points, and poured out more serum than usual. The lateral ventricles contained several drachms of fluid, the left most; and the *foramen* of Monro was more open than natural. In the left ventricle, behind and on the outside of the *optic thalamus* there was a large, soft, brownish tumour, which displaced the *fornix* and extended into the descending *cornu*, which, as well as the posterior cornu, was much enlarged. The medullary matter around it was much disorganized, being softened and broken down. The *corpus striatum* and *choroid plexus* were healthy. A tumour of a similar nature had commenced in the same situation in the right ventricle.

The abdomen contained several pounds of serous fluid. The right lobe of the liver adhered strongly to the diaphragm, but was perfectly healthy in its structure, and did not present any trace of an abscess having ever existed in it. There was no adhesion of any internal organ to the peritonæum opposite the external scar. Both kidneys were unusually small, hard, pale, and scabrous; the cortical part was pale and granulated; and a great part of the tubular portion was disorganized by a deposition of grayish yellow matter, and did not retain its fibrous structure. The other viscera were in the natural state.

In the chest there was found considerable serous infiltration of the lungs. The heart was healthy.

CASE II.—*Francis Magee*, aged 57, a weaver, at the time of his admission into the Infirmary on the 5th August 1828, had been affected for three weeks with considerable œdema, and some swelling and firmness of the belly. He had also occasional vomiting in the morning, and dull pain on pressure in the pit of the stomach and along the margin of the ribs on the right side. He had likewise frequent cough, with difficult expectoration of tough opaque mucus, and considerable difficulty of

breathing. The chest sounded everywhere loudly on percussion; and both acts of respiration, but particularly expiration, were prolonged, inspiration being also indistinct, expiration distinct, sonorous and sibilant. The pulsation of the heart could not be felt with the hand when he lay on the left side; and with the stethoscope both sound and impulse were feeble. The pulse too was feeble and only 52 in the minute. The tongue was furred and breath fetid; the bowels required the frequent use of laxatives; the urine was of natural quantity, but exceedingly pale, being of the lightest possible straw colour, and depositing a moderate quantity of white flakes when heated.

His pectoral complaints were of eight years standing, and began subsequently to the healing of an old ulcer on the leg, which had been occasionally healed, though only for a few weeks at a time, during twelve years previous to its final cicatrization. About a year before his admission into the hospital his breathing got worse, so as to annoy him when at work. About that time he had also a comatose attack, which lasted a-day and was removed by blood-letting. After that his urine had been always pale but natural in quantity. For two months before he entered the hospital he had pain in the loins, difficulty in passing urine, and frequent attacks of vomiting.

He was ordered ten drops of tincture of digitalis thrice a-day in an ounce of infusion of cassia, and likewise a mercurial pill every evening. Laxatives were also given from time to time. On the third day of this treatment the urine was 104 ounces, and had a specific gravity of 1007.9. The œdema was lessened; and the action of the heart both to the hand and to the stethoscope was natural, though rather feeble. On the 11th August the œdema was gone, the ascites nearly so; but his breathing was as laborious as ever, and he complained of pain round the whole lower margin of the chest, particularly in the loins, where pressure made the pain shoot towards the stomach. The digitalis was discontinued, and a squill mixture ordered in its place.

From this time the urine began to decrease in quantity, till on the 16th it was only 40 ounces daily. Its specific gravity was 1008.4, it was as colourless as ever, coagulated more abundantly when heated, and contained very little urea. There was no return of the dropsical swellings, but his difficulty of breathing and cough were not in the least relieved. Next day the breathing was worse. He also became affected with headach, drowsiness, contracted pupil, some livor of the face and tremors of the hands. The pulse was 60 and full, and the tongue brown on the centre. Fourteen ounces of blood were therefore taken from the arm, with some relief to the dyspnœa; and the

blood was very buffy in one cup. The squill was now abandoned and the digitalis resumed. On the 18th the symptoms connected with the affection of the head were rather increased, and he was feeble and much exhausted. The urine was only fifteen ounces. A brisk laxative and a purgative enema were ordered, leeches were applied to the temples, and subsequently a blister to the head; but without any advantage. His stupor and tremors got gradually worse and worse; he complained of tenderness over the whole belly; the urine on the 19th was only twelve ounces; on the 20th twelve ounces were withdrawn by the catheter. On the morning of the 21st he died.

The whole urine passed during the last thirty-six hours of his life was two ounces. This had precisely the same external qualities as the urine previously passed, but had rather a higher specific gravity, namely 1009.5.*

Inspection.—There was very little œdema of the limbs. The face was not livid, and the scalp was free of blood. The sinuses of the dura mater contained only a moderate quantity of blood; the arachnoid and pia mater, as well as the substance of the whole brain, were remarkably destitute of blood, and blanched. There was not above half a drachm of fluid in each lateral ventricle, and half an ounce in the base of the skull. Even in the base of the brain the vessels were unusually empty of blood. The cortical matter of the brain appeared less in thickness than natural. In the middle of the left *thalamus*, half an inch behind the anterior commissure, there was a cavity which would have held a cherry-stone; it was crossed by filaments of cellular tissue, walled in by a thin partition of condensed cerebral substance, but not surrounded by redness or softening.

The pericardium and base of the left lung adhered to the pleura of the ribs by very old adhesions; and four ounces of clear serum were contained in the pleural sac of that side, but none in the pericardium. The posterior part of the lower lobe was very œdematous. The walls of the left ventricle of the heart were somewhat thickened and its cavity contracted. The aorta was slightly and uniformly enlarged at the arch, and its whole inner membrane thickened, hard, and wrinkled,—the valves being also involved in this change of structure. On the surface of the right lung there were many old adhesions to the ribs; and in its substance a great deal of œdematous infiltration. The fore part of both lungs was gray, strongly crepitant when handled, and slightly emphysematous,—the whole air-cells being somewhat enlarged. The nature of their structure in the pos-

* It contained 23.9 parts per thousand of solid matter, of which 14.7 were urea with acetates, 4.6 alkaline muriates, sulphates and phosphates, and 3.5 albumen. The earthy phosphates were inappreciable.

terior part could not be ascertained on account of their state of infiltration. The greater bronchial tubes were filled with mucus. The blood was everywhere black and fluid.

The stomach and intestines were healthy. The spleen was pale reddish-brown, firm, and composed of little radiated masses, (not unlike the mineral Wavellite in appearance.) The liver was somewhat larger than usual, but in structure perfectly healthy. The kidneys were both much diseased. The right was rather less than natural, externally rough with small irregular nodules and of a pale grayish-brown colour, internally of a pale grayish-yellow tint. The *tubuli uriniferi* were much nearer the surface than in the healthy kidney, greatly diminished in size, and pushed as it were outwardly by a deposit around the *pelvis* of grayish-yellow, indistinctly granular matter, into which also the whole cortical substance was converted, so as to have lost its usual fibrous appearance. Even the fibres of the *tubuli* were unusually pale, and the yellow matter was deposited among them. The *pelvis* of the kidney was small, the ureter pervious. The left kidney was very much diminished in size, flattened and flabby. Its cortical substance was in the same state as that of the right kidney, but rather darker, and with a few distinct tubercles; and some grains were softened. The tubular portion was of a dark brownish-red colour, and not fibrous at all; and it contained several small watery cells, apparently the remains of the infundibula. The ureter was pervious. The capsular fat of both kidneys was indurated, and the tunica propria thickened and adhering.

Analysis of the Blood.—About an ounce of blood was collected from the vena cava by an incision in the loins, great care being taken to keep it clean and pure. It was black, fluid, and nearly free of the odour of putrefaction. It was heated in a vapour-bath at a temperature a little under 212° , and rapidly stirred as soon as it began to coagulate. A thick, brownish-red, granular mass being thus formed, a little distilled water was added; and after agitation, the whole was filtered. A cherry-red fluid passed through, which at 212° deposited more brown flakes and became wine-yellow in colour. This was evaporated nearly to dryness in the vapour-bath at a temperature beneath 212° , during which a fetid odour was exhaled, exactly the same as that of the patient's breath during life. Just before the fluid began to acquire a syrupy consistence, a drop of it was treated with nitric acid, which rendered it opaque and caused considerable coagulation; but crystals were not formed. The syrupy extract, when acted on by boiling alcohol, gave a pale wine-yellow solution, which was evaporated in a small glass vessel till it began to thicken. This extract had the same fœtor.

On the addition of a few drops of nitric acid the same odour was exhaled from it as from extract of urine when similarly treated; and immediately fine, grayish-red, flaky crystals of a pearly lustre were formed in abundance, so as to thicken the whole mass. These were evidently scales of nitrate of urea.

CASE III.—The next case bears a striking resemblance to the last in many respects; and on that account I regretted much that the friends could not be persuaded to consent to an examination of the body. Notwithstanding this material deficiency in the history of the case, it presents some interesting points for the consideration of the physician.

James Thomson, aged 53, a travelling hawker, was admitted into the Edinburgh Infirmary for dropsical and pectoral complaints, on the 22d August 1828. Four months before, he had an attack of jaundice, of which he was cured in six weeks by laxatives. After enjoying tolerable health for a month, he was seized with dropsy and difficult breathing, which rapidly increased, till in ten days he was as ill as when he entered the hospital.

At the time of his admission he was affected with much dyspnoea, which was easiest when he lay horizontally, and with frequent cough, accompanied by scanty, clear expectoration. The chest sounded well on percussion everywhere, perhaps unusually loud in front. The respiratory murmur was every where sibilant or sonorous, obscure in inspiration, distinct in expiration, prolonged in both, but particularly in expiration. The pulsation of the heart was diffuse, but not unnaturally extensive. In the neck there was remarkably distinct pulsation of the jugular veins. The limbs were œdematous below the knee. The abdomen was considerably enlarged, tense, fluctuating, tender, especially along the margin of the ribs on both sides, so that it was impossible to ascertain whether any deep-seated hardness or tumour existed. The pulse was 96, full and firm; the tongue whitish, with considerable thirst; the skin of natural warmth, and leucophlegmatic. The urine amounted to thirty ounces daily, had a dirty reddish-brown hazy appearance, deposited a considerable sediment of vesical mucus, emitted a faint urinous odour, and when heated gave a considerable flaky precipitate. Its specific gravity was only 1009.1; and it contained only 22.8 parts per thousand of solid matter, of which 16.9 were urea with animalized acetates, 3.3 alkaline muriates, sulphates, and phosphates, and 1.5 albumen. The quantity of earthy phosphates was inappreciable.

Three weeks before his admission he had just recovered from a severe mercurial course, which did him no good. He admitted

that he had been in the habit of taking rather more whisky than other workmen, but denied that he was addicted to intoxication. He had no recollection of having ever suffered from dysuria or lumbar pains; but had been long liable to stomach complaints.

He was immediately ordered to be bled to the extent of sixteen ounces, from which he experienced considerable relief to his pectoral symptoms. The blood was not buffy. The serum had a density of 1024.8, gave a less firm coagulum when heated, had only 81.2 parts of solid matter per thousand, and contained a substance which possessed almost all the properties of urea. The analysis will be stated at the end of the case, in order not to interrupt the narrative. Next day a blister was applied to the breast, digitalis was prescribed to the extent of ten drops thrice a-day in the infusion of cassia, and some laxative pills were given, which he was instructed to take occasionally, for correcting a constant tendency to constipation.

On the 25th the urine was 40 ounces and less turbid. On the 27th the pulse had fallen to 64, the belly was less distended, and the tenderness was confined to the epigastrium. The urine, however, had not increased in quantity, and his dyspnoea was as severe as ever. A mercurial pill every night was added to the other medicines in order to promote the action of the digitalis. On the 29th the digitalis was discontinued, as he was attacked with vomiting, and complained of seeing strange objects. The urine had not increased in quantity, was 1009.1 in specific gravity, and coagulated abundantly when boiled. The pulse had fallen to 58, and continued to sink gradually to 45, which state was attended with much faintness and exhaustion. A little port wine was accordingly ordered, and on the 1st September an anodyne; at the same time the supertartrate of potass was directed to be taken as mentioned in page 265. His dyspnoea meanwhile had rather increased, and the tenderness in the loins had returned. No hardness or swelling could be felt in the right hypochondrium. Next day, after a refreshing sleep, the pulse was found to be 100, full, and very easily compressed; the skin hot; the countenance oppressed; and the urine passed in twenty-four hours only amounted to eight ounces. The wine and opium were discontinued. In the evening the oppression amounted to stupor, the pulse became slow and feeble, and the pupils contracted. After the action of a purgative clyster he slept quietly, passed above twenty ounces of urine, and on the 3d felt better, except that his exhaustion had increased. The pulse was 48, feeble and irregular; and the countenance flushed. His exhaustion and stupor went on gradually increasing from this time, and were only relieved for a brief interval by the action of a cathartic. At mid-day of the 4th he was excessively soporose, but could be roused; at four he

was complete comatose, and at midnight he died without any other symptom of note. Very little urine was passed after the morning of the 3d, and that only when he was at stool.

Examination of the Blood.—Blood was drawn from the arm on the 23d, as already noticed; and the serum was examined for urea. The specific gravity of the serum was 1024.8, and when heated it formed a coagulum of rather less firm consistence than natural. Its solid contents when thoroughly dried in the vapour-bath were 81.2 per thousand. The serosity procured by repeatedly boiling in water the residue of its evaporation, was evaporated to dryness in the vapour-bath, and the matter left was boiled in pure alcohol. When the filtered solution was concentrated by evaporation numerous crystals were formed, acicular, transparent, colourless, and very deliquescent. These were dissolved in a few drops of water, and then treated with a little nitric acid. The same smell was exhaled as from the action of that acid on extract of urine, and in two or three minutes colourless silky acicular crystals were formed in little radiated masses. (See afterwards, p. 235.)

A comparative analysis was made of the serum of blood taken from a young woman who was feigning sickness. The serum had a specific gravity of 1030.8 and contained 102.2 parts of solid matter per thousand. The alcoholic solution procured, as in the former instance, from this solid matter, gave by evaporation granular crystals, the solution of which in water did not crystallize on the addition of nitric acid.

CASE IV.—*Murdoch Campbell*, aged 27, a labourer and night-watchman, tall in stature and of robust habit, was admitted into the Infirmary on the 30th April 1828, on account of erysipelas of the right leg of a few days' standing, which commenced soon after his having been dismissed from the clinical ward cured of slight rheumatism. He had a similar attack some years before, which ended in suppuration; and over the inner ankle an aperture was at that time formed, the scar of which was obvious. The tibia was also considerably enlarged above the ankle.

From this state he soon recovered in a day or two under low diet and the use of laxatives. On the 3d May my attention was drawn towards him more particularly by his leucophlegmatic appearance. On careful examination there was found general puffy swelling on both sides of the neck, with enlargement of the glands at the angles of the jaw, slight swelling of the abdomen, some difficulty of breathing, and œdema of both legs, especially the right. He had no sickness. The urine was reported to be scanty. The pulse was 84 and strong, and he had a good deal of general oppression. He was immediately ordered to be bled till faint-

ing approached, and thirty-four ounces were drawn before he became sick. The blood was very buffy and much cupped. The breathing was immediately much relieved, and next day the pulse was 60 and soft. But at noon, although there was no swelling above the pubes, he had not passed any water for thirty hours; he complained of umbilical pain on pressure and of tormina; and there was considerable somnolency. A dose of Epsom salt was ordered, and also a common injection.—Next day, the 5th, he had passed 60 ounces of urine, and felt generally better; but the somnolency and umbilical pain continued, and the abdomen was increased in size. The puffy swelling under the jaw, however, had disappeared. A drachm of spirit of nitric ether was ordered thrice a-day in a cup of water.—On the 6th the somnolency was less, but the umbilical pain was worse; and therefore, as the pulse was natural, sixteen leeches were applied near the umbilicus, but with little relief.—On the 8th the urine was only from 16 to 20 ounces daily, and of a light straw colour; and it deposited a pretty copious fleecy precipitate when heated. The oedema was undiminished. Twelve leeches were now directed to be applied to the loins; two drachms of super-tartrate of potass three times a-day were substituted for the ether; two squill pills morning and evening were also added; and as he complained much of the hospital diet disagreeing with him, he was ordered tea instead of porridge, and beef-tea instead of broth.

On the 9th he was decidedly worse. The tenderness of the abdomen had increased and spread along the whole margin of the ribs, except in the region of the loins. The puffiness under the jaw, the general oedema, and the leucophlegmatic appearance, which had been slowly gaining ground for three days, were augmenting much more rapidly; and he had more somnolency, with considerable headach over the eyebrows. The pulse was 80, full and firm, the tongue clean, the bowels slow, the urine 28 ounces and more coagulable by heat. He was then ordered a little croton oil with colocynth pills, and directions were given to bleed him again till the approach of fainting. Thirty-six ounces of blood were drawn without inducing sickness, and the blood was very buffy and much cupped, except in the last of five cups, which was natural. He experienced great relief to the pain in the abdomen, the headach ceased, the somnolency abated, and the pulse fell to 70. The croton operated sufficiently. The urine was only 28 ounces, pale, considerably loaded with albumen, and of the specific gravity 1016.—On the 11th I learned that the abdominal pain had again become severe on the previous evening, and that an unsuccessful attempt had been made to repeat the venesection, for which conditional orders had been left.

His somnolency had increased, and the pulse was full and firm. Blood was ordered to be drawn by cupping from the loins to the extent of fourteen ounces; and from this great relief was obtained both to the somnolency and abdominal pain, which in consequence became confined to the umbilicus, and was not felt except on heavy pressure. The urine during the next twenty-four hours was 24 ounces, and fully more coagulable.

On the 13th the squills and supertartrate of potass were abandoned; and ten drops of tincture of digitalis were ordered in an ounce of infusion of cassia thrice daily.—On the 17th the urine was from 20 to 30 ounces daily, and more coagulable. Occasional saline laxatives had been given to correct a tendency to constipation. The digitalis caused slight nausea. The swelling of the neck and abdomen had diminished, that of the limbs was unabated.—Next day the somnolency returned. Sixteen ounces of blood were therefore directed to be withdrawn from the loins by cupping; and the digitalis was ordered four times a-day. The somnolency was removed by the cupping, and the abdominal pain was farther relieved.—On the 20th the urine had increased to 26 ounces; but the patient complained of headach, giddiness, and sickness towards evening for four days afterwards. The pain of abdomen all this time was constant, dull, confined to the epigastrium and increased on pressure; but no local fulness or hardness could be discovered.—On the 25th the abdominal pain was more severe and extensive. Twenty leeches were therefore applied to the epigastrium, but without any relief. Next day the pain was worse, the pulse 80 and firm, the urine 30 ounces. Venesection was accordingly again repeated till syncope approached; and forty ounces of blood were drawn, which was excessively buffy, concave, and contracted in every cup. From this he experienced very great relief. The somnolency ceased, the pain disappeared almost entirely, and the abdomen was much diminished in size. At the same time the urine, which was 30 ounces daily, became much less albuminous, as it was merely rendered hazy by heat. A mercurial pill was then ordered with the digitalis.—On the 29th the improvement continued progressive. The leucophlegmatic appearance of the skin, as well as the œdema, had diminished every where; and the urine was 50 ounces daily. He still, however, had some tenderness in the epigastrium.

On the 1st of June the mercury was abandoned, as the gums had become tender. The pain still continued to be felt in the epigastrium, especially on firm pressure. The urine was about 60 ounces daily, and it gave but a faint haze when boiled. On the 3d it was 75 ounces. The mercurial fetor was strong and the mouth very tender, but there was not any sali-

vation. The bowels required occasional laxatives; but their effect was very uncertain, sometimes operating mildly, sometimes occasioning severe tormina and diarrhœa, so as to render the use of opium necessary.—On the 5th the urine was 40 ounces, and again slightly coagulable by heat. The abdominal pain had entirely ceased.—On the 8th the diarrhœa was very troublesome, and the digitalis excited nausea at each dose. It was therefore discontinued.

Next day, the 9th, he felt much better. There was now no abdominal pain of any kind; no swelling of the belly; and the œdema and leucophlegmatic appearance of the skin had everywhere disappeared. The urine was natural in quantity, and hardly became even hazy when heated; but it retained its pale colour. His medicines were then omitted.—On the 15th the urine was from 20 to 30 ounces daily, pale, but quite clear when boiled. Diarrhœa had again recurred after some laxative pills and was checked by opium. His diet had been for some days enlarged a little.—On the 19th, as he continued to improve progressively he was allowed a beef-steak daily, and the full diet allowance of other articles.—After suffering during the next ten days several attacks of diarrhœa whenever laxatives became necessary, he was on the 30th quite well, his countenance was natural, and his strength had improved very much. The urine meanwhile was towards 60 ounces daily, pale, and either not changed at all by heat or rendered but slightly hazy. His diet was enlarged still farther.—He was kept for security's sake another month in the hospital, during which he became florid, fleshy, and active. On the 28th July he was dismissed; and at that time the urine was natural or rather abundant in quantity, being commonly about 50 ounces daily, and it had been for many days entirely free even of haziness when heated; but it continued unnaturally pale, though less so than on the 30th June.

I regret exceedingly that it was out of my power to learn what afterwards became of this man, as he went to the island of Skye immediately after quitting the hospital.

CASE V.—For the particulars of the following valuable case, where a still more perfect cure was accomplished than in the one just related, I am indebted to the kindness of my colleague Dr Gregory.

Marion Clinkscapes, aged 28, was admitted into the Infirmary on the 4th March 1829, under Dr Gregory's charge, for dropsical complaints. She had considerable œdema of the limbs; some enlargement of the abdomen, with fluctuation, and tenderness on pressure in the umbilical region; also difficulty of breathing in the horizontal posture, or on any unusual exertion. The pulse was 96 and rather feeble, the tongue whitish,

the bowels regular, the catamenia suppressed for six months, her appetite impaired, and her sleep disturbed towards morning by uneasiness in the abdomen. The urine was reported scanty but was pretty copious during the first day after she was admitted; it was very pale and became turbid with the deposition of a flaky precipitate when heated.—The œdema commenced four months before her admission and two months after delivery, the swelling of the abdomen several weeks afterwards, and the abdominal pain some weeks after that. The pain was at first in the right hypochondrium and stretched towards the top of the sternum, and it was attended with frequent palpitation in the night-time. She ascribed her complaints to her having sat on a cold stone by the sea shore a few days before her legs began to swell.

The treatment consisted chiefly in one blood-letting, and the administration of half an ounce of supertartrate of potass every morning, together with a pill twice a day which contained a grain of squill powder and half a grain of digitalis. The blood was drawn on the 5th, when the pulse was 88 and of good strength, to the extent of twelve ounces, and it was not buffy.—Next day the uneasiness in the abdomen and dyspnœa were gone, and the œdema of the limbs had abated. The pulse was 88 and the tongue clean. The urine, of which 32 ounces had been passed, no longer became even turbid when heated, and it was rather high-coloured.—On the 7th the urine was 70 ounces, pale and not coagulable; and the abdomen had decreased somewhat in size.—On the 8th and 9th the daily quantity of urine was about the same, there was still fluctuation in the abdomen; but very little œdema remained; and the pain of abdomen had not returned. On the 10th and 11th the quantity of urine was about 100 ounces daily, free from haziness when heated, and of natural colour and smell. On the two next days it was 70 ounces daily, and the pulse had now become natural.—On the 20th she continued free of complaint; there was no longer any œdema of legs or fluctuation in the abdomen. The urine was natural in quantity and colour, and did not coagulate. As she wished to leave the hospital she was dismissed on that day. (See afterwards, p. 290.)

CASE VI.—The next case is chiefly interesting on account of the appearances found after death, as will be afterwards explained under the general remarks to be made upon all the cases. The particulars are obligingly communicated by my colleague, Dr Home, in whose clinical ward the patient was treated.

John Johnson, æt. 38, a weaver, was admitted into the hospital on the 16th March 1828. He had much œdema of the limbs and scrotum, some swelling, tension, and fluctuation in the

abdomen, with tenderness in the epigastric region; also slight cough, and considerable difficulty of breathing in the horizontal posture. The pulse was 96, and small; the heat 96°; the skin dry; the tongue florid; the bowels slow; and the urine scanty. Towards the close of the previous December his complaints began with œdema after working some time in a damp place; and after disappearing for a short while, the swelling returned towards the end of January with rigors. He had a similar attack sixteen years before while in Spain, soon after being cured of ague. His pectoral complaints were also of some years standing.

The treatment consisted in frequent purgatives and supertartrate of potass as a diuretic. From this time till the 21st no particular change took place in the symptoms. The urine never exceeded twenty-four ounces. On the 21st it was ascertained to be coagulable both by heat and by muriatic acid. On the 30th the dropsical swellings had rather increased. He was attacked on that day with retching and vomiting, which recurred frequently. The pulse became more frequent. The thighs were excoriated, and an erythematous blush spread upwards on the nates. The œdema meanwhile continued to increase; great debility and exhaustion came on; and on the morning of the 4th May he expired.

Inspection.—The intestines were much distended and unusually white on their surface, and purulent matter was collected between their folds. Some pus was also found here and there on the liver, and in the region of the kidneys. Six pounds of sero-purulent matter were removed from the cavity of the abdomen. The mesentery and peritonæal covering of the lower turns of the intestines were unusually vascular at their depending portions. The peritonæal coat of the liver was checkered with purulent matter, which was also deposited between its lobes. Its substance was hard, and much tuberculated and knotty on the surface. It adhered firmly to all the adjacent organs, to the stomach, diaphragm, omentum, duodenum, descending colon, and particularly at its concave surface to a large firm tumour, which on subsequent examination was discovered to be the right kidney extensively diseased. This gland was converted into a large cyst having a thin crust of bony substance, and intersected internally by several partitions of the same nature; and its contents consisted of a turbid serous fluid with a large quantity of silvery flakes floating in it. These flakes I afterwards examined with care when washed; they were pure white and brilliant, like spermaceti; soluble in boiling alcohol, from which they crystallized on cooling; insoluble in a boiling solution of caustic potass; and fusible at a temperature somewhat higher than 212°. They were therefore pure Cholesterine. The right renal artery was

nearly obliterated. The left kidney was much enlarged, and its internal structure softer and whiter than natural. The infundibula were here and there lined with specks of cholesterine. The ureter was larger than natural.

In the chest the lungs were found gorged in their posterior parts, and somewhat emphysematous on their anterior surface. The parietes of the heart were thickened, and the cavities of the ventricles contracted. In the sac of the pericardium and in each sac of the pleura a small quantity of serum was observed. The head was not examined.

CASE VII.—The following case, which also occurred in the Clinical Wards during the Spring course of 1828, has been kindly communicated to me by my colleague Dr Alison.

Margaret Toulan, æt. 35, a married woman, was admitted into the hospital on the 22d February. The whole limbs were very œdematous, and the abdomen was considerably distended and fluctuating. She had headach, nausea, and dull heavy pain in the right hypochondrium, stretching across the stomach to the left hypochondrium, and increased by pressure or coughing. She had also frequent severe cough, with difficult, mucous expectoration, and some dyspnœa. The pulse was 100, small and irregular; the tongue rather dry; her sleep broken by frightful dreams; her appetite indifferent; the urine pale and scanty.

She reported that she had a similar attack nine years before; that it was caused by exposure to cold and wet; that it lasted three months; and was not preceded or accompanied by any local pain. Since then she had been for some years subject to cough, palpitation, and tendency to faint. The complaints for which she entered the Infirmary began a month before with shivering, which was succeeded by headach, nausea, pain in the abdomen, and increase of her pectoral complaints. In the course of a week the pain was principally felt in the hypochondrium; and she was seized with vomiting, which frequently recurred till about three days before her admission. The urine became scanty, and her legs œdematous only eight days before admission, and the œdema rapidly increased.

She was immediately bled to eight ounces, and a laxative powder was given; but she did not experience any relief. The blood was sizzly. Next day she was ordered a calomel pill, and also a pill containing a grain of squill, with half a grain of digitalis, three times a-day, and twelve leeches were applied to the epigastrium with considerable relief to the pain. The same treatment was repeated on the three succeeding days, but with only temporary advantage, the urine continuing scanty, the dropsical swellings undiminished, and the tenderness of the ab-

domen unabated. On the last of these days, the 26th, she had much vomiting. Her medicines were discontinued, the common squill pill was substituted, and a grain of calomel, with as much opium, ordered to be taken thrice a-day.—On the evening of the 27th, as the vomiting was frequent, and the tenderness of the abdomen had increased, eight ounces of blood were again drawn from the arm, with some relief. The blood was buffy, and the serum opaline.—On the 28th and 29th the leeches were re-applied, and a draught of ether and laudanum given at times to check the vomiting. The urine was examined on the latter day, and found to coagulate abundantly when heated. For the next five days the vomiting and tenderness were less troublesome; but on the evening of the 4th March the tenderness of the abdomen had increased so much that she was again bled to eight ounces, and with much relief. The blood was buffy, and its crassamentum loose.

The vomiting, however, recurred; the urine continued scanty and very coagulable; no material impression was made on the dropsical swellings; the pulse became more rapid and feeble; and she was attacked on the 7th with a fit of rigors followed by pain in the right lumbar region. Afterwards the abdominal tenderness was felt most in the hypogastrium. Meanwhile her exhaustion rapidly increased; and she died early in the afternoon of the 9th.

Inspection.—The superficial cellular substance of the parietes of the abdomen was found generally thickened and softened, and presented several patches of increased vascularity and unnatural effusion of serum. Its substance had a grayish colour and pulpy consistence, quite different from the yellow colour and firm consistence of the healthy adipose substance covering the chest.

The peritonæum was healthy; the villous coat of the stomach and intestines was free from disease; the liver had a mottled appearance, but its substance was healthy. The right kidney was of a lighter colour, and more dense in its substance than natural. When it was laid open by a longitudinal incision, it was found of the same pale colour throughout; but the cortical substance had undergone most change. The left kidney was similarly affected. A slight effusion of serum was found in both cavities of the chest, as well as in the sac of the pericardium.

OBSERVATIONS.

In the following remarks on the cases now described, the reader may be presumed to be acquainted with the statements of Dr Bright, of which a full analysis appeared in a

former volume of this Journal.* The substance of his observations is, that dropsy frequently arises from an organic disease of the kidneys, which when fully formed commonly consists in the deposition of a yellowish granular matter in its texture;—that this disorder is always found after death, when the urine during life is albuminous;—that in such cases the urine is of low specific gravity, and contains an unusually small proportion of urea and salts;—that the disease of the kidney is often indicated by pain in the loins or across the upper part of the belly, by sickness and vomiting, and occasionally by purple or bloody urine,—that it is very often accompanied in its course with a strong tendency to inflammation of the internal organs, and to affections of the head,—and that blood-letting is in most instances at some period of the disease an appropriate remedy. It will at once appear on a perusal of the cases related above, how pointedly they confirm all these statements.

The first, second, and seventh cases are examples of dropsy occurring along with disease of the kidney, and without disease in any of the other organs whose organic derangements of structure are usually considered the causes of dropsical effusion. The nature of the organic change which takes place has not been particularly settled, further than that the tubular part of the kidney becomes more and more encroached on by the yellowish deposite as the disease advances. The secretion of cholesterine by the kidneys in the sixth case is a curious fact, which may be turned to account afterwards when the pathological history of the disease is more fully ascertained. Meanwhile it appears to be connected as much with alteration of structure in the liver, as with disease in the kidney. Dr Bostock in some forms of tubercular liver found a substance approaching in nature to cholesterine diffused through the texture of that gland; and in the present instance the liver was in a very advanced stage of tubercular derangement.

In many of the cases related by Dr Bright, not only the kidneys, but likewise the liver, nay, sometimes even the heart also, were diseased. I have seen several examples of the former description; and very lately an instance of the latter kind occurred in the person of a woman *Wright*, a clinical patient, who was for a few days under my charge. She died evidently from diseased heart: But the urine was strongly coagulable. On dissection there was found much effusion of serum into the pericardium, the pleura, and the abdomen. The œdema was inconsiderable. The heart was much enlarged, and affected with hypertrophia; the aortic valves were retracted, and the curvature of the

aorta dilated, and connected with an aneurismal sac. The liver was enlarged, and the yellow matter of its texture increased beyond the due proportion. The right kidney was partially invaded by the grayish-yellow deposit, the left kidney similarly, though very slightly, affected, and both were flabby and grayish-coloured externally. The urine coagulated copiously for at least a fortnight before her death. Here the heart was evidently the first organ which had suffered. In the case of Johnson (6), on the other hand, it is probable that the kidney was first disordered, and then the liver. These examples illustrate a remark of Dr Bright,—that there is a strong tendency of the organic diseases of the three organs, the heart, liver, and kidney, to succeed disease in one another, provided the patient live so long that the primary disease reaches an advanced stage.

In all the cases of dropsy with diseased kidney which have come under my notice the specific gravity of the urine has been much beneath the natural standard. The highest I have yet remarked is that of a woman *Dewar*, at present my patient, in whom it is 1021.3, while the daily quantity does not exceed sixteen ounces. The lowest I have examined was 1006.9. This observation was made in the instance of a woman *Burns*, lately under my charge, and at a time when the daily quantity was about the natural standard. It was so colourless as scarcely to exhibit a faint straw tint in a tumbler; and in a common ounce phial it appeared as limp and colourless as water. It contained only 15 parts per thousand of solid matter, of which 11.6 were urea with the associated acetates. The specific gravity may be very low at an early period of the disease. In the clinical patient, *Wright*, (p. 282,) although the kidneys were very partially changed in structure, the density of the urine was only 1010.8, when the daily quantity was natural.

The fundamental change of the urinary secretion in this variety of dropsy is a diminution in the proportion and quantity of urea. In every case I have examined there was a material deficiency,—the quantity contained being seldom so much as half the usual proportion, and occasionally, as in the instance of *Burns*, not above a fifth. But, although probably an essential defect, as well as the chief cause of the dropsy and other symptoms, it does not appear that its relative scantiness is an accurate measure of the relative urgency of the disease in different cases. The woman *Burns*, in whom the urea is only a fifth of the natural quantity, has just been almost entirely freed from the dropsical swellings; and the man *Campbell* (case fourth), and the woman *Clinkscales* (case fifth), were cured, although the quantity of urea could not have been much greater. In *Wright* the urea did not exceed a third of the

natural quantity; nevertheless the dissection proved that the disease in the kidneys had made very little progress. On the other hand, in *Irving* (case first), where the urea was a full half of the natural quantity, the dropsical effusion was removed very slowly, and returned very soon after its removal; and after death the kidneys were found in an advanced state of disease.—When by an increase of the secretion of urine the daily quantity of urea discharged approached or exceeded the natural standard, the dropsical effusion usually diminished with rapidity.

The salts of the urine are invariably diminished in quantity as well as the urea, and commonly in the same proportion. Yet in some instances, for example in the case of *Irving*, the quantity of salts in the urine does not observe at different times the same proportion to the urea. The insoluble earthy salts have appeared to me always very scanty, sometimes nearly wanting altogether.

In the three cases (1, 2, and 7) in which no other organ but the kidneys was diseased, Dr Bright's pathognomic sign, coagulability of the urine by heat, was remarked in a greater or less degree; and the same symptom was observed in all the other cases. I may farther add, that I have found coagulable urine in many other dropsical patients; and that in all in which the state of the internal organs was ascertained after death, amounting to eight or nine in addition to those here published, the kidneys were found diseased. This accords with the statement of Dr Bright that coagulable urine in dropsy will be invariably found to indicate organic disease in these organs.

Is the secretion of albumen vicarious of the secretion of urea? The affirmative would be a very natural supposition; but it does not accord well with all the facts. In most of the cases I have seen where the urine was very pale, of very low specific gravity, and deprived of the greater part of its urea, as in cases 2 and 3, as well as in that of *Burns*, the quantity of albumen was small, never exceeding $3\frac{1}{2}$ parts of dry albumen per thousand: While in the cases where the urea was considerable in quantity, as in that of *Irving* and *Dewar*, the albumen was also considerable, being in the former so high as 10 or 11 parts in the thousand. Besides, the secretion of albumen may be nearly or entirely prevented by proper treatment without the secretion of urea being restored; as is illustrated by the instances of *Campbell* (4) and *Irving* (1). Although the albuminous impregnation of the urine is not to be considered a substitute for the urea, it appears probable that the discharge of albumen by the urine, as well as into the great cavities and cellular tissue throughout the body, is caused by the retention of the urea and salts in the system. The greatest quantity of

albumen I have found in any of the cases which have come under my notice, was 14 parts per thousand. This was in a woman *Carmichael*, now my patient. The whole solid contents of the urine amounted to 36.25 per thousand, the daily quantity of urine being at the time natural. In Dr Bright's cases the albumen appears to have been often much more abundant.

An interesting fact observed by Dr Bostock in his experiments on the coagulable urine of Dr Bright's cases is, that the serum of the blood has sometimes a low specific gravity, and is deficient in its proper proportion of albumen. This is exemplified by the case of *Irving* (1), in whom the density of the serum was only 1020, and the solid contents 68 parts in the thousand; by the case of *Carmichael*, mentioned above, in whom the specific gravity of the serum was 1022.5; and also by the case of *Thomson*, (3), where the density of the serum was 1024.8, and the solid contents 81 per thousand. Healthy serum, it is well known, exceeds even the last of these considerably in density and in the quantity of its solid matter: The serum of blood taken from a girl who was feigning sickness, I found to have a specific gravity of 1030.8, and to contain 102 parts of solid matter per thousand. The specific gravity of the serum has always been lowest where the urine was most loaded with albumen. It is hence probable that the albuminous secretion of the urine is nothing more than a transudation of serum from the blood.

Another interesting object of research in this disease relates to the presence of urea in the blood. Dr Bostock sought for it in the serosity of several of Dr Bright's patients, but could detect only "a matter possessing peculiar properties, which seemed to approach to those of urea." In the case of *Magee* (2), I detected unequivocally a considerable quantity of it in the blood after death. The crystals ultimately formed by nitric acid were brilliant scales of a grayish-red colour, in every respect the same as nitrate of urea formed in extract of urine. In the case of *Thomson* (3), an attempt was made to discover it in the serum of blood drawn during life. Crystals were formed in the alcoholic extract by nitric acid; but they were acicular, and had not the scaly appearance of true nitrate of urea. They had a brilliant, pearly appearance, however, and resembled that salt in every other respect except in their form of crystallization. I have since had an opportunity of examining the serum of a patient where the circumstances were very favourable to success. This was in the case of the woman *Burns*, mentioned in page 283, whose urine, although not greater in quantity than natural, contained only a fifth of the usual proportion of urea. She was cupped in the loins on account of pain in that quarter. The serum was examined in the manner

described in page 274; that is, an extract was made from the serosity, and an alcoholic extract was prepared from the aqueous extract,—all the evaporations being conducted in the vapour bath. This extract was crystalline and deliquescent. Its solution in water was treated with nitric acid; upon which a slight effervescence took place, an odour was discharged like that of the action of nitric acid on extract of urine, and in two or three minutes the whole fluid was apparently converted on a sudden into a beautiful radiated mass of foliaceous pearly crystals. These when dried on blotting-paper did not differ in any respect from scales of common nitrate of urea. The quantity was by no means inconsiderable. It may be regarded as proved, therefore, that in the dropsy arising from diseased kidney, urea exists in considerable quantity in the blood when it is materially defective in the urine.

The preceding results confirm the conclusion drawn not long ago by MM. Prévost and Dumas from their ingenious experiments on the extirpation of the kidneys in animals,—that urea is not generated in the kidneys, but exists ready-formed in the blood, and is merely eliminated by these organs.

It is necessary to add, that I have made three other attempts to discover urea in the blood, without success. But this was in cases where the proportion of that principle in the urine was about twice as great as in the three instances in which I was successful, and where consequently a much less proportion existed in the blood. Although crystals were not formed in the alcoholic extract by nitric acid, a granular matter was sometimes thrown down, and an odour was always exhaled like that given out during the action of nitric acid on extract of urine.

A very common appearance of the serum of the blood in the present disease is a slight milkiness amounting to opalescence. This state I conceive to depend on the presence of a little oil in the blood. Dr Bostock indeed was unable to detect any oleaginous matter in such blood. But perhaps his failure may have been owing to the method of analysis, which he has not detailed. I have several times detected oil in opaline serum, by agitating it in a tube with ether, allowing the mixture to remain at rest a few seconds and withdrawing and evaporating the ethereal fluid which rises to the top. This method answers very well, as ether, provided it be free of alcohol, does not coagulate the albumen of serum. Care must be taken to use ether free of fatty or waxy matter, which it very generally contains.

As to the symptoms of this disease in the kidneys, the observations made in our Infirmary fully coincide with those of Dr Bright.

Of the symptoms which may be considered proper to the diseased state of the kidney, there have often been remarked pain and tenderness in the loins, still more frequently dull pain and tenderness across the upper part of the belly, sickness and vomiting, occasionally dysuria, or frequent micturition, and sometimes red urine. The abdominal pain has sometimes been confined to the right hypochondrium; and that when the liver was not at all affected. These symptoms have at times been distinctly traced as having occurred before the dropsical effusion appeared; and sometimes they were preceded by rigors. Wherever the exact commencement of the dropsy could be recollected by the patient, the disease was described as having occurred soon after some unusual exposure to cold; and several have ascribed it to having drunk excessively of cold water while overheated. The dropsical effusion, which is to be considered not so much a disease, as one of the symptoms of a disease, is not an essential, though a very general, accompaniment of the deranged state of the kidneys. The patient *Magee* (2) was for a few days entirely free of œdema and ascites, and they returned only in a very trifling degree a short time before his death. *Irving* was at one time free of dropsical effusion for several weeks after the urine had ceased to be abundant; yet there could be no doubt that the kidneys were at that time extensively disorganized.

Dr Bright has called the attention of the profession pointedly to a strong tendency which prevails in this disease to inflammatory affections of the great cavities. This tendency has not been remarked so much among the patients of the Edinburgh Infirmary. Inflammation of the chest in particular has been by no means so frequently remarked with us as among his patients in London. Chronic catarrh, connected for the most part with pulmonary emphysema, has been almost an invariable accompaniment; but peripneumony or pleurisy has been seldom witnessed. On the other hand, we have remarked a strong tendency to affections of the head. In one instance bloody tumours were formed in the lateral ventricles (case 1;) in two the patients died with gradually increasing coma (2 and 3) and in a fourth, the somnolency was so great as to excite fears of an incipient disease of the brain (4.) The tendency to excessive somnolency has also been remarked in other instances, which have not been detailed in the present paper. In reference to this affection, the appearances after death in *Magee*, who died with it very distinctly marked, are interesting. Instead of congestion or other appearance of determination of blood to the brain, that organ and its membranes were most unusually free of blood.

The treatment laid down by Dr Bright has been long applied in Edinburgh as well as elsewhere to cases of what were usually called inflammatory dropsy,* and which there is much reason to believe were frequently dependent on incipient derangement of structure in the kidney. Since his work was published, the same treatment has been employed with juster views of its mode of operation; and with marked success. The good effects of blood-letting are distinctly shown in several of the cases here published, but above all in those of *Campbell*, *Irving*, and *Clinkscales*, (4, 1, 5); and the particulars of Campbell's case will show that in a proper subject the abstraction of blood may with propriety be carried to a very great extent. This remedy has never seemed to act so beneficially on the dropsical swellings, abdominal pain, and collateral affections, as when the albuminous impregnation of the urine diminished or ceased soon after the blood was drawn. The blood has often been buffed and cupped to an extent hardly ever surpassed, even in acute rheumatism; and in such cases blood-letting has appeared to me more effectual than where the blood coagulated in the usual manner.

Various diuretics have been tried. Digitalis has acted well in many instances; in others, if the symptoms had not begun rather too early for such a supposition, it might have been conceived that digitalis acted dangerously as a narcotic. Super-tartrate of potass has appeared here as in Guy's Hospital to be one of the most certain of the diuretics which have been resorted to. Mercury, which Dr Bright seems to dread as being likely to excite severe ptyalism, or even gangrene, although used in moderate doses, has been resorted to on many occasions to aid the operation of diuretics; and even when it did affect the mouth, which, however, was never intended, its effects appeared as manageable as in other diseases.

The main purpose served by diuretics is to increase the daily quantity of the urea and other salts usually thrown off by the urine. In this respect the action of diuretics deserves particular notice. It is not merely the quantity of aqueous secretion that is increased by their means. The solid contents are generally increased in nearly an equal proportion, that is, while the daily quantity of urine is increased, the urine retains its specific gravity, or at least does not lose it nearly in the proportion in which its quantity is augmented. Thus, in the case of *Irving*, on the 22d September, when the quantity of urine exceeded 90 ounces, the density was 1016.4, and the solid contents 36.9 per thousand; while, on the 16th October, when

* Dr Abercrombie, Edin. Med. and Surg. Journ. xiv.; Dr Tweedie, *ibid.* xv.; Dr Graham, *ibid.* xviii.

the quantity was 36 ounces, the density was 1016.3, and the solid contents 39.3. In the patient *Burns*, whose case has been several times alluded to, though not detailed, the urine on the 31st July was 30 ounces daily, and had a density of 1006.9, with 15 parts of solid matter per thousand; while, on the 3d of August, by which time she was under the influence of supertartrate of potass, so that the daily quantity amounted to 84 ounces, the density was 1006.4, and the solid contents about 14. This fact renders the beneficial operation of diuretics very intelligible: They enable the kidneys to throw off the quantity of salts and hyper-azotized matter, which is daily discharged in the healthy state, whose discharge is essential to the preservation of health, and the deficiency of which in the urine is doubtless the cause of the dropsy and other affections observed in the disease under consideration. It is a singular fact, that the œdema often gains ground when the urinary secretion is rather above than under the natural standard as to quantity. Nay, in some cases the œdema gains ground though the quantity of urine is much above the healthy average. The case of *Irving* about the end of September, (p. 265,) is a striking illustration; and I have since met with other examples of the kind hardly less remarkable.

An important point in respect to the treatment of this variety of dropsy, and of the disease on which it depends, is the possibility of a radical cure. Of this Dr Bright seems disposed to entertain doubts (p. 70.)

When the change in the structure of the kidneys has arrived at an advanced stage, a cure is evidently impracticable; for the secreting apparatus is actually destroyed. This stage is probably indicated by an excessive deficiency of urea in the urine, whether it be highly albuminous or not. At the same time it is worthy of notice, that when the urine is in this state, very marked amendment has been accomplished, if not absolutely a cure. In the case of *Campbell* the urine, from its pale colour, low specific gravity, and the quantity of albumen contained in it, certainly did not hold more than 24 parts per thousand of urea with the associated acetates; nevertheless, after having been some weeks in a state of great debility, with much œdema and alarming symptoms of the head affection, which has usually terminated the disease in our Infirmary, his œdema entirely disappeared, his ruddy complexion returned, and his strength and activity, both of body and mind, were restored nearly to their original condition. But it was remarkable that the urine was still deficient in urea, while it had altogether lost its impregnation of albumen. It was the source of great regret that this man's progress could not be watched

longer. For the urine at the time of his dismissal, although not diminished in quantity, was decidedly deeper in colour than a few weeks before; and it appeared not at all improbable that the urea was in the course of being restored still farther, perhaps even to the natural standard. At all events, however, this case will go far to establish, that the change going on in the kidneys may be arrested at a stage which is compatible with the enjoyment of good health under careful regimen. The case of *Clinkscales*, treated by Dr Gregory, is a farther proof of this; nay it seems even to show that the secretion of urea may be very much restored, after being in great measure suspended. To what extent it was actually restored it is impossible to say, as the colour of the urine in this variety of dropsy is sometimes tolerably deep, when the proportion of urea is considerably short of the healthy standard, and a press of other occupations prevented me from making in the case of *Clinkscales* the analysis which was entrusted to me. I have just learned that this woman died at the end of July with the same complaints of which she was cured in April. This will show the exceeding tendency of the disease to return. But, nevertheless, I cannot help thinking from her appearance and the state of the urine at the time of her dismissal, that a complete cure was accomplished, and that with ordinary care on her part, and proper medical superintendence, the cure would have been confirmed.

A powerful argument in favour of the possibility of accomplishing a radical cure in such cases is the well known fact, that the dropsy which sometimes follows scarlet fever is often cured completely. This variety of dropsy has not yet been examined in reference to the views advanced by Dr Bright. But the urine during its course is often coagulable. Dr Abercrombie indeed mentions in the history of one of his cases in his paper on the treatment of dropsy by blood-letting, * that it was not coagulable. My colleague, Dr Alison, however, informs me, that he has found it not only often coagulable, but likewise occasionally red or even almost black, as if loaded with the colouring matter of the blood,—a state which Dr Bright says is not uncommon in dropsy with coagulable urine unconnected with scarlatina. There appears little reason to doubt, therefore, that in the dropsy consequent on scarlatina the kidneys are often diseased; and probably this disease is the cause of the dropsical effusion. Such cases being familiarly known to admit of a radical cure, it may be inferred that the dropsy which is the special subject of this paper is similarly circumstanced.

* Edin. Med. and Surg. Journal, xiv. 172.

Many cases of the successful treatment of dropsy with coagulable urine will doubtless occur to the recollection of practitioners of extensive experience. But it may be reasonably objected to cases quoted from general recollection, that their ultimate history was not ascertained, and that the statements of Dr Bright, as well as the cases detailed in the present paper, show a marked tendency in the disease to return after a brief, though sensible interval. My colleague, Dr Alison, however, has stated to me that he is certain he has known cases of permanent cure effected in adults who had dropsy with coagulable urine, unconnected with scarlatina, but who were subjected to early treatment; and he has mentioned a special case, where, after a severe attack, the patient remained free of dropsy for seven years. She is now, however, labouring under a second attack of the disease.

In relation to the present topic, a very material object is to ascertain more precisely the symptoms at the commencement of the disease in the kidneys; for there seems a probability, that in its commencement it is a low inflammatory affection, which may be vigorously and effectively treated. These symptoms have not been very well ascertained, and what is equally unfortunate, they are often so trifling as to receive little notice from the patient. It is not improbable that an albuminous impregnation of the urine occurs very early. Although this condition, according to the statements of Dr Bostock,* occurs occasionally in the healthy state of the body, it is a phenomenon which ought always to excite suspicion, and enforce the necessity of farther inquiry.

August 4, 1829.

ART. V.—*Remarks on Amaurosis, with Cases.* By Dr J. A. ROBERTSON, F. R. S. E. Surgeon to the Eye Dispensary of Edinburgh, &c.

THE term Amaurosis has never been distinctly defined, but may be considered as applicable to all those cases in which vision is impaired or lost from functional or structural disease of the retina or optic nerves.

A preternatural state of dilatation of the pupil, the iris remaining immoveable under every change of light, has been considered a very certain sign of amaurosis; but I have seen in more than one instance the pupil dilated and immoveable, without vision being much affected. Two years ago I attended a patient labouring under slight attack of iritis. When he first came under my care the pupil was exceedingly small. Belladonna was employed during the whole course of the

* Bright's Reports, p. 8.