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ON

SOME DISEASES

IN WHICH

ALBUMINOUS URINE OCCURS.

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SINCE the promulgation of the views entertained by Dr Bright and others, in reference to the urine containing albumen in certain diseased conditions of the kidney, members of the profession in general, have willingly given their assent to this doctrine. But whilst, on the one hand, it cannot be denied that Dr Bright, by his researches, threw light upon much that was formerly obscure, on the other, it may fairly be questioned whether the medical profession are not disposed to attach too much importance to the simple appearance of an adventitious principle in the renal secretion, as pathognomonic of structural change in the kidney. It is my object, then, in the present communication, to inquire whether there are diseases, apart from change in the renal structure, in connection with which albumen is contained in the urine, and by this means attempt to show that this phenomenon is not of such rare occurrence as is perhaps generally believed.

Although Dr Bright, doubtless, is entitled to the merit of being the first to proclaim to the medical world, the fact of renal disease, co-existing with an altered constitution of the urine and dropsy, as mere symptoms of the primary renal change of structure, yet the existence of albumen in the urine of certain patients labouring under dropsy was made known in the year 1764, by Cotunnius, who, adverting to this phenomenon, as occurring in

a young man affected with anasarca, to whom he gave cream of tartar, and increased by this means the flow of urine, says, " nam duabus libris ejus urinæ ad ignem admotis cum pene dimidium evaporasset, reliquum facessit *albam in massam*, jam coacto ovi albumine persimilem."* Again, in the year 1770, we find Dr Fordyce stating, that, " if the kidneys are relaxed or stimulated, chyle, serum, coagulable lymph, and even the red part of the blood may be thrown out." † Dr Darwin, in 1794, states, " there is a third species of diabetes, in which the urine is mucilaginous, and appears ropy when pouring it from one vessel into another, and will sometimes coagulate over the fire."‡ In 1798, Rollo thus writes, " nitrous acid added to healthy urine produces slight effervescence, and gives it more or less of a reddish colour, but produces no precipitation. In some diseases, however, particularly general dropsy, or anasarca, this reagent, when dropped into the urine, produces a milkiness, and in some instances, a coagulation similar to what would take place if added to the serum of the blood ;" and again, " in morbid states of the urine, the coagulable part of the serum is detected both by the nitrous acid and even by heat."§ In 1811, Blackall, ‖ Cruickshanks, ¶ and Nysten detected the same phenomenon. The latter says that he examined the urine of a young man labouring under acute peritonitis, under which he died ; and among the other substances discovered, he states that it contained " a large amount of albuminous matter, which the urine does not contain in a state of health." Talking of the urine belonging to dropsical patients, he states that he procured some from a young man, 18 years of age, who had been affected with ascites for several months, to all appearance idiopathic ; and among the other substances detected by chemical analysis, he adds, " as regards the great quantity of albumen found in this urine, it will be necessary to increase analyses, and support them by the examination of dead bodies, in order to determine if the dropsy had any share in its development, or if it was dependent upon a particular state of the urinary organs." He also, alluding to peritonitic urine, says, that " it contained much albumen, which leads to the supposition that the urine becomes albuminous in peritonitis."** In 1812, Dr Wells †† likewise directed attention to the appearance of albumen in the urinary secretion.

* Cotunnius de Ischiade Nervosa, Neapoli, 1764, republished in Thesaur. Sandifort, p. 417.

† Fordyce's Elements of Practice of Physic, 1770, p. 18.

‡ Darwin's Zoonomia, 1794, Vol. i. p. 316.

§ Rollo on Diabetes, 1798, pp. 443–446.

‖ Blackall on Dropsies, 1811.

¶ Ibidem, (see Appendix.)

** Nysten, Recherches de Physiologie, 1811, p. 255, 260, and 262.

†† Transact. of a Society for the improvement of Med. and Chir. Knowledge, Vol. iii. p. 167. London, 1812.

Previous to bringing forward cases for the purpose of proving the frequent existence of albumen in the renal secretion, altogether independent of any change of structure occurring in the kidney, it may, perhaps, be well shortly to advert to the opinions expressed by various authors of eminence as to the extreme rarity of its occurrence. Dr Osborne states, in connection with this subject, "in no instance have I met with coagulable urine without diseased kidneys, or healthy kidneys with coagulable urine." Dr Christison states, that, although coagulable urine may be found without kidney disease, it is, nevertheless, "very rare." M. Rayer is said to have examined the urine of 400 patients taken indiscriminately, the result of which was, that only three presented albuminous urine without granular kidney. M. Solon examined the urine of 500 or 600 persons either in health or full convalescence, and found only one with albuminous urine. And lastly, Professor Forget, on two different occasions, examined the urine of between 40 and 50 patients in his hospital, and "found albuminous urine only in those affected with dropsy, and in whom, when they did not recover, the inspection proved the existence of diseased kidneys."*

On the other hand, among those who strongly contend for the frequent appearance of albuminous urine without kidney disease, we may mention the name of Dr Darwall, who illustrates his position by several cases, one or two of which we now call attention to. Talking of effusions which frequently attend diseased states of the heart, he observes:

Case I.—"In a patient who died in the Birmingham Hospital, during the present year, at a very early stage of the effusion, two months before his death the urine was barely rendered turbid, but the evening he died it was nearly rendered solid by boiling. On dissection, the heart was found enormously enlarged, and the aorta very much diseased, the kidneys were perfectly sound."

Case II.—Another case "occurred in a lady who had been suffering from pulmonary symptoms, and symptoms of disease of the heart for nine months. When we first saw her, at this time, the urine coagulated strongly, and continued to do so till the period of her death, three months afterwards; yet, while the left lung, the pleura, and the heart, exhibited serious disease of long standing, and while the liver was also diseased, though in a slighter degree, there was no appreciable change whatever in the substance of the kidneys."†

The three following are cases of pneumonia, and occurred in our own experience.

* See Christison on the "Granular Kidney," page 39.

† Cyclopædia of Practical Medicine, Vol. i. Article "Dropsy," p. 637 and 640.

Case III.—John Guy, aged 25, a stout, sober, and healthy young man, by occupation a seaman, after having been exposed to cold, was seized with rigors, which were shortly afterwards followed with dyspnœa, cough, and copious rusty-coloured expectoration; crepitating rale heard all over the right side; passed about a pint of urine in the twenty-four hours, of a dark straw-colour, specific gravity 1012. In this case, nitric acid gave an albuminous precipitate to the extent of nearly one-half of the volume of fluid employed, which precipitate withstood the action of heat. This occurred at an early period of reaction. The young man subsequently recovered.

Case IV.—Alexander Ballingar, an old soldier, aged 68, stated that he enjoyed during his life the best of health, with the exception of a severe inflammation of the chest, which was brought on by lying three days and nights on the field of Waterloo, after having been wounded in that engagement. He had been ten days ill with dyspnœa, cough, and coloured expectoration before seen by me, at which time all these symptoms continued. In addition, the right side of chest upon percussion gave a sound as dull as that emitted by marble; percussion on left side tolerably natural; bronchial respiration and bronchophony were heard distinctly all over the right side, while mucous râles, with puerile respiration, were present in the left side of chest; passed about a pint of urine in the twenty-four hours, of the colour of small beer, specific gravity 1022, which yielded no precipitate by heat alone. After the addition, however, of a little nitric acid, a copious albuminous precipitate was the result, which effectually withstood the reapplication of heat, showing that the urine had been previously alkaline. This man died.

Upon dissection, the whole of the right lung was found to be in the state of gray hepatization, with extensive old cellular adhesions between the *pleura costalis* and *pulmonalis* of both sides; the left lung was in a state of active congestion. The kidneys and other organs were perfectly healthy. This man, it should have been stated, was a drunkard.

Case V.—John Gray, aged 45, by profession formerly a soldier, had fought at Waterloo, and died the same day as the preceding case, labouring under all the symptoms of pleuropneumonia. Upon dissection, recent bands of lymph were found passing between the *pleura costalis* and *pulmonalis* of the right side, with some serous effusion into the corresponding pleural sac. Right lung in a state of red hepatization, with small portions here and there having passed on to the gray, slight effusion into the pericardial cavity, with soft lymph between its serous coats. Kidneys perfectly healthy to all appearance, though rather pale in colour; both structures, however, quite distinct. Passed before death

about 18 ounces of pale-coloured urine daily. Specific gravity 1012; heat and nitric acid gave an abundant precipitate of albumen.

Most of the following cases came under my own direct observation.

Case VI.—Mrs Ross, aged 63, of sober and temperate habits, before death had for some years been affected with all the symptoms of scirrhus of the pyloric extremity of the stomach, such as, almost constant pain, anorexia, and frequent vomiting of a dark-coloured fluid, somewhat similar to coffee-grounds. Upon dissection, the pyloric extremity of the stomach was thickened and hardened, which arose from its cellular tissue having become hypertrophied. Kidneys perfectly healthy, as were all the other abdominal organs. The lungs were loaded with frothy mucus. Left ventricle of heart in a state of hypertrophy without dilatation; its other cavities were perfectly healthy and natural; the two serous surfaces of the pericardium were universally adherent by means of old cellular bands. During life there was nothing remarkable in respect of the renal secretion, as regarded quantity. Then, it was not examined. After death, however, the quantity of urine obtained from the bladder, though too limited to enable us to ascertain its specific gravity, nevertheless, by the agency both of heat and nitric acid, afforded an albuminous precipitate almost equal in volume to the quantity of fluid employed.*

Case VII.—Mrs W. for three years before death had laboured under symptoms of diseased stomach. Upon dissection, the pyloric extremity of the stomach was found in a well-marked state of what is usually denominated scirrhus of the stomach. All the other abdominal organs were healthy. Unfortunately, however, the kidneys were not minutely examined, so that we are unable to bring forward any positive evidence as to their natural or healthy state. We have, however, thought this case worth inserting along with the preceding one of scirrhus of the stomach, more especially as the urine which was obtained from the bladder was highly albuminous.

Case VIII.—J. A., 73 years of age, had been the subject of retention of urine for the last ten or twelve days of his life, seemingly dependent upon a paralyzed state of the bladder. The urine was secreted in considerable abundance, and was of a dark greenish colour; specific gravity 1022. This urine contained a large quantity of albumen. Upon dissection the left kidney was very

* In many of the succeeding cases, it will be observed that the urine was submitted to chemical examination after the death of the patients. Now, though I am aware that on this account objections may be urged against the validity of such cases, on the ground of the serum of the blood exuding through the tissues of the bladder after death, and consequently mingling with the urine therein contained, nevertheless, as from experiment I know this to be by no means a phenomenon of universal occurrence, I think it but right to record these cases in conjunction with others.

small and atrophied, containing a considerable sized calculus within its pelvis. The parenchymatous tissue of this kidney was almost entirely converted into serous cysts. A smaller calculus, of a peculiar flat button shape, was contained in one of those cysts at the upper part of this kidney. The right kidney was in a state of hypertrophy, but otherwise healthy. The urinary bladder was large, and immensely hypertrophied in all its coats; its inner or mucous coat was rough and granular, several small calculi were found in the urethral portion of the prostate gland, which gland itself was much increased in size.

Some writers upon the granular kidney, in establishing the existence of albumen in the renal secretion, as one of the pathognomonic symptoms most to be relied on for pointing out the disease, deny, that, whilst the renal tissue remains unaltered, any organic lesion of the liver is capable of producing the phenomenon in question. It will be seen, by referring to a few cases which follow, that albumen was detected in the urine of individuals, in whom the tissue of the liver was, upon dissection, found to deviate from its normal condition, and to have assumed that peculiar appearance known by the term cirrhosis. Little value may, perhaps, however, be attached to such cases, seeing that it has been doubted by able authority whether this seeming change of structure be really an accidental deposit. I have, notwithstanding, thought them worth recording.

Case IX.—A Prussian sailor fell by accident into the hold of his vessel. Immediately afterwards he was brought to the Casualty Hospital (Leith), when it was found that he had sustained a severe fracture of the cranium. He died in a few hours after admission, with symptoms of compression of the brain. Upon dissection, a large coagulum was found between the inner table of the scull and *dura mater*. The corresponding or left cerebral hemisphere was much compressed, and partially lacerated. The liver was large, and contained many large patches affected with cirrhosis. The spleen was soft, and the kidneys perfectly healthy. The urine was pale and colourless; specific gravity, 1016. When exposed to heat or nitric acid an abundant precipitate of albumen was the result. This man was uncommonly powerful, 30 years of age, and in the full enjoyment of health both previous to and at the time of the accident.

Case X.—J. Robertson, aged 30 years, a stout muscular porter, of intemperate habits, was seized with all the ordinary symptoms of *delirium tremens*, from which he died.

Upon dissection, the traces of general cerebral congestion were apparent, without, however, any of the prominent effects of inflammatory action. Considerable serous effusion was found between the arachnoid membrane and *pia mater*, as also at the

base of the cranium. The two serous surfaces of the pericardium were universally adherent, by old cellular tissue. The left ventricle of heart was hypertrophied, without much dilatation. A ring of osseous deposit was found surrounding the mitral valve.

The liver was about its natural size, but much affected with cirrhosis. The kidneys were perfectly healthy. The urine was of a dark straw-colour; specific gravity, 1018. Heat and nitric acid gave an albuminous precipitate, equal in volume to perhaps a fourth of the fluid employed.

Dr Blackall gives an instance of albuminous urine co-existing with diseased liver, which we shall here abridge.

Case XI.—A. B. aged 45, sallow and bloated skin; pulse 100, hard; dyspnœa; loss of voice, and stricture about the hypochondria; abdomen swelled; frequent dark bilious discharges; œdema of legs; urine of the appearance and colour of rennet whey, copious at night, precipitating at 160; convulsions shortly came on, with fixed but not dilated pupils. Blood drawn was watery, and much cupped. Not more than two hours before her death, the pulse remained still quick and hard.

Dissection.—Lungs everywhere free from adhesion; about four ounces of bloody serum on each side of the chest; a small quantity of pale fluid in the pericardium; very little water in the abdomen. The liver hard, with a thick curled edge, its membrane being rather white, and greatly thickened, and its surface irregular with tubercles. A considerable portion of its substance was divided into hard brown tubercular masses; the other viscera of the abdomen sound. "I speak," says he, "particularly of the kidneys."* It is clearly evident from this language, that his attention was in an especial manner directed to the kidneys, so that it is scarcely possible to conceive that, had their tissue been materially affected, the change would have eluded his observation.

Case XII.—James Lamb, aged 48, by occupation a carpenter, was squeezed between two logs of wood in a ship-building yard, and immediately brought to the Leith Dispensary, where he soon afterwards died. Upon dissection, the four superior ribs of both sides were found fractured. The right lobe of the liver was lacerated and torn. Its substance presented the appearance usually known under the name of cirrhosis. The kidneys were quite healthy. The bladder contained so little urine as to prevent our ascertaining its proper specific gravity; but which, nevertheless, yielded a copious precipitate both by heat and nitric acid. This man had enjoyed good health previously.

Case XIII.—V. Ward, aged 41, died labouring under the symptoms of *phthisis* and *diabetes insipidus*. Upon dissection,

* Blackall on Dropsies, p. 145.

the lungs were found tuberculous. The liver had seemingly undergone fatty degeneration. The kidneys, and other organs, were healthy. The urine was of a pale colour; its specific gravity, however, was not ascertained; heat and nitric acid both yielded a copious albuminous precipitate.

Case XIV.—W. Saunders, aged 60, died of chronic ulceration of the epiglottis and larynx. Upon dissection, the liver was found partially affected with cirrhosis. The kidneys, as well as other organs, were, to all appearance, healthy. The bladder contained a small quantity of urine, which did not admit of its specific gravity being taken, but which yielded a copious precipitate by heat, which was not redissolved by the addition of acid.

The following are cases of various descriptions.

Case XV.—William Hollingworth, aged 45, of very temperate habits, had long laboured under symptoms of diseased heart and blood-vessels, from which he at length sunk. Upon dissection, the left ventricle of the heart was greatly dilated, with proportional hypertrophy. The right auricle was greatly dilated, without hypertrophy. The inner membrane of the ascending aorta was covered with osseous laminæ.

The urine was of a dark-straw colour; specific gravity, 1022; heat and nitric acid both yielded an albuminous precipitate.

Case XVI.—James Stirling, aged 23, a young man previously in the enjoyment of good health, was seized suddenly at Hull with indisposition, for which blood was taken from the arm. On his return home he was labouring under severe inflammation of the vein which had been opened. Latterly, symptoms of purulent effusion within the pleural cavity took place, under which he sank.

Upon dissection, the veins of the arm were found filled with purulent matter. Several pints of the same fluid were contained in the right pleural cavity. The kidneys and other viscera were healthy. About a pint of urine was passed in the twenty-four hours, of a straw-colour; specific gravity, 1012; heat and nitric acid in this instance formed almost a solid coagulum.

Case XVII.—Jane Paterson, aged 3½ years, had been affected with well-marked pertussis for about two months. By imprudent exposure to cold, an attack of *cynanche trachealis* supervened, and terminated fatally.

Upon dissection, the lungs were found to be the seat of interlobular emphysema. The larynx was highly vascular throughout, having its mucous surface covered here and there with soft lymph. Heart, liver, kidneys, and other organs were perfectly healthy in this case. The urine was pale and colourless; its specific gravity was not ascertained; heat and nitric acid, however, gave a large precipitate of albumen.

Case XVIII.—J. M., aged 5 years, had a mild attack of scar-

latina, from which he was convalescing favourably. About three weeks after the appearance of the eruption, his parents observed him slightly swelled in the lower extremities. At this period he was suddenly seized with dyspnœa, and severe lumbar pain, stretching itself down the thighs; the breathing was hurried and laborious, with loud mucous rattle over the whole chest; the urinary secretion was almost suppressed, and the small quantity passed was of a high colour, and deposited an abundant precipitate of a brick colour; pulse 170, strong and full. He was immediately bled, and leeches were applied to the loins. The urine was examined, and its specific gravity found to be 1015, at the same time that it contained an abundant proportion of albumen.

Upon dissection, both lungs were found in a state of active congestion; all the other viscera were healthy, with the exception of the kidneys, which were congested.*

As our limits will not permit a full detail of each individual case in which albuminous urine was detected, we must close this part of our subject by little more than a simple mention of those cases of disease in which this phenomenon was found.

1*st*. It was observed in the case of a young girl affected with pertussis. This girl is now in the enjoyment of excellent health.

2*dly*. It was observed in a case of *diabetes insipidus*, since dead, without a *post mortem* examination being obtained.

3*dly*. It was observed in a case of icterus, occurring in a previous healthy man, whose urine was of the low specific gravity of 1008. This man is since quite well.

4*thly*. It was observed in a case of chronic bronchitis, with diseased heart, where there was no reason to apprehend kidney disease.

5*thly*. It was observed in the case of a man for many years affected with syphilis, having lost his nose and soft palate by ulceration. This man had taken large quantities of mercury.

6*thly*. It was observed in a man labouring under severe gastric fever, owing to over-indulgence in eating and drinking.

7*thly*. It was observed in a young girl affected with severe rheumatic fever; and

8*thly*. It was observed in a case of modified variola, occurring in a girl four years of age, and the period when it was noticed was during the second day of the eruption.

We thus see that the simple appearance of albumen in the urine is not confined to those cases in which the structure of the kidneys has undergone an evident change; but that the same phenomenon is often visible in cases where the most careful examina-

* The appearance which the kidneys presented in this case was simply, as might have been *a priori* expected from the symptoms, that of active congestion, without the slightest vestige of any of the prominent appearances which, according to Dr Bright, characterize the first stage of the affection described by him.

tion fails to detect a deviation from the appearance which these organs ought to present in perfect health.

In attempting to account for the renal secretion sometimes containing albumen apart from kidney disease, we shall take advantage, in our subsequent remarks, of some of the cases which we have previously detailed, in order to illustrate our explanations; for instance,

Case XVIII. presents us with an example of scarlatina, in which the presence of albuminous urine was discovered. In that peculiar form of anasarca which follows the scarlatinous eruption, more especially after imprudent and too early exposure to cold, it has been found that the urine possesses characters strikingly analogous to those of the granular kidney, in so far as one of the pathognomonic symptoms of the latter disease is concerned, viz. coagulability by the application of heat, or upon the addition of nitric acid. This well known phenomenon has often been alluded to, and brought forward by those who are disinclined to attach that degree of importance to the simple state of coagulability which the urine may possess as characteristic of renal lesion, and which the partizans of Dr Bright's doctrine value so highly. But, however little this example may be regarded as affecting the views of Dr Bright and his followers, it cannot be denied that the almost constant and general appearance of albumen in the urinary secretion of scarlatinous dropsy, goes not little to stagger the faith of those, who would believe in its existence only in connection with organic lesion of the kidney; for, in order to reconcile this seeming incongruity, they have recourse to the expedient of almost identifying the two diseases. Harmony is thus established by their referring the scarlatinous and renal dropsy to one and the same cause, and the example of those opposed to this theory thus seemingly overturned; because brought forward for the purpose of showing that there were other diseases besides that of the granular kidney, in which not only did dropsy follow as a secondary or symptomatic affection, but that the urine might also be found to contain a large quantity of albumen, altogether independent of, and unconnected with renal lesion.

The attention of the medical profession was, we believe, first directed by Mr Hamilton to the fact, that in the scarlatinous dropsy, subsequent to the eruption, the kidneys, when cut into, present pretty much the same appearance as they do in the genuine form of Bright's disease in the first stage.

When we reflect upon the various forms which disease may assume; or when we compare the relative appearance presented by active and passive congestion, where none of the other more characteristic products of the former are present in addition to redness, we may well pause before we give absolute credence to such

a sweeping proposition, as would declare that the kidneys, (admitting that they may externally present somewhat the same appearance in the two affections now under consideration,) are nevertheless perfectly identical in point of lesion. If such were the case, how comes it to pass that the mortality in the one disease so far exceeds that observed in the other? Ought not this very fact of itself to lead us to the suspicion that, in that peculiar form of disease of the kidney which Dr Bright has described, and with which his name is associated, there is a lesion of the organ widely differing from that which exists in the kidney after scarlatina? The vascular tissue which enters into the composition of this organ is liable to various gradations of tint, depending proportionally upon the quantity of blood which it may happen to contain at the time of examination. In most acute febrile or exanthematous affections, therefore, in which the natural and healthy function of the kidneys is either suspended or interfered with, it surely is not irrational to suppose, that active or passive congestion may, to a certain extent, be present in the renal substance; which peculiar condition of the vascular tissue we apprehend to be the real cause of the apparent similarity which exists between the real granular kidney and the same organ after scarlatina. The adherents of the doctrine which contends for the similarity of structural lesion, which the kidney is the seat of in the two diseases, for the purpose of throwing aside the simple state of passive congestion, and discarding this condition of the kidney as explanatory of the appearances which they assume it to present, may, with seeming plausibility, in substantiation of their own proposition, bring forward cases of dropsy after scarlatina, in which the kidney presented unequivocal and irrefragable evidence of having undergone that pathological change described by Dr Bright and other authors. All this, we most willingly admit, may take place; but, on the other hand, we are disposed to regard these isolated cases as exceptions to a general rule, and as simple examples of the coincidence of scarlatina, and it may be subsequent dropsy, in a system where the kidneys were previously the seat of organic disease. More matter might easily be brought forward, even from Mr Hamilton's paper, for the purpose of showing that an essential difference exists between renal and scarlatinous dropsy; but this our present limited space will not permit.

We have alluded to congestion of the kidney, as likely to lead to the confounding of appearances presented by that organ in the granular kidney and scarlatinous dropsy; but we come now to consider hypothetically, as to the likelihood which exists of congestion also exciting an albuminous state of the urine. Although the general question has not yet been decided as to whether dropsy is to be ascribed to diminished absorption, or undue exhalation,

it is, nevertheless, generally admitted in some cases to depend upon a want of balance between these two functions. Dr Marcet gives a particular account of the chemical nature of the dropsical effusions found in various diseases, and in different cavities of the body, as in hydrocephalus, ascites, hydrothorax, &c., from which it would appear that the prevailing animal substance is albumen. As plethora has been shown by Magendie to be unfavourable to absorption, may we not justly consider this state of the system as one of the predisposing causes of dropsy? Now, if the due equilibrium which ought to subsist between absorption and exhalation be thus interfered with by means of plethora, we may easily perceive how an organ, or structure within any of the cavities of the human body, becoming the seat either of active or passive congestion, should stand as cause to the effect of serous effusion, which subsequently succeeds in the cavity in which they may happen to be contained. If such is the case with regard to the pleural or abdominal cavities, by extending the operation of the same law to the kidney, we may perhaps explain the existence of albumen in the urinal secretion.

The pelvis of the kidney may justly be regarded in the light of a membranous cavity, so that any circumstances tending to excite fulness or plethora of its vessels, will have the direct effect of disturbing the balance between the functions of exhalation and absorption, the exhalation being increased, whilst, *pari passu*, the absorption is diminished, may therefore satisfactorily enough account for a more than usual quantity of serum mingling with the proper renal secretion, and consequently giving rise to the existence of albumen. Such, we apprehend, takes place in those cases of diseased heart, more especially where hypertrophy of the left ventricle exists; in which albuminous urine is not unfrequently found, as in cases 10th and 15th; for it must be obvious to every one, that in such cases, the kidneys, as well as the other viscera below the diaphragm, are liable to become the seats of congestion, either owing to increased arterial action, or the imposition of some barrier to the free return of the blood by means of the veins. Were we to enter into the field of speculative inquiry, as to other probable causes of albuminous urine, we might readily mention a few.

We have said that it may be caused by a species of dropsy of the pelvis of the kidney itself, owing to plethora disturbing the proper balance between the function of exhalation and that of absorption; the blood at the time being in a state of perfect health. But may we not refer this phenomenon to an essentially morbid condition of the circulating fluid itself? The ancients were well aware of the important part which the fluids sustain in the animal economy; and were inclined to ascribe much, if not most

diseased action, to some vital change in the nature and quality of the fluids themselves. Thence arose their system of humoral pathology. Perhaps none of the fluids were regarded by them so much in default as the blood; but, like all other too exclusive doctrines, the pathology of the humoralist gradually gave way to that of the solidist, who, arguing from the changes perceptible in structure, rested too much on simple organic lesion, to the almost total rejection of the changes which might previously have been effected, in respect of the quality and composition of the fluids by means of which these solids were maintained. That the blood as a fluid is subject to disease, is, we believe, pretty generally admitted in the present day; and if we reflect that the blood is next in importance to what we term *life itself*, since by its undisturbed and healthy circulation, that most mysterious principle is upheld, it is not difficult to perceive how vast must be the baneful influence exerted on the living economy, by a deviation of this vital fluid from the true standard and composition of health. Accordingly, we find, as the result of rigorous observation, that, in certain diseases, the blood undergoes important modifications.

Without entering into a minute chemical detail of this fluid, which would be foreign to our present undertaking, it may be sufficient to remark, in a general way, a few of those diseases which most convincingly demonstrate to us the truth of these observations. *First*, then, we find that the absolute quantity of blood may be increased, as in plethora, or be diminished, as in that state of the system called anæmia. *2dly*, In respect of its quality, important deviations from health are sometimes distinctly cognizable. The various constituents of which it is composed may individually be either in a state of excess or deficiency; thus the solid material, or *crassamentum*, may be at one time too abundant; at another, the serum may preponderate or diminish in quantity or quality, whilst again the hematosine may vary as to its proportion. The fibrine, albumen, and salts entering into the composition of the serum, are also liable to important deviations. In the disease or peculiar condition of the system styled Chlorosis, we have a familiar illustration of the deficiency of colouring matter. The blood is also liable to deficient coagulation. Huxham says, in talking of the blood in malignant fever, "the crasis of the blood is not sufficiently firm, too attenuated; the serum blackish, and tinctured with red." The opinion of early writers, with regard to the imperfect coagulation of blood in certain fevers, has been subsequently fully substantiated and confirmed by the experience of more modern observers. In yellow fever, for example, Dr Stevens states, that the blood is in a much more fluid state after death, than is usually the case in other dis-

cases. His words are, " the colour of the whole mass of blood, both in the arteries and veins, was changed from its natural scarlet or modena red, to a dark colour. I have frequently filled one glass with the black fluid taken from the heart, and another with the black vomit taken from the stomach. They were both so unlike the blood of health, and resembled each other so completely, that it was almost impossible to distinguish the one from the other; and from its appearance, it was very evident that such diseased blood could no more stimulate the heart, or support life in the solids, than putrid water can nourish vegetables, or carbonic acid gas support respiration."* In Asiatic cholera, again, we have an instance where the blood has been found in the very opposite state to this, as regards consistence, being thick, and of a very dark colour; but perhaps one of the very best instances for the purpose of exemplifying the wonderful change which the blood sometimes undergoes, is to be found in the disease termed Scorbutus. Dr Mead, in describing the blood in this disease, says, " as it flowed out of the orifice of the wound, it might be seen to run in different shades of light and dark streaks. When the malady was increased, it ran thin, and seemingly very black, and after standing some time in the porringer, it turned thick, of a dark muddy colour; the surface in many places of a greenish hue, without any regular separation of its parts. In the third degree of the disease it came out as black as ink, and though kept stirring in the vessel many hours, its fibrous parts had only the appearance of wool or hair floating in a muddy substance."† In this affection, then, we see the wonderful influence which certain kinds of diet exert upon the quality of the blood. In the disease termed *purpura haemorrhagica*, or *hæmorrhœa petechialis*, we have one of the most palpable instances of abnormal fluidity of the blood, as is evident from the circumstance of its issuing from its proper vessels, independent of any abrasion. The mucous membrane seems to be the tissue from which it is most prone to flow. Looking at all those circumstances, therefore, it will surely be admitted that albuminous urine may result from a morbid or abnormal fluidity of the blood.

Other agencies, still, we conceive, may be capable of producing an albuminous state of the urine. Dr Darwall says, " as a secreting organ, the kidney is especially liable to be affected by the pabulum afforded it; and should the blood reach it in an imperfect state, whether in consequence of indigestion, &c. we may expect that its function will be impaired." It is a well-known fact that the urine is often highly albuminous after having partaken of pastry, and other indigestible substances. Our case 6th, not fully

* Stevens on the Blood. † Mead's Medical Works.

detailed, presents us with an example of albuminous urine following indigestion. May not nervous influence modify the renal secretion ? Take for example the affection commonly termed hysteria as a familiar and daily instance of illustration. We all know that, in this affection, a pale and copious secretion of urine is one of its prominent symptoms, and it is to be borne in mind that this peculiar condition of the urine requires but little time for its development. If, then, nervous agency has such a powerful influence in inducing the simple change of colour in the renal secretion, apart altogether from any thing like structural lesion, it surely is not difficult to suppose that a change or modification in its constituent elements may be effected through the same medium.

We come now to offer a few remarks upon the true value of albuminous urine, as pathognomonic of organic disease of the kidney. We have seen that the granular kidney is not the only disease in which albumen makes its appearance in the urine. We have also enumerated several instances in which this phenomenon was present, without the most careful examination after death, revealing to us any change of structure in the substance of the kidney. It must, however, have struck those who paid attention to the specific gravity of the urine, in those cases which we detailed, and where particular care was taken to ascertain this point, that in very few cases, indeed, had we anything like the unusual low specific gravity so characteristic of the granular kidney. To this physical symptom, then, we would be inclined to attach more importance as a single symptom, than the mere presence of albumen in the urine. Dr Prout says, " I am induced to conclude, that an albuminous condition of the urine taken alone, as a symptom, does not, in the present state of our knowledge, indicate the use of any particular remedy, or mode of treatment, but that, nevertheless, it is a symptom of which we ought to be always aware, since, taken in conjunction with the others, it may be occasionally useful in directing us to form a more correct judgment of the general nature of the disease."

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