

The History of Albuminous Nephritis

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In pathology, there are few new observations in which one does not discover roots in the earliest medical “researches”. One is above all struck by the truth of this when retracing the path by which medicine has come to know the disease which I will discuss in this section of my work. On the one hand, vague but reliable reports have, for a long time, been sighted amongst diseases of the kidney and some dropsies, whilst on the other hand, more precise reports have been recognized amongst certain dropsies and coagulability of the urine. The discoveries made by Dr. Bright have essentially consisted of drawing together these three things: dropsy, coagulation of the urine and diseases of the kidney in which he found specific characteristics. Thus we see that this wonderful discovery was the natural fruit of the past and the conclusions drawn by a sagacious mind from his own observations and foregoing research.

Taken from the point of view of contemporary science, it is a simple but unique work, but taken from an historical viewpoint, it appears complex: the parts of which it is composed come into focus and one understands how a new scientific idea is born, if one may so put it, of the stimulus of preceding works. History alone is capable of making this interesting analysis and to this end I divide the history of albuminous nephritis into three sections. In the first I review the studies which have demonstrated a link of any kind between dropsies and renal lesions. In the second, I set out the studies of those who have established a link between albuminous urine, low in urea and salts, and some dropsies. Finally, in the third section, I demonstrate the point at which the three different studies converge. There they cease to be isolated and unrelated and they form a concept which in turn becomes simple and elementary and which provides the basis for new work.

It is in the history of anasarca and general dropsies where one must search for the elements of the history of the observations on albuminous nephritis which have been produced over the years.

I. The Relationship between Certain Dropsies and Diseases of the Kidneys

Hippocrates had already pointed out certain dropsies which had their source in the loins or the kidneys (since it is unlikely that he indicated anything other than the kidneys) and the passage in which he gives these opinions is so remarkable that I have included it here:

Dropsies occurring in acute diseases are particularly bad because they do not cause any fever; they increase pain and lead to death. Some come from the bowels and the loins, others from the liver. In the

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first, the feet become swollen and there is a persistent diarrhoea which does not lessen the pain in the bowel or the loins neither does it empty the abdomen.¹

Now it seems that the dropsy that occurs following acute disease, which is distinct from that which produces affections of the liver, accompanied by an obstinate diarrhoea which does not empty the abdomen, is nothing more than the dropsy which one often sees as a consequence of acute or chronic nephritis.

Without doubt these early data have a certain vagueness which prevents them from receiving the scientific merit which they deserve: they are obscured in other passages by hypothetical considerations, but it is none the less true that two significant causes of dropsy, i.e. diseases of the liver on the one hand, and affections of the loins on the other, are very clearly indicated here.

Elsewhere Hippocrates also indicates the influence of a diminished urinary output as a cause of dropsy:

Those who suffer from an excess of bile have a disturbance of the bowel which produces small particles similar to semen and full of mucus. They bring pain to the base of the stomach. Their urine does not flow easily. Dropsy develops from cases of this kind.²

Galen opposed Erasistratus, who attributed all dropsies to the difficulty that the blood experienced in traversing the liver. First of all he remarks that, without any apparent tumefaction, without any obstruction in the liver, dropsies occur, which might be the result of lesions of the small intestine, of the mesentery, the lungs or the kidneys, an excessive haemorrhoidal flux, metrorrhagia, amenorrhoea and possibly to other similar alterations to the uterus.³ And moreover:

There are those, and above all keen Erasistratians, who think that dropsy is produced only when there is an obstacle to the blood flow towards the liver; that it is never brought about by the spleen or any other organ and that it is always brought about by cirrhosis of the liver. Nevertheless, we regularly see, that a suppressed chronic haemorrhoidal flow, or an excessive purging leading to extreme chilling, engenders dropsy. Similarly, in women, complete menstrual suppression or prolonged flooding will produce this result.⁴

Moreover, Galen⁵ supposes that dropsy occurs when the blood becomes too serous and the kidneys do not excrete this serosity:

Indeed after the juices which are contained in the veins, have been dissolved into bloody, serous matter, the kidneys, which have been designed to draw off this excreted matter, especially when they are healthy, do indeed cleanse the serum from the veins but they continually transmit the flux to the bladder. *But when the kidneys are not strong enough to draw it*, either the veins transmit serum of that kind into the stomach or spreading it over the whole body, suddenly reveal features of dropsy.

Again one does not find in Galen the important distinction between febrile dropsies coming from the loins and those coming from the liver. However, of the three

¹ Gardeil, J. B., *Traduction des Oeuvres médicales d'Hippocrate, sur le texte grec, d'après l'édition de Foës*, Prognostic 21, 4 vols. in 8vo, [Toulouse], 1801.

² *Coacae praenotiones*, n. 443, *Hippocratis opera*, in fol. ed. Foës, p. 190, Francofurti, 1621.

³ *De locis affectis*, LIV, v, vol. III, p. 204, ed. J. Froben, [1561].

⁴ *De humoribus... commentarii* [in *Claudii Galeni opera omnia*], ed. C.G. Kühn, vol. XVI, p. 447, [Lipsiae, C. Knobloch, 1821–1833].

⁵ Galeni, *Omnia quae extant*, vol. II, classis 3. *De symptomatum causis*, lib. 3, p. 57, in fol., Basileae, [1561].

forms of dropsy that he recognizes (anasarca, ascites, tympanites) one, the “febrile anasarca”⁶ could, in terms of its characteristics, correspond to anasarca consequent upon albuminous nephritis. In all cases, he has to some extent recognized that the kidneys were contributing to certain dropsies. The Renaissance writers who violently disagreed with Galen for attributing all dropsies to an affection of the liver had clearly not understood, because one sees in these passages not only that he recognized dropsies without lesions of the liver, but also that he connected several to lesions of other organs.

In enumerating these organs, lesions of which might give rise to dropsy, Caelius Aurelianus also mentioned kidney lesions.⁷

In discussing diseases of the kidney, Aretaeus describes, in a rather confused manner, *an affection of the kidney* of which the principal symptoms (sanguineous urine, swelling, unexpected cerebral symptoms, problems with digestive functions) could correspond to albuminous nephritis with dropsy although he attaches these disturbances to renal calculi.⁸

Alexander of Tralles⁹ recommended bloodletting in certain anasarcas, considered much later as inflammatory or sthenic, but he says nothing about their origin.

Aetius, in a remarkable passage, says that individuals who are suffering from *hardening of the kidneys*, eventually become dropsical, as happens to those who suffer induration of other viscera.¹⁰

The understanding of the *connection between dropsy and hard kidneys* was not lost to the Arabs, and Avicenna (apparently following personal observations) also described quite strikingly the state of the urine of dropsical patients suffering from hardening of the kidneys or a hard abscess of these organs.¹¹ Furthermore, he supposes that a kind of

⁶“Anasarca i. gets its name ‘through the flesh’, it is when the whole body swells up with oedema: and it flows all round: the genitals are affected for sufferers, their appetite for food is removed and fever accompanies it.” (Galenī, *Omnia quae extant*, in fol., Basileae, 1562, vol. I, p. 94. *Galenī ascriptae definitiones medicae*.)

⁷“For Erasistratus says that the liver is painful; for he confirms that he always finds it stony when opened up: but others say that it is the colon but agree about the liver; others say it is the spleen and the liver and the colon; others say it is the peritoneum as well: *others have said that the kidneys too* and the matrix are the main cause of pain.” Caelii Aureliani, *De morbis acutis et chronicis; morb. chron.*, lib. 3, cap. VIII, in 4to, Amstelodami, 1654, p. 473.

⁸“For they *grow extremely pale*, become sluggish, are inactive, are fussy about their food, they are in trouble with indigestion: and when blood has been excreted, they become languid, their limbs are relaxed, even the head is made lighter and rather easily moved. But if no blood has flowed in circulation, they are troubled with headaches, their eyesight grows dim, darkness spreads over them, they suffer giddiness; then others in large numbers lapse into epilepsy, swelling up as if covered with mistiness, like those who suffer from intercutaneous dropsy.” Aretaei, *De causis et signis acutorum et diuturnorum morborum*, ed. H. Boerhaave, in fol., Lugduni Batavorum, 1735, p. 54.

⁹“Accordingly, it is necessary to treat dropsy anasarca sometimes both by cutting a vein and by purging.” Alexandri Tralliani, *libri duodecim*, lib. 9, p. 531, in 8vo, Lugduni, 1560.

¹⁰“Whenever *hardening of the kidneys occurs*, it does not bring any further pain certainly: but for those who are sick, it seems as if something is hanging from an empty place in the stomach, and numbness occurs in the hips and inability to use the legs and they only pass small amounts of water and in the rest of their bodily state they are very like those suffering from intercutaneous water. In addition, some in the course of time clearly decline into dropsy, just as also happens from other hardened entrails.” Aetius, *Tetrabiblos*, lib. III, cap. XVII, in 4to, Basileae, 1549, p. 606.

¹¹“Either there is a stoniness arising from a hot abscess because of the cold which turns it to stone, or heat that enlarges it: both of these are contributory causes preventing the development of maturity . . . *And the urine is thin, small in quantity* for the reason that they both draw off too little liquidity because of the weakness of their ability and the weakness of the powers of expulsion of both of them: and, deprived of digestion, it is thin; and the reason for this is a blockage: for it prevents its penetration because it is cloudy; and mostly of that which is thin: in fact sometimes blockage restrains the urine and weakness prevents its ability to dissolve. And

connection exists between diseased kidneys and affection of the liver that leads to dropsy.¹² But he does not think it necessary that both organs should be diseased simultaneously for dropsy to develop.¹³

What is particularly noteworthy is that Avicenna clearly discusses dropsy in a chapter entitled 'Diseases of the Kidneys'. He attempts to distinguish this type of dropsy from ascitic dropsy, produced by diseases of the liver, and in commenting on a passage of Hippocrates relating to dropsies arising from the loins, he gives a brief but lively outline of acute dropsy.¹⁴ Finally he speaks of intestinal ulceration in these same cases.¹⁵ Thus it appears evident that, at this time, it was well known that there were dropsies arising from the loins, also hard, altered kidneys, and that in these dropsies urine was scanty and thin.

The most important and celebrated physicians of the Renaissance did not express themselves in such a clear and definitive manner with regard to these dropsies.

Fernel¹⁶ supposes that in ascites the serous humour which naturally exits through the kidneys discharges into the cavity of the abdomen by some accidental rupturing of the parts contained therein: "*the serous liquid*, since it is thin, by itself without blood, as is usual, *flows out through the kidneys* and gathers within the abdominal cavity" (p. 510). "Because without this", he continues, "all those with suppressed urine would become dropsical, which does not occur." He says that anasarca is nearly always accompanied by fever, and that the urines are pale, tenuous and unrefined: "fever which is almost continuous but slow moving, finishes with a pulse that is slight, frequent and irregular: urine is white, thin and utterly unrefined" (p. 508). And if he did not grasp the connection between the tenuous urine and alterations of the kidneys, he did state clearly that urine was very different in ascites (that one knows depends more frequently on lesions of the liver): "the urine is extremely infrequent and that almost thick and red; especially if the liver has provided a start to the disease" (p. 509).

Nevertheless, if by recognizing the remarkable differences in the urine in anasarca and in ascites, it was already possible, at the time of Fernel, to distinguish *dropsies dependent on*

sometimes further to this occurs agitation. And very often it leads to dropsy because of the blockage of passage of the liquidity of the blood and its return to the body." Avicennae, *In re medica*, lib. III, f. 18, tract. 2, p. 858, in fol., Venetiis, 1514.

¹² "And when the ailments invade the kidneys, the liver is weakened until it reaches the point where dropsy develops, whether the kidneys are hot or cold." *Ibid.*, p. 852.

¹³ "And so the cause [of ascites] which is in the ability to separate, is because separation is shared between the ability to separate in the liver and the ability to draw off in the kidneys: when therefore both of them are weakened, or one of them, or a blockage has taken place in the passages, and peculiarly when there is a hard abscess in the kidneys and the liquid is not separated and the body does not receive it and the passages do not bear it, then of necessity there arises one of the methods of the occurrence of dropsy ascites." *Ibid.*, p. 771.

¹⁴ "And if (dropsy) were to begin in both groin and loin, an abscess would begin from the feet; then occurs flux of the stomach, bloody and long, which is not resolved and water does not come out with it. And dropsy of which the cause is hot, is accompanied by signs of heat and comes from inflammation and thirst and yellowness of colour; and bitterness of mouth: and acute dryness in the body and a decline of appetite for food, with yellow and green vomiting, and a fierce burning when urinating ultimately because of the strength of the jaundice. And if it is of the kind in which liquefaction is increased and so is expulsion to the natural passages, it is marked by a flood of yellowness and signs of liquefaction and is preceded by voiding and urinating, which is lavatorial and strong. And then begins the alchatin from parts of the groins. And in the same way all dropsy arises from acute illnesses." *Ibid.*, p. 773.

¹⁵ "And sometimes with dropsy occurs voiding which is bloody, and is not cut short and is not cured either; since the wateriness is not produced by looseness but rather what weakens the body is produced by looseness, and sometimes excoriation and ulceration lead on to dropsy." *Ibid.*, p. 800.

¹⁶ Fernel, [J.], *Universa medicina*, p. 510, in. fol., Coloniae Allobrogum, 1679.

diseases of the liver from anasarca with thin urine (and dependent on kidney lesions), it should be added that no one distinguished at that time these anasarcas from those that occur in diseases of the heart, and those in which the urine is generally pale or colourless and which never displays the physical and chemical characteristics of the urine of those individuals that become dropsical following diseases of the liver.

At that time the organs were rarely examined after death and it is not surprising that the condition of the kidneys should have been indicated in very few observations, above all when one reflects that it was not until many years later that the condition of the kidneys in dropsical patients was so carefully recorded. Therefore, it is not without some amazement that I read, in Schenck,¹⁷ a case reported by Jean Hesse which appeared to me an unequivocal example of chronic albuminous nephritis with dropsy. During life the patient had bloody urine, later followed by dropsy and a notable diminution of the urinary secretion: after death, a remarkable alteration of the kidneys was found. Here is the passage in question:

D. Christophorus Furer, as a result of a ride over rough places in the month of July began to urinate blood copiously and when he had neglected this for many months his body became amazingly thin so that it seemed to be wasting away. At last the urine began to lessen and his body to swell so that it became ascitic. Many and various remedies were used, but in vain. Ultimately there followed a complete suppression of urine, however the region of the bladder never became swollen. We applied things that can provoke urine, (but nothing too strong) such as anise oil, the oil of the moschat nut and similar things, but in vain: however we did not dare to resort to stronger remedies because of his declining strength and for fear that the urinating of blood might return. Accordingly he died in the month of February when he had passed no urine for eight days. There had been no thirst and his bowels were flowing copiously. We judged that the disease was in the kidneys, which the outcome also showed, for when the body was cut into, the liver was somewhat too hard but healthy enough except that in the part where it touched the right kidney, it was half-decayed. *The right kidney had lost all its colour so that it had white flesh* and clearly contained no urine. But the left one was a little better and contained a small amount of urine. The bladder plainly held no urine. From this we guessed that the whole of that disease had arisen from the kidneys, which had been weakened from that flow of blood so that they could not draw to themselves the serous excretions of the body. We also found the omentum broken and contracted very narrowly into little globules. And I think that this had been the reason for the weakness of the digestion of the stomach about which he always complained as Galen testifies (in 'On the use of parts'). In the bag of the gall-bladder we found thick, green bile which flowed down every day into the stomach and produced nausea as a result of which he used to produce green vomit.

Foreest, less clear than the Arabs on the influence of the kidneys in the production of dropsies, added nothing to the observations of his predecessors.¹⁸ Van Helmont is one of the authors who attacked with the greatest force the exclusive role which it was generally supposed that Galen had attributed to the liver in the production of dropsies. Van Helmont cites several openings of dropsical cadavers in which the livers were found to be healthy; and on another front he insists, most particularly, on the influence that affections of the

¹⁷ Schenck, J., *Observationum medicarum rariorum*, lib. vii, in fol., Lugduni, 1644. *De hydrope*, lib. 3, obs. xii, p. 417.

¹⁸ "For also the kidneys do not separate the serous substance of the blood because of their blockage, sometimes because of their weakness too . . ." and further he says, "From the kidneys indeed occurs not only the passage of damage between themselves but it also occurs accidentally if they do not cleanse the liquidity, as a result of which much of it remains in the veins and the blood becomes watery and the serum is drained out."

kidneys have in the development of dropsy. Finally he reports a case in which a dropsical patient produced during life a small quantity of brownish-red urine and in whom, at post mortem, an alteration of the left kidney was discovered.¹⁹

“It is,” says Van Helmont, “through the kidneys that dropsies are formed and cured. And since the kidney is the main promoter of dropsy, although another member may from time to time contain the cause on individual occasions, accordingly, dropsy ascites is always the immediate product of the kidney . . . therefore true dropsy ascites is in the kidneys” (p. 515). He remarks, however, that the renal calculi in the kidneys do not produce dropsy and he explains this by a certain role that he attributes to the “principle of life” and which is far from clear.

Lazare Rivière studied dropsies in a more general fashion than the majority of his predecessors. He wrongly attributes to Galen the opinion adopted by a great number of authors, that all types of dropsy derive from the liver. And in this connection, he recalls that Hippocrates had already indicated that dropsies came not only from the liver and from the spleen, but also from other parts *situated in the space between the ribs and the ilia*; and he adds that contrary to the supposed opinion of Galen:²⁰ “For this reason that in the dissection of many dropsical sufferers the liver has been found to be unharmed and undamaged, as is agreed by published authorities from very many case histories.” According to him, dropsy is due not only to the liver and the spleen, but also to the kidneys:

After the liver and the spleen the kidneys attract serous matter, transferred to the vena cava, and they free the whole body from a surplus supply of it, so that, if their function has ceased, a very great supply of serum would be retained in the veins, and if this spreads into the abdomen, it produces dropsy ascites in a short time. But the attraction of the kidneys can cease for many reasons: *too immoderate cold, tumours*, ulcers and obstructions which are strong enough to diminish, abolish or interrupt their function. (Ibid.)

Thus, he supposes (and in this I believe he is correct) that several forms of diseases of the kidneys can produce dropsy; but he did not know the kidney lesions which particularly

Foresti, [P.], *Observationum et curationum medicinalium ac chirurgicarum opera omnia*, lib. xix, obs. 28, scholium, [vol. 1], p. 371, [Rothomagi, 1653].

¹⁹Van Helmont, [J.B.], *Ortus medicinae*, art. *hydrops. Ignotus*, in 4to, Amstelodami, 1748: “Since indeed, in the event of the stomach swelling up through a failure of urine, and so indeed it seemed that dropsy should be ascribed to neglect of the kidneys . . . But I have never been able to accept that the liver should be the cause of dropsy, if all dropsy could be explained through urine . . . wherefore for me the fault lies in the kidney rather than the liver (p. 508). A certain citizen was in pain for a long time between the false ribs and could not breathe without pain but after the suggestions of the doctors had been tried out, ultimately he died of dropsy but his liver was found to be free from harm. A treasury official from Brabant after suddenly passing blood, for a long time was treated by doctors in vain and for the same reason was subjected by his family to healing springs: on his return he began to show signs of hardness on the left side of his abdomen beneath the ribs and then the shin bone on that side became swollen. But the chief physicians and those of Louvain, although they saw that his urine was similar to healthy ones and then showed that his liver was not to blame, nevertheless did not cease from the continual use of unblocking laxatives and diuretics; indeed they dosed him with a concoction of iron salts, variously treated to combat obstructions: and in the end he died of dropsy with a huge belly. Those who had been in attendance from the hour of the passing of blood, could not say that they had been called in too late (an opportunity for an excuse). Now when his body was dissected, his liver was found to be not guilty: but the left kidney had swollen with a clot of extravenuous blood (such as is in a cooked sausage) and larger than normal” (p. 510). Further on, in his animated style in speaking of this *fiscal*: “And in addition because the kidney is settled as maker, achiever, performer and governor of true dropsy” (p. 513).

²⁰Rivieri, Lazari, *Opera medica universa; praxeos medicae*, lib. xi, cap. 6: *De hydrope*, p. 326, in fol., Lugduni, 1738.

produce dropsical conditions, and he did not say that several affections of these organs were in no way followed by dropsy.

Ploucquet cites as an affection of the kidney in dropsy, an observation of Baillou²¹ in which there was only one kidney, twice the size of a normal one. The liver showed an alteration which appeared to me to correspond to cirrhosis: “the liver hard, dry and variegated with countless colours: the colour was rather ashen in many places: finally all its substance became infected.”

Le Pois²² repeated that which Fernel said regarding the influence of diseases of the kidney on the production of dropsy and he equally added that it was not necessary for the kidney²³ to be diseased for the serous deposits to occur, but in support of his opinion he cites, however, a case where dropsy very rarely forms: “Also at times a collection of serum arises from the retention of urine, and, if the water does not descend into the bladder because of the small stones contained in the ureters, it goes back and fills the bodily system with serum so that the body appears swollen without any damage to the liver.”

Independent of Hesse’s observation cited above, I should make particular mention of a case of anasarca reported by Bonet according to Heurne:²⁴

A sixty year old who had supported life by begging, afterwards was taken into hospital as an invalid where he died after a stay of three weeks. About six months previously as a result of his depraved life he had lapsed into leukophlegmasia, which had gradually deteriorated into *ascitic dropsy and a marked hydrocele of the scrotum*. There was also a marked swelling of the feet, a lowered appetite with continual flux of the bowels as a result of the lowered tension of his entrails. When the body was opened, these were the main features: in the abdomen water was found in moderate quantity, for nature had unloaded much either by withdrawal or through distribution. *The liver was not much different from its natural state* except that it was a little paler. But the spleen was so small that it scarcely had half the size of a natural kidney: similarly it was particularly flabby and pale. Its channels, which stretch to the stem of the fundament and the base of the belly, were scarcely visible because of their thinness. In the bag of his gall bladder (which nevertheless held a moderate amount of bile) there were three little stones of remarkable composition, for each one of them showed shape almost of a mulberry, except that they were more deeply cut and the parts were clinging together just like rather outspread grapes in one bunch but light black and crumbly like rather tender charcoal. *The kidneys were not far from their natural size and position but they were much changed from their natural colour: for they were white almost like milk*. In the left cavity of the thorax some water was found which was also more abundant than it ought to be in the pericardium. But the lung of the right side was made up of parts that were everywhere continual and the whole of it was swarming with foul matter, spots of which were also apparent in the left one. But the cavity of the heart (as also its large channels) had been stuffed with a sticky liquid, white and very gripping so much so that it is believable that his blood had been similar.

²¹Ballonii, G., *Opera omnia*, vol. i, p. 192, *Epid. et éphémér.*, lib. 2, in 4to, Genevae, 1762.

²²Pisonis, N., *De cognoscendis et curandis praecipue internis humani corporis morbis libri tres*, vol. ii, p. 220, in 4to, Lugduni Batavorum, 1736.

²³This idea that Galen attributed dropsy to an affection of the liver had been reproduced by a number of authors; however, it is completely false: the passages of Galen cited above do not allow equivocation. What probably gave rise to the error is the mediating role that Galen theoretically accorded to the liver in the production of dropsy.

²⁴Boneti, Th., *Sepulchretum sive anatomia practica*, lib. iii, sect. xx, *De cachexia, anasarca, leucophlegmastia*, obs. xvi, vol. ii, p. 359, in fol., Lugduni, 1700.

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After having reported these facts, Bonet declares that dropsy was evidently due to an alteration of the kidneys, and he links this case with that of Hesse, reported by Schenck. Finally, he thus explains the formation of dropsy: “The kidneys,” says Lindenius, “are aqueducts for collecting waters which flow down from the whole structure and sending them down into the bladder as if into a cistern. *If they do not perform this function, those waters flow back and infect the whole household*”.²⁵

Without doubt, several doctors had formed a vague idea about the renal alterations which could produce dropsy. Thus Stoffelius²⁶ affirms that, in all anasarca (*from the supply of excretions produced*), Schwartz found the emulgent veins occupied by a mucous matter or phlegm (*that it had always been found in veins that acted as drains for mucous, right as far as the kidneys or clear phlegm*). Others neglected to examine the kidneys after death in the cases where the disease was probably the consequence of an affection of the kidneys, as in the following case reported by Plater:²⁷

So I lately treated a virgin of marriageable age who suffered from erysipelas fever, *who exposed herself to rainy, cold air and washed the linen clothing*. She suddenly developed serious breathing difficulties with *serous swelling of the whole body*, beginning initially in the feet, at last with the serum breaking out on her thigh and the swelling of her whole body by no means ceasing but increasing daily, she died after she had been confined to bed for a few months.

It is above all in the history of anasarca, or in cases peculiar to this disease, that one finds renal lesions indicated as a cause of dropsy. However, some observers, led by Willis, attributed anasarca to a primary alteration of the blood, an opinion which has re-emerged of late. Thus Willis supposes that the blood contains a matter which cannot leave in the normal way; this is pure hypothesis.²⁸

On the other hand, the diminished urinary output was regarded by Sydenham as an effect of dropsy, and not its cause, and he makes no mention of previous observations that tend to prove the influence of the diminished urinary output and diseases of the kidney on the production of dropsy.²⁹ Schroek, cited by Lieutaud,³⁰ reports on the contrary, a case of dropsy with renal lesion which was preceded by a very notably diminished urinary output.

²⁵ *Ibid.*, p. 362. Another case cited by Bonet (*ibid.*, p. 354, obs. II) is less conclusive: “Citizen N gradually fell into a state of consumption and had almost the whole of his liver putrified; his bladder was empty and his gall bladder was abnormally loose and open: the kidneys were stained with a yellow colour, their parenchyma was leaden blue.” This alteration to the kidneys in my view corresponds to the third form of albuminous nephritis, but in another passage (*ibid.*, obs. v, p. 212) where the same patient is discussed, it is not the cortical substance but the tips of the mamilla that are yellow and discoloured.

²⁶ Boneti, *Sepulchretum*, vol. II, p. 359.

²⁷ Plater, Felicis, *Praxeos medicae*, vol. III, *De extuberantia*, cap. 3, p. 186, in 4to, Basileae, 1736.

²⁸ Willis, T., *Opera omnia*, vol. II, p. 245, [Amstelaedami, 1682], *De anasarca*: “The watery humour which makes up anasarca, proceeds entirely or for the most part from the blood: it is produced without doubt as a result of failure or corruption of the blood, continually within a bloody mass and pours out of the ends of the arteries in too great a supply to be taken out by veins and lymph ducts, and restored and removed through the kidneys and pores of the skin and other outlets of serous liquid. From these things it follows that the material cause of this disease is watery humour and the efficient cause is blood which presumably produces the waters and deposits them in affected places.”

²⁹ Sydenham, Thomae, *Opera medica, Tractatus de hydrope*; vol. I, p. 334, in 4to, Genevae, 1769: “And so urine is produced sparingly because the blood serum which ought to have been excreted through the urinary passages by the law of nature is already deposited in the hollow of the abdomen and in other parts capable of taking it in.”

³⁰ Lieutaud, [J.], *Historia anatomico-medica*, vol. I, p. 252, [Paris, 1767], *Ephem. ant. cur.*, vol. I, an. 9 and 10, p. 410.

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This case appears to me to correspond to the 6th degree of albuminous nephritis:

A fifty year old man, devoted to drunkenness *is suddenly seized with strangury*. A catheter is applied in vain: for there is no pain and no swelling in the bladder. *The pain was serious in the left kidney*. Then even after seventeen days vomiting occurs: the body swells; the memory is affected, speech is hindered and ultimately he died of suffocation. When the body was opened, *in place of the right kidney there is found a hard and cartilaginous little body with the size of a small hen's egg*. When this was dissected, inside clots of blood appeared with water-coloured stones and little portions of putrid kidney substance. *The left one was found three times bigger than normal, semi-cartilaginous and in a rounded shape*.

Boerhaave³¹ also numbers the kidneys among the organs in which an obstruction may cause dropsy, and he reports a remarkable work³² that tends to prove that which was later demonstrated in albuminous nephritis—that the matter peculiar to urine may, in certain diseases of the urinary tracts, be found in the ventricles of the brain. Here is the work in question:

“A merchant of the Hague, occupied with important affairs, abstained from passing urine for a period of 24 hrs. The next afternoon, he wished to urinate but was unable to satisfy his need.” Boerhaave remarks that the bladder had lost its contractile force as a result of the excessive distension. “On the third day, the introduction of a probe into the organ had no effect—nothing was voided. The sixth day, stupor, somnolence, considerable sweating with a fetid odour, similar to that of the pulmonary exhalations, a frequent pulse, convulsions and lethargy were experienced: the fourteenth day the patient died. A liquid resembling urine was found in the ventricles of the brain.” Boerhaave does not comment on the condition of the kidneys nor of the bladder.

Morgagni³³ had already recognized that dropsy could occur following alteration of other parts of the abdomen besides the liver: “And surely whatever part, in fact whatever cause, can delay the flow of blood for a comparatively long time or flow of lymph or of the humour with which the hollows of the body are moistened, beyond the normal or increase the secretion or reduce the outflow afterwards, can produce the origins of this disease.” And he places the kidney amongst those parts, diseases of which can produce dropsy. He reports that the structure of the kidneys was profoundly altered in a man who died in an unexpected manner and in whom the thigh and knee were swollen with fluid and in whose abdomen and chest some ounces of fluid were also found. “Finally”, he says, “the internal structure of each kidney seemed confused and there were also in evidence small cells full of humour, one of which (for the rest were concealed somewhat further inside) showed itself partly on the surface.”³⁴ The ureters of this same subject showed a remarkable alteration. (See ‘Diseases of the Ureter.’)

Morgagni also cites the case of an elderly dropsical woman, whose kidneys, it appears to me, showed the granulation later described by Bright:

Some entrails of a woman who had died in this hospital, and her head, were brought into this school when I was holding an anatomy (class) in the year 1726. The substance of the innermost part of her

³¹ Van Swieten, Gerardi, *Commentaria in Hermanni Boerhaave aphorismos*, § 1229, vol. iv, p. 168, in 4to, Parisiis, 1773.

³² Boerhaave, [H.], *Praelectiones academicae*, vol. III, p. 315, Gottingae, 1741.

³³ Morgagni, [G. B.], *De sedibus, et causis morborum*, epist. xxxviii, art. 9, [Naples, 1762].

³⁴ Morgagni, [G. B.], *De sedibus, et causis morborum*, epist. xlii, art. 11; epist. xl, art. 21.

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brain was dark and marked with frequent spots of blood: the lateral ventricles were not free of water, which had flowed inside it: the brain was very soft. Both in the hollow of the thorax and also in the stomach there was an amount of water and it was foul. The tubes of the womb had their large orifice blocked, indeed its end was firmly stuck to the ovary. *Both kidneys had uneven surfaces and were mottled with white spots here and there* where they had sunk in; so that you could easily understand that that unevenness was not natural. But the urinary bladder was red inside.

But elsewhere he exposes the development of dropsy in a purely hypothetical form.³⁵ Thus he cites a case in which a patient who had taken a large quantity of drink without passing urine was found at post mortem to have a kidney which was almost destroyed by calculus, and he supposed that the urine had leaked into the abdomen. Finally, he also cites an observation of Plater and another of Dodoens, in which the kidneys and the spleen were healthy, and he attributes the development of ascites to an outpouring of urine coming from the liver or the bladder. These cases of urine overflowing into the abdomen are evidently distinct from dropsies.

If one consults the different chapters of his immortal work, indicated in the 'Index'—Art. 'Dropsy', one sees that in these observations, which are a little too concise, the condition of the liver and spleen (lesions of which were, at the time, regarded as principally producing dropsies), were carefully indicated, despite that more often no mention was made of the condition of the kidneys. However, in a case of ascites with disease of the liver, Morgagni describes a remarkable renal alteration.³⁶

F. Hoffmann³⁷ expresses himself very clearly on the distinctive characteristics of urine in anasarca and ascites: "After that it is noticeable that in anasarca urine is passed in a thin stream and it is white, in ascites it is small in quantity and thick with a large amount of red brick-like sediment." For the rest he makes no mention of diseases of the kidneys as a cause of dropsy. In a paragraph ("the anatomical dissection of those who had died of dropsy") he enumerates the alteration of the liver, the spleen, the mesentery, the lungs and the heart, which have been observed, and makes no mention of alteration of the kidneys. Lieutaud had the fortunate idea of looking at the lesions of the viscera, noted after death in dropsical patients, but this analysis was made on incomplete observations in which the names of the principal organs are themselves not indicated. However, in several post mortems of dropsical bodies he mentions some quite serious renal lesions and, notably, calculous kidneys.³⁸

J. P. Frank indicates several illnesses, scarlatina, scrofulus, syphilis, intermittent fevers, diseases of the liver, heart, etc. as general causes of dropsy, but he makes no mention of ischuria, nor diseases of the kidneys. At the same time³⁹ he describes a case of *dropsy with pain in the loins and urine resembling cloudy beer*—two circumstances which one often

³⁵ Morgagni, [G. B.], *De sedibus, et causis morborum*, epist. xxxviii, art. 19.

³⁶ Epist. xxxviii, art. 28: "The particular membrane of one kidney (for I did not inspect the other one) had become quite thick and very easily followed if anyone pulled it; the canaliculi were also thicker than usual and for that reason much more obvious."

³⁷ Hoffmann, F., *Medicinae rationalis systematicae*, cap. xiv, vol. iii, p. 324, *De hydrope*, in fol., Genevae, 1761.

³⁸ Lieutaud, [J.], *Historia anatomico-medica*, [vol. 1], pars 1, obs. 231, obs. 458, obs. 1117, obs. 1118, obs. 1119 and obs. 1075, in 4to, Paris, 1767.

³⁹ Frank, J. P., *Traité de médecine pratique*, French translation by J M Goudareau, vol. iv, [Paris, 1820–1828] p. 199.

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encounters in dropsy following albuminous nephritis, which I find sufficiently interesting to quote:

A woman of 26 years, of florid complexion, was received at l'hôpital de Pavie for pregnancy rather than for illness. We questioned her about her condition: she replied that she was ascitic and that she had come for the third time to ask for 'tapping' because neither squills, nor any other remedy had, up to now, been able to relieve it. As she had confidence in an experienced hospital doctor we left her in his hands. But some hours after she said she wished to be admitted to the clinic: we readily agreed. She told us that several months previously, she had enjoyed the best of health when her periods were suppressed by a sudden shock, that a short time afterwards she had succumbed to this dropsy, resistant to all remedies, also to the paracentesis that had twice been performed. At the time she asked for our help, she was producing every twenty-four hours, only two or three ounces of *urine resembling cloudy beer*. The functions were not deranged, but the patient experienced thirst, pain in the loins, a little heat and she was constipated. She had a big, full pulse but not rapid. The young students, of great merit but devotees of novelty, were at that time enthusiasts of the doctrine of Scottish medicine: a sublime doctrine in many points, erroneous in many others. I asked one of my most distinguished students, a zealous partisan of the new system, how he would treat the patient. He regarded the disease as debilitating and he proposed opium, a large dose of ether with a decoction saturated with quinine. I prescribed bloodletting of a pint, a decoction of barley with a little cream of tartar and of nitre (saltpetre). Several students profoundly disapproved of this method, considering dropsy as a wasting disease, because it was the product of a debilitating passion such as fear. However, the next day a quart of less charged urine flowed, the pulse became higher and more free. Again a pint of blood was taken. The urine increased so rapidly that within the space of fifteen days, the dropsy disappeared, a great surprise to the partisans of asthenia. The following year this woman came to see us at the clinic; her health was undeniable.

Sauvages described several forms of ascites indicated by the ancients (ascites from the liver; ascites from the spleen; ascites from scrofulus mesentery, etc.) but he does not mention *ascites of the kidneys*, already indicated by Aetius and the Arabs—however he mentions an *anasarca urinosa* consecutive to ischuria and suppression of urine.⁴⁰ This form of anasarca is not exactly the same as that which was described at length in his article but it approaches it, in as much as it has as its origin a renal lesion, a suspension or a diminution of urinary secretion. The observation upon which Sauvages bases this form of anasarca is sufficiently curious for me to report it here.⁴¹

The five year old son of Mr. Bondon, an engraver of our town, was struck by the stone; he suffered little, but at intervals the stone so completely obstructed the entrance of the canal of the urethra, that the urine, after having filled the bladder, flowed back into the body, and little by little established an anasarca, or leucophlegmasia, which flooded the whole cellular tissue. The child remained collapsed and drowsy until the urine resumed its course, the anasarca was entirely dissipated and, if one accepts a little puffiness of the skin, this little patient appeared to enjoy good health. To give a reason for the natural cessation of this symptom, it is sufficient to observe that the gradual distension of the bladder, in making it lose its elasticity, widened the entrance to the canal of the urethra, and the stone being no longer trapped against the sides, easily disengaged

⁴⁰ Sauvages, [F. B. de], *Nosologica methodica*, vol. II, p. 474, in 4to, Amstelodami, 1768.

⁴¹ Pamard, fils, 'Sur une leucophlegmasie urineuse, causée en premier lieu, par la présence d'une pierre dans la vessie, guérie par l'opération, et, en second lieu, par la crispation des filières sécrétaires des reins, guérie par les humectans' (*Journal de médecine de Roux*, vol. XXIII, 1765, p. 421.)

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itself. The child's parents, accustomed to this happening, were no longer frightened, because it ceased of its own accord; but as it was becoming more frequent and of a longer duration, I was asked to see the patient.

I examined him, and after giving him a preparation suitable to his constitution, I cut him (for the stone). The moment I had made an incision in the neck of the bladder, the first jet of urine forced away the stone, which happily fell into a basin, making a noise which saved me useless further exploration. It was in form and weight exactly like an olive stone, as its surface was rough all over. I judged it to be the only one. By the twelfth day the patient was almost healed, and from the time of the operation there was no longer any question of swelling. When I saw it return with the same rapidity I was all the more surprised, particularly since I had had no cause to attend him, and since the mother and the sick-nurse both protested their exactitude in observing the regime that I had prescribed, I regretted my limited search in the bladder where I suspected, given the similarity of the symptoms, there was another stone. Within the space of three hours the urinary retention had already reached the shoulders. I examined the patient with a view to freeing the bladder of the obstacle which I suspected, but I found nothing; and I did not draw even one drop of urine. Placing a hand over the stomach, which, although distended, did not present to my touch the roundness of the bladder which is characteristic of dilation, above all in children where it is normally very large, I judged the problem to be coming from the kidneys; warm diuretics were employed, which visibly augmented the problem. The swelling had reached the face and the flow of urine was so free that the swelling appeared to grow from the side that one placed the child; he was collapsing and drowsy; his pulse hard and concentrated. The danger was all too evident—a situation that I cannot describe vividly enough, for myself as much as for my small patient, but, in truth, I blamed the kidney spasm on some imprudence, that someone did not wish to confess to me. The state of the pulse confirmed the weakness and thus, in order to relax the kidneys and despite the bloating, which had doubled the child in size, I took blood from his arm. I took two bowls of black blood. I wrapped him in a bed sheet, folded six times and soaked in tepid water, at the same time giving him lots of cold water to drink.

With these general fomentations, repeated every quarter of an hour and continued the following four hours, I had the satisfaction of seeing the urine begin to flow. The release was announced by a syncope which lasted some minutes. He was revived by the application of hot and cold compresses and in a few days he was completely well. To complete the cure I had recourse to gentle hydragogic purgatives, which in expelling the matter contained in the front passages entirely lifted the puffiness; it was more stubborn than previously where there was no question either of inflammation or erythrim.

This case should be compared with that of Boerhaave and the following, cited by Henri-Auguste Wrisberg,⁴² of a patient who had not been able to pass a drop of urine for more than six days; after death one found the bladder distended by five pints of urine, the ureters dilated, the pelvis also dilated and gangrenous. The liquid, having a urinous odour, flowed out into the abdomen, the chest and even the brain.

Portal⁴³ also accepts the influence of renal lesions on the development of dropsy.

Of all the morbid, abdominal alterations, there is nothing which more often gives place to dropsy *than that of the urinary tracts*, which of a scrofulous nature or other, tend more or less to disturb the excretion of urine. In fact, if this excretion is disproportionate to the secretion made by the kidneys, naturally there results an accumulation of urinous fluid, which overflows first of all into the cellular

⁴²Wrisberg, H. Aug., *Commentationum, medici, physiologici anatomici, etc.*, p. 168, in 8vo, Gottingae, 1800.

⁴³Portal, A., *Observations sur la nature et le traitement de l'hydropisie*, vol. I, p. 151, in 8vo, Paris, 1824.

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tissue of different parts of the body, and consecutively to the cavities, to the point that one sometimes recognizes a distinct odour of urine in the overflowing liquids.

The same effect could occur, if by some particular morbid affection the kidneys were not secreting a sufficiently large quantity of urine, since there would then result an over abundance of aqueous liquids, which would terminate fairly promptly in dropsy.

Indeed, to what extent will this cause not have a similar effect, the secretion of urine being the one, after perspiration, which is generally the more copious, and sometimes similarly which is the more abundant, as in times of cold and damp! The morbid alterations which can diminish the secretion of urine are numerous, sometimes existing in the kidneys themselves, also very frequently in the ureters, the bladder and the canal of the ureter.

In a previous work⁴⁴ Portal said, "I have recognized the smell of urine in an overflow of water which appeared in the ventricles of the brain of a man who died of suppression of urine."

Dr. Andral⁴⁵ observed and published in 1826 a case of dropsy without heart disease, nor peritonitis, but Dr. Andral said, "There was another organ which presented an alteration which should not be lost sight of, it was the kidneys, of which the exterior cortical substance and part of the tubules were no longer constituted by more than a whitish granulated tissue, divided into small masses or grains which separated the rest from the natural reddish kidney tissue. In several other points however, one perceived, still intact, the cones of tubulous, mammillated tissue." And although Dr. Andral cites this case as an example of *essential dropsy* and in this case any organic alterations cannot be taken into account, he was, however, so struck by the lesion of the kidneys that he ended his observation with the following remarks: "Had this particular lesion of the kidneys produced an obstacle to the free secretion of the urine, and following that did it, more or less directly, contribute to the production of dropsy? How could it be this was the only form of lesion that the post mortem revealed there, but if the cause of the disease is here, although very obscure, the cause of death is, on the contrary, evident; it was due, quite manifestly, to double hydrothorax."

Dr. Barbier of Amiens was evidently one of the first to observe two of the alterations of the kidneys in albuminous nephritis.⁴⁶

One often meets with kidneys of remarkable smallness. A lack of nutrition, an excess of absorption following an inflammatory work of their tissue, reduces their volume to a third, or a quarter of that which it should be.

In oligotrophy [a term derived from the Greek and used by Dr. Barbier in place of 'atrophy'] of the kidneys, the urinary output is always noticeably diminished and there often appears a general oedema.

We were presented with a very curious case of oligotrophy of the kidneys. A woman came to the hospital with a very pronounced state of leucophlegmasia. The heart appeared to me to be slightly dilated—all other systems were in good condition. We were surprised not to find more lesions with this dropsy; we were even more surprised to be unsuccessful in augmenting the urine by the use of any remedy, which was rare. Nitred drinks, squills and digitalis were all employed in vain, and the healthy state of the stomach permitted persistence in their administration. A pleurisy which occurred

⁴⁴ Portal, [A.], *Cours d'anatomie médicale*, vol. iv, [Paris, 1804], p. 77.

⁴⁵ Andral, [G.], *Clinique médicale*, vol. iii, 1st ed., [Paris], 1826, p. 567.

⁴⁶ Barbier, J. B. G., *Précis de nosologie et de thérapeutique*, vol. i, p. 410, in 8vo, Paris, Oct., 1827.

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unexpectedly caused the death of the patient. The kidneys were found to be in an advanced state of atrophy; one was scarcely a quarter of its normal volume; the other was reduced to two thirds. It is certain that diuretics could not produce their usual effect, of producing a large evacuation of urine, in patients that have this faulty conformation. Oligotrophy of the kidneys is a cause of leucophlegmasia, which one had not previously recognized.

The following passage⁴⁷ is no less remarkable:

The tissue of the kidneys is susceptible to experience a morbid hardening; so the secretion of urine is always less abundant. Diuretic medications do not augment it, and a determined anasarca manifests itself. This lesion of the kidneys is a cause of this last disease which is often missed.

A woman came into l'Hôtel Dieu in a state of leucophlegmasia. After an investigation carried out over several days, we were unable to assign a material cause for this affection. The organs contained in the body cavities appeared healthy; the heart only slightly dilated. Despite the prolonged use of diuretics, of nitrate of potassium, squills and digitalis, the dropsy continued and progressed; the patient died on the 23rd June 1827.

At post mortem, one recognizes that the brain is in a healthy condition; but one discovers a morbid flabbiness and oligotrophy in the scapular and dorsal parts of the spinal medulla. This woman's pulse was fairly feeble, and her blood was not of a rich complexion; the coagulum that furnished the veins was very small and soft; *the serum was of a milky colour*. This patient had difficulty in breathing, a great muscular weakness; and she usually remained lying down. Did not these phenomena precede the lesion of the spinal cord? The stomach is a little oligotrophic; the patient had little appetite; the intestines and the liver are in a normal condition. The lungs show no alteration; the right ventricle of the heart is slightly dilated.

We turn our attention to the kidneys and we find a quite remarkable degeneration in both organs; their tissue is more consistent, more solid; the scalpel cuts them only with difficulty. The sclerosis of the kidney tissue, the diminished urinary output which follows, do these factors perhaps explain the leucophlegmasia? We have seen atrophy of the kidneys lead to this and to so hinder output that the diuretics do not have their usual effect. In the preceding January this woman was bled from the arms. *One was struck by the milky colour of the blood*. The intention was to analyse the fluid but unfortunately it was mixed with a solution of lime chloride and thrown away.

In this observation made by Dr. Barbier, one finds not only an example of the third form of alteration to the kidneys described by Dr. Bright, but also an indication of the milky state of blood serum, already observed by Blackall and Bostock and later by Christison who has demonstrated that this appearance was due to an excess of fatty matter.

II. Reports of Albuminous Nephritis with certain Dropsies

All the observations, all the remarks and the researches which I have set out in the first part of this brief account have sought to establish incontestably that certain dropsies are dependent upon alteration to the kidneys or a diminished urinary output. Other research demonstrated that urine might contain albumin and that in certain dropsies, the liquid was coagulable, whereas in others it was not; and that the presence of albumin in the urine of these dropsical patients coincided with other changes in the composition of the urine, notably with a considerable diminution of urea and salt.

⁴⁷ Barbier, op. cit., 'Sclérisie des reins', vol. 1, p. 553.

Cotugno⁴⁸ is, to my knowledge, the first observer who has demonstrated experimentally the presence of albumin in the urine of dropsical patients—I make an exception of the previous observations which were made on the presence of blood (and as a consequence serum) in patients developing dropsies following scarlatina, observations which I have already mentioned.⁴⁹ But Cotugno appears to have ascertained the presence of albumin in urine from a purely theoretical viewpoint. He had recognized that the liquids secreted by the serous membranes in the normal state did not contain, at least in any notable amount, the animal material which naturally exists in blood serum, and which is coagulable when heated. On the other hand he had ascertained that the liquid secreted by the same membranes when inflamed and the “humour” of the serous outpourings in these membranes and in the cellular tissue of dropsical patients, contained this same material, which is transformed by heat into a substance resembling cooked egg white; finally he was certain that healthy urine was not coagulable when heated. Knowing these facts, and having had evidence of the sudden diuresis of the dropsy at the same time as the urinary secretion of the patient was notably increased (a circumstance which could not be attributed to the quantity of fluid intake), Cotugno, supposing that the dropsical fluid was evacuated with the urine, wished to prove that, in fact, urine had the properties of dropsical fluids:

However, it was decided to settle the matter by a sure experiment—submitting the urine to the fire—for I, who knew from the bodies of those who had died of this type of dropsy that the waters between layers of skin contained a great amount of matter capable of coagulation, came to hope that it would happen that, if the sick man excreted such waters through urinary channels they would reveal the matter of coagulation with which they were filled, if they were applied to fire. As I had anticipated, this was revealed by the experiment. For when two pounds of the urine had been applied to the fire, when almost half had evaporated, the rest was formed into a white mass, very like the softest white of an egg when it has once set solid. And that experiment remained as long as that rich flow of urine persisted and even those who had been absent from the previous experiment and had heard of it in large numbers, discovered the same result by frequent repetition.

Thus Cotugno considers this coagulable state of the urine as dependent on the passage of dropsical liquid through the urinary tracts. The same idea is reproduced in another passage where first he makes known the presence of albumin in the urine of diabetics:

And not only in the *increased urine of those suffering from dropsy*,⁵⁰ but also in the urine excreted by sufferers from diabetes, we discovered more than once by similar trials, this characteristic of urine showing coagulatory matter to the fire, although not so marked. And so it has been established for the first time, that urine which no one has found coagulable in healthy people can contain coagulatory matter at one time or another.⁵¹

Without doubt Cotugno was mistaken in attributing the presence of coagulable matter to the passage of the dropsical fluid through the urinary tracts because a host of observations have proved to me that this does not occur, or very rarely, with the conditions indicated by

⁴⁸ Cotunnii, [D.], *De ischiade nervosa commentarius*, pp. 24, 25, in 8vo, Viennae, 1770.

⁴⁹ [*Traité des maladies des reins*, Paris, J.-B. Baillière, 1840, vol. 2, para. 606, p. 437.]

⁵⁰ Cotugno is mistaken: it is rare that one sees albumin in the increased urine of dropsical patients, when the disease ends favourably. In dropsies with coagulable urine, the urine becomes less charged with albumin when augmented in quantity; in the others the albumin does not pass, or very rarely and always in small quantity.

⁵¹ Cotunnii, *ibid.*, pp. 24, 25.

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Cotugno; but the discovery of albumin in the urine of a dropsical patient and the other research of Cotugno on the serum contained in the urine of diabetics and in other morbid “humours” should be noted as one of the first victories for the application of chemistry to pathology and the origin of later research into the presence of albumin in the urine.

Fordyce⁵² observed the passage of blood serum: “If,” he said, “the kidneys are *relaxed or stimulated*, then chyle, serum, coagulable lymph and also the blood cells may be excreted in the urine.” But Fordyce does not say which diseases are the ones in which this opening or stimulation of the kidneys occurs; he makes no special mention of dropsy.

Cruickshank⁵³ has the merit of having taken the presence or absence of albumin in the urine of individuals affected by dropsy as the basis of an important distinction. In separating the dropsies in which the urine is coagulable from those in which it is not, he has made a distinction more solidly established later by Wells and Blackall. In fact Cruickshank remarks that: “In general dropsy⁵⁴ urine is coagulable with both heat and nitric acid and by this means,” he says, “one is easily able to distinguish this dropsical affection, which is dependent on the viscera”; and by “dropsies dependent on the viscera”, in his time, one was understood to be referring above all to dropsies produced by diseases of the liver and the spleen. Amongst other cases of dropsy, Cruickshank cites one in which death occurred after about six weeks and where the urine contained so much albumin that with regard to the coagulability it differed very little from the serum of the blood itself.

Cruickshank and Cotugno’s research not only demonstrated that urine contained albumin in certain dropsies, but also established that in diabetes and in certain dropsies which arise following this illness (and in which the condition of the kidneys is little known) urine may equally well contain albumin. This important fact was again pointed out by Latham⁵⁵ in a case which appeared to me all the more remarkable in that the urine did not contain more sugar when it became more albuminous, and that it continued to be secreted in abundance.

Darwin⁵⁶ also described a form of diabetes in which the urine is albuminous. “The urine,” he said, “mucilaginous and flowing when poured from one glass to another, coagulates sometimes with heat; this disease disappears at intervals and appeared to be caused by previous dropsy in some part of the body.” One sees that Darwin, like Cotugno, considers the passage of albumin into the urine not as a symptom of serious disease, but more often as a sign of the recovery from an evident or hidden dropsy.

Later, Dupuytren⁵⁷ suggested that if one gave diabetics very high animal protein food, their urine very promptly changed its form; that in it one found albuminous matter the quantity of which diminished over a period of some days. Increasingly it appears to be an unequivocal sign of the amelioration of the disease; following which the albumin

⁵² Fordyce, G., *Elements of the practice of physic*, 5th ed., p. 34, in 8vo, London, 1784.

⁵³ Cruickshank, [W.], in [John] Rollo: *Cases of diabetes mellitus*, chap. vi, ‘Experiments on urine and sugar’, pp. 443, 447, 448, in 8vo, London, 1798.

⁵⁴ Although one generally attributes to Cruickshank the expression “inflammatory dropsy” it is in general dropsy that he is said to have observed coagulable urine.

⁵⁵ Latham, [John], *Facts and opinions concerning diabetes*, p. 139, in 8vo, London, 1809.

⁵⁶ Darwin, [E.], *Zoonomia*, vol. 1, p. 467, 3rd. ed., 8vo, London, 1801.

⁵⁷ *Bulletin de la faculté de médecine de Paris*, vol. 1, Feb. 1806, p. 41.

disappears little by little, and then the kidneys begin to secrete urea, uric acid, and it is not long before the urine becomes the same as that of a healthy person. For him the presence of albumin in the urine is not an indicator of the existence of a dropsy or of its development at some future time; it is a completely different pathological condition, it is the sign of recovery from diabetes. Watt⁵⁸ also declared that he had found a notable amount of albumin in the urine of diabetics without their later developing dropsies.

At the same time, one cannot disguise that the foregoing observations, with post mortems, were not necessary to clarify the history of dropsies which one sees frequently enough occurring in diabetics. In these same patients I have seen dropsies with non-coagulable urine and other dropsies with coagulable urine and in which cases I obtained a cure (see 'Diabetes').

Wells's works on dropsies,⁵⁹ sadly insufficiently known in France, are without doubt one of the most remarkable points in the history of dropsies with coagulable urine and the renal lesions which accompany them. Wells not only proved that the red colouration of the urine in anasarca following scarlatina was caused by the blood cells or haemoglobin, but also recognized (which no one had previously demonstrated) that urine in certain forms of dropsy contains serum components and at the same time having its own tint or hue. "The urine in this state (*anasarca following scarlatina*)," he said, "having precisely the same appearance which is given to healthy urine by dissolving it in the red matter of the blood, it appeared to me probable that the red colour of the diseased urine depended on the presence of the same matter. To put this opinion to the test of experiment, I exposed some of the diseased red urine to the heat of boiling water upon which there formed in it numerous flocculi of a dirty brown colour. These being suffered to fall to the bottom, the fluid above became clear, and of the colour of pale common urine . . . There is another part of the blood," he added, "which I have almost always found present in the urine of people affected with this dropsy, which is *the serum*. For in all the cases of it, except two that were very slight, in which I exposed the urine to the heat of boiling water, a flocculent matter formed in it, which when the urine was not red, was of a white colour."

In another work based on observations commenced in 1798, but not published until 1812, Wells completed his first research into dropsy with coagulable urine. To prove the presence of serum in the urine he used the same agents which we employ nowadays, i.e. nitric acid and heat. Having on several occasions observed that the same urine did not always produce the same coagulum when exposed to nitric acid and heat, subsequently he always submitted the urine to these two tests. In order to better study how albumin behaved in the urine, and to judge its approximate proportion, he mixed different proportions of serum with urine in order to note the appearance of the precipitation obtained with heat and nitric acid on these pre-determined amounts of serum.

With the aid of either one or both of these reagents, he examined the urine of 138 patients suffering from dropsies produced by causes other than fever following scarlatina and in 78 cases he found serum in the urine. In his study of the proportion of albumin in the urine, he

⁵⁸ Watt, [R.], *Cases of diabetes, consumption etc. with observations*, in 8vo, Paisley, 1808.

⁵⁹ Wells, [W. C.], 'Observations on the dropsy which succeeds scarlet fever. On the presence of red matter and serum of the blood in the urine of dropsy which has not originated in scarlet fever', *Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge*, vol. III, [1812], pp. 16 and 194.

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remarked that it could contain a large quantity of serum whilst having the appearance of healthy urine; that at times it was very pale, without sediment, or slightly opaque and resembling whey. Besides this, he studied the slight sediments of these types of urine, noting the variations in the proportion of serum in 29 cases of anasarca not dependent on scarlatina and recording serum in the urine of 23 cases. He observed that the presence of serum in dropsical urine was not only independent of the weakness, but also often accompanied by a full and rapid pulse and that the patients often suffered sharp pains in the kidneys and limbs before and after the appearance of dropsy. Finally, he put all his effort into examining, after death, the condition of the principal viscera in this type of dropsy, and the first which he clearly described were *renal lesions in connection with coagulable urine*.

In a 47-year-old soldier, whose urine contained a large quantity of serum and who died dropsical after presenting symptoms of inflammation of the chest, Wells found the inferior lobe of the right lung severely inflamed; “*the kidneys were much harder than they usually are*. Their cortical part was *thickened and changed in its structure* from the deposition of coagulable lymph and there was a small quantity of pus in the pelvis of one of them. I do not conclude, however,” added Wells, “from these appearances and those which were found in the former case (larger and softer kidneys with vesicles, cysts, etc.) that the kidneys are always diseased when the urine in dropsy contains much serum.”

After having recorded the presence of serum in the urine of certain dropsies, and its absence in that of many others, in order to know just at which point the presence of albumin is characteristic to dropsy, Wells submitted the urine of 104 patients (non-dropsical) to the action of nitric acid and heat. In 54 cases of chronic disease, the urine did not contain any serum; in 35 cases there was very little, and in one (that of a man with a urethral discharge) when heated, the urine gave a coagulum which formed a quarter of the mixture; but in another test, made with the urine of the same person (when the discharge was less) the quantity of coagulum was also reduced; Wells said it was thus evident that the serum contained in the urine came from purulent matter. Finally, wishing to know if one did not occasionally encounter albumin in the urine of persons in good health, or at least apparently so, he found albumin in one of them, who later developed dropsy, *after having experienced pain in the loins*, and a diminished urinary output.

Whilst Wells was thus studying the presence of serum in urine from a variety of viewpoints—while he sought serum in the urine of dropsical patients, in urine voided during several chronic and acute illnesses, and finally in individuals judged by appearance to have been in good health—observations of much less importance, but not without value, were being made by other observers.

Dr. Baillie, having had the idea of examining comparatively two urine samples coming from two dropsies of which one was not from the effect of a disease of the liver, sent the two samples to Professor Brande⁶⁰ who, in the first (which was alkaline), recorded the presence of albumin and the diminution of the natural quantity of urea, and a deposit which he thought to be the rosacic acid described by Dr. Proust. The other urine sample, which was taken from a patient suffering from dropsy dependent on disease of the liver, did not contain albumin, neither did it show the diminution of urea observed in the other sample.

⁶⁰ Brande, [W. T.], ‘An account of some changes from disease in the composition of human urine’, *Transactions of a Society for the Improvement of Medical and Chirurgical Knowledge*, read on 3 Feb. 1807, vol. III, [1812] p. 187.

The fact that there is a diminution of urea in albuminous urine of dropsical patients is described here for the first time.

At that time, there was very little interest in France regarding research into albumin in the urine of patients suffering from dropsy or other disease. Nevertheless Séguin, in his studies on tanning, had noted that a dissolution of tannin added to urine produced variable precipitations depending on the different states of the subjects; which brought him to the conclusion that the urine test with tannin indicated the proportion of nourishing substances which were lost by this excretion and might be useful in medicine. Fourcroy,⁶¹ recalling this observation of Séguin, gave, in a rather uncertain manner, the opinion that the precipitation produced by the tannin might be due to albumin but, absorbed in other work, he did not devote himself to the research into albumin in urine produced by various diseases.

It is in the general pathological studies of urine made by Nysten⁶² that one finds the first detailed chemical observations made in France on the urine of dropsical patients. Nysten did not take long to recognize that urine had neither the same composition nor appearance in all types of dropsy. In the case of one patient he observed the urine was deep red, cloudy, even on leaving the bladder, and had an ammoniacal smell; it was alkaline and became very frothy when agitated and remained frothy for a long time.⁶³ When left to stand a while, a flocculent sediment formed above, while the urine remained clear. The sediment was formed by triple phosphates. The dark colour of the urine was caused by an oily matter, no visible urea existed; it contained a large quantity of albumin.

Nysten also noted that urine in a case of acute peritonitis contained a large quantity of albumin and a third more urea than in the urine of a healthy man. If Nysten had known the research undertaken by Brande, he would have noted that the albuminous urine from a dropsical patient analysed by Brande differed significantly from the albuminous urine observed in a case of peritonitis; in one, the urea was in much smaller proportion than that in a healthy patient, in the other, on the contrary, the urea was in excess.

Chapotin⁶⁴ was perhaps the first to note the existence of albumin in the urine, described as *milky* (albuminous-fatty), which one observes fairly frequently among the inhabitants of l'Île de France. In this most strange affection, the patients over many years habitually produce albumin in their urine without becoming dropsical, and I have noted recently that the kidneys were healthy. The habitual passage of serum in the urine over several months and years was therefore not sufficient to cause dropsy.

The idea of classifying dropsies in two large divisions, dependent upon whether or not the urine produced by the patients was or was not coagulable, already indicated by Cruickshank, verified and developed by Wells, was then applied more or less in the

⁶¹ Fourcroy, [A.-F.], *Système des connaissances chimiques*, etc., vol. x, p. 146, [Paris], 1800.

⁶² Nysten, [P. H.], *Recherches de physiologie et de chimie pathologiques*, p. 256, etc., in 8vo, Paris, 1811.

⁶³ "I have often noted this 'frothy' or yeasty appearance of the urine when it contains a significant amount of albumin. Dr. Tissot has pointed this out in his thesis, but I should say that if this characteristic leads one to suspect the presence of albumin, it is in no way a definite indication. Not only do urines that are highly charged with albumin sometimes present not even a single bubble even after several hours, but also, after a similar period, other urines, devoid of albumin and presenting no coagulum when exposed to heat and nitric acid, may present a ring of bubbles contiguous with the sides of the jar. Many such urines contain a significant quantity of animal matter in their extract. I am at the same time reminded of a certain aphorism of Hippocrates: 'If bubbles appear on the surface of urine, there is a disease of the kidneys, which is likely to persist.'" (vol. vii, p. 341.)

⁶⁴ Chapotin, [C.], *Topographie médicale de l'Île de France*, p. 57, in 4to, Paris, 1812.

same period by Blackall in a treatise “ex professo” on dropsies.⁶⁵ Blackall reported 31 cases of dropsy in which the urine was not all albuminous, of which two occurred following scarlatina, and 56 cases with coagulable urine, of which 11 were attributed to scarlatina, 9 to the mercury treatment, 9 to the effect of cold and damp, or to alcohol abuse, and 2 to cold water taken as a drink when the body was sweating. These investigations gave his work a truly practical nature. Blackall had noted with exactitude the properties of urine, and he thought that, in some cases (independent of the changes experienced due to the presence of albumin), it had lost most of the characteristics of urine, and that it was probably urea that was missing. In this condition, he said, it appeared transparent and aqueous and was slow to putrefy.

With regard to the connection between the alteration of the urinary secretion and renal lesions, although Blackall had, on several occasions, observed renal lesions at post-mortem examinations of dropsical patients, he appears not to have seen as clearly as Wells the connection between these lesions and albuminous urine. He cites nine autopsies. In one case of dropsy after scarlatina, complicated by pleurisy, erysipelas, gangrene and decay of the sacrum, Blackall found the kidneys *a little soft and flaccid*; in another case of dropsy with pericarditis and pleurisy, the kidneys were *extremely hard* and contained small cysts. In another case (dropsy, constitutional syphilis and liver disease) the kidneys were remarkably solid and firm and *their structure was confused*; in a fourth case (dropsy, peritonitis, ulceration of the caecum, diarrhoea, previous use of mercury, pulmonary tumours) *the kidneys were engorged with blood as if they had been injected*. In a fifth case of dropsy complicated by pleurisy and erysipelas, the kidneys were more enlarged than in the healthy state, and *their cortical substance a little more brown and duller* than normal.

Thus, Blackall recognized that in five cases of dropsy with coagulable urine, there was notable alteration of the kidneys. However, he concluded from his research that the urinary organs are often exempt from any appearance of structural alteration, notwithstanding the large alteration in their secretion; that, in two cases of dropsy produced by mercury, the kidneys were firmer than usual (in one of the two, this state was so pronounced that it was almost scirrhus). Finally, he said that only subsequent research could decide if this condition of the kidneys is purely accidental or the effect of treatment; and if there is a connection between this alteration of the kidneys and the presence of blood serum in the urine.

Blackall, having verified in cases of dropsy with coagulable urine, during life and after death, inflammation of the serous membrane; having further proved the usefulness of antiphlogistics and, in particular, bloodletting, in a great number of cases; having also frequently noted the buffy state of the blood, sometimes very pronounced, and even more pronounced when the urine was more coagulable, and since the system showed fairly unequivocal signs of an inflammatory state (“*the whole system bears the greatest marks of inflammation*”); I would say that Blackall expressed the opinion that these dropsies, with coagulable urine, were the result of a general inflammatory state. Finally, to give a new force to his observations and to support this opinion, he recalled that Alexander of Tralles, Paul of Aegina, Spon, Home, Stock and Grapengiesser had recommended bloodletting in this type of anasarca.

⁶⁵Blackall, John, *Observations on the nature and cure of dropsies*, in 8vo, London, 1813, 2nd ed. 1814, 3rd ed. 1818, 4th ed. 1824.

To summarize, although Blackall later remarks in his postscript that he had found diseased kidneys in a large number of cases (“*in an unusual proportion*”), he appeared disposed (probably influenced by the lesions that he had observed in the serous membrane and other parts of the body) to regard this dropsy rather *as the result of a general inflammatory affection*, than the consequence of an inflammatory state of the kidneys; but it is nonetheless clear that this experienced observer, whose work had an eminently practical nature, had been struck, as had been the finest observers that had preceded him, and above all those who had made a special study of anasarca, following scarlatina, by the *phlogistic nature* of dropsies with coagulable urine. The influence which he exercised over the opinions and the practice of other doctors was probably due to the practical nature of his work, an influence much more marked than that of Wells, whose work was accorded such scientific merit. I will add, nevertheless, a final remark, which is that Blackall was incorrect to state quite so categorically that one could be guided with surety, in the use of blood-letting, by the fairly rapid appearance of the albuminous state of the urine, and by the strength and abundance of coagulum,⁶⁶ because I have several times recorded the existence of a firm and abundant coagulum in very early cases of albuminous nephritis where bloodletting was not at all applicable.

Dr. Blackall’s work had keenly caught the attention of medical practitioners and many were eager to verify his observations. With this aim in mind, Dr. Crampton⁶⁷ undertook a work which would have been of great interest had it been carried out with greater care and precision. He gave summary reports of the history of 74 cases of dropsy treated at the Steeven’s Hospital, Dublin, in the year 1817. One cannot conceive how he omitted to note the albuminous or non-albuminous state of the urine. To justify the omission, with which he was reproached when he read his work to the medical association of King’s and Queen’s College, Dr. Crampton said that having noted the condition of the urine in several cases, and not having been able to draw on any practical induction, he thought he could disregard this circumstance in his last observation; that the number of cases in which he had found coagulable urine compared with those where it was not coagulable were negligible, nor was he “able to connect those cases where inflammatory symptoms existed with the presence of coagulable urine.” On the other hand, he had observed a certain number of cases in which bloodletting was strongly indicated, even though the urine was not coagulable. He added that this opinion regarding the impossibility of drawing practical inductions from the urine was shared by Dr. Percival, who practised in the same hospital, and by Dr. Reid who was at that time carrying out a clinical attachment.

One knows that in order to have had any success in opposing the distinction made by Blackall, it would have been necessary to proceed more logically than Dr. Crampton had done. Also, I make mention here of his work in order to demonstrate that at that period, as nowadays, the opposition which a pathological study met with in order to become incontestable depended above all on the faulty and imprecise manner in which one proceeded in the observation and the subsequent discussion of relevant findings. Amongst the large number of observations that Dr. Crampton reported there were, nevertheless, a certain

⁶⁶ “A correct guide to it (venae-section) may be found in the firmness, copiousness, and early appearance of coagulum in the urine.” Blackall, *op. cit.*, [1813], p. 281.

⁶⁷ Crampton, [J.], ‘Clinical report on dropsies’, *Transactions of the Association of Fellows and Licentiatees of the King’s and Queen’s College of Physicians in Ireland*, vol. II, 1818, p. 140.

number which are not devoid of interest; amongst others those in which the kidneys were “*much enlarged and soft*”. (Obs. XII.)

Shortly afterwards, Abercrombie⁶⁸ published several dissertations in favour of the antiphlogistic method that Blackall recommended against sthenic dropsies, with coagulable urine. These researches did not add anything further to previous knowledge. It is far from the case with the work of Dr. Scudamore. In his research into gout,⁶⁹ having noted that the urine (during or after the paroxysm of gout where the patients did or did not become dropsical) sometimes contained albumin, he studied the composition of such urine with great care. On the general conditions which give place to the passage of albumin, he expressed opinions which he would probably have modified if he had had an opportunity to examine the kidneys after death. Thus, he says that on every occasion that he had found albuminous urine in dropsical or non-dropsical patients, the kidneys showed an irritable and precipitated action, that the emissions were frequent and accompanied by irritation, and sometimes very abundant. “It must not however, be understood,” he continued, “that I intend by this observation to ascribe this peculiarity simply to *nervous* disturbance. As a general position, I believe it may with truth be contended, that most of the morbid actions of the kidney which we find are derived from some error in the functions of the digestive organs.” He added something which had not previously been stated so clearly, that, in eight specimens of albuminous urine coming from non-dropsical patients, there was a very remarkable diminution of urea and uric acid, similarly the natural salty elements of the urine; in such a case, he said that the secretory action of the kidneys was very imperfect.

Latterly, Dr. Prout, the author of the most remarkable work on alterations to the urine, set aside in his treatise a chapter on albuminous urine.⁷⁰ But from the point of view which he had found necessary to adopt (studying the alterations to the urine, abstraction made of the infections which they produced) he was inevitably driven to expose the general views on albuminous urine, which could not be applied with certainty to any morbid state already determined. Nevertheless, in order to make his remarks more precise, Dr. Prout declared, in relation to this, that he set aside from his subject urine which became albuminous by a simple mixing with the blood, and he devoted his remarks almost uniquely to a very notable alteration to the urine (see ‘Chylous urine’). His research into albuminous urine also led to other conditions; he analysed urine from those suffering from gout; and in these cases, as in chylous urine, he believed he had noted that the albumin contained in the urine differed from the albumin of the blood; that it compared, in some properties, with those of calcium, although they were distinct one from the other; that finally it presented the properties natural to the albuminous matter contained in chyle. Further to this, he stated that, in a small number of cases, the albumin contained in urine was the same as that in blood serum.

One cannot conceal that this general manner of studying the albuminous state of the urine sometimes led Dr. Prout to error, above all when he corroborated Blackall’s opinions on sthenic dropsy, with coagulable urine, by using his personal observations on a very different disease, characterized by chylous urine. For the rest, realizing himself that his

⁶⁸ Abercrombie, [J.], ‘Observations on certain dropsical affections which are successfully treated by blood-letting’, *Edin. med. surg. Journ.*, vol. xiv, [1818], p. 163.

⁶⁹ Scudamore, [C.], *A treatise on the nature and cure of gout and gravel, etc.*, 4th ed., pp. 313ff, in 8vo, London, 1823.

⁷⁰ Prout, [W.], *Inquiry into the nature and treatment of gravel, calculus, and other diseases connected with a deranged operation of the urinary organs*, in 8vo, London, 1821, 2nd. ed. revised, 1825.

considered subject (albumin in urine taken as the point of departure) presented some uncertainty, he ended by saying: "I am induced to conclude that an albuminous condition of the urine, taken alone, as a symptom, does not, in the present stage of our knowledge, indicate the use of any particular remedy or mode of treatment, but that, nevertheless," he added, "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 direction as to form a more correct judgement of the general nature of the disease."

Pursuing the research of Wells and Blackall on dropsies with coagulable urine, following scarlatina or produced by other causes, Dr. Alison, Clinical Professor at Edinburgh, announced in his lectures of 1823 that he had found, in similar cases, *hard and mammillated kidneys*. Dr. Gregory, who reported this circumstance, had published several interesting cases, observed by Dr. Alison, amongst others, one concerning a young woman⁷¹ who, affected in 1820 by a general dropsy with strongly coagulable urine, enjoyed good health and was going about her affairs until the beginning of 1829 when she was again attacked by dropsy with coagulable urine, of which she died within the space of a year's illness.

When the mucous membrane of the urinary tract, and in particular that of the bladder, is inflamed it brings about a secretion of a mucous or purulent matter which contains a certain quantity of albumin, and which deposits a form of sediment when it is left to itself. I recall this study, because Dr. Howship,⁷² in discussing the *appearance of the albuminous matter in urine*, described under this title the mucous sediments and not the true state of albuminous urine. Latterly, several observers have also incorrectly connected similar urines, rendered albuminous by their mixing with mucus and pus, to those which were rendered in albuminous nephritis, and this has been a source of confusion both for the diagnosis and the treatment of the disease. As for the globules that Dr. Howship claimed to have observed in the albuminous matter, these are nothing more than mucous or purulent globules; for liquid or solidified albumin does not present globules when subjected to microscopic inspection.

Dr. Howship made an even more unfortunate comparison in placing purulent sediments, notably composed of urates, in the same category as the mucous or purulent sediments which often contained albumin.

III. The Relationship between Albuminous Urine, Certain Renal Lesions and Certain Dropsies

Such were the principal advances in medical science, on the existence and influence of renal lesions in the production of dropsies, and on the connection, seen with some difficulty, between the lesions and secretion of a coagulable urine, when Dr. Bright published his excellent work.

Having first recalled the remarkable influence that the diseases of the heart and the large vessels, diseases of the liver and the veins, and that of inflammation of the serous

⁷¹ [Gregory, J.C., 'On diseased states of the kidney connected during life with albuminous urine'], *Edin. med. surg. Journ.*, vol. xxxvii, [1832] p. 67, obs. LXVII.

⁷² Howship, [J.], *A practical treatise on the symptoms, causes, etc., of the most important complaints that affect the secretion and excretion of the urine*, pp. 70ff, in 8vo, London, 1823.

membrane exercise on the development of dropsy, Dr. Bright clearly announced that dropsy had also a further source in particular alterations to the kidneys.⁷³ He added that every time that dropsy depended upon these renal alterations, the urine was more or less albuminous, whereas he had never found coagulable urine in a great number of other dropsies which he had observed and which were dependent upon organic diseases of the liver. As for the morbid secretory action of the kidneys, he stated that it was the result of a great number of causes, of which the influence was above all exercised on the skin and the stomach and of which the definitive result was to produce an inflammatory state of the kidney itself (“or producing a decidedly inflammatory state of the kidney itself”); that, if this condition continued, the kidney, the organ of urinary secretion, experienced a *permanent alteration in connection with this morbid action*, or a deposit which was the result of this action. He recalled that his observations on the constitution of urine in dropsies were altogether in agreement with those of Dr. Blackall. Dr. Bright added that he had found “another and apparently very opposite state of the system prone to a secretion of the same character, namely in persons who have been long the subjects of anasarca recurring again and again, worn out and cachectic in their whole frame and appearance, and usually persons addicted to an irregular life and to the use of spirituous liquors.” He continued:

In all the cases in which I have observed the albuminous urine, it has appeared to me that the kidney has itself acted a more important part, and has been more deranged both functionally and organically than has generally been imagined. In the latter class of cases, I have always found the kidney decidedly disorganized. In the former, when very recent, I have found the kidney gorged with blood. And in mixed cases, where the attack was recent, although apparently the foundation has been laid for it in a course of intemperance, I have found the kidney likewise disorganized.

In Dr. Bright’s exposition, one finds, in summary, the entire history of albuminous nephritis, its acute and chronic forms. One can only regret that, in the later description which he gives of the lesions which produce dropsy, he loses sight of the anatomical characteristics of albuminous nephritis, which he had so well observed and indicated.

I transcribe here the general description that Dr. Bright gives of the renal alterations and in which sadly one does not find more than the lesions of chronic albuminous nephritis. And on this occasion I should say that, if the pathological nature of the disease (to the knowledge of which his name remains attached) was not recognized by several authors who wrote subsequently on this disease, this was due above all to the fact that they had formed an incomplete idea of this disease, particularly of its chronic form; and because one had not taken account of the observations and the remarks that Dr. Bright had made regarding its acute form; and finally because he, himself, had not attached to this acute form the importance which it merited. This also resulted from another circumstance: that as the chronic lesions of the kidneys had been observed much more frequently after death than the congestive form of the acute state, an imprecise and incomplete idea of the disease had been formed.

“From the observations which I have made”, says Dr. Bright, “I have been led to believe that there may be several forms of disease to which the kidney becomes liable in the progress of dropsical affection: I have even thought that the organic derangements which

⁷³ Bright, R., ‘Diseased kidney in dropsy’, *Reports of medical cases*, in 4to, London, 1827, [pp. 3, 4, 67].

have already presented themselves to my notice, will authorize the establishment of three varieties, if not of three completely separate forms, of diseased structure, generally attended by a decidedly albuminous character of the urine."

In the first form, a state of degeneracy seems to exist, which from its appearance might be regarded as marking little more than simple debility of the organ. In this case the kidney loses its natural firmness, becomes of a yellow mottled appearance externally; and when a section is made, nearly the same yellow colour slightly tinged with grey is seen to pervade the whole of the cortical part and the tubular portions are of a lighter colour than natural. The size of the kidney is not materially altered nor is there any obvious morbid deposit to be discovered. (Plate II, Fig. 4 of Dr. Bright). This state of the organ is sometimes connected to a cachectic condition of the body, attended with chronic disease, where no dropsical effusion has taken place, either into the cellular membrane or into the cavities of the body. I have found it in a case of diarrhoea and phthisis, and in a case of ovarian tumour. In the former, it was connected with slight and almost doubtful coagulation of the urine by heat; in the latter I omitted to examine the state of the urine. I also met with nearly the same condition of the kidney, with some opaque deposits interspersed through the structure, in the case of a man who died exhausted with diarrhoea brought on by hardships and intemperance, and in whose case the secretion of urine was very deficient, but whether coagulable or not I had no opportunity of ascertaining. When this disease has gone to its utmost, it has appeared to terminate by producing a more decided alteration in the structure; some portions becoming consolidated, so as to admit of very partial circulation; in which state the surface has assumed a somewhat tuberculated appearance, the gentle projections of which were paler than the rest and scarcely received any of the injection which was thrown in by the arteries (Pl. II, Figs. 1, 2 and 3). In this more advanced stage, if it be the same disease, dropsy has existed and the urine has been coagulable. (Sallaway, Obs. iii.)

The second form of diseased kidney is one in which the whole cortical part is converted into a granulated texture, and where there appears to be a copious morbid interstitial deposit of an opaque white substance. This in its earliest stage produces externally, when the tunic is taken off, only an increase of the natural fine mottled appearance given by the healthy structure of the kidney; or, under particular circumstances, gives the appearance of fine grains of sand sprinkled more abundantly on some parts than others (Pl. V, Fig. 3). On making a longitudinal section, a slight appearance of the same kind is discovered internally, and the kidney is generally rather deficient in its natural firmness. After the disease has continued for some time, the deposited matter becomes more abundant, and is seen in innumerable specks of no definite form thickly strewed on the surface; and cutting into the kidney these specks are found distributed in a more or less regular manner throughout the whole cortical substance; no longer presenting a doubtful appearance, but most manifest to the eye without any preparation (Pl. III, Fig. 3); and other cases less advanced, requiring maceration in simple spring water for a few days to render them more obvious (Pl. IV, Fig. 3). When this disease has gone on for a very considerable time, the granulated texture begins to show itself externally, in frequent slight uneven projections on the surface of the kidney; so that the morbid state is readily perceived even before the tunic is lifted. The kidney is generally rather larger than natural; sometimes it is increased very much, but at other times it is little above the natural dimensions (Pl. I). Occasionally I have seen (Hobson, p. 59) the kidney assume a good deal of the tuberous appearance observed in the advanced stage of the first disease, as shown in the representation of Sallaway's kidney (Pl. II): but then it has been manifest even by simple inspection, but much more so after maceration, that the

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whole is made up of small opaque deposits. It is evident from the case of Hobson that this state of kidney, attended also with highly coagulable urine, may exist without any marked appearance of anasarca.

The third form of disease is where the kidney is quite rough and scabrous to the touch externally, and is seen to rise in numerous projections not much exceeding a large pin's head, yellow, red and purplish. The form of the kidney is often inclined to be lobulated, the feel is hard, and on making an incision the texture is found approaching to semi-cartilaginous firmness, giving great resistance to the knife. The tubular portions are observed to be drawn near to the surface of the kidney: it appears in short like a contraction of every part of the organ with less interstitial deposit than in the last variety. This form of disease existed in a case from which I had a drawing executed about three years ago, it also existed in Bonham (p. 22); and a most decidedly marked instance of it may be found in Stewart (Pl. III, Figs. 1 and 2) where, however, the kidney was of a lighter colour than in the other cases, which were more of a purplish grey tinge. I believe that the case of Smith (p. 24) belonged to the same. In most of these cases the urine has been highly coagulable by heat, at times forming a large curdled deposit, though in one case (Castles) where an approach to this appearance was found on the outside of the kidney, but with marked structural change in the liver, and with a confirmed bronchial congestion, only a dense bran-like deposit of a brown colour was produced by the application of heat.

Although I hazard a conjecture as to the existence of these three different forms of disease, I am by no means confident of the correctness of this view. On the contrary it may be that the first form of degeneracy to which I refer never goes much beyond the first stage; and that all the other cases, including Salloway, together with the second series and the third, are to be considered only as modifications, and more or less advanced states of one and the same disease.

I have sometimes felt doubtful whether the cases of Peacock and Thomas (Pl. III, Figs. 3 and 4) were to be viewed as the more early stages of the decidedly granulated kidney (King, Beaver, and Richardson), or whether the opaque flaky deposit which they exhibited in their structure might be considered altogether another form of the disease. I think, however, from the appearance, that the former is probably the case; and although King dated his disease from a less remote period than either Peacock or Thomas, yet there is no reason that the disease had not made either a more insidious, or a more rapid progress, in his case than in that of the others.

Besides these three forms of disease, passing almost into each other, and usually attended with decidedly coagulable urine, there are two other deranged conditions of the kidneys in which the coagulation is sometimes observable, but in a very subordinate degree, and often though observable on one day is quite lost on another. One of these morbid states consists in a preternatural softness of the organ; the other in the blocking up of the tubular structure by small portions of a white deposit bearing the appearance of small concretions. In the former a corresponding loss of firmness has been observed in the structure of the liver, and the spleen and the parietes of the heart, the action of which organ had been observed during life to be deficient in force. In the other cases, besides the obstructed state of the uriniferous tubes, the whole structure of the kidney has been somewhat deranged, the cortical portion firmer than natural, and the tubular part has lost the regular convergency of the vessels, so that they have assumed a waved direction. It is by no means improbable that we shall hereafter find many other sources of renal irritation to be connected with an analogous state of the urine.⁷⁴

Finally, a further circumstance has in no small measure contributed, even in these latter times, to propagate the opinion that albuminous nephritis was a chronic disease; it is the general description of this disease given by Dr. Bright himself in his latest work (1836), because it does not actually correspond to other than the chronic form, and there is virtually

⁷⁴Bright, Richard, *Reports of medical cases*, London, 1827, pp. 67ff.

no mention made of the acute form to which belongs the greatest number of cases one observes following scarlatina. I add, finally, that in England itself, this opinion, and in my opinion this error, are so propagated and widespread that virtually all the names used to designate this disease have been borrowed from the appearance of renal lesions, consecutive or secondary to the original inflammatory alterations of the kidneys (mottling; white degeneration; contraction or granulation; granular disease, etc.).

Feeling that it was extremely important to examine, with the greatest care, the composition of the urine in a large number of cases of dropsy with coagulable urine and dependent on an affection of the kidneys, Dr. Bright had the clever idea of invoking the collaboration of Dr. Bostock, who was familiar with these types of research and known for his important works in physiology and pathological chemistry. Dr. Bostock (letters included in *Reports of medical cases*, pp. 75ff) therefore examined the urine of the patients treated by Dr. Bright.

The results of these studies were contained in three letters addressed to Dr. Bright; Dr. Bostock verified that the proportion of albumin was generally considerable (although this varied from case to case), that the proportion of salts and urea was diminished and that the specific gravity of the urine was almost always notably less than that of healthy urine; like Dr. Prout, he thought that the albumin contained in the urine that one sometimes found there in a particular condition, did not present exactly the same characteristic as that of the blood serum.

Presuming that such a remarkable alteration of the urinary secretion could be preceded or followed by some alteration in the blood, Dr. Bostock did not content himself with noting that the blood was often buffy coated (something which had already been noted by Blackall); he looked to see if this liquid had a modified chemical composition.

He was, I believe, the first to have verified the diminished specific gravity of the serum which had become more aqueous, and he had discovered, by analysis, that the blood contained a matter which presented the principal characteristics of urea, matter which Dr. Christison later recognized as urea itself.

Dr. Bostock⁷⁵ was of the opinion that the urine of a healthy man could contain albumin under the influence of minor causes, but as he adds that this albumin was in a peculiar state, and that it was not coagulable by heat, thus doubts remain with me regarding the precipitations said to be albuminous which he had obtained by pouring hydrochloric acid into the urine, which can precipitate the urates when it is very concentrated. It is again even more doubtful that the precipitate produced in the urine by the addition of mercuric-chloride, when it does not produce clots or a coagulum when heated, could be albumin; finally the potassium cyanide also precipitates mucus of the urine. Now it is following these experiences and others, which are not much more conclusive, that a large number of pathologists have admitted that one often finds albumin in the urine of a healthy man under the influence of the most superficial causes.

Wells and Blackall's research on dropsies with coagulable urine had already caught the attention of the Edinburgh physicians when the work of Dr. Bright came to give a forceful impulse to the new studies into this type of dropsy, on which Drs. Abercrombie, Alison and

⁷⁵ Bright, *Reports of medical cases*, p. 80. *Cyclopaedia of practical medicine*, art. Urine [vol. 4, London, 1835].

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Home had already gathered several observations. Soon the works of Dr. Christison⁷⁶ and Dr. Gregory⁷⁷ came to give a new force to the opinion of the celebrated London physician who had found opposition or restrictions amongst other physicians of merit such as Drs. Elliotson, Graves, Copland, etc.

Dr. Christison reported seven observations of dropsy with coagulable urine, dependent on renal lesions. In the presentation of symptoms and the lesions found at post mortem, these cases correspond exactly to the three forms described by Dr. Bright. In these observations, Dr. Christison noted exactly the specific gravity of the urine (the diminution of which is one of the important characteristics of the chronic form of the disease). However, that which above all distinguished his work was the study of the alteration of the blood and the setting out of the trials, with the aid of which he isolated the urea (p. 298). Dr. Christison summarized his observations saying that they fully confirmed those of Dr. Bright, which could be formulated thus:

- (1) 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:
- (2) this disease is always found after death, when the urine, during life, is albuminous:
- (3) in such cases, the urine is of a low specific gravity and contains an unusually small proportion of urea and salts:
- (4) disease of the kidneys is often indicated by pains in the loins or crossing the upper part of the belly, by nausea and vomiting, and occasionally by urine of a reddish-purple or sanguineous colour:
- (5) it is very often, in its course, accompanied by a strong tendency to inflammation of the internal organs and to affections of the head; and bloodletting is in most instances at some period of the disease an appropriate remedy.

It should be noted that, if several of these propositions summarized an important discovery, several also, taken as absolutes, were not rigorously exact. Thus it was later recognized, and nowadays is incontestably so, that urine could be albuminous during life, equally in dropsical patients suffering from heart disease for example, without one finding at post mortem one of the conditions of the kidney described by Dr. Bright, nor even more likely, granulated kidneys. Beyond this, the summary is lacking a precise and explicit indication of the early alteration to the kidneys which later causes the granular deposit when the disease is prolonged for a period of one or more months. Also missing is a clear indication of the symptoms of the acute form of dropsy with coagulable urine so common following scarlatina, the form in which the blood emissions are so generally healthy, and which so rarely terminate in granular alterations of the kidneys when it is fatal.

In a later work published in 1839⁷⁸ Dr. Christison gave a general and more complete description of Bright's disease, particularly that which refers to the *connections with dropsy, inflammations and other diseases*. In this work, where he has contributed not

⁷⁶ Christison, Robert, 'Observations on the variety of dropsy which depends on diseased kidney', *Edin. med surg. Journ.*, vol. xxxii, 1829, p. 262.

⁷⁷ Gregory, J. C., 'On diseased states of the kidney connected during life with albuminous urine', *Edin. med. surg. Journ.*, vol. xxxvi, 1831, p. 315; *ibid.*, vol. xxxvii, [1832] p. 54.

⁷⁸ [Christison, Robert], *On granular degeneration of the kidneys*, in 8vo, Edinburgh, 1839.

only his own researches but also those of authors on the Continent which have come to his notice, he has, correctly, distinguished two forms of the disease according to these symptoms: one *acute*, the other *chronic*. But it appeared to me that the acute form described by Dr. Christison did not correspond exactly to the most common acute form, the clearest manifestation of the disease, such that one sees following scarlatina.

Taken generally, Dr. Christison's description represents rather the cases of chronic albuminous nephritis which *first appear with inflammatory symptoms*, but afterwards present as a slow disease, occasionally without fever, or again, to other cases in which the disease, after first appearing in a chronic form, afterwards presents one or more inflammatory paroxysms at somewhat closer intervals.

As for the chronic form of the disease, he has set out the characteristics with the greatest exactitude. Above all he has studied the alterations to the urine and the blood with a particular care which is one of the principal merits of his work. He has also paid particular attention to the causes of the disease and its secondary affections. With regard to the anatomical characteristics of the disease, he described seven forms according to his own research and other descriptions which had been given in France:

- (1) Congested kidneys with or without granular deposit in their substance:
- (2) the true granular degeneration of the cortical and tubular substance (*a finely granular-abotryoidal*):
- (3) the degeneration in a homogenous mass, of a yellow-grey, of which the consistency is between that of the liver and that of the brain:
- (4) disseminated tumours:
- (5) an induration or a semi-cartilaginous hardness:
- (6) atrophy with disappearance of the renal structure with or without one of the morbid states mentioned above:
- (7) a simple anaemia.

In my opinion, these forms do not appertain to albuminous nephritis, apart from those which are characterized by blood congestion, yellow degeneration, Dr. Bright's granulations and atrophy with hardening. Alterations such as disseminated tumours and simple anaemia do not belong to this form.

Dr. James Craufurd Gregory, of whom Science regrets the premature loss, published in 1831⁷⁹ a memoir full of examples and judicious remarks regarding diseases of the kidney connected with albuminous nephritis. He cites at least 80 cases gathered by himself or his colleagues, physicians of the Royal Infirmary of Edinburgh. It is to be regretted that several of these studies were expounded too summarily, and that the nature of several others was not cleared of all uncertainties; but the manner in which Dr. Gregory presented them is certainly interesting. An initial group is composed of cases in which dropsy with coagulable urine is fatal, after having presented important secondary symptoms such as vomiting or diarrhoea. The second group is composed of equally fatal cases of dropsy with coagulable urine and of which the important secondary symptoms come from the respiratory or circulatory system. A third group comprises the cases in which there is virtually no dropsy and others in which the urine has not been examined during life and in which the disease of

⁷⁹ *Edin. med. surg. Journ.*, vols. xxxvi-xxxvii [1831-1832].

the kidneys has only been recognized after death. Finally, a fourth group comprises the cases in which the patients recover or have been relieved.

I shall not pause to consider the studies of the first, second or fourth groups relative to dropsy with coagulable urine, which have been accompanied during life by more or less pronounced abdominal or thoracic complications; similar studies are numerous in Science. The studies comprising the third group, on the contrary, merit particular attention. It is true that Dr. Christison has already stated that he had observed in non-dropsical individuals, renal alterations that he had identified in cases of dropsy with coagulable urine; but Gregory has drawn attention more forcefully to the subject by assembling a number of cases in which he hoped to find this peculiarity.

His observations xxvii, xxx, xxxi, xxxii, xxxiv, and xxxv and above all observations xxx and xxxv, in fact seemed to me examples of albuminous nephritis without dropsy. In my opinion, the other observations appertain to other diseases and, as the circumstances which confused Gregory in 1831 continue in 1839 to be a source of error for many observers, it is important to point them out: (1) It is first of all the presence of albumin in the urine in other diseases of the urinary tract; thus observation xxxv is a case of cystitis and of simple nephritis, in which the urine, mixed with a certain quantity of "mucous pus", was albuminous. Observation xxix is similarly a case of inflammation of the bladder with urine mixed with mucous pus. (2) A second source of error is that at the time that Gregory was writing, the anatomical characteristics of simple chronic nephritis were not well known; because I believe I was the first to prove that the yellow discolouration of the kidney, the hard, marbled aspect, are the lesions that one finds in simple nephritis as in albuminous nephritis. I would also point out a fact which should strike those who continue to contest the similarity between chronic simple nephritis and albuminous nephritis; it is that the differences between certain anatomical appearances of simple chronic nephritis and chronic albuminous nephritis may have been so slight that they were overlooked; since observers such as Dr. Christison and Dr. Gregory had mistaken one for the other. There is a further circumstance which has probably been a source of error for Gregory; I refer to the study of the low specific gravity in chronic albuminous nephritis. This diminution of the specific gravity of the urine is, without doubt, an important sign and acquires even greater importance when one connects it with other symptoms of the disease, but I established that this notable diminution of the specific gravity of the urine was also a sign of simple chronic nephritis, secondary or not, as often occurs in chronic cystitis. The urine mixed with a certain quantity of mucous pus offers, in that case, two characteristics (*low specific gravity and the presence of albumin*) that many people believe even today are unequivocal signs of albuminous nephritis, but in this case (as I have remarked) the urine offers a mucous sediment; glairous or purulent, or at least under microscopic inspection, the mucous or purulent globules exist there, besides other symptoms of cystitis.

If Gregory did not compare the specific gravity of urine in chronic simple nephritis with the specific gravity of urine in the cases of renal lesions which normally produce dropsy, he is right to claim that he, more than others, had studied the variations that the specific gravity of urine presented in the healthy state and in cases of dropsy with coagulable urine. In fact, he had observed the variations in the specific gravity of urine in two healthy men at three different periods of the day, during a twenty-day period. He had given the specific gravity

of the urine of 58 healthy men and that of the specific gravity of the urine of 50 individuals suffering from dropsy with coagulable urine. He had made analogous research into the specific gravity of the blood serum of dropsical patients. He had stated, as had Drs. Bostock and Christison, that it was generally less than in the healthy state. Here there is also an important but not definitive characteristic: because the specific gravity diminishes in a certain number of chronic diseases and in acute diseases after repeated bloodletting (see tables 2 and 3).

Dr. Graves⁸⁰ having been one of the most prominent opponents of the opinions of Dr. Bright with regard to the influence of certain renal lesions on the production of dropsies with coagulable urine, I will carefully examine his objections and indicate certain errors which escaped him; but before going any further, I feel I should include here Dr. Graves's opinions as he presented them.

I cannot, (he said) subscribe to the opinion so warmly advocated by men of distinguished talent, both in London and Edinburgh, that an albuminous state of the urine in dropsy depends upon a structural change in the kidneys. I have met with so many cases in which the *albumen entirely disappeared* under proper treatment, that the conclusion seems inevitable, that such a state of the urine may be, and is frequently produced by mere functional derangement of the secreting organ, and not by such a change of structure as is described by Dr. Bright and others. The word functional is used here as distinguished from permanent and evident alteration of structure. It is satisfactory to find that my opinion has the support of both Dr. Elliotson and Dr. Mackintosh. The following is one of several cases which I have treated successfully in a manner not generally practised by others. That great master of pathology and practice, John P. Frank, long ago threw out the hint that some cases of dropsy may be analogous to diabetes. An attentive observation of the different forms under which dropsy presents itself, led me to the following conclusions. When dropsy comes on gradually, is chronic, and unattended by any evidence of being caused by inflammation either of the chest or belly, and where we cannot detect the existence of organic disease either in the thoracic or abdominal cavity, then there is some reason to suspect that the dropsy may be analogous to diabetes. If, in addition to these characters, the urine is found either more copious, or as copious as natural, and especially if it is found to be albuminous, then our suspicions are strengthened, and we are justified in trying the peculiar method of treatment which this variety of dropsy demands, and which consists not in bleeding or leeching, not in purging or exhibiting diuretics, not in mercurializing the system, but in the use of opium and animal food in moderate quantity. Of the success of this treatment in such cases (but in such only), we have had several striking instances in the Meath Hospital, among the rest the following.

Arthur Noble, a policeman, was admitted on the 16th of May, affected with considerable anasarca of face, trunk and extremities. His disease was of many weeks' standing, and although at its first origin it appeared to have been induced by cold, and to have had an inflammatory character, yet, at the date of his admission, every symptom of inflammation and of fever had disappeared, if we except some tenderness of epigastrium, probably owing more to flatulent distention than to gastritis. Appetite bad, thirst great, urine loaded to an extreme degree with albumen, *skin moist*, constipated, he has some cough and expectoration, depending on slight bronchitis, together with a certain degree of dyspnoea, which may be owing to slight pulmonary oedema. It is to be remarked, that this man's

⁸⁰ *Lond. med. Gazette*, vol. VII, Feb. 1831, p. 385; *Dublin Journal of Medical Science*, [vol. 6], no. 16, 1835, pp. 72–74; *Archives générales de médecine*, second series, vol. VI, 1834, p. 559.

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health had been broken for a year and a half, consequently long before the appearance of the dropsical symptoms. Having acted briskly on the bowels on the first day, we gave a powder consisting of one drachm of supertartrate of potash, and one scruple of bark three times daily. This had an excellent effect on the kidneys, increasing the urine, but not in proportion diminishing the quantity of albumen. His skin continued to be moist, and he improved in appearance and strength; but it was observed that he scarcely ever slept more than one hour at night, while the dropsical swellings that had at first rather diminished, became stationary. The latter circumstance, combined with his watchfulness, the complete absence of fever, his great thirst, albuminous urine, and the absence of organic disease, together with the moist state of the skin, determined me to use opium, which was administered at first in the form of enema, but afterwards in that of a pill, containing one grain and a half of opium. Under this plan of treatment his sleep and thirst rapidly returned, his urine diminished in quantity, and became every day less albuminous, he rapidly gained strength and flesh and finally the thirst and swellings disappeared. He left the hospital on the 17th of June, *his urine having for many days been perfectly free from albumen.*⁸¹

And therefore, I concede that Dr. Bright was wrong to say that an albuminous urine was always indicative of the renal alterations which he had described; but this does not alter the fact that nowadays it should not be well-demonstrated that the opinion expressed by Dr. Bright is perfectly correct in the great majority of cases, above all when, at the same time, there is evidence of anasarca. As for the dropsies which one sometimes observes in diabetics, this is without doubt unproven, neither is it probable that they depend on one of the renal lesions described by Dr. Bright (although, to my knowledge, kidneys in similar conditions have, again, not been well studied) but in supposing one should find the kidneys perfectly healthy in such dropsical patients, it remained to demonstrate that the urine in these cases contained albumin showing alterations in its composition such as would be found in dropsy with coagulable urine and renal lesions; neither Dr. Graves, nor any others, have currently made such studies. With regard to the use of bloodletting, by lancet or leeches, nowadays everyone recognizes that in chronic albuminous nephritis with dropsy, these remedies are not appropriate other than in case of paroxysm and against intercurrent inflammations. Finally, with regard to the case cited by Dr. Graves, it tends only to demonstrate the usefulness of opium in cases of chronic anasarca with albuminous urine. Supposing that this case should be independent of an affection of the heart, or a cachectic state of the constitution (analogous to that which one observes in scorbutics, whose urines are sometimes albuminous) or other conditions again in which the urine may become albuminous, this does not prove that urines of a low specific gravity, low acidity, neutral or alkaline, most frequently without sediment, are not an almost certain indicator of the alterations described by Dr. Bright.

It is not with any firmer foundation that Dr. Graves reproaches Blackall for having advised the use of bloodletting indiscriminately for all cases of dropsy with coagulable urine; because if Blackall did so strongly insist on the usefulness of bloodletting in this type of dropsy, it was because he had recognized that it did not often present in the inflammatory form; that it was complicated, in a great number of cases, by inflammation of the pleura, the pericardium, the lungs, etc., the existence and frequency of such alterations having been confirmed by earlier research. However, Blackall in no way absolutely proscribed the use

⁸¹ *Dublin Journal of Medical Science*, [vol. 6, 1835], no. 16; *Archives générales de médecine*, second series, vol. VI, 1834, p. 559.

of tonics, but rather recommends their use in the last stage of this type of dropsy, and reports a great number of cases in which he has used quinine to advantage.

Propagated by medical teaching, the opinions of Drs. Bright, Christison and Gregory were set out in a concise yet detailed manner by Dr. Spittal, in his inaugural thesis, presented at Edinburgh in 1831.⁸²

Dr. Spittal remarked that the presence of albumin in the urine was in no way an absolute sign of the alteration to the kidneys described by Dr. Bright. This comment did not lack foundation, but the observations which were used to prove it did. In fact, on the authority of Turner and Gmelin, Spittal affirms that albumin exists in healthy urine, and as proof he cites that it precipitates with tannin and deuto-chlorine of mercury; thus one knows that these two reagents can occasion, in urine, precipitates quite different to albumin.

That which Dr. Bright had observed and spoken of regarding the acute form of the disease escaped the attention of the Edinburgh doctors because he had made no mention of it in his general description. Following their example, Dr. Spittal depicted Bright's disease as a chronic affection, although he indicated congestion of the kidneys as the first stage of the disease. Also he expresses himself thus relating to the origin of the disease: "This illness is believed to draw its origin from the slow inflammation of the kidneys." The fact that it was then ignored that acute anasarca with coagulable urine, following scarlatina, is one of the most frequent forms of the disease demonstrated this, and that an observation of Dr. Bright's relative to the acute form of the disease has passed virtually unnoticed.

Dr. Craigie⁸³ mentioned, in his clinical report of 1832–33, two cases of hardening of the kidneys, which had been accompanied in life by albuminous urine and anasarca. He attributed these alterations to a chronic inflammatory condition of the glandular substance of the kidneys. The surface of the kidneys was irregular with small protuberances and depressions, the base of which was more vascular than the protuberances.

Dr. Craigie supposes that this alteration is distinct from those which had been described by Dr. Bright (although it appears to me to correspond to his third form) and he sees the depressions as consecutive to a partial congestion, following which a portion of the cortical substance would have been re-absorbed. The fact is that similar depressions, and at the same time a quite considerable atrophy of the cortical substance, are often observed in simple nephritis and chronic albuminous nephritis.

In a memoir on dropsy with coagulable urine, published in 1832, Dr. Barlow of Bath declared⁸⁴ that in his opinion Dr. Bright had, with clarity, established a relationship between coagulable urine and an organic alteration of the kidneys. Dr. Barlow has further published a case of derangement of the kidneys which he regards as simply functional, and in which the urine was albuminous. This case concerned an active man, of good constitution, who had been admitted to the Bath Hospital in May 1830, for treatment of general dropsy of a strongly inflammatory nature. When heated his urine coagulated into a solid mass. With the help of active treatment the patient improved that July. This man, who was a labourer, continued to do well even though he worked continuously; which he would not

⁸² Spittal, R., *Dissertatio de quodam vitio renum, quod urinae mitatio particularis comitatur*, Edinburgh, 1832.

⁸³ Craigie, [D.], 'Report on the cases treated during the course of clinical lectures, delivered at the Royal Infirmary in the session 1832–1833', *Edin. med. surg. Journ.*, vol. XLI, [1834], p. 120.

⁸⁴ [Barlow, E., 'On dropsy, with coagulable urine'], *Midland Medical and Surgical Reporter*, [p. 255], May 1832.

have been able to do, said Dr. Barlow, had he been struck *with the organic disease of the kidney described by Dr. Bright*.

It is evident, after reading this passage, that Dr. Barlow, in common with all the English physicians who have written about dropsy with coagulable urine, regards Bright's disease as chronic and does not suppose it exists in an acute form.

Dr. Elliotson had also challenged, on several points, the opinion of Drs. Blackall and Bright. At the same time he recognizes⁸⁵ that dropsy may be the consequence of renal lesions and that the urine is generally albuminous when the kidney is affected organically, or when it is the site of a powerful sanguinary congestion or an inflammatory condition. But, with regard to the urine being albuminous, he thinks that one cannot conclude that the kidney is in a state of organic disease because, as he points out; "I have seen so many persons cured of dropsy, and restored to perfect health, who had albuminous urine; and if the kidney had been originally diseased, we can hardly suppose that that would have been the case; nor could congestion and inflammation of the kidney be supposed, because there were no signs of such affections. I have continually seen albuminous urine in cases of dropsy without any reason, first or last, to suspect disease of the kidney and I have seen the dropsy completely cured."

"It is possible," he continued, "that in disease of the kidney, and in congestion of that organ, the urine may generally be albuminous, the converse cannot be said, that if the urine be albuminous, we cannot necessarily conclude that the kidney is in these diseased conditions." He also thought it incorrect to assume that "when the albumin in the urine is of considerable quantity and firmness, making a firm coagulum on the application of heat, that there are usually proportionate to this marks of inflammation, and that a correct guide to venesection will be found in the firmness, copiousness, and early appearance of an albuminous coagulum in the urine."

I recognize, with Dr. Elliotson, that Blackall was incorrect to state in so general a manner, that one could find a sure guide for the use of bloodletting in the appearance of the urine coagulum; but Dr. Elliotson himself remarks that Blackall had modified the over-generalization of his proposition by saying that bloodletting should be employed with propriety and its effects should be noted before recommencement of treatment.

Without denying that the presence of albumin in the urine may, in some cases, be occasioned by a disease of the kidneys, Dr. Darwall⁸⁶ thinks that too much emphasis has been given to this phenomenon. To justify his opinion, he cites a case of dropsy with coagulable urine, in which a great diminution of albumin had been observed, over a period of several days, after the administration of sulphate of quinine. He adds that at post mortem the kidneys were found to be perfectly healthy with the exception of the cortical substance, which was paler than normal.

I have already stated⁸⁷ that this patient had heart disease; that the kidneys were not perfectly healthy, and that it was not said, in the observation, if the specific gravity of the urine was or was not inconsiderable, as usually occurs in chronic albuminous nephritis.

⁸⁵ Elliotson, [J.], 'Reports of cases, etc.' ['Announcement of cases – Dropsy'], *Lond. med. Gazette*, vol. vii, [1831], p. 315.

⁸⁶ Darwall, [J.], in *Cyclopaedia of practical medicine*, art., Dropsy, [vol. 1, London], 1833, p. 641.

⁸⁷ [*Traité des maladies des reins*, Paris, J.-B. Baillière, 1840, vol. 2, para. 562, p. 277.]

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Dr. Copland,⁸⁸ after having divided dropsies into two classes, of which one (primary dropsies) corresponds to those I described under the name of “hydrophlegmasia” and of which the other (secondary dropsies) includes dropsies following heart disease, certain affections of the veins, the lungs, also diseases of the liver, the kidneys, etc., made some remarks relating to dropsies which originate in the kidneys. Regarding this he recalls that lesions of these organs, as those of other viscera which had been found diseased in dropsy (diseases of the heart, for example), could exist with or without dropsy. He thinks that all changes to the structure of the kidneys can be linked to the production of serous effusion, especially when it interferes with the natural function of these organs. Of all the kidney lesions which produce dropsy, the principal, according to Dr. Copland, is the disease described by Dr. Bright. But Dr. Copland believes that dropsy rarely forms when the kidneys alone are affected. For him, dropsy most often results from an association of lesions of the kidney with those of the heart, the lungs and the liver. In such cases, he adds, the diseases of the kidney may be primary or secondary, and most frequently they are secondary. In the latter case, dropsy begins as when it occurs in the diseases of the circulatory and respiratory organs; the association with kidney disease is often distinctly indicated by pain in the loins, by nausea, vomiting, diarrhoea and by coagulable urine. In some cases, however, renal disease may exist without these symptoms, and urine may be coagulable without the kidney necessarily being involved.

When the affection of the kidney is primary, dropsy commences with anasarca; it rapidly extends to the cavities of the pleura, the pericardium, the peritoneum and sometimes the arachnoid. In the majority of cases, the symptoms are more acute and the progress of the disease more rapid than in any other form of symptomatic dropsy.

In this case it is not unusual to observe symptoms of pleurisy, pericarditis and peritonitis before the more advanced stage of such dropsy is reached. Dr. Copland seemed disposed to attribute the secondary inflammatory lesions to the alteration of the secretions of the membranes themselves due to the alteration in the blood (by default of the elimination of the material that nature usually rejects outside the body, when the action of the kidneys is normal and regular). With regard to the presence of albumin in urine, it has a place in other diseases without renal lesions. But it is certain that one frequently observes albuminous urine when such lesions exist and also in acute dropsies. Finally, Dr. Copland adds that he has often observed albuminous urine in acute diseases of children where there is no renal alteration, and that this phenomenon is not unusual following eruptive fevers.

Several comments made by Dr. Copland are well-founded; in my opinion others are not. Thus, it is highly contentious that the kidneys, in dropsy with coagulable urine, should more often be affected secondary to other diseases rather than primarily. In acute anasarca, following scarlatina, and in a great number of cases of chronic anasarca, resulting from the cold and dampness or the abuse of alcohol, the kidneys are also primarily affected and sometimes uniquely affected.

The cases of coincidence of renal lesions with diseases of the heart or with pulmonary phthisis, etc., in which the affection of the kidneys is most frequently secondary, are more

⁸⁸ Copland, [J.], *A dictionary of practical medicine*, art., Dropsy, in 8vo, London, 1833.

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rare than cases of primary affection. The excretion of albumin, in other acute or chronic diseases, which do not originate in the urinary channels, is an incontestable fact, but I consider it extremely doubtful that albumin exists in the urine of sick children in such a large number of cases as Dr. Copland supposes (see table 1).

I continue now with the exposition of work undertaken in England on Bright's disease; I will return later to the research carried out in France, which originates from my first studies on diseases of the kidney made in 1830.

One recognizes that, quite often, cerebral symptoms develop in simple or severe nephritis and sometimes in albuminous nephritis. Dr. Wilson⁸⁹ cites several cases of cerebral affections which evidently relate to one or other of these kidney inflammations.

In 1833 G. Hamilton⁹⁰ published a work which deserves particular mention in which he established through post-mortem examination that which clearly links the observations of Wells and Blackall with those of Dr. Bright, in acknowledging that anasarca with coagulable urine following scarlatina belongs to the disease described by Dr. Bright. Dr. Hamilton's observations have been confirmed by observations made in France more or less simultaneously and by later observations published by Drs. Wood, Mateer, etc.

Dr. Burrows,⁹¹ in his lectures on the blood and urine, has expressed the opinion that heat alone cannot unequivocally prove whether or not a urine, is albuminous. He said:

A sailor was admitted into St. Bartholomew's Hospital, with ascites and general anasarca. From his own account his complaints had originated from cold, and consequently saline diuretics were prescribed for him. His symptoms, after a short residence in the hospital, indicated a deeper-seated cause of disease; and his kidneys were suspected to be affected. His urine was heated frequently during the last three weeks of his life, but no coagulation of albumin took place.

I examined this man's body after death, and found that the kidneys had undergone that kind of disorganization described by Dr Bright. I therefore took the kidneys to Dr. Bright, who said they were excellent specimens of the disease which he had described.

Dr. Burrows attributed the non-coagulation of this urine by heat to a neutral or alkaline state of the liquid produced by the ingestion of neutral vegetable salts. Unfortunately Dr. Burrows did not say if this urine was coagulable by nitric acid, nor to which form of the disease described by Bright it corresponded. I have, in fact, seen the quantity of albumin in urine diminish considerably or disappear completely in these cases where the kidneys have become severely hardened following albuminous nephritis.

After having recalled the ancient division of dropsy into acute and chronic, sthenic and asthenic, Dr. Anderson⁹² says that these divisions correspond almost exactly to the distinctions made by Blackall between dropsy with coagulable urine and those without. He thinks that, in general, the presence of albumin in urine is an indication of an inflammatory state which demands the most active antiphlogistic treatment.

⁸⁹ *Gazette méd. de Paris*, 1833, p. 27.

⁹⁰ Hamilton, [G.], 'On the epidemic scarlatina and dropsical affection which prevailed in Edinburgh during the autumn of 1832', *Edin. med. surg. Journ.*, vol. xxxix, [1833], p. 140; 'Cases' (ibid. vol. xliii, [1834] p. 303); 'On the treatment of scarlatina anginosa' (ibid. vol. xlvii, [1837], p. 141).

⁹¹ Burrows, [G.], 'Physiological and pathological observations on the blood and urine', Lec. II, *Lond. med. Gazette*, vol. xiv, [1834] p. 555.

⁹² Anderson, John, 'Observations on renal dropsy', *Lond. med. Gazette*, vol. xv, [1835] pp. 855 and 903.

These opinions of Dr. Anderson appear to me to be too strong because it is incontestable that chronic alterations of the kidneys and dropsies with coagulable urine which accompany them, are the most frequent of all forms of albuminous nephritis, and they rarely require an active antiphlogistic treatment.

In this type of inflammation of the kidneys, as in many other inflammatory conditions, and in particular in the simple and chronic inflammation of these organs, the active antiphlogistic treatment, which principally consists of bloodletting, is not only impractical but also dangerous. One should also recognize that it is impossible to label all the acute dropsies under the two divisions made by Blackall, because there are dropsies consecutive to diseases of the heart, in which the urine contains small quantities of albumin and which offer virtually no phlogistic characteristics, and on the other hand there are dropsies consecutive to chronic peritonitis, in which the urine is not coagulable.

Dr. Anderson published a very interesting case of dropsy with coagulable urine following rheumatism, and he gave a table of the coagulability and non-coagulability of the urine in several diseases.

After having studied chronic diseases for more than eight years in the Sir Patrick Dun Hospital, Dr. Osborne⁹³ had several opportunities to study the disease which concerns us. He summarizes thus his observations on dropsy dependent on renal lesions:

- (1) It is always connected with disease of the kidney, which, when sufficiently advanced, is marked by the deposition of a greyish structure impermeable to injections, within the substance of the organ.
- (2) The suppression of perspiration is the most general cause of this disease; and the long-continued excitement of the organ by spirituous liquors, or diuretics, the next in order of frequency and importance.
- (3) The most successful treatment consists in the restoration of the functions of the skin; which being accomplished, the disease, if free from complications, never fails to be removed.
- (4) Bloodletting and purgatives are also suitable remedies, while diuretics are either injurious, or, if removing the swellings for a time, tend ultimately to cause a return of the disease, under a more aggravated and intractable form.

Dr. Osborne does not ignore the fact that albumin is present in other affections. He says that in fevers and other inflammatory diseases, one obtains an albuminous deposit by treating the urine with a concentrated solution of corrosive sublimate; that such urines are strongly coloured and charged with urea and when they are treated with nitric acid they produce abundant crystals, without evaporation of the urine; that no coagulation is obtained by heat if one does not continue the evaporation.

It is very probable that the precipitate which Dr. Osborne appears to consider as formed by nitrate of urea was constituted by the urates with or without albumin. In some cases of renal lesion, Dr. Osborne had observed in the emulgent veins a substance which resembled blood fibrin, but which had a caseous consistency.

Dr. Seymour,⁹⁴ in his remarks on dropsy with coagulable urine, consecutive to kidney affections, made some assertions which I do not believe to be entirely correct. Thus he says

⁹³ Osborne, [J.], *On dropsies, connected with suppressed perspiration, and coagulable urine*, London, 1835.

⁹⁴ Seymour, E., 'The nature and treatment of dropsy, considered especially in reference to the diseases of the internal organs of the body which most commonly produce it', *The Medico-Chirurgical Review*, [n.s. vol. 26, 1836–37, pp. 1–24.].

that, in the least severe cases of the disease, cases where the kidney is visibly congested or engorged, the urine is less coagulable, whilst it has been demonstrated to me that during this period, notably in acute cases which occur following scarlatina, the albuminous coagulum is often considerable from the first day. But Dr. Seymour has made a remark based on the coincidental cases of affections of the kidneys and diseases of the heart. Contrary to Dr. Bright, Dr. Seymour thinks that diseases of the heart and the kidney are not consecutive to renal affection, but that they are often the result of the same cause, i.e. the abuse of liquor. With regard to the proportion of cases of dropsy in which the kidneys were affected, Dr. Seymour says that in half the cases received at St. George's Hospital, the urine was coagulable, and that in almost a third of these cases, ending in death, the kidneys were the only diseased viscera. The other two thirds include granulation of the kidneys, and diseases of the heart and of the liver. Dr. Seymour, like all English pathologists, considered the disease described by Dr. Bright as "an organic alteration of the kidneys", that he came to regard as being the result of a simple functional derangement of the kidneys, the acute and eminently curable dropsies following scarlatina, whilst in fact they are the result of the first stage of the morbid degeneration which if not halted later leads to one of the three forms described by Dr. Bright.

The English pathologists have not only not grasped the connection between the first stage of albuminous nephritis and the alterations, varied in appearance and structure, which succeed it, but also one, Dr. Corrigan,⁹⁵ in presenting to the Pathological Society of Dublin two kidneys *said to be* granulous, was of the opinion that these two kidneys which corresponded to the two forms described by Dr. Bright, were not successive conditions of the same disease. One of these kidneys, much more enlarged than in the healthy state, was pale and smooth on its surface; the cortical substance was of a uniform yellow colour, due, according to Dr. Corrigan, to an interstitial deposit of lymph. According to Dr. Corrigan, this alteration would be analogous to certain forms of enlarged livers known in England under the name of *large, yellow, hardened liver*. The other kidney was rough and granulated on the surface; it was very slight in substance, deformed and smaller than in the natural state.

The yellow kidney was evidently an example of the first form of the disease described by Dr. Bright; the second corresponds to his third form. I do not go as far as Dr. Corrigan in considering that the yellow kidney could be an alteration similar to those of the large, yellow or hard livers; the yellow kidneys are more often soft.

Dr. Corrigan does not, however, give any proof of the impossibility of the transformation of a yellow and voluminous kidney into a hard, mammillated kidney, less voluminous than in the natural state, whilst other pathological studies prove, at least, the possibility of this transformation. And returning to the kidney, one knows that it is normal to find the kidneys enlarged and marbled with yellow following certain nephritides, consecutive to chronic diseases of the bladder, the prostate and the urethra. It is well known also that it is not rare to find the kidneys hard, mammillated and atrophied in those who have suffered for a long time from the same diseases. Similar occurrences can be found in the testicle and in the liver, which, whilst more enlarged than in the healthy state in the early period of

⁹⁵ *Dublin Journal of Medical Science*, vol. xv, March 1839, p. 185, no. XLIII.

inflammation, are later quite discoloured, becoming hard, mammillated, rough and quite atrophied in the most advanced stage of the disease.

Dr. Mateer⁹⁶ divided dropsies into three forms. The first comprised those in which one observed coagulable urines; the second, dropsies with non-coagulable urine, and dependent on the lesions of organs other than the kidneys, whilst the third is composed of dropsies with non-coagulable urine, and which depend, according to Dr. Mateer, on an anaemia of the kidneys. According to Dr. Mateer, Bright's granulations are no more than a deposit of coagulable lymph in the cellular tissues of the kidneys; and he supports the inflammatory nature of the disease and is an advocate of the antiphlogistic treatment. On the other hand, he cites seven cases of dropsy which he believes to depend on an *anaemia of the kidneys*; but no autopsy proves the existence of this alteration. Dr. Mateer recognizes it, because the diuretic stimulants cured the disease on six occasions, by producing, in the majority of cases, a temporary and less marked albuminous state of the urine; also because an anaemic state of the kidneys seemed to him favourable to the development of dropsy, and that this anaemia of the kidneys often exists in chronic diseases. These inductions, it must be said, cannot be accepted thus devoid of proof.

Dr. Mateer, having frequently examined the urine of the fever patients (in the Fever Hospital in Belfast) remarked that it often contained albumin in the final stages of the disease and he considered this phenomenon to be critical when added to the deposit of urates, which one later observes in the urine.⁹⁷

Dr. Robert Willis⁹⁸ included under the name *sero-albuminous urine* all the cases where the urine was charged with albumin, at the same time separating from this group, those in which the albumin is accompanied by a notable quantity of the fatty matter which he classified as *oleo-albuminous urine*. In the first group, he brought together again the urine voided in albuminous nephritis and the albuminous urines coming from other morbid conditions, which had not at all the same composition and which were not accompanied by the same symptoms during life, nor did the same lesions present at post mortem. In the group of *fatty-albuminous urines* were included chylous urine, oily urines, and all cases in which the urine could contain fatty matter and albumin. Such groupings may be made in semiology when the presence of fatty matter and of albumin in the urine is accepted as a sign, but they cannot hold good in pathology, where one should not describe in the morbid state more than a well-defined affection.

Since I devoted my attention to special researches on the diseases of the kidney (that is, since 1830) I was occupied with repeating the observations of Dr. Bright on the kidney lesions which produce dropsy, and with the alterations to the urine which accompany them. These studies, undertaken at l'hôpital de la Charité, soon caught the attention of the students. One of these, Dr. Tissot,⁹⁹ took as his subject the dropsy produced by a granulous

⁹⁶ Mateer, W., 'On the coagulability of urine as a diagnostic and therapeutic sign of dropsy', *Edin. med. surg. Journ.*, vol. XLVII, 1837, p. 68.

⁹⁷ "By and by the urine becomes towards the turn of the fever, albuminous; thus showing that the kidneys are called into excited action, and roused from their state of anaemia. At the same time, too, the general febrile excitement is lowered. After the kidneys have for some time excreted albumen, this suddenly disappears, and uric acid and the urate salts are formed in its place, and in this way the *crisis per urinas* is effected." (*ibid.*, p. 93.)

⁹⁸ Willis, Robert, *Urinary diseases and their treatment*, p. 150, in 8vo, London, 1838.

⁹⁹ Tissot, E., *De l'hydropisie, causée par l'affection granuleuse des reins*, in 4to, Paris, 1833.

affection of the kidneys. It was the first inaugural dissertation undertaken on the subject at the Paris Medical School. He reported seventeen particular histories of the disease (for the main part gathered whilst working for me), appropriate to making known the principal forms of the disease. To know for example: the acute form with satisfactory outcome (Obs. v and xii); the anatomical state of the kidney, in the first degree of the disease, before the formation of the granulation (Obs. xi); the accompanying inflammation of the renal vein (Obs. xv); certain predominant symptoms, such as diarrhoea (Obs. iv and x); the cerebral symptoms (Obs. vii) and the principal complications of renal disease, with pulmonary congestion (Obs. viii); pneumonia (Obs. i); peritonitis (Obs. ii); pulmonary phthisis (Obs. vi, ix, xi, xii and xiii) and with scrofula (Obs. xvi). These observations, gathered with the greatest of care, are, in general, more detailed than the majority of those which have been published to date. Dr. Tissot studied the constitution of the urine, and indicated an easily proved characteristic of albuminous urine, i.e. that of forming, *by insufflation, large, persistent bubbles similar to soap bubbles*. He cited a case in which the disease was barely accompanied by dropsy; and whilst generally recognizing the value of the presence of albumin in urine as a sign of Bright's disease, he indicated several diseases in which the urine may be quite albuminous; haematuria, cancer of the kidney, cystitis, final stage tubercular affection of the kidney, hydronephrosis, etc. He called attention to pulmonary phthisis as a fairly frequent cause of kidney alteration and the good effects that I had obtained with steam baths, bloodletting and the use of horseradish in these diseases.

A young doctor, whose loss to Science must be deeply regretted and who was attached to my division as intern, was Dr. J. C. Sabatier, who also published several observations¹⁰⁰—some collected during my service, the others at l'hôpital des Enfants; and he accompanied them with practical remarks on the nature of the disease. One of the most curious observations which he cites is that of a five-year-old child struck by dropsy with coagulable urine developed under the influence of cold and humidity and in whom the disease disappeared under the influence of scarlatina. This child died some time after a subsequent attack of dropsy with coagulable urine. At the time of this study, Sabatier asked himself how, in this case, the scarlatina had operated to cure the alterations to the urine which normally accompany it. Personally, I do not understand either, but I have reported a similar case of dropsy with coagulable urine which improved in the course of varicella (Obs. LXXIX).

Sabatier also tried to explain how an affection of the kidneys could produce dropsy:

In this disease albumin abounds in the urine, and diminishes proportionally in the serum, and the specific gravity of the serum is decreased in the same proportion, as the urine becomes more albuminous. The blood serum, finding itself impoverished, becomes more fluid, more tenuous and by this means it can more easily penetrate the walls of the arterial capillaries. If one accepts that after this modification of the blood, the venous absorption is less active, one can understand from this how, in similar cases, the overflow of the serous cavities and the infiltrations of the cellular tissues are formed.

Sabatier supposes that the serum does not itself pass through the kidney; but that by an inexplicable modification of its function, the kidney allows the serum albumin to pass, and sometimes also the coloured matter of the blood.

¹⁰⁰Sabatier, [J. C.], 'Considérations, et observations sur l'hydropisie symptomatique d'une lésion spéciale des reins', *Archives générales de médecine*, second series, vol. v, 1834, p. 333.

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Although ingenious, Sabatier's theory is not above criticism. First of all it is improbable that the albumin contained in the blood serum should be separated by the kidney, in a more concentrated state than it is in the blood serum. With regard to the study of the diminution of the specific gravity of the blood serum, it is easy to find a simpler and more natural explanation. In albuminous nephritis with considerable anasarca and abundant serous deposits in the pleura and the peritoneum, it is by the action of these deposits and above all by the passage of the albumin in urine that a very considerable quantity of serum is withdrawn from the blood; and if, which is very probable, by the action of drinks, when the disease is febrile, or by a limited diet, or by a weakened digestion, when the disease is chronic, the blood becomes thin, the specific gravity of its serum may diminish without one necessarily supposing that the kidneys separate from the blood more albumin than was proportionally contained in the serum. It is by a mechanism analogous to this that I believe that the specific gravity of the serum diminishes in proportion when one repeats the bloodletting in an acute disease. In this case, the blood becomes poor and its serum diminishes in density, not because one abstracts greater quantity of its solid element, or because of the water which it contains, but because the aqueous part of the blood had been reintegrated more rapidly than its organic elements.

On the other hand, many objections may be made to the opinion which attributes the serous deposits in the cellular tissue and the cavities of the serous membranes to a more tenuous state of the serum than in a healthy state. Besides, the serum can become tenuous without it forming dropsy (albeit that there is unlikely in any disease to be such a feeble specific gravity as in albuminous nephritis). In patients suffering from chronic non-dropsical albuminous nephritis, when bled, the serum presented this weak specific gravity, without the existence of a serous deposit in the cellular tissue or the serous membrane, etc. On the other hand, following scarlatina one sees very considerable anasarca, with effusion in the pleura or in the lower abdomen, without necessarily supposing that the loss of albumin through the urine had been very considerable before the appearance of dropsy. Finally, one knows that these acute dropsies with coagulable urine are treated with success by bloodletting, which would probably not happen if their formation could be explained by thinning of the blood, the diminution of the specific gravity of the serum and its greater tenuity.

Dr. Monassot,¹⁰¹ who had observed cases of albuminous nephritis in my service, and others at l'hôpital de la Pitié, set out, with great precision, the general characteristics of this disease, above all, of the chronic form. He opposed Sabatier's theory, which had attributed dropsy to a greater tenuity of the serum, and he believed he could explain the development of dropsy by the diminution of the urinary secretion; but this theory cannot account for either the general dropsies which arise, sometimes almost suddenly after scarlatina, nor of those which form when the urinary secretion is not visibly diminished.

At the same period, Drs. Guersent¹⁰² and Baudelocque,¹⁰³ both doctors at l'hôpital des Enfants, and one of their best students, Constant,¹⁰⁴ too soon lost to science, studied dropsy with coagulable urine in children, amongst whom it had been somewhat neglected, apart

¹⁰¹ Monassot, [J.], *Etude sur la granulation des reins*, in 4to, Paris, 1835.

¹⁰² *Gaz. méd. de Paris*, 1834, p. 553.

¹⁰³ *Gaz. méd. de Paris*, 1834, p. 105; *Gaz. des hôpitaux*, 1834, p. 102; *Gaz. des hôpitaux*, 1835, p. 521.

¹⁰⁴ *Ibid.*

from following scarlatina; unfortunately they published no more than a small number of their observations.

Soon the study of urine, and in particular research into the presence of albumin, became more common in the Paris hospitals, but it happened, as it did in England, that the doctors in other respects well-informed, albeit unfamiliar with the study of renal lesions, announced that they had found no granulations in the kidneys of dropsical patients, whose urine was strongly albuminous. Misled by the denomination “granular disease”, and for lack of knowledge of its other anatomical forms, they did not recognize when it really existed in another form. The fact is, that the possibility of a general dropsy with strongly coagulable urine, without the important renal lesions described by Bright, was easily accepted by some and even more easily propagated by others.

The research into albumin in urine also led to further error. Several doctors announced as a contradictory fact that they had found albumin in cases where the renal lesions described by Dr. Bright did not exist, and also in non-dropsical individuals, and they concluded that the presence of albumin in urine was of no value or little value, since one encountered albumin in urine in a number of diseases, differing in site, nature, etc.

For the rest, the errors were not general. Several doctors remained convinced that a morbid phenomenon, considered in isolation, had no definitive value as a sign, but could have an important value when one connected it with other accompanying conditions, or preceding conditions, and since they knew that one found albumin in a large number of diseases, they insisted on the necessity of a comparative study of albuminous urines, in terms of their composition, in order to define their differences and to see to what degree the two conditions of urine described by the English pathologists (albumin and weak specific gravity) indicated, during life, the lesion described by Dr. Bright. At least, it is thus that I have proceeded, and it was this also which determined one of my students, Dr. Desir, to take as the subject of his inaugural thesis the study of albumin, considered both as a phenomenon and as a sign in diseases,¹⁰⁵ whilst at the same time, other considerations mentioned led him to summarize the anatomical characteristics of the six principal appearances which the kidneys may present in albuminous nephritis. Since the descriptions that he gave of these lesions are more or less the same as those which are given in this work,¹⁰⁶ it is unnecessary to reproduce them here. Dr. Desir clearly indicated that, in cases of dropsy with coagulable urine, one should not always expect to find granulations in the kidneys, and that one was inevitably unlikely to recognize the disease, if one did not know all its forms. Dr. Desir also indicated a vast number of acute and chronic diseases in which urine could be slightly coagulable:

- (1) In an inflammation originating in the aorta with a disease of the sigmoid valves. In the last stages the urine became bloody, it was coagulable with heat and nitric acid. At autopsy, the kidneys were rough and their surface hard and injected. The mucous membrane of the bladder was injected and red and that of the calices and the pelvis was ecchymotic.
- (2) In a case of endocarditis, with extreme rapidity of the circulation, the urine was slightly coagulable for three days at the commencement of the disease, which ended happily.

¹⁰⁵ Desir, A., *De la présence de l'albumine dans l'urine, considérée comme phénomène et comme signe dans les maladies*, in 4to, Paris, 1835.

¹⁰⁶ [Traité des maladies des reins, Paris, J.-B. Baillière, 1840, vol. 2, para. 502, p. 99.]

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- (3) In a pleurisy which occurred the tenth day after a lying in, the urine had been coagulable for the first three days.
- (4) In a case of double bronchitis ending in gangrene of the lung, following an abortion at six months, the urine had been very coagulable during the final three days. At post mortem, the kidneys were found to be in a normal state; the bladder very injected.
- (5) In pneumonia of the right side, with much fever, in a woman of fifty-eight years; the urine had been coagulable the third, fourth and fifth days of the disease. The seventh it had completely ceased to be so; the recovery was complete the fifteenth day.
- (6) In gastro-enteritis with jaundice and rapid pulse, the urine was coagulable during the first few days.
- (7) We have seen bloody urine in a case of haemorrhagic smallpox. At autopsy there was found to be a considerable bloody outpouring in the calyx and pelvis of the right kidney.
- (8) In a confluent smallpox, the urine became albuminous the second, third, fourth and fifth days; the mucous membrane of the bladder was found to be very injected and red.
- (9) The same was noted regarding the urine of a patient suffering from malaise and lassitude. The next day the urine was no longer coagulable.

In seventy-six other cases of acute diseases, the urine was coagulable neither with nitric acid nor heat.

“In not one of the preceding cases,” Dr. Desir continued, “would the deposit obtained by nitric acid or by heat be considerable; it was never more than an eighth of the liquid examined, and in this we are in agreement with the observation of Dr. Wells; this phenomenon was never of more than short duration. Of these nine observations of albuminous urine in acute diseases, we had four occasions to examine the organs after death and we always confirmed morbid condition of the urinary tracts. There was inflammation in the bladder and kidneys, a congestion with effusion of blood, as it appears in the nasal cavities, the respiratory tract, the gums, the eyes, and sometimes the skin in certain conditions, and at certain periods of the disease. In five cases of pregnancy, on three occasions the urine was slightly coagulable, without any derangement in the health (of the patient). Might not the abundance of blood in the pelvis of the kidney and the restriction of circulation in the compressed bladder suffice to account for this state?”

In 107 cases of chronic disease unconnected to the urinary tracts Dr. Desir found no albumin in the urine: however, he did encounter it in some cases of paralysis of the limbs but this phenomenon was related to cystitis consecutive to urine retention. Dr. Desir notes that in blenorrhagia, acute and chronic cystitis and inflammation of the ureters, the calyx and pelvis, in cancer of the kidneys and bladder and in hydronephrosis, the urine can contain a certain quantity of albumin. He examined with me the urine from 133 patients suffering from venereal diseases, of which 106 had primary symptoms and 27 had secondary symptoms. Finally he summarized his thesis with the following propositions:

- (1) Every time urine contains matter coagulable by heat and nitric acid it is albuminous. It is even more necessary to say that the urine should be coagulable both by heat and by nitric acid to declare that it is albuminous, that nitric acid, like heat, if used alone could be a source of error; certain urines highly charged with urates produce a precipitate by nitric acid and the neutral and phosphatic urines became thick with heat. Furthermore other reagents such as tannin and alum have confused even experienced observers.
- (2) When urine is albuminous, there is a lesion of the urinary apparatus or of its function.

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This proposition summarizes several observations mentioned in his dissertation which prove not only that several material lesions of the kidneys (comprising the six forms of albuminous nephritis) may be accompanied by albuminous urine, but also that albumin is present in urine in simple cases of functional disorders of the kidneys.

- (3) If urine is albuminous in dropsy, more often than not there exists at the same time the absence or diminution of urea that one confirms in the blood and in the liquid of the serous cavities.

This proposition indicates one of the principal characteristics of this type of albuminous nephritis.

- (4) In the course of mercury treatment, the urine is not albuminous except in the case of an intercurrent disease of the urinary apparatus.

This proposition, resulting from investigations made at l'hôpital des Vénériens or in my service, modified the opinion of Wells and other observers who attributed the development of albuminous urine to the employment of mercury preparations in treatment.

- (5) In an acute disease, urine may contain a certain quantity of albumin over a period of several days; this phenomenon has sometimes indicated a sanguineous congestion of the kidneys, the ureters or of the bladder.

The exactitude of this observation has been proved by a host of subsequent observations.

- (6) In a healthy individual, the urine may occasionally be albuminous during a 24-hour period following an irritation of the urinary tracts.

Previously, Dr. Bostock had announced that he had found in healthy men albumin precipitable by a corrosive sublimate and which was not coagulable by heat. This left doubts about the existence of albumin in healthy urine; other matter could have been precipitated by the sublimate. The use of the double action of heat and nitric acid in the investigations reported by Dr. Desir left no doubt about this fact. Recently Dr. Christison has suggested that the use of certain foodstuffs may produce the same phenomenon.

- (7) In acute cystitis, the urine contains much mucus; but when it is coloured by a certain quantity of blood, it is albuminous.

The existence of albumin in urine (in certain cases of cystitis) is an important fact to note, for as I pointed out above, this circumstance led Gregory to error; and I have seen a certain number of cases of urine retention with distension of the bladder and oedema of the lower limbs which have been wrongly taken for albuminous nephritis with dropsy, simply because the urine, with or without bloody globules, but always full of purulent or mucous matter, was coagulable.

- (8) When the urine contains much mucus and is albuminous, if at the same time there is pain following the course of the ureters or in the region of the kidneys, these symptoms should be attributed to an acute inflammation of the mucous membrane of the calices, the pelvis or the ureters and not inflammation of the kidneys themselves.

The object of this proposition was to anticipate the mistake that many authors had made in confusing the urine which became albuminous as a result of being mixed

with mucus with the coagulable urine that one observes in dropsy consecutive to renal lesion.

- (9) If, in the urine, the albumin is a flocculent, concrete deposit, it comes from the bladder or ureters or the chronically inflamed pelves or calices, or from a tuberculous kidney, in which the calices and pelves are affected or from an abscess of the prostate or the surrounding area which connects with the bladder.

I would add that such urines, when filtered, sometimes contain albumin.

- (10) A purulent and albuminous urine, in the case of a renal tumour, is the principal symptom of distension of the renal pelvis.

I must add that in hydronephrosis the urine also contains a certain quantity of albumin, when the communication between the kidney and the bladder is not completely cut off.

- (11) A purulent and albuminous urine becomes glairy, ropy (catarrhal) when an alkali is added.
(12) Urine is alkaline in a certain number of nephritides, without there being a prolonged retention of urine in the bladder.

I would add that the acidity of urine diminishes not only in simple, chronic nephritis, but also in chronic albuminous nephritis.

- (13) If the albuminous urine is charged with a viscous, glairy deposit, it suggests a chronic inflammation not only of the mucous membrane of the bladder or the ureters, the calices or the pelves, but also of the substance of the kidneys. In cystitis and chronic inflammation of the pelves, the urine is purulent but not glairy.

In this proposition and in another cited above (proposition 11) Dr. Desir has expressed the opinion (which I believe well-founded) that, in inflammation of the urinary tracts, a strongly alkaline urine is sometimes secreted, and that the glairy appearance is due to the action of the alkali on the mucus or the pus. When the urine remains acid, this appearance in fact is not evident.

- (14) Albuminous urine, charged with the red colouring matter of blood if habitually voided, is one of the principal symptoms of cancer and fungal tumours of the urinary apparatus.
(15) If a urine, normally without deposit, precipitates with the application of heat and nitric acid a slightly abundant coagulum; if other elements of blood in the urine are or are not present; if this phenomenon continues without fever, with or without pain in the loins; if there is, at the same time, dropsy, however slight it should be, one may say that there exists one of the kidney diseases described above, of which three generally go under the name of "Bright's disease", although it is more convenient to put them under the collective label "albuminous nephritis".
(16) If a similarly albuminous urine is persistently present in a person who does not show signs of other urinary diseases, such a condition is sufficient, in a great many cases, to confirm albuminous nephritis and to anticipate the subsequent development of dropsy.

These two propositions hold true in a great majority of cases. They would have been perfectly exact if Dr. Desir had mentioned two circumstances which were well known to him, since he pointed them out in his thesis, that is, the weak specific gravity of urine in chronic albuminous nephritis and the exception formed by certain diseases of the heart and large vessels.

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- (17) If, after having been excessively abundant, with a more or less sweet taste, the urine becomes coagulable by heat and nitric acid, this phenomenon indicates one of the diabetic states that Drs. Thénard and Dupuytren regard as a first step towards recovery but which others regard as indicative of developing dropsy.
- (18) Finally, the presence of albuminous urine being a characteristic common in several acute or chronic diseases of the urinary tracts, there must be several other additional symptoms or negative signs for it to be of any real significance in diagnosis. Whilst it is useful in the determination of several diseases, it is of major importance in the diagnosis of dropsies and the affections which produce them. It is the most reliable symptom and, during life, the most positive sign of albuminous nephritis. Finally, the presence of albumin in urine, as a sign, can serve as a prognosis in diabetes, to establish the diagnosis of tuberculosis of the kidneys, calices and pelvis and in the recognition of other organic alterations of the urinary tracts.

Dr. Forget¹⁰⁷ who, during his time in Paris, took a keen interest in my research into diseases of the urinary tracts, was made a Professor at Strasbourg after a brilliant career at the Medical School there, and undertook some very interesting research into albuminous nephritis. This he set out in a letter which he did me the honour of addressing to me.

Dr. Forget began his research with the idea that a significant quantity of albumin in the urine of a dropsical patient always indicated one of the renal lesions that I described under the term “albuminous nephritis”. Soon he discovered the exceptions to this rule, and he was keen to point these out, indicating the circumstances which could be a source of error to others. To begin with he cites a case of Bright’s disease, in its purest form, with its symptoms and renal lesions; then, after having reported a characteristic case of this disease which ended in a complete recovery under the influence of an active treatment, he sets against this a case of apparent recovery in which the infiltration disappeared although the urine remained albuminous. Another research served to prove that the disease may exist without dropsy, and that it cannot be suspected during life, if one does not examine the urine with care. But that which above all provides a particular interest in Dr. Forget’s work, are the considerations suggested to him by some cases of albuminous urine that he observed in dropsies consecutive to affections of the heart; it is the sagacity with which he shows how difficult it was to divide affections of the kidneys and of the heart, when they existed simultaneously in a dropsical patient whose urine was albuminous; these are the doubts levelled against the opinions of several English pathologists, who regarded as secondary to Bright’s disease the hypertrophy present in cases of dropsy with renal affection; it is the penetration with which he establishes the diagnosis of albuminous nephritis in a case of pulmonary phthisis accompanied by anasarca and albuminous urine without disease of the heart; finally it is the fully justified response that he makes to those who oppose the idea that one finds albuminous urine in diseases other than Bright’s disease.

“How often,” he asks, “does diagnostic science possess unequivocal, infallible, pathognomic signs? Well then! That which applies in other diseases will also apply in albuminuria; having decided that a particular symptom always indicates an affection of the

¹⁰⁷ Forget, [C. P.], ‘Lettre sur l’albuminurie (maladie de Bright), adressée à M. le Dr. Rayer’, *Gaz. méd. de Paris*, 1837, p. 609.

kidneys, one will specify the cases and describe the exceptions, as for any other symptom, but the fundamental fact remains as a general, if not infallible principle, and science will none the less have achieved a precious victory.” Such a response continues to be valid.

The works of the English doctors on dropsy with coagulable urine, and above all the research of Wells, Blackall, Bright, Gregory and Dr. Christison, had not attracted in France all the attention which they deserved, when Dr. Genest¹⁰⁸ resolved to make them known by summarizing the work which they had done whilst in my service at l’hôpital de la Charité. Dr. Genest set down the state of science with regard to this pathology with great clarity and precision, and thus contributed to the spread of knowledge regarding the characteristics of this affection. There is not a single important detail in the history of this disease that Dr. Genest has not described.

Regarding the assertion of Wells and Blackall on the influence of mercurial preparations in producing dropsy with coagulable urine, he challenged the research I had undertaken with Dr. Desir at l’hôpital des Vénéériens; regarding the opinion given by Dr. Bright that dropsy with albuminous urine did not develop before the age of puberty, he challenged the research of Constant and Hamilton in Edinburgh. He observed, with reason, that Dr. Bright and the Edinburgh doctors had truly described no more than the chronic form of the disease. The fact is, that until then, Dr. Bright’s description had been taken as the general and complete description of the disease. He analysed the symptoms with care, and he recalled a fact pointed out by Dr. Tissot in 1833, and in 1835 by Dr. Desir, a fact which has often been pointed out in my service, that is to be aware that nitric acid could sometimes cause a precipitation in the urine due to the over-abundance of uric acid and urates, a precipitation that heat could cause to disappear and that should not be confused with albuminous precipitates, and it is to be regretted that in later observations this point was not always taken into account. Dr. Genest also describes most carefully my observations on the acute form of the disease, which has not since been described so clearly by any pathologist. Finally he ends his work with some propositions which provide a summary of my opinions on the principal characteristics of the disease:

- (1) Alteration to the kidneys always precedes dropsy, and it sometimes exists for a long period without it.
- (2) Dropsy may disappear and the alteration to the kidneys persist (apparent cures).
- (3) The alteration of the kidneys precedes the alteration of the blood and the serous fluids.
- (4) The anatomical characteristics of kidney lesions, and the symptoms observed during life, demonstrate that this alteration is of an inflammatory nature.
- (5) Antiphlogistic treatments such as bloodletting, milky diet, tepid baths, etc., whilst at first highly efficacious, are often useless at a later stage, as with all other treatments, when the alteration to the kidney is so profound that it appears incurable.
- (6) The development of secondary chronic inflammatory diseases of the serous membranes of the large intestine, the bronchi, cerebral affections, etc., appear due to alterations to the blood, consecutive to alterations to the urinary secretion.

¹⁰⁸ Genest, [J.-L.], ‘Etat actuel des connaissances sur la maladie des reins désignée sous les dénominations de maladie de Bright, affection granuleuse des reins, néphrite albumineuse’, *Gaz. méd. de Paris*, 1836, p. 449.

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In pointing out every day, in his clinical lectures, the importance of well observed facts, sufficiently perfect that science might gather them together, Dr. Bouillaud¹⁰⁹ set himself to assemble with care all relevant particulars. He not only noted the condition of the principal organs and the principal functions, but also paid particular attention to the state of the humours, the blood, the saliva and the urine of virtually all patients presenting at his clinic. He was one of the first to draw attention to the precipitations that nitric acid and heat sometimes cause in the urine of patients suffering from acute affections; such as in pleurisy, in pericarditis, in rheumatism, in typhoid fever, etc., and in several chronic diseases, in certain diabetes, in certain diseases of the heart, etc.; and he also felt that the presence of albumin in urine, being a phenomenon common to several acute and chronic diseases, did not alone signify albuminous nephritis (Bright's disease) and that this important symptom would inevitably be a source of error if other signs arising from the composition of the urine or other symptoms did not come to its aid.

In 1837 Dr. Vincent-Victor Guillemin¹¹⁰ took Bright's disease as the subject of his inaugural thesis; it was the first time that the subject was presented at a public examination at the Medical School of Strasbourg.

The author's object was to make a simple statement regarding the state of the science in this disease, and this he accomplished with success. After having faithfully recalled the research undertaken in both England and France he reported on several well-chosen examples of this affection, gathered at the clinic at l'hôpital de Strasbourg.

The first observation communicated by Dr. Forget is one of a remarkable case of recovery. In Obs. II the dropsy improved but albumin persisted in the urine. Obs. III is a remarkable example of albuminous nephritis preceded by intermittent fever and which, after having been completely cured, was followed by a relapse in which only the dropsy disappeared whilst the albumin persisted in the urine. Obs. IV is a complex case; not only were the kidneys altered, but also unequivocal traces of peritonitis existed which appeared to have followed paracentesis. Finally, in Obs. V one was obliged to practise paracentesis and, the day after the operation, the patient was overcome with violent shivering, succeeded by complete prostration; death occurred some days later.

These last two facts seem to confirm that which I have often observed, i.e. that paracentesis is nearly always useless in such cases; because even though there is no peritonitis after the operation, the effusion of serum in the peritoneal cavity soon appears, and in addition the patients often fall into a state of collapse swiftly followed by death.

One of my students, Dr. Bureau,¹¹¹ after having recalled that one found albuminous urine in several acute and chronic diseases and that Dr. Tissot, in 1833, and Dr. Desir, in 1835, had already noted this circumstance, cautiously expressed his opinion regarding the characteristics by the aid of which one might recognize albuminous nephritis during life:

When dropsy exists, it is necessary to be assured first of all, that the dropsical phenomenon is not connected to any organic disease other than that of the kidneys; and secondly, that there is no other

¹⁰⁹ Bouillaud, [J. B.], *Clinique médicale de l'hôpital de la Charité*, vol. II, p. 270, vol. III, pp. 190, 197, 287, etc., in 8vo, Paris, 1837.

¹¹⁰ Guillemin, [V.-V.], *Essai sur la maladie de Bright*, in 4to, Strasbourg, Feb. 1837.

¹¹¹ Bureau, [J. V.], *De la néphrite albumineuse ou maladie de Bright, affection granuleuse des reins*, in 4to, Paris, 1837.

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cause for the presence of albumin in the urine. Other characteristics of the urine should also be noted, for example, the diminution of specific gravity of the urine and the blood serum, the diminution of the proportion of urea in the urine, the presence of this substance in the blood, etc. Thus, in this disease, as in all others, it is not only on the basis of particular symptoms, but also when they are taken as a whole, that one can establish a definite diagnosis.

Dr. Bureau strongly emphasized the phlogistic nature of the disease.

If you encounter it in the early stages, you find injection, an extraordinary augmentation of the volume of the cortical substance, then anaemia, with or without marbling, a slaty colouring, signs which one knows to be in essence incontestably inflammatory, since one discovers them again in other cases of simple nephritis with deposits of pus . . . In addition, a large number of the symptoms peculiar to this affection are again found in inflammatory diseases, such as the localized pain, evident in certain cases; the febrile state, the inflammatory buffy coat which covers the blood and finally, the greater tendency for the organs to develop intercurrent phlegmasia, as if they had been under the influence of an inflammatory diathesis . . . and the causes under the influence of which albuminous nephritis normally develops; the impression of cold and humidity, the sudden suppression of perspiration, are these not the same grounds which so frequently lead to pneumonia, pleurisy, bronchitis and rheumatism . . .? Lastly, as a final criterion, let us remember the fact established by observation, and be aware that, in the early period of the disease, powerful antiphlogistics are the most successful of all media currently employed.

I differ from Dr. Martin Solon¹¹² on two points, which I believe to be of some importance, namely on the group of diseases which he has assembled under the general title *albuminuria* and also on the nature of Bright's disease. This disagreement does not prevent me from according to Dr. Martin Solon's book the authority which it merits since it contains a host of interesting facts, some relating to diverse anatomical forms of Bright's disease, to the existence of albuminous urine in some cases of heart disease without renal lesions, and in some cases of intermittent fever, exanthema and continuous fevers.

Dr. Martin Solon's work appeared in 1838. It arose in response to the research carried out in England by Drs. Elliotson, Copland, etc., also my own research and notably the remarks published by Dr. Tissot in 1833, and by Dr. Desir in 1835, and the observations of Dr. Bouillaud and of Dr. Forget in 1837, suggesting that urine might contain albumin in a great number of diseases, independent of the disease described by Dr. Bright. What mattered, was clearly to distinguish it from other affections in which the urine similarly contains albumin, and other dropsies in which it may be found incidentally: there was a need to specify the circumstances where the presence of albumin in the urine would really indicate a lesion peculiar to the kidneys. He showed less interest in uniting under the name *albuminuria* other diseases with a common characteristic, i.e. the presence of albumin in the urine.

In adopting this point of view, Dr. Martin Solon was inevitably led, in turn, to describe under the title *albuminuria*, first Bright's disease, then diseases of the heart and inflammations of the mucous membranes of the urinary tracts, in which the urine contained albumin. Today, I find it no more possible in pathology to group a set of diseases under the

¹¹²Martin Solon, F., *De l'albuminurie ou hydropisie causée par une maladie des reins, etc.*, in 8vo, Paris, 1838.

name *albuminuria* any more than it is possible to group under *miliary fever* the diverse diseases of which one of the most salient symptoms will be fairly abundant sweating.

Of the 32 observations of *albuminuria* which comprise the first part of his work, four relate to simple inflammation of the kidneys or the pelvis or to haematuria; the other 28 appertain to Bright's disease.

The observations in the first series that Dr. Martin Solon described under the titles *renal hyperaemia with anasarca* and *albuminuria* (Obs. I, II, III and VII) are the acute cases of Bright's disease. Obs. IV, V and VI are examples of the same disease with affection of the heart. Obs. VIII, in which the urine gave a whitish sediment, clotted, homogenous, and apparently purulent, is evidently a case of pyelonephritis without dropsy, a disease quite different from Bright's disease. Obs. IX is a case of pyelonephritis with cystitis. Finally, Obs. X is a case of haematuria. The last three observations are, in my opinion, incorrectly attached as an appendix to the series of cases that Dr. Martin Solon described under the name of *first degree albuminuria*.

With regard to the ten observations of *second degree albuminuria*, these are cases of simple albuminous nephritis (Obs. XI and XII), of albuminous nephritis complicated by heart disease (Obs. XIII), of sub-acute albuminous nephritis (Obs. XIV), and of chronic albuminous nephritis (Obs. XV and XVI).

The third series (*third degree albuminuria*) contains only a single observation; it is an albuminous nephritis treated with four bloodlettings, under the influence of which the dropsy disappeared but the albumin persisted in the urine.

The second section includes the cases that were fatal. In this section one no longer finds the division of the disease into first, second and third degree albuminuria. The observations are classified according to the presence or absence of renal lesions.

The first series (*albuminuria without lesion of the renal tissue*) includes two observations (Obs. XVIII and XIX); the first appears to be cachexia, the second, endocarditis with albuminous urine.

The second series (*albuminuria with renal lesions*) is separated into several subdivisions; the first (*albuminuria and hyperaemia of the kidneys*) is composed of two observations (XX and XXII). In one (*hyperaemia of the kidneys with albuminuria*), the passage of the albumin very probably depended on a disease of the heart; the second is a true albuminous nephritis in which the renal alteration corresponds to that which I have described as the first anatomical form of this disease. "The kidneys", says Dr. Martin Solon, "were the seat of a considerable hyperaemia and possibly the beginning of inflammation indicated by the colour and the greater friability of the organic tissue."

In another series of studies (*a mixture of hyperaemia and yellow degeneration*) corresponding to my second anatomical form, there is a single case (Obs. XXII), that of a pulmonary phthisis with albuminuria and anasarca.

The third series, which corresponds to my third anatomical form, is entitled: *dropsy with albuminuria, yellow degeneration of the kidneys* and contains four cases. The first is remarkable in that the atrophied left kidney was only an inch in length by a fraction of an inch in width. The case should be compared with a case reported by Dr. Christison where one of the kidneys was almost entirely atrophied by the development of an enormous cyst,

and another case reported in my practice (Obs. xxvi) where there was a complete absence of one of the kidneys.

Obs. xxiv is a good example of a yellowish swelling of the cortical substance of the kidneys, which were about a half inch thickness in the narrowest parts and slightly more than a half inch in many of the others. The patient had a white tumour on the knee and pulmonary tuberculosis. Obs. xxv is similar case in a consumptive patient; Obs. xxvi is another example of this form of renal lesion, with abortion at three and a half months of pregnancy.

The fourth series (*the albuminuria and granulous production described by Dr. Bright*) corresponds to my fourth anatomical form and is comprised of a single observation (xxvii). It is a case of albuminous nephritis complicated by heart disease.

The fifth series (*albuminuria, variable degeneration of the renal tissue and accidental prolongations*) comprises two cases ending in death. In one there was no autopsy (Obs. xxix), the other (Obs. xxviii) is possibly a case of albuminous nephritis, complicated by pulmonary phthisis, a stomach cancer and an infiltration of the tubercular or cancerous matter into the tissue of the kidneys, the cortical substance of which was pale and of a yellowy colour. Dr. Martin Solon considers these kidneys as representative of his fifth degree of albuminuria, but is it possible to consider as a form distinct from Bright's disease, the yellow degeneration of the kidneys with coarse miliary tubercles, above all when only a single case has been found, in which there were also tubercles in the lungs and a cancer of the stomach?

On the other hand, in my opinion Dr. Martin Solon did not have to separate the anatomical characteristics of albuminous nephritis, *the hard marbled and embossed state of the kidneys* described by Dr. Bright as the third stage of the disease, and in my classification, the sixth. The fact is that this hard state of the kidney is the final product of the morbid changes of which renal hyperaemia is the first. The frequency of this anatomical lesion in chronic albuminous nephritis is so great, that nearly all observers have reported examples. Above all, this induration should not be confused (and included under a single form) with degeneration that may be tuberculous or cancerous, with cysts, or simply, with every alteration that one may incidentally discover in the kidney. These incidental alterations cannot constitute either a form, or a pathological variety of the disease. The tubercular and cancerous degeneration of the kidney are a local expression of diathesis completely different to albuminous nephritis, whilst induration is one of its terminal states.

I now come to the second point in my discussion of Dr. Martin Solon's work, i.e. the nature of Bright's disease. And here, Dr. Martin Solon himself presented arguments favourable to my opinion, which I include herewith.¹¹³

It is worth noting that a great number of Dr. Martin Solon's observations are entitled: acute nephritis (Obs. vii) or sub-acute (Obs. xiv, xvii, xxiii, xxiv) or chronic nephritis

¹¹³ In a great number of passages, Dr. Martin Solon describes the symptoms, the lesions and the effects of the remedies which prove the inflammatory characteristics of the disease. In Obs. iii he says that "the lengthy duration of the loin pain experienced by this patient makes one think that his slight albuminuria was caused by a renal irritation accompanied only by hyperaemia, but which would have been followed by sub-acute nephritis and possibly by degeneration, had one not halted the disease process."

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(Obs. xvi, xxviii) or latent nephritis (Obs. xii, xiii, xv, xxvi, xxvii); that, in these observations, one finds symptoms of Bright's disease, and that at post mortem the kidneys have shown lesions characteristic of this disease in its different stages. Now according to the titles which he gave to his observations, and according to certain remarks which accompanied them, it is clear that Dr. Martin Solon, like nearly all practitioners, had been struck, in a great many cases, by the phlogistic appearance of the disease. Also, he says, in his general description, that in this affection: "the kidney becomes the seat of a morbid state which is indeed of an inflammatory nature, but that which one calls sub-acute, latent, and which does not manifest itself on the outside by any sympathetic phenomenon" (p. 261).

Dr. Martin Solon, in other passages of his work, contests the inflammatory nature of this disease, and, in the meeting of 8 October 1839 of the Royal Academy of Medicine,¹¹⁴ he

In another (Obs. vii) he says that "In place of a simple hyperaemia, it is evident that an inflammation of the renal tissue has developed in this patient: there is no other inflammation. Anasarca and ascites clearly appear to be caused by the sole influence of a morbid condition of the kidneys. This has prompted us to place this observation among the cases of acute albuminuria or acute dropsy caused by disease of the kidneys. Antiphlogistics and rest have shown the most favourable results in such inflammation and its effects up to the present time. The rapid termination of all these events has given us hope that morbid processes will not develop in the kidneys and that there will be no recurrence of dropsy." Dr. Martin Solon expresses more or less the same opinion in other passages (Obs. xvii). "In fact, we see," he says, "this decline immediately leads to loin pain, undoubtedly caused by hyperaemia, then inflammation of the kidneys. We see this disease as aggravated by excessive work, the ingestion of cold drinks, then the anasarca manifests itself and the albuminuria becomes evident. This case, therefore, can be counted amongst those in which the kidneys are the point of departure and the principal site of the disease."

And later (Obs. xxiii) he says, "The renal degeneration in this case is evidently independent of all other lesions, the state of the heart could not have any influence on it. Should it be attributed to a latent nephritis determined by the decline in the patient? The successive incidences which followed this decline and the absence which followed the absence of all other causes lead one to think so. It is also possible that, burdened by the function of its congenital underdevelopment, this kidney would more easily become the site of over-irritation, which, whilst remaining latent, has none the less been capable of altering its nutrition; nevertheless, in this patient, as in some others, one is tempted to consider that a sub-inflammatory process had led to the development of the observed disorder." And further on (Obs. xxiv), "Was the anatomical condition observed in this woman due to an old inflammation of these organs? The pain experienced for so long in the lumbar region makes it a possibility."

And finally (Obs. xxv), "the lively pains suffered in the lumbar region before the appearance of complete oedema suggest that, in this patient, the renal degeneration had reached an inflammatory state during the lying-in period."

And elsewhere he says, "In the first state there is renal hyperaemia, sub-inflammation, and latent inflammation, in the other, alteration of the nutrition, organic degeneration and development of incidental products" (op. cit., pp. 275 and 276). Is it not clear that Dr. Martin Solon, in these passages, as in several others, appears to share the opinion previously set out by several of my students, that the kidney is inflamed in the first period of the disease? Only the expressions that he uses, such as "sub-inflammation" and "latent inflammation" prove that he regards this type of inflammation as completely distinct from simple nephritis, which is incontestable. In another passage he insists even more strongly on the dissimilarity of the disease from ordinary inflammation. "Even though the patient has in no way experienced pain in the lumbar region, one recognizes however, on examination, that the kidneys have been the site of a considerable hyperaemia and possibly of the commencement of inflammation which is indicated by the colour and greater friability of the organic tissue. However, this will not be such as to produce an inflammation as to determine hypertrophy of the tissue, that hyperaemia will seem to be destined in this disease, as one does not observe the normal consequences of an inflammatory process" (op. cit., p. 133). With regard to incidental occurrences (tubercles, cancerous matter, etc.), Dr. Martin Solon is wrong I believe to indicate them as an ending, as a form of Bright's disease; they are completely different.

¹¹⁴Meeting of 8 October 1839 of l'Académie royale de médecine: "Dr. Martin Solon thinks that Dr. Rayer's expression is wrong for several reasons: 1. There are several cases of ordinary nephritis in which the urine shows itself to be albuminous, 2. Bright's disease is not a nephritis and one must be determined to find inflammation all over in order to see one of the kidney alterations described under this name." (*L'Expérience*, vol. v, [1839], p. 241).

spoke out most strongly against the denomination *albuminous nephritis*, which I had given to this disease of the kidneys. At the same meeting he showed a kidney of enormous volume, which weighed 12 oz and of which the cortical substance was transformed into a yellowish tissue without granulation. "This kidney," he said, "is no longer hyperaemic but it has been formerly."

Previously, Dr. Martin Solon had said,¹¹⁵ "Dr. Rayer had thought to establish a large difference between this last affection (nephritis) and the first (Bright's disease) in calling the latter *albuminous nephritis* . . . we do not say", continues Dr. Martin Solon, "that albumin exists in the urine of all the patients affected with nephritis, but it appears to us likely that, in the majority of nephritides, the urine will be albuminous; since we can affirm that it had this characteristic in four of the patients struck by acute or chronic nephritis, the only ones which we have observed for several years."

If it is true that the nephritides, of whatever type, should be accompanied by the passage of albumin in the urine, this will prove, not that I was wrong to call Bright's disease "nephritis" but that I was wrong to call it *albuminous*. Let us see, however, if there are not some observations to make on the cases of nephritis with albuminous urine reported by Dr. Martin Solon. In fact, in the cases which he cites, the presence of albumin in the urine depends on the mixture of the urine with pus or purulent mucus, produced by an inflammation of the excretory conduits of the kidney, and the albumin did not result from the inflammation of the renal substance itself. In this case it finally develops into a true pyelitis. Albuminous urine produced by a mixture with pus cannot be confused with the albuminous urine rendered in Bright's disease (a distinction that Dr. Desir had already mentioned in his thesis in 1835); therefore it is with other facts that the passage of albumin in the urine should be established, in certain cases of simple nephritis.

An argument apparently of greater value, and contrary to my opinion, is reported by Dr. Martin Solon, when he establishes a comparison between simple nephritis and Bright's disease. In the first, he says, there is a deep and severe pain in the lumbar region, nausea, vomiting, but no infiltration of the lower limbs; in the second, very little lumbar pain, often no nausea, or vomiting, but more or less prompt infiltration of the lower limbs.

I have never said, nor have any of my students, that Bright's disease is the same inflammation as that which constitutes simple nephritis. Consequently, if Dr. Martin Solon demands identity between the symptoms of the two affections (simple nephritis and albuminous nephritis) it is altogether irrelevant. But if he contents himself simply to argue the dissimilarities, he wishes to show that they are by nature absolutely incompatible, I shall recall some facts which prove that there is nothing and that, if there are dissimilarities, there are also important similarities. And furthermore, all simple nephritides are not accompanied by the same symptoms. One sees acute nephritis, similarly bilateral, appearing following retention of urine or after cutting for stone, to be without sharp pain in the lumbar region, without nausea and without vomiting. On the other hand, it is not entirely correct to say that there is no nausea or vomiting in albuminous nephritis; these occurrences are, on the contrary, one of the most frequent secondary symptoms of the disease. Another point: when one sets one type of nephritis against another in order to show the differences, it is necessary to set an acute against an acute—a chronic against a chronic.

¹¹⁵Op. cit., p. 246.

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Since, if you set a simple chronic nephritis against a chronic albuminous nephritis you will find that there is little or no lumbar pain in either; that the specific gravity of the urine is inconsiderable in both; that nausea and vomiting are not only not more frequent in simple chronic nephritis than in albuminous nephritis, but also that one observes them more frequently in the latter; that if, in simple chronic nephritis, the urine is often alkaline, it is normally slightly acid and sometimes alkaline in chronic albuminous nephritis, that in both types, one has found urea in the blood. Finally that the development of dropsy and the consistent presence of albumin in the urine, are the two characteristics which separate the two types one from the other.

As for the uselessness of antiphlogistic treatments at certain stages of albuminous nephritis, and similarly the ineffectiveness of bloodletting against the secondary symptoms caused by a primary phlogistic process, is this different to other inflammations? Is there not, on the contrary, a common characteristic? Similarly the chronic testicular engorgement following orchitis; the intestinal ulcerations and indurations in chronic dysentery; and the purulent or non-purulent pleural effusions and the alterations of blenorragia and chronic cystitis and finally, chronic inflammations, primitive or secondary to acute inflammations, are they no longer to be considered inflammatory because bloodletting neither cures nor aggravates them? If, in albuminous nephritis, as in simple nephritis, following chronic inflammation, the kidneys become hard and mammillated and the disease no longer yields to the bloodlettings which no one recommends in similar lesions, is it surprising that they are resistant to nearly all therapeutic agents? Does the success of small bloodlettings, recommended by Dr. Martin Solon, prove that the disease is not inflammatory? The repeated bloodlettings, again advised by him, when the blood is often covered with an inflammatory buffy coat, is this not an additional fact which, with several others, testifies to the phlogistic nature of the disease?

In the acute form, and nearly always at the beginning of other forms, the inflammatory nature of the disease has been recognized by all observers, and by Dr. Martin Solon himself.

As in nearly all inflammations one sees in albuminous nephritis, which is initially latent then passes to a chronic state, the acute inflammatory symptoms are missing or have disappeared, and have been replaced by others of an asthenic type and by an apparent healthy state.

As in all inflammatory diseases, the inflamed organ shows alterations in appearance and its structure, alterations such as easily provide analogies in other organs: hyperaemia is succeeded by discolouration and a morbid deposit (granulation) and later by induration. It is true that, in this type of nephritis, one does not see (or at least so rarely that this may be considered altogether exceptional) pus deposited in grains or infiltrated in the renal substances. Without doubt this is a remarkable anatomical peculiarity of albuminous nephritis. But this fact is not without analogy: does one not see deposits of plastic lymph as being one of the peculiarities of rheumatoid nephritis, and the bloody and fibrous deposits to appertain almost exclusively to certain nephritides caused by morbid poisons?

I add, that it is not a disease in the course of which the phlogistic diathesis will be more pronounced, or in which it shows in a greater number of areas and under a greater number of forms; that whether or not this inflammatory diathesis is consecutive to an alteration of

the blood, the fact is (and observation further attests to it), that in the course of albuminous nephritis, inflammation multiplies with truly frightening ease and variety.

Up to now, I have confined myself, as has Dr. Martin Solon, to the area of induction: I have argued the similarities between Bright's disease and simple nephritis and the other inflammations; he has argued the dissimilarities. But should the question remain solely in that area? No, without doubt one must then move on to an examination of the diseased kidneys themselves. So, in the first form of albuminous nephritis, the kidney is red, tumefied, sometimes painful; if one does not know that it is hot, one knows at least that this state is accompanied by fever. I ask then, in the present state of knowledge, and employing the language of pathological anatomy, is this not an inflammatory condition? Now, in order to prove that the chronic as well as the acute form is of an inflammatory origin, it suffices to demonstrate that the renal alterations of the chronic form arise from the renal alterations of the acute form.

Nobody has demonstrated with greater clarity than Dr. Littré¹¹⁶ the chain of different anatomical lesions which one observes in the kidneys, following albuminous nephritis; I conclude by reproducing what he said in 1837, before the publication of Dr. Martin Solon's work:

In the first form of albuminous nephritis, the volume of the kidneys is augmented; in an adult their weight may increase to 8 or 12 ounces in place of their mean weight of 4 ounces. Their consistency is firm without hardness, like that of kidneys swollen by a watery injection; their surface, which is a vivid red, is spotted with a large number of small red points, deeper than the overall colour of the organ. On cutting one immediately recognizes that the enlargement of the kidney is due to the swelling of the cortical substance. Internally, this substance presents a large number of small red points similar to those which one sees externally and which correspond, for the most part, to Malpighian corpuscles, strongly congested with blood.

Let us stop a moment to consider the characteristics of this description, or glance at the figure given by Dr. Rayer. We have the swelling of the organ, very often considerable; also we have a general redness which indicates a no less general hyperaemia; the entire cortical substance is engorged with blood. If one adds to these considerations the fact that, in the living, the kidney is painful and that pressure on the loins induces this sensitivity; if one recalls that an antiphlogistic regime is undeniably beneficial in the early stages and that the blood produced by the bloodletting practised at this time is covered with a buffy coating, one will recognize that the morbid state of the kidneys described above is a truly inflammatory state with all the characteristics described by the pathologists, and one will agree with Dr. Rayer on the nature of the anatomical lesion which he has drawn, described and defined.

From this form, with such clearly marked characteristics, one must move on to subsequent forms which, according to the pathological work undertaken at the core of them, are quite different from this original form. In order to find the link between those which are apparently so different, one must discover the intermediate gradations which remove all that is arbitrary in the comparison and the analogy.

If the autopsies expose kidneys where the redness and sanguineous engorgement subsists in certain parts and has in others given place to appearances normally encountered exclusively in even more remote forms, it will be permitted, in the light of experience, at least to link the state where the inflammatory characteristic is the least evident, to the state where the inflammatory characteristic is the most manifest. This is the condition which Dr. Rayer has described as the second form. The

¹¹⁶*L'Expérience*, vol. 1, p. 60, in 8vo, 1837.

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volume and the weight are augmented as in the first form; but that which appertains specifically to the second is a very noticeable mixture of anaemia and hyperaemia, the marbled appearance of the surface of the kidneys produced by the pockets of red, spread over a base of a whitish-yellow. On cutting, the swollen cortical substance is pale yellowish in colour, flecked with red, and it stands out strongly from the tubular substance, of which the colour is a reddish brown.

This established, and a point of departure having been found between the state where the phlegmatic appearances are manifest, and the state where such appearances are less defined, the rest follows on naturally; and there is no great pressure to assimilate other lesions of albuminous nephritis to the general products of inflammation, nor to connect to a common work or a successive transformation the various disorders which are anatomically essential to this affection.

Thus, when the volume and weight of the kidney is augmented, even when one no longer sees either blotches or marbling, even though the cortical substance is of a uniformly pale colour, of a whitish rose, slightly yellowish tint, or an even paler colour like that of eel's flesh (third form), nevertheless one knows that this state is only a more pronounced degree of the second form, where the sanguineous engorgement is even slighter but a discoloured tissue remains, still swollen and full of the remains of an inflammation, where the resolution has made no progress. This discolouration, which may make the anatomist hesitate, even in the presence of augmentation of both the volume and the gravity, is a natural development of the lesion which constitutes the origin of albuminous nephritis. It is distinguished by an overall, intense redness and it has passed through the marbling to arrive at a colour which we see in the third form.

That which I will say regarding the third form applies exactly to the fourth, which has been specified by Dr. Bright under the title "granular kidneys". As in the preceding form, these organs are more voluminous and more weighty than in the healthy state; their external surface, most frequently a pale yellow, is dotted and sometimes covered by small blotches of a milky white, slightly yellowish colour, the size of a small pinhead, often linear and resembling fairly closely the small milky curds which will be scattered irregularly in a fairly large number on the surface of the kidneys. All is concealed by a very thin veil, through which they appear to be under a varnish. The surface of the kidneys is completely smooth. Sometimes these little milky blotches (Dr. Bright's granulations) are rare in the thick part of the cortical substance and abundant on the surface. Sometimes, on the contrary, the granular alteration invades the whole depth of this substance. When one separates the kidneys from their convex side towards their fissure, the cortical substance presents, as in the second and third form, an overall yellowy anaemic colour which contrasts strongly with the red of the tubular substance. The swollen cortical substance occupies a much larger space than in the healthy state, particularly in the extension between the pyramids. In this description, one again finds everything that characterizes the product of an inflammation; swelling, augmentation of weight and graduated transition of a considerable sanguineous injection, to a generally anaemic and yellowish colour. But another characteristic also appears; the milky pockets disseminated at the surface and in the interior of the cortical substance and improperly called "granulations".

With the aid of Dr. Rayer's research, and in the setting down of these ideas, I have overcome all that is difficult in this discussion. It is no longer necessary to insist on the equally inflammatory nature of the two last forms. The fifth, more rare than the preceding, also causes an increase in the volume and the weight of the kidneys. That which is above all characteristic is a particular appearance, which one cannot better describe than by saying that a great number of little grains of semolina appear to be deposited underneath the cellular membrane itself.

Finally, in the sixth form, which appears to correspond to the third variety described by Dr. Bright, the kidneys, rarely more voluminous and sometimes even smaller than in the healthy state, are hard and present irregularities on the surface. Here, one distinguishes few, or no, milky blotches, but on cutting, one nearly always discovers a certain number in the thick part of the substance.

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This then is the gathering together and general review of the quite remarkable alterations that anatomical pathology has revealed to us in the texture of the kidney. Dr. Rayer thinks that the six principal forms that he has described are, in anatomical terms, successive. To this proposition of Dr. Rayer's I will add not a restriction, but a distinction; and this distinction suggests itself on examination of the plates, produced with such precision that he has submitted them to public examination. In fact, if, for example, one considers Fig. 4 of Plate VIII, one sees a kidney, more enlarged than in the healthy state, strewn with pockets or granulations, but at the same time red and hyperaemic. It appears then that the kidney passes from the sanguineous and inflammatory engorgement of the early period to a granulous state without going through the second and third forms. So it appears that the particular inflammation that constitutes albuminous nephritis is being established with all its characteristics, to follow subsequently two directions, two anatomical metamorphoses, the one manifesting itself by a yellowish anaemia without granulations, the other manifesting itself in the granulations themselves. That which precedes all other lesions is the red engorgement of the kidney, with augmentation of weight and volume; that which succeeds it is sometimes the development of a tumefied rather than anaemic tissue. These two forms appear not to come one from the other, but may arise one from the other immediately the inflammatory engorgement has begun. We note, in fact, that in these diverse transformations, the lesion should essentially remain the same because albumin continues to pass in solution in the urine from the first to the last form, whether the kidney be large and red, or large and colourless, whether or not it contains granulations. The granulations are no more than accessory and their presence is by no means indispensable to the production of the pathological phenomenon which consists of the secretion of coagulable urine.

Several authors have believed that with the aid of skilful or microscopic anatomical observations, they could discover which are the principal elementary tissues affected in albuminous nephritis, and on follow-up, the nature of the affection. Dr. G. Valentin,¹¹⁷ having examined microscopically two infant kidneys, of which the external surface showed pockets of ashy grey, disseminated in the middle of the yellow coloured cortical substance, said: "The straight canals (urinary conduits) of the tubular substance were empty or contained no more than a small quantity of a very liquid substance. The flexuous conduits (convoluted tubules) of the cortical substance were almost entirely blocked with a greyish yellow matter, which had injected them in some measure and made them very visible. If one examined a very thin coating of this substance under the microscope, with a greater enlargement and a strong light, one recognized the convolutions of the urinary conduits. Their diameter, in the cortical substance, was at least 0.0035 of an inch, and in the tubular substance 0.0054 of an inch. The convolutions of the canals showed nothing abnormal. One of the kidneys was very finely injected, but the distribution, neither of the diameter of the blood vessels nor the Malpighian corpuscles, showed the least alteration.

"The yellowish grey substance which filled the flexuous urinary conduits was composed of granular particles, irregular, and of variable volume, of small molecular bodies and yellow globules circular in form. The right urinary canals contained the same matter, only in a much smaller quantity.

¹¹⁷ Valentin, G., 'Examen microscopique des granulations des reins', *L'Expérience*, vol. 1, [1837], p. 366. Extract from *Repertorium für Anatomie und Physiologie*, 2nd vol., 2nd cahier, 1837, p. 290.

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“In this subject, the testicles were remarkably small and contained granular globules of 0.004 of an inch in diameter and very small globules possessed of a very powerful molecular movement.

“The diameter of the seminiferous vessels was 0.002 of an inch. In the epididymis there were very few granular globules, the small bodies endowed with movement were found in a small number. The diameter of the conduit, given to its mean, was 0.006 of an inch.

“If I am not mistaken,” said Dr. Valentin, “it appears from this examination that, in this case, the kidneys are no more than the receptacle of the urine, modified in its composition; they do not appear altered to the naked eye and in future it is in the blood itself that one should seek the cause of the changes that have taken place in the secreted liquid. Are we not already certain that urea is secreted elsewhere than in the kidneys?”

Dr. Valentin is too hasty, it appears to me, in promulgating a general theory about the disease after a microscopic inspection of one of its forms and after a single observation. Dr. Valentin says that the blood vessels and the Malpighian corpuscles do not show any change; but this integrity is not present in all cases, and I have thus observed and drawn the Malpighian corpuscles, altered and replaced by small vesicles. And regarding the fact that the urinary conduits of the cortical substance and the epididymis were filled with granular globules, one cannot definitely conclude that there had been a general alteration of the blood, particularly since Dr. Valentin did not say he personally had confirmed this alteration in the blood. Moreover, in the other forms, it is not demonstrated that similar facts had been noted regarding the disease or that other phenomena in connection with an alteration of the blood had been seen.

On the other hand, Dr. Gluge’s microscopic observations of Bright’s disease¹¹⁸ do not agree with Dr. Valentin’s. According to Dr. Gluge, the kidney degeneration consists essentially in a problem with the circulation, in the capillary vessels of the cortical substance, and particularly in the Malpighian corpuscles. “This problem,” says Dr. Gluge, “is due to a stoppage of the circulation; the blood corpuscles lose part of their substance, then they collect and impede the blood flow; then follows imbibition of the serum in the urinary conduits, albuminous urine and dropsy.”

Dr. Corfe attributes the whitish granulation that one observes in the kidneys to a deposit of fat or of stearine in the conduits of the cortical substance, which he calls *oily*. I will not linger over this hypothesis; I prefer to note that this author cites several cases of dropsy with coagulable urine, one of which is very acute and quickly fatal, in which the kidneys are of a very deep colour resembling that of the spleen.¹¹⁹

IV. Conclusion

After having read this summary, nothing can deny that, if the ancients had not completely ignored that dropsy could have its source in an alteration of the kidneys or of the urinary secretion, that if the Arab physicians had again more clearly grasped the connection between certain dropsies with renal lesions and tenuous urine, that if, since the Renaissance, certain isolated, scattered and unconnected facts, had been brought together

¹¹⁸ Gluge, Gottlieb, *Anatomisch-mikroskopische Untersuchungen zur allgemeinen und speziellen Pathologie*, first cahier [Minden], 1839.

¹¹⁹ Corfe, G., *A popular treatise on the kidney*, in 8vo, London, 1839.

to verify these reports, nothing, in my opinion, can deny that these facts would not have remained obscure despite the vehement declamations of van Helmont; whilst the experiences of Cotugno and Cruickshank on the coagulability of urine in certain dropsies, fertilized and brought into the domain of Science by the research of Wells and Blackall, finally led to Dr. Bright's important discovery, i.e. renal lesions producing dropsy with coagulable urine.

Having arrived at the end of my work on albuminous nephritis nothing remains but for me to draw the reader's attention to certain points in the history of this disease. And first, the considerable differences that it shows in its acute and chronic form should be noted; differences which, I think, I must insist have not been clearly explained, and that one has for far too long and too generally thought that Bright's disease was an *organic* affection. This opinion has been the source of grave errors with regard to the nature of the disease and its curability; it led to discussions which, having no true foundation, offered nothing.

The constitution of urine (an important fact to note and retain) is not the same in both forms. All observers have given, as an important characteristic of the urine in Bright's disease, the diminution of the specific gravity of the urine, and not only does this diminution not occur in the acute form, but also the specific gravity in this last form is very often above that of healthy urine. This distinction of the two forms of this disease was, above all, especially necessary, since the antiphlogistic treatment, so often efficacious in the acute form, is generally ineffectual or useless in the chronic form.

The pathological physiology, in these researches on the production of dropsies, will have to take into serious consideration the phenomenon of albuminous nephritis. Because if this disease shows that affections of the kidney play a role in certain cases in the production of the serous effusion, it shows at the same time that the mechanism is still unknown. One may think, and has in fact thought, that as the albumin passes through the urine the blood becomes thin and in this way gives place to dropsy; but this explanation does not stand up in face of the facts. It is certain, on the one hand, that in albuminous nephritis following scarlatina, the patient quickly becomes dropsical, before the loss of albumin has become too considerable, and on the other hand, that in haematuria, endemic in tropical regions, the affected person produces albuminous urine over a period of many years, sometimes throughout their whole life, without becoming dropsical. It is necessary then to acknowledge that we ignore how, in Bright's disease, dropsy is connected with the loss of albumin.

Finally, I will close by adding here a remark which experience confirms more and more, and which I have probably not indicated before with sufficient emphasis. The connection which links albuminous nephritis with scarlatina has made me think that both conditions require careful surveillance during convalescence, if one has succeeded in bringing the patient to that state. I think that (and this is the practice to which I now conform) when one has successfully treated a person suffering from albuminous nephritis, when dropsy has disappeared from the body cavity, when the urine not only no longer contains albumin, but also has completely regained its natural composition, it is necessary to keep the patient sheltered from harmful situations and particularly from cold and damp. I believe one will thus avoid many fatal relapses, so much to be feared in this disease. These precautions hold good for all patients, and above all for those who, as soon as they leave our hospitals, return to their exhausting work, and find themselves exposed once more to influences most prejudicial to a sustained recovery.