LECTURES ON THE PATHOLOGY, DIAGNOSIS, AND TREAT- MENT OF BRIGHT'S DISEASE.

By GEORGE JOHNSON, M.D., F.R.S.,
Physician to King's College Hospital; Professor of Medicine in King's
College, London; etc.

LECTURE II.—Concluded.

Varieties of Acute Bright's Disease: 1, with epithelial desquamation (desquamative nephritis); 2, without desquamation, and with or without small hyaline casts; 3, with exudation-cell casts, with or without epithelial desquamation; 4, without albuminuria. *Changes in the Blood.*—*Etiology.*—*Diagnosis.*—*Prognosis.*

I HAVE described to you the usual course of acute Bright's disease associated with a copious desquamation of renal epithelium. For this form of disease, I originally proposed the name of *acute desquamative nephritis* (*Med.-Chir. Trans.*, vol. xxx, p. 170). This acute desquamative nephritis is the most common and typical form of acute Bright's disease. But the term acute Bright's disease and acute desquamative nephritis are not strictly synonymous. There are cases of acute Bright's disease with dropsy which, in all their general features, resemble the cases which I have described as acute desquamative nephritis; but they differ in this respect, that from first to last, whether they terminate in recovery or in death, there is no evidence of that process of renal desquamation which forms the characteristic anatomical feature of the cases to which I have before referred. The urine is as scanty and as highly albuminous as in the other class of cases; but it either contains no tube-casts, or it contains, in variable numbers, the small hyaline casts (see Fig. 8), moulded within the clear canal of tubes which retain their lining of gland-cells. When the disease terminates fatally, the kidney presents to the naked eye the same appearances which characterise the acute desquamative cases; but, on microscopic examination, the sections of the convoluted tubes appear very different. The gland-cells are unusually bulky, granular, and opaque; but the central canal of the tube, instead of being filled with desquamated epithelium, is clear and open; so that, while the "cloudy swelling" of the epithelium renders the margins of the tubes darkly granular and opaque, the epithelial nuclei being indistinctly seen or even quite concealed, the central canal of the tube appears comparatively light and clear. (Fig. 12.)

Fig. 12.—Sections of Tubes having Dark Granular Epithelium, with the Central Canal clear.— $\times 200$.

In other cases of acute Bright's disease, the urine contains few or no epithelial casts; but it deposits a sediment in which are found numerous casts, mostly of the small size which indicates that they have been formed within the central canal of tubes, which are lined by gland-cells; and these small casts contain numerous round cells, which are identical in appearance with pus-cells and with white blood-cells. (See Fig. 13.) I formerly called these "pus-casts"; I now call them "exudation-cell casts". The name "pus-cast" is suggestive of suppuration and the formation of abscess; but no such destructive process is associated with the appearance of these exudation-cell casts in the urine. These casts are not unfrequently mixed with epithelial casts in cases of acute Bright's disease; but in several instances I have seen them in great numbers unassociated with epithelial casts. I have not been able to discover the exact source of the cells by a microscopic examination of the kidneys; but, since the publication of Cohnheim's researches, it has occurred to me

that these exudation-cells may probably be white blood-cells—leucocytes—which have migrated through the walls of the Malpighian capillaries, and subsequently become moulded into small cylindrical casts within the central canal of the convoluted tubes.

Fig. 13.—Casts entangling small round Exudation-cells, from a case of Acute Bright's Disease. *a* and *b*. Small casts. *c*. A large cast. *d*. Scattered cells.— $\times 200$.

In some cases of acute Bright's disease, the exudation-cell casts are of large size. (See *c*, Fig. 13.) This would indicate that the cast had occupied the whole diameter of the tube, and so had replaced the epithelial lining of the tube. In some cases, the exudation-cell casts are present from the commencement of the disease; in other cases, the epithelial casts, which were seen at the beginning of an acute attack, are gradually replaced by the exudation-cell casts, which in their turn become mixed with and replaced by epithelial casts during the progress of recovery and before the final disappearance of all morbid products from the urine. I am now describing phenomena which, when I had ample time and opportunity, I have again and again observed and noted, and which you may see for yourselves if you will diligently study the microscopic characters of the urine from day to day during the progress of acute Bright's disease. Moreover, I have a permanent record of the phenomena, in the form of actual specimens of the tube-casts, which retain their characteristic appearances after having been kept for years as microscopic objects.

You see, then, that while acute Bright's disease is usually associated with a more or less copious epithelial desquamation, there may be no desquamation of renal epithelium, and either no tube-casts or only small hyaline casts in the urine; while in other cases, either with or without epithelial casts, there may be casts crowded with small exudation-cells. The appearances which I have described are sharply defined in some cases, while in others they gradually merge into each other. Epithelial casts and desquamation may be abundant or entirely absent, or present in moderate amount. The casts with exudation-cells may be numerous and unassociated with epithelial casts, or the two forms of tube-casts may be combined with and replace each other in variable proportions. It is certainly interesting, and, I think, of some practical importance, to note these different appearances in the urine.

In all the cases of acute Bright's disease to which I have hitherto referred, although the microscopical appearances in the urine are various, the general symptoms and the physical and chemical characters of the secretion are alike, and in particular the presence of a large amount of albumen is a constant phenomenon. Now, I have to tell you that we sometimes, though rarely, meet with cases of acute general dropsy in which the urine, although scanty, contains not a trace of albumen. In the great majority of cases, acute Bright's disease and acute albuminuria are synonymous terms; but in these few exceptional cases the latter term is inapplicable, for the urine is not albuminous. Dr. Blackall described two cases of acute general dropsy after scarlet fever in which the urine was not coagulable either by heat or by nitric, or, as he calls it, "nitrous" acid (*op. cit.*, p. 12 to 21). Dr. Roberts gives the history of two cases after scarlet fever, both fatal—one acute, the other chronic (*On Urinary and Renal Diseases*, pp. 24 and 400). Dr. Basham has recorded the case of an adult in whom general dropsy followed exposure to wet and cold. He recovered (*Lancet*, August 1867). And I have notes of four cases that have come under my own observation. Three of these cases recovered, and the fourth was im-

proving when he was lost sight of. In two of my cases, the dropsy followed scarlet fever, and in the other two it was probably a result of exposure to cold. In two of the cases, neither albumen nor tube-casts could be discovered throughout; in one, a trace of albumen was found on one occasion; and in the fourth, after general dropsy had existed for six weeks without albumen or tube-casts, a trace of albumen and some hyaline casts appeared.

Now what is the explanation of these rare, remarkable, and exceptional cases? I have neither seen nor heard of any satisfactory explanation of them, and I am not prepared to give you one; but I venture upon one or two suggestions and queries. There is reason to believe that suppressed action of the skin is a powerful concurring cause of the dropsy which is associated with albuminuria; and this, perhaps, is the explanation of the frequent association of dropsy with the renal disease which results from scarlet fever or from exposure to cold and wet. In both these classes of cases, the functions of the skin must obviously be more or less impaired—in the one by the specific inflammation, and in the other by cold; whereas diphtheritic albuminuria, without implication of the skin in the morbid process, rarely if ever gives rise to general dropsy. Then the question arises, Is it possible that suppression of the cutaneous secretion may alone cause acute general dropsy without the implication of the kidneys? May acute general dropsy result from a metastasis of the perspiration from the skin to the areolar tissue and the serous membranes? And may the scanty secretion of urine in these exceptional cases be a result of the morbid transfer of water to the tissues where the dropsical effusion takes place, as, by a reversed action, the perspiration is checked and the skin of a diabetic patient rendered dry by the copious flux of liquid through the kidneys? I am not prepared to answer these questions. In most cases of acute dropsy without albuminuria, the urine has been scanty and high coloured. In one of Dr. Roberts's cases, the urine was scanty almost to suppression, only two drachms having been voided in twenty-four hours; "it contained casts, but not a trace of albumen." The form of tube-casts is not mentioned. The total quantity of urine voided during the last seven days of life amounted to between six and seven ounces. No autopsy was permitted. In the second case, the urine contained neither albumen nor casts; but it was scanty and high coloured; and, death having occurred after an illness of five months, "the kidneys were found to be good examples of the smooth white Bright's kidney." In this case, it would seem that, although there was no albuminuria, there was some structural change in the kidneys. Dr. Wilks has published in the sixth volume of the *Pathological Transactions* a remarkable case of general dropsy, with a peculiar form of renal disease, but without albuminuria, in a woman aged 35. The urine passed amounted to about twelve ounces in the day, of specific gravity 1012, and not albuminous. A few days before death, the urine became less in quantity, and for the last four days none was obtained. The kidneys were pale and large, their combined weight being seventeen ounces. The cortical portion was seen by the naked eye to be scattered over with small round dots like grains of sand. On a microscopic examination, these were found to be the Malpighian bodies, the capillaries of which were covered over with mulberry-like masses of oil-globules, while the tubes were healthy.

It may hereafter happen to some of you, to have the opportunity of throwing additional light upon the pathology of these rare and exceptional cases of general dropsy not dependent on heart-disease and unassociated with albuminuria.

We have seen that the chief varieties and modifications of acute Bright's disease with albuminuria are the following: 1, with epithelial desquamation (desquamative nephritis); 2, without desquamation, either with or without small hyaline casts; 3, with exudation-cell casts, either with or without epithelial casts and desquamation. Lastly, we have, as an entirely distinct class of cases, rare, exceptional, and obscure in their pathology, acute Bright's disease, or at any rate acute general and febrile dropsy, without albuminuria.

Changes in the Blood.—The effect of acute Bright's disease is not only to cause an admixture of blood-constituents with the urine, but also to bring about a large accumulation of urinary materials in the blood. While the urine is usually more or less bloody, the blood becomes in a greater or less degree urinous. Dr. Christison was the first to announce the fact that the blood in these cases contains a large amount of urea, and that urea is found in the dropsical and inflammatory effusions (*Edinburgh Medical and Surgical Journal*, October 1829). Not only is the blood altered by an accumulation of urinary materials, but also by a loss of its own normal constituents. The density of the serum is reduced from 1030 or 1031 to 1022 or even 1020. The loss of density is greatest when the urine has been most albuminous; and it is probably explained by the escape of serum through the kidneys. The hæmoglobin or colouring matter also diminishes rapidly, the normal proportion being 1,335 in 10,000. Dr. Christison found it reduced, after a few weeks' illness, as low as 955 in one case, in another to 564; and in a young man ill for three months and a half subsequent to scarlet fever, who had never been bled before, it was only 427. At the commencement of the disease, the loss of colouring matter is less rapid than the extreme pallor of the patient would seem to indicate; and it is probable that the blanched appearance of the skin is partly occasioned by the quantity of water in the subcutaneous tissue.

Etiology.—Acute Bright's disease may occur at all ages from infancy to extreme old age. The two most frequent causes of acute Bright's disease with dropsy are exposure to wet and cold and scarlet fever. Either of these causes is alone sufficient to excite the disease; but their combined action—exposure to cold during the progress of scarlet fever—is a most powerful determining cause of the malady. Diphtheria is a frequent cause of albuminuria; but, as I have before said, diphtheritic albuminuria is rarely associated with dropsy. Amongst the less frequent causes of acute albuminuria are measles, erysipelas, pyæmia, the absorption of poisonous materials from the uterus after parturition, rheumatic fever, the malarious poison, typhus and typhoid fever, cholera, and, lastly, excessive eating and drinking, more especially when combined with dyspepsia. In the majority of cases, acute albuminuria resulting from other causes than scarlet fever and exposure to cold is unassociated with dropsy, and its history belongs to that of the disease with which it is associated as a complication. We shall find hereafter that albuminuria resulting from one or other of the various causes here referred to sometimes leads to a chronic and incurable degeneration of the kidney. Excess of alcohol is a more frequent cause of chronic than of acute Bright's disease. A remarkable case of transient alcoholic albuminuria occurred when Dr. Baxter was house-physician to our hospital. A man between twenty and thirty years of age was brought in one night by the police. He was unconscious, and breathing stertorously. He was believed to be drunk, and a large quantity of vinous liquid was pumped out of his stomach. The unconsciousness remaining, uræmia was suspected, and some urine drawn off with the catheter was "loaded with albumen". He was then put into bed, cupped over the loins, and a purgative given. When Dr. Baxter visited the ward in the morning, he found the man sitting up and clamouring for his discharge. He said that he had been very drunk over-night, but now he had nothing the matter with him. He passed some urine, which was found of normal colour and specific gravity, and without a trace of albumen. He then left the hospital in triumph. The temporary albuminuria was the result of renal congestion while the excess of alcohol was being excreted by the kidneys.

Diagnosis.—In most cases of acute Bright's disease, the symptoms are so obvious that the disease can scarcely be overlooked or mistaken for any other. The only cases in which there is a possibility of acute albuminuria being unrecognised are those in which it is unassociated with dropsy. But, the existence of albuminuria being discovered, it is not always easy to determine whether this is the result of a recent acute attack, or of a chronic degeneration of the kidney. We shall be in a better position to discuss this important practical question after we have studied the various forms of chronic Bright's disease. Meanwhile, however, I may tell you that, as a rule, high coloured, smoky, and blood-tinged urine, of high specific gravity, is an indication of a recent acute attack; and equally so is a copious sediment composed of epithelial and blood-casts (Figs. 6 and 7), or of exudation-cell casts (Fig. 13), alone or mixed with epithelial casts. The appearance of oily casts and cells (Fig. 9), in combination with numerous epithelial casts, does not materially affect the diagnosis. On the other hand, urine of low specific gravity and very pale in colour, yet highly albuminous, is usually evidence of chronic disease; and this evidence is strengthened by the appearance of numerous oily casts and cells unassociated with epithelial or exudation-cell casts. Large hyaline casts (Fig. 8) in pale highly albuminous urine point to disease not only chronic, but in an advanced stage. We shall return to this subject and discuss it more fully in a future lecture.

Prognosis.—Acute Bright's disease has a tendency to terminate in complete recovery. It is essentially a curable disease, as much so as acute bronchitis or acute pneumonia. The earlier the patient comes under treatment, the better is his prospect of recovery; and, on the other hand, the longer the symptoms have continued without signs of amendment, the more grave does the prognosis become. The prognosis is, on the whole, more favourable in the young and middle-aged than in those more advanced in years; but the disease may prove mild and tractable even in very aged persons. For obvious reasons, the prospect of recovery is better in the case of those who can avoid exposure to cold and other injurious influences, than when the patients' circumstances are less favourable.

In favourable cases, a copious secretion of urine, of comparatively

low specific gravity and of paler colour, with a diminishing amount of albumen and decrease of dropsy, are amongst the earliest signs of amendment. Albuminuria is usually the last symptom to disappear. The time of its disappearance varies, in different cases of recovery, from a few days to many months. If the urine continue albuminous for more than six months, it becomes more and more doubtful whether it will ever cease to be so; but I have seen cases of complete recovery after albuminuria had continued for one, two, and even three years. So long as the urine continues albuminous, in however slight a degree, although the dropsy and all other general symptoms may have passed away, recovery must be considered incomplete. Acute Bright's disease, although, as a rule, a curable, is not unfrequently a fatal disease. There are some symptoms and complications which indicate a case of more than ordinary peril; such as a very scanty secretion of highly albuminous urine; frequent and distressing vomiting; great anasarca, with a tendency to erysipelatous inflammation of the skin; dropsical effusion within the chest, either in the pleura or the pericardium, or both, with urgent dyspnoea; inflammation of the lung, or pleura, or pericardium, or endocardium; severe and persistent headache, which is apt to be followed by convulsions and by coma, with a brown and dry tongue. All these are symptoms of grave, though not always of fatal, import. When the renal disease is acute, and therefore essentially curable, recovery sometimes occurs after the most formidable symptoms of uræmic poisoning have been present.

A consideration of the exciting causes of the renal disease forms an element in the prognostic indications. When Bright's disease results from [some inherent constitutional defect, without obvious exciting cause, it is generally more intractable than when it is directly due to exposure to cold or to the influence of some specific blood-poison, as, for instance, that of scarlet fever or erysipelas. To all general rules of this kind there are exceptions, and each case requires a separate and careful study.

Let me impress upon you one point of practical importance. Before you pronounce a patient to be entirely free from his malady, be careful to test the urine, not only after rest and fasting—*i. e.*, in the morning before breakfast—but after food and exercise. Albuminous urine is usually more copiously so after food and exercise; and you will sometimes find that, while the urine before breakfast is quite free from albumen, that which is secreted after a meal is decidedly and even copiously albuminous. In some cases, exercise has even more influence than food in exciting renal congestion and albuminuria.

An attack of acute Bright's disease confers no immunity from future attacks; on the contrary, the disease may occur more than once in the same subject, a result either of inexplicable predisposition or of a liability resulting from a first attack. I think my experience warrants the statement that when acute albuminuria has resulted from some non-specific cause, such as exposure to cold and wet or excessive eating and drinking, it is more likely to recur than when it has been excited by a specific morbid poison such as that of scarlet fever, which, as a rule, does not occur a second time in the same individual; but I have known patients so unfortunate as to have two attacks of scarlet fever, and each attack complicated with albuminuria. I shall defer the important question of treatment until we have passed in review the various forms and complications of chronic Bright's disease.

NOTES TOWARDS THE HISTORY OF THE MEDICAL STAFF OF THE ENGLISH ARMY PRIOR TO THE ACCESSION OF THE TUDORS.*

By W. R. E. SMART, C.B., M.D.,
Inspector-General, R.N.

OUR military medical history commences with the third Roman invasion, when the Emperor Claudius, A.D. 43, landed in Kent, took command of the army of Aulus Plautius, crossed the Thames, and took Camalodunum (Colchester) by siege. In the following year the Senate decreed him a triumph, and conferred on him the title of Britannicus, to be inherited by his then infant son, and gave honours to his military followers. Amongst these was Scribonianus Largus, *medicus*, who, it may be presumed, shared in those honours and privileges, and who made for himself literary renown also. He wrote a treatise *On the Composition of Medicines*, containing about three hundred formulæ, among which it has been surmised there may have been some remedies of which he gained a knowledge in the campaign in Britain. His treatise was held in high repute, and a century later Galen introduced several of his formulæ in his writings.

A sadder reminiscence rests on the name of another Roman military *medicus* who served in Britain. In the ruins of Chester-in-the-Wall (anciently Borcovicus, a first-class station) there has been found a mortuary stone, six feet high, bearing this inscription: "Sacred to the infernal Gods. To Anicius Ingenuus, *medicus* in ordinary of the first cohort of the Tungrian Legion. He lived xxv years." This Tungrian (Tongres, *hodie*) legion was recruited on the banks of the Maese in Belgic Gaul, up to Spa, then as now famous for its mineral waters. It marched north under the Emperor Severus A.D. 207, and had the guardianship of Borcovicus entrusted to its first cohort, which recorded, in a tablet that has been found, that it constructed a thousand paces of the wall.

We know that whatever the nationality of a Roman legion, its officers were Romans of family rank; and this *medicus* who died so young must have been, from his name—Anicius Ingenuus—a man of good descent. In early manhood he was *medicus* of the first cohort of a celebrated Roman legion, which, consisting of 1,100 men, was of double the strength of the other cohorts. They led the van in battle, and guarded the eagle—the standard of the legion—and of these it was said by Cicero, "His divina et presentia signa venerantur." From this incident of the regard in which the young *medicus* was held by his cohort, may be inferred the carefulness of the Romans in appointing their military *medici*, who, like our own, stood in the double capacity of physician and surgeon to their corps.

Britain was to the Romans a far more difficult possession to conquer and to hold than India has proved itself to be to us modern Britons, for throughout an occupation of three hundred years its tenure was "by the sword". Among the Roman emperors, Cæsar, Claudius, Vespasian, Adrian, Severus, Caracalla, Constantius, and Constantine the Great, owed much of their military reputation to their services in Britain, which shows the importance of that command; and Great Britain is indebted to Indian warfare for the training of many of her most famous generals. The sculptured stones that tell of the Roman occupation are highly treasured by modern Britons. Whatever may be the duration of our hold on India, it is open to doubt that, after a lapse of fifteen hundred years, there will remain such a sculptured testimony erected by the officers and men of his regiment to tell of their regrets and of the worthiness of any of the hundreds of medical officers who have fallen at their posts in the acquisition or defence of the British Indian empire as that which which still remains in memory of Anicius Ingenuus, the young Roman military *medicus*. Happily, time, the destroyer of all things, has not erased the monument to him erected by the first cohort of the Tungrian legion.

Our Saxon forefathers were a very martial race, every freeman being a "weaponed man" born to bear arms, dishonoured in appearing without his sword, having the inherent right of private feud, and of maintenance in just quarrels by his kindred and neighbours; and he was bound to serve the king in defence of his kingdom for any term the occasion might require. Of their military organisation and customs, very little further than this is known.

Leechdom, or the art of healing, from the Saxon word *læc*, meaning, according to Ernest Schulze, a physician, was much esteemed in Saxon England, and it was always combined with the priestly office. *Domesday Book* does not give us the name of a single Saxon *medicus* possessing land under Edward the Confessor; but, among the tenants *in capite* under the Conqueror, there is the name of one Aluric, possessing an estate in Hampshire. The land in his possession was also before the Conquest in that of an Aluric, a common name among Saxon landowners, and we may infer that he inherited one of his numerous family estates, if he were not the individual who had been deprived of the greater part of them at the Conquest.

The respect in which the art of medicine was held is displayed in the ecclesiastical canons of the reign of Edgar (959-975 A.D.), wherein analogies are drawn between spiritual sins and bodily diseases. Penitence is likened to medical treatment under a skilful leech, and its results to the action of a "vomit" in expelling a deadly poison; and it is decreed that confession should be made under this formula: "I confess to Almighty God, and to my confessor, the *spiritual leech*, that", etc. These are appeals to the mind of a rude race, made through the known to the unknown, such as our missionaries may employ now: they show how closely medicine was affiliated to theology. One of the primitive duties of Christianity was the care of the sick, maimed, halt, and blind; and up to the twelfth century the art of curing lay in the province of the church. Its *materia medica* consisted of simples; and more cures were effected by altered regimen, by visits to holy wells, and by faith, than by medicaments, some of which were of disgusting or of revolting nature, strangely mixed up with pagan charms, magical arts, superstitious prayers, and offerings to the clergy.

Our knowledge of medical affairs among our Saxon forefathers has

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