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Notes on the
Different Varieties of Bright's Disease,
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This Thesis is chiefly composed of Notes that
I have taken of the Lectures of Professors
Beale and Johnson on Bright's Disease. Also
of notes taken by myself of some of Dr. Grainger Stewart's
Lectures on the Pathology of Bright's disease.

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Notes on Bright's Disease.

Under the name of Bright's Disease are included several Acute and Chronic Diseases of the Kidney which are frequently associated with albuminous urine Dropsy, and other secondary complications. Their nature was first pointed out by Dr. Bright and they have been in consequence named after him. These diseases are not due to any Local or Mechanical causes such as Stone, Blows on the Loins, Stricture of the Urethra, or to Cancerous or Scrophulous Deposits in the Kidney, Etcetera: but all the Varieties of Bright's Disease are derived from a common origin, and this common origin is a morbid condition of the blood.

The proofs of this are as follows;—

1. Both Kidneys are affected with the same disease and with the same form of it, although perhaps one kidney may be slightly more diseased than the other.

These facts show its blood origin and also that it is a typical example of symmetrical disease

2. Patients have to our knowledge, in the majority of cases, some morbid condition of the blood; thus Bright's Disease is frequently a result of the poison, or some product of it, of Scarlatina, Measles, Typhus, Diphtheria, Gout, Diabetes, or some other disease which vitiates

the blood. In this way too Exposure to Wet & Cold by suppressing the secretion of the Skin and thus retaining certain principles in the blood which ought to have been eliminated from it, is often a cause of Acute Bright's Disease. Again, Emphysema Bronchitis, Congestion of the Lungs, and Disease of the Left side of the Heart, may also cause it by interfering with the proper aeration of the blood, and by impeding its circulation.

3. The morbid poison of the blood, whatever it may be, first of all attacks those portions of the Kidney where the most active functional changes are taking place, namely the bloodvessels or the glandular epithelium of cortical portion. The epithelial cells of the convoluted portion of the urinary tubules are attacked, and in consequence either temporary or permanent changes in their structure result, or it may be destroyed altogether & the tubules completely dead.

4. All the different Varieties of Bright's Disease agree in the fact that they invariably commence in the cortical portion of the Kidney.

Before considering the morbid changes which take place in the glandular structure of the Kidney

as a result of Bright's disease, it may be as well to give a short summary of what is known respecting the natural structure of the gland in respect to its function. The blood from the Renal Artery passes into the Malphigian tufts of capillaries, and first of all into those capillaries which compose the free surface of the tufts as they lie in the Malphigian capsules. A Malphigian capsule consists of a fine hyaloid membrane continuous with and analogous to, the basement membrane of the urinary tubule, the capsule closely embraces the Malphigian tuft at the point where an afferent and an efferent vessel form its root, so to speak.

The cavity of the capsule is not quite half filled with the tuft, and opposite to the tuft is the orifice of the convoluted tubule; at this latter point the capsule is lined with fine nucleated epithelial cells: this epithelial lining extends only half way into the capsule, and as stated before when the Malphigian tuft is situated, the capsule consists only of a fine membrane. Thus the Malphigian capsule is nothing more than the dilated blind extremity of the urinary tubule demarcated at a certain part of its epithelium for the more convenient performance of a

certain part of its function. This function is the separation of the watery portion of the urine from the blood, and by this beautiful arrangement & by the situation of the capillaries of the efferent vessel of the tuft (on its free surface) the escape of water through the thin walls of these vessels is readily achieved.

The efferent vessel collects the blood from the internal capillaries of the tuft & leaves the capsule, it soon afterwards ~~passes~~ enters into another system of minute capillaries which lie on the outer walls of the urinary tubules and are called the inter-tubular plexus.

The tubules after they leave the Malpighian capsules become very much convoluted. They are composed of a fine basement membrane which is lined internally by a layer of opaque cells of the Spheroidal or glandular type of epithelium (these constitute the true secreting structure of the Kidney and possess the peculiar property of being able to eliminate certain salts, from the blood which are the more solid matters of the urine). On the external surface of the tubules lies the capillary plexus already mentioned. These convoluted tubules & blood vessels form what is called the cor-

bical portion of the kidney and present a fine illustration of the greatest amount of secreting surface provided in the smallest possible space. It may be mentioned that the epithelial cells fill up one half of the cavity of the tubule thus leaving a clear canal of one half: and that their junction does not seem to require their constant renewal for they are but rarely found in the urine except as a result of disease. The blood is collected from the inter tubular plexus of capillaries by the radicles of the Renal or Emulgent Vein which conveys it from the organ. The convoluted portions of the Kidney end in straight ducts these straight portions are composed of basement membrane and epithelium, but the cells differ from those of the convoluted portions being more scaly and granular & much less opaque in the cones or pyramids which these straight ducts form. Between the straight tubes in the pyramids lie straight vessels called vase recta these are partly supplied with blood direct from the Renal Artery and partly from the efferent vessels of the Malpighian tufts. The straight portions of the tubules have probably not much to do with the

secretory Junction of the Gland, their epithelium being so different in character to that of the convoluted portions, at all events there can be no doubt that these last are the seat of the most active functional processes. Nevertheless the former have something else to do besides acting as mere ducts, being as they are pretty liberally supplied with blood vessels. Their canal is larger than that of the convoluted portions but their total diameter is smaller. The pyramids which they constitute form what is called the medullary portion of the Kidney.

All these various structures Malpighian bodies, bloodvessels and tubules are enveloped in a Matrix or Stroma which some say consists of fibrocellular tissue full of holes in which the tubules ~~are~~ imbedded: others say it is a fine granular transparent substance and contains small granule cells. Lastly the Kidney is enveloped ~~in~~ fibrous capsule and this sends in fine fibrous bands into the cortical portion. In health it is readily separable from the surface of the gland: at the hilus of the Kidney it is continued inwards lining the sinus and forming sheaths for the bloodvessels and ducts.

All these various structures which compose the Kidney are liable to disease; and in the various forms of Bright's disease, and in their different stages, not only the glandular epithelium but also the Bloodvessels and Stroma become the seat of morbid changes. What these morbid changes consist of will now be considered.

Bright's Disease occurs in the Acute and Chronic forms, and each of these may be subdivided into Varieties. The following is the classification adopted here

- I. Acute Bright's Disease
 - 1. Acute Desquamative Nephritis
 - 2. Acute Suppurative Nephritis
 - 3. Acute Non-Desquamative Nephritis

Chronic Bright's Disease is best considered under its anatomical characters.

- II. Chronic Bright's Disease
 - 1. Small Granular Kidney or Chronic Desquamative Nephritis.
 - 2. Large White Kidney of which Dr. Johnson gives 3 varieties namely;
 - A. Non-Desquamative Waxy or Amyloid
 - B. Granular, Fat Kidney
 - C. Mottled Fat-Kidney

1. Acute Desquamative Nephritis as its name implies consists of an acute inflammation of the Kidney which is characterized by desquamation of the epithelium of the glandular structure, and by the presence of albuminuria, and is in some cases associated with Dropsy.

This inflammation may be set up or excited by various poisons circulating in the blood.

Among the most common of these causes are 1. Scarlet Fever 2 Mecles 3 Diphtheria 4 Erysipelas 5 Pyæmia 6 Typhus 7 Typhoid 8 Wet & Cold 9 Rheumatic Fever 10 Cholera, Etcetera.

In Diphtheria albuminuria is more frequently met with than in Scarlatina, and in the latter disease Dropsy is a more frequent sequel of this disease than it is in Diphtheria.

Dropsy very seldom occurs after Cholera or Typhus Fever.

In Jaundice we get Bile in the Urine and also Renal epithelium and tube casts stained with bile in consequence, and we may also get albumen in large quantity. In fact the vicarious excretion of Bile by the Kidney in Jaundice causes desquamation of the tubules just in the same way that the poison of Scarlatina does and likewise we get congestion and albuminuria. One gland may perform the office of another, but there must be some

change in the gland-cells in consequence, and the change often consists in desquamation. This desquamation is not necessarily a mischievous process. Thus if the poison of Scarletina, for example, which is naturally eliminated by the skin in the form of a rash and consequent desquamation, be suddenly suppressed, other organs are called upon to eliminate the morbid materials thus thrown back into the blood. And among these organs thus called upon to perform a vicarious elimination, or at all events an increased elimination (for probably all the excretory organs have a share in the elimination of the poison) the kidneys occupy a most prominent position. The result of the blood poison to the kidneys is the desquamation of the epithelium lining the urinary tubules and especially that of the convoluted portions. As a rule we get no Renal Epithelium or casts in the urine in health, as these gland cells in the natural state do not appear to require to be shed so frequently as those of many other organs do. But as a result of disease the occurrence of epithelial cells and of casts of the tubes in the urine is a prominent symptom, and the various conditions in which they are

ground in this fluid show the state of the Kidney very truly. In certain cases desquamation of the Renal Epithelium is analogous to desquamation of the Skin, and it need not be a more serious process than this is: In fact the prognosis of Acute Desquamative Nephritis is very favorable because the free desquamation purifies the blood. In this form of Bright's Disease patients generally make a complete recovery, especially if they come under treatment in the early stage of the disease. There is no reason why it should be more fatal than Pneumonia & many other Acute Diseases are, and it is certainly as amenable to treatment. The patient once having had an attack of Acute Desquamative Nephritis is susceptible to its return, especially if the first attack was caused by an exposure to cold. Second attacks of Scarletina have also been known to be complicated with this disease for the second time. Any inflammatory diseases or Brain symptoms accompanying Acute Desquamative Nephritis increase the danger very much as might be expected.

This disease is generally the sequel of Scarletina and it is during the period of eruption and desquamation

of Scarlatina, that the danger of infection and also of renal complication are greatest. Cold, Bad Ventilation, and Injudicious Diet are also common causes. The disease often commences without any local symptoms whatever. There may be Pain in the loins. Paleaurs and Puffiness of the face, generally first noticed in the lower eyelids in the morning is often the first symptom that attracts notice. But these may attract little or no attention. The dropsy may have become general before relief is sought: and dropsy soon becomes general in these cases & the abdomen, legs &c become very much swollen & after a while the whole body becomes oedematous. Increased fever, Nausea, Vomiting, Headache, Drowsiness, Dyspnoea (from impeded circulation in lungs from blood poisoning, then you get oedema & crepitation may be heard: it often depends upon Pleurisy or Disease of the heart) are often all of these accompanying symptoms of more or less importance. If there is severe long continued headache & drowsiness because of Coma These brain symptoms are due to blood poisoning from retention of Urea & are not due to inflammation. If the patient die comatose the brain will be found congested & there will be effusion of serum. The tongue may be brown and dry. It is often difficult to diagnose between

Acute ~~Dis~~granulation Nephritis abito first onset and Typhus, and we may have the two combined. An inquiry into the general history and the careful watching for the eruption will generally clear up doubtful cases. The Thermometer too may be used & if the temperature is high the case will probably turn ~~out~~ one of Typhus. The poisoning of the blood by Typhus & by Urea have very similar symptoms.

The Diagnosis and Prognosis of the Case must be inferred from the general symptoms just mentioned combined with a careful examination of the condition of the Urine.

The Urine in the first stage is scanty but passed frequently it is high colored, may be quite dark, from admixture with blood. The Specific Gravity may be lower or even higher than normal. Albumen occurs in variable quantity, at first the urine upon the application of Heat & Nitric Acid may become very nearly solid from the excessive amount. As the attack passes off the quantity of albumen steadily diminishes & the natural color returns. The cause of the albumen is the serum of the blood which transudes through the walls of the congested vessels into the Malpighian capsules & Fibrin also coagulates in the tubes & under the epithelial cells adhere to it & thus casts of the tubes are formed & washed down into the urine. In the first stage of this disease the blood cannot freely circulate in the kidney & the Malpighian capillaries become engorged & in some

cases ruptured. In consequence of this congestion there is less urine secreted & the function of the gland cells become impaired & that result of inflammation the effusion of Serum & Fibrin occurs. If the vessels are ruptured blood mingles with the urine

The Casts formed in the tubes are of various kinds Fibrin is the basis of them all, sometimes the epithelial cells are loose and dry & then to the fibrin & thus epithelial casts are formed. They are like moulds of jelly & under the microscope are seen to consist of fibrin & the constituents of epithelial cells variously modified. Sometimes the cast consists of fibrin alone, it is then the diameter of the central cavity of the tubule. Sometimes they contain blood corpuscles & thus blood casts result. Besides the exudative fibrinous & Blood Casts & the Epithelial casts called Desquamative just described & w? we get in Acute cases, other casts are also seen. Fatty Casts & Granular Casts are seen as the disease advances & the Epithelium & fibrin become disintegrated. Small waxy casts & sometimes even Large Waxy Casts are also seen. Fatty casts consist of fibrin with w? is entangled epithelial cells full of oil. The granular casts consist of fibrin & oil globules & fatty granules.

The Waxy casts indicate the last stage of structural disintegration of the tubules, the large casts are extremely rare in this form of Bright's disease they are distinguished from the small waxy casts by their size & sharply defined outline. Waxy

Cysts are of comparatively large size they have a whitish or waxy appearance & are transparent. They are moulded in tubes entirely denuded of epithelium hence the large size because they occupy the whole ^{cavity} ~~diameter~~ of the tubes. The small waxy cuts result from tubes having contracted after their junction has been destroyed. These waxy cuts are composed of a ^{transparent} structureless substance, & are either secreted by the basement epithelium after it has lost its epithelium or it may be they are the basement membrane itself which is thus expelled; Dr. Johnson holds the former opinion. Sometimes some cells are seen at one end of these waxy cuts there are absent White Blood Corpuscles.

The Cysts formed in the convoluted portions of the urinary tubules are then indication of serious structural disease but coagulable matter is also thrown out into the straight portions. So not infrequently we get a small convoluted cut wh^{ch} has passed into the straight portion & whilst lying there become surrounded by coagulable materials: the small cut lying ^{imbedded} in the large one may be seen by the microscope & at once proves that the Cysts are derived from both portions of the tubule, although the state of that wh^{ch} is derived from the convoluted portion is the most important, indicating as it does the changes which are going on in the most important part of the organ. The

Cast may however become broken up or remoulded straight in its passage through the straight tubule. The casts some times contain crystals of Lithic, Oxalic Acid, Etc.

When the acute attack is passing off the flow of urine becomes copious, this is due to the accumulation of Urea in the blood, W² now begins to exert its natural diuretic effect in proportion to the cause of the morbid changes in the kidney passes off. There is also less albumen because as the circulation in the capillaries becomes freer there is less tendency to the effusion of serum. Ify casts are also sent at the end of 2 or 3 months the affected tubes become dis-integrated & granular casts result - perhaps a few waxy casts. As Convalescence proceeds the quantity of albumen becomes less & less & that of Urea more. The amount of albumen & that of Urea thus stand in an inverse ratio to one another.

If a case of Acute Degenerative Nephritis should prove fatal, by the effects of retention of Urea in the blood or from some other complication, the kidneys will be found to present the following morbid appearance.

They are increased in size & weight (each may be 7, 8, 9 ounces or even more) They are soft from oedema. congested & mottled with haemorrhagic spots. The cones are dark colored & the tubes opaque, this opacity is due to their

cavities being filled with epithelium, fibrin, albuminous matters & debris. The convoluted tubes also contain oil. The Haemorrhagic spots are Malpighian capsules & convoluted tubes filled with blood from rupture of the Malpighian capillaries. The Malpighian capsules are half filled with collapsed vessels & the other half with effused blood. If the Malpighian tufts are examined they will be found opaque & their surface granular & nuclei can be seen in their walls. The engorgement of the capillaries & consequent effusion & haemorrhage is due to 1. The impediment offered by the extremely difficult circulation in the Kidney from the large number of vessels, and afterwards is partly mechanical from the obstruction of the tubes ^{with} effused matters. 2. The congestion is due to Urine retained in the Kidney, w^h congests the Renal vessels in a similar manner to that w^h CO₂ exerts when it causes congestion of the Lungs.

The Treatment of Acute Degeneration Nephritis consists in keeping the patient in bed in a room ^{at a} uniform temperature carefully avoiding all risks of chills. A scanty diet should be given because the digestion is already impaired & undigested food causes the urine to become albuminous. Rest the Kidney by calling upon ~~the~~ Skin and

Promote to increased action. The Means to be employed are the Hot Air Bath, Diaphoretic (especially Liq. Ammon. Acetatis) Purgatives Calomel Collyrium Magnesia. Give active purgatives if there are the symptoms. In the same case also Cup over the loins.

Common Irritation over the Kidney, as Dry Cupping, Mustard or Ammoniac. Turpentine or Castor-oil are not to be thought of. All Stimulant Diuretics are to be avoided but mild ones may be exhibited. No Mercury is to be given except as a purgative. Digitalis acts very powerfully.

Alcohol too acts more powerfully because the Kidneys cannot excrete it fast enough, so unless the patient is very low it should not be administered.

Under this treatment the Dropsy gradually disappears as the vessels become unloaded & a copious flow of urine takes place as that natural diuretic Urea begins to exert its influence. For this reason alone we ought not to give Diuretics. The Dropsy disappears before the urine is free from albumen & the patient should be strictly ordered not to leave the House whilst there is any trace of albumen, but a Relapse take place: unless it is fine warm summer weather and change of air is greatly needed for him.

As Convalescence steadily proceeds the patient may return to his usual diet. In children now there is a voracious appetite & it should not be indulged. No Saltmeat, Bacon & other such indigestible food should be permitted. Steel is the best tonic in these cases the Fr. Ferri. Puellor. may be combined with Liquor Ammoniac Acetatis.

Too active a course of Treatment is to be avoided the above is Dr. Johnson's treatment.

2. Acute Suppurative Nephritis The last disease may shade gradually into this form or the two may exist together. They are essentially the same disease, with the following pathological differences. Instead of Epithelial cells & casts we find casts crammed with pus cells & free pus cells in the urine. Thus the epithelium must likely the effused fibrin degenerate into pus from the violence of the inflammation it may be.

Dr. Johnson says that Abscess of the Kidney is never a result of Bright's Disease

The ^{other} Symptoms, Causes & Treatment are much the same as in the preceding variety. Diagnosis from the Pus.

Prognosis more unfavorable because the suppurative indicates greater damage to the Glandular

Structure. Upon P. M. Exam? The Kidneys will be seen to have their uriniferous tubules crammed with pus & pus cells will be found in other parts of the organ. Several tubules will be destroyed.

3. Acute Non Desquamative Nephritis differs from the last 2 varieties in the important particular that the urine does not contain any casts whatever at first, a few waxy casts may be noticed. Neither is the urine discolored with blood nor does it contain oil or pus: but it may be just as albuminous or even more so than it is in Acute Desquamative Nephritis. It is not always easy to diagnose between the Acute & Chronic Varieties of Non Desquamative Nephritis.

The Prognosis is much more unfavorable in this disease than it is in the other Acute forms.

The urinary tubules in this disease are not open & their central canal is quite clear. The cells on opposite granules.

The Causes of this disease are a morbid state of the Blood which may be produced by the continuation of any long lasting disease such as Scrophul, Syphilis, Nervous, Arter, &c, &c. There byet a depraved condition of the nutritive fluid, & thus there is defective

nubition, and as a consequence of this there is a degeneration of the smaller bloodvessels of various organs is one of the earliest results. The Kidneys, Liver, Spleen and other organs are implicated usually at the same time. This change in the minute bloodvessels of the Kidney has now to be considered. It commences in the muscular fibre cells of the middle coat of the small afferent arteries, the actual structure of these cells is at length destroyed & in its place we have deposited a peculiar substance allied to Starch, and hence called by Virchow Amorphoid. The arteries become thickened their calibre diminished & as a result of this congestion of the Malpighian capillaries takes place. As the disease proceeds the surrounding periphery & also the capillaries become involved in the degeneration, & the disease passes into the chronic form. To overcome the obstruction offered to the circulation by the congestion in the tufts (consequent upon disease of the afferent arteries) the heart is excited to increased action & thus more blood is driven into the organ. The urinary constituents of the blood easily escape & there is a copious flow of urine throughout the disease as no obstruction is met with in the tubes.

The state of the Blood is as follows - The White corpuscles are increased in number, the Red ones are diminished & Dr. Stewart of Edinburgh has observed that they have no tendency to adhere together as in health, & that they lose their natural form and become elongated and spindle shaped. The blood is therefore pale and watery.

The liquor Serpinis is probably deficient in fibrin

As the disease advances the congestion becomes greater a large amount of serum exudes through the vessels, and thus the amount of albumen is accounted for. This increase of albumen may however be very gradual, there is often no edema. The amount of pale urine excreted is always very great sometimes it is enormous & has been known to exceed 200 ounces in the 24 hours. It is of low specific gravity. It either contains no casts at all, or only a few waxy casts.

Among the most important of the Symptoms of Acute Non-suppurative Nephritis are the following; -

1. Frequency of micturition, a very large quantity of pale watery urine escapes which gradually becomes more albuminous if the disease is not checked.
2. Great Debility
3. A pale & puffy complexion.
4. Thirst, the quantity of urine however is larger than that of the total

amount of fluid consumed by the patient 5. Diarrhoea
 6 Enlargement of the Liver and Spleen. 7 Perhaps a slight
 amount of Dropsy, as slight œdema of the ankle at night;
 but Dropsy in most cases never appears at all, owing no doubt
 to the large amount of serum which escapes by the urine.
 But if the disease assumes the chronic form & the quantity
 of urine which is excreted becomes less & contains more al-
 bumen in proportion to its quantity than it did before, then it
 is that Dropsy may gradually come on & prove a very serious
 complication.

The majority of cases of Acute
 Non Desquamative Nephritis have a tendency to become chronic
 and thus ultimately prove fatal. But in the Acute form unless
 some complication as Acute Inflammation of the Lungs or other
 important viscera set in, there is reason to suppose that
 with judicious treatment a recovery might take place.

At all events several cases have been reported by Dr. Grainger
 Stewart in which a marked alleviation of the symptoms
 took place under such treatment. Tonics, especially
 Iron are very useful, and the administration of the Iodide
 of Potassium in those cases with a Syphilitic taint, and
 of Cod Liver Oil & the Iodide of Iron in Strumous cases, will
 be found most beneficial: they will be pretty certain to
 mitigate the symptoms. Combined with these remedies
 attention must be paid to the Diet and Habits of the

patient. Great care must be taken to prevent an exposure to Cold & but a relapse occur. If the disease should prove fatal by the occurrence of any serious complication the Kidneys will be found to present the following appearances varying in degree according to the amount of disease present: — The gland may be increased in size & weight or it may be contracted & atrophied. It is of a pale color. The capsule is thickened & adherent. The surface of the Kidney is granular. Cutting through the gland is like making a section of wax. The cortical substance is pale & anæmic & may be atrophied. (In Chronic Cases the Cones may be also anæmic) It presents a translucent appearance. Upon the application of Iodine numerous orange red spots appear with fine streaks leading from them: these are the Malpighian tufts & afferent arteries. The blood vessels of the medullary cones are only affected in the advanced stages of the disease: Iodine then makes them stand out in parallel lines. The combined application of Iodine & Sulphuric Acid to these degenerated blood vessels gives a blue color, a beautiful violet tint, which is however very difficult to obtain. This is the peculiar reaction (which is analogous to that which Starch gives with the same re-agent) from which the morbid material receives its name Amyloid. Amyloid Degⁿ of the Kidney is always associated with the same disease in the Liver & Spleen, and sometimes in the Villi of the Intestines, which latter is the cause of the Diarrhoea.

II. CHRONIC BRIGHT'S DISEASE.

1. Small Contracted Granular Kidney (or Chronic Desquamative Nephritis) Is analogous in the Kidney to Cirrhosis of the Liver. There is a peeling away of the epithelial cells from the tubes which at length leads to atrophy of the tubular structure. It is most commonly met with in Gouty people, & Dr. Todd gave it the name of the "Gouty Kidney". It is always Chronic & is never a sequel of the acute disease.

The following are amongst the most common Causes; - 1. Gout, which is by far the most frequent. 2 Intemperance 3 Cardiac Disease 4 Emphysema 5. Bronchitis, thus it may be due to obstruction of the circulation in the Lungs from Heart disease &c, causing a morbid condition of the blood.

In the last stage of Diabetes also we may get it for the epithelial cells become at length altered by the constant excretion of Sugar, & after a while they desquamate. Chronic Desquamative Nephritis is very rarely associated with Dropsy, but this symptom is a very common one in that form of Chronic Bright's Disease characterized by a fatty degeneration of the epithelium.

All these diseases of the Kidney arise from its glandular office there are poisons in the Blood, in Gout &c, which have to be excreted by the Kidney, & in consequence of the deleterious influence they exert upon the epithelial cells, these become changed & ultimately are destroyed. And when the cells are destroyed the tubules & Kidney atrophy, because its function is gone.

The Symptoms of Chronic Degenerative Nephritis are often very obscure at first; 1. There may be muscular pains in the loins, but more frequently there are none whatever: with the pain in Gouty cases we get Acid Urine & plenty of Lithates in it.

2. Frequent micturition with an abundant flow of ^{pale} urine of low Specific gravity especially at night; but this symptom may be absent.

3. Albuminuria there may be no albumen in the urine at first but as the disease advances it becomes mixed with the urine in considerable quantity, but in the latter stages it again becomes scanty & may even disappear altogether. N.B. This is the only form of Bright's Disease in which there may be great destruction of Kidney structure with no albuminuria.

4 Tube-casts In gouty cases a ^{slight} cloudy deposit will be noticed in the urine, this is composed of granular epithelial casts these are indicative of the destruction of glandular texture which is going on. They are of a grayish color and are easily distinguished from the granular blood casts which are the color of Mahogany. As the disease advances the deposit of casts becomes larger, & this increase of deposit is generally associated with increased albuminuria. Large and Small Waxy casts are now also seen, they occur in much larger number in this disease than in the Acute variety: always towards its latter stages when they are often very numerous and indicate the total destruction of the tubules. The greater the number of casts, the worse the prognosis of the case.

5. Dyspepsia is very frequent from the secretions being rendered morbid. The Stomach & Intestines make efforts to throw off the Urea (or Carbonate of Ammonia into H_2O it is transformed) which neutralizes the acid of the Stomach & so deranges the digestion. Ammonia in excess has also been perceived in the breath. Urea is also found in some quantity in the perspiration, bile, milk, etc.
6. Anaemia owing to the blood being deficient in coloring matter it is also more fluid, there is excess of urea & deficiency of albumen & other matters. It is of low specific gravity. The Urine contains less urea & more albumen.
7. Muscular Cramps which may pass on to convulsions &c, these are due to the depressed condition of the Blood.
8. Dropsy. In the majority of cases this symptom never appears, out of 33 cases it only was present in 14. This fact shows that the Chronic Contracted Kidney cannot be as some have supposed the advanced stage of the Large ^{Fatty} Kidney, for in the latter disease the amount of dropsy is very great & very general. it occurred in 22 out of 24 cases. The reason of this difference is evident for there is a copious flow of urine in the Contracted Kidney as the tubes are not filled up with granular material, but the epithelium gradually peels away. In the Large Kidney on the contrary the Urine is scanty.
9. Chronic Rheumatism is a frequent accompaniment.
10. Head-ache, the urine should be always most carefully

examined when this symptom is constant. It may be the precursor of Delirium, Convulsions or Coma. Frerichs says that there is no relation between the amount of Urea in the blood, and the cerebral symptoms. This observer says that they are due to Carbonate of Ammonia, he has injected this into the blood of animals & produced these symptoms; but this goes but a little way to prove that this salt is the sole cause of the convulsions in this disease. If the quantity of Urine & its specific gravity be carefully taken during 24 hours, a fair estimate of the amount of solids excreted may be obtained. But many other circumstances besides Disease of the Kidney influence the quantity of solids. Thus a man lying in bed & taking no exercise does not excrete so much solid matter as he does under other circumstances. So the quantity of solids will not tell the exact advance of the Renal disease. If the headache be constant & there is drowsiness & if at the same time the specific gravity of the urine is very low, & the deposit of casts & amount of albumen is large: then this symptom will be due to accumulation of Urea in the blood exerting its morbid influence on the Nervous centres. In such a case the occurrence of convulsions & death by coma are to be greatly apprehended. The Urea may have become transformed into Carbonate of Ammonia before the brain symptoms come on & they may be due to the change.

10 Disease of the Heart as Acute Pericarditis or Endo-carditis may be caused by Bright's disease, and they

may come on very insidiously. According to Dr. Bright there
 was hypertrophy of the Left Ventricle in 52 cases out of 100, no
 disease of the Large Arteries or Valves being present. Cir-
 culation of impure blood gives rise to the congestion of the
 Renal & other capillary systems, & the heart is excited to
 increased action to drive the blood on and the result is
 hypertrophy. Bright said that the morbid blood also
 excited the heart to increased action. Endocardial disease
 may be a result or a cause of Chronic Bright's disease
 it always seriously complicates the Renal affection. It
 may cause disease of Kidney 1. By retention of CO_2 owing
 to Pulmonary congestion thus rendering the blood impure
 2 By Congestion. 12. We may get Hemorrhage
 into the brain from the constant irritation of the morbid blood
 exerted upon the brittle capillaries & from the increased force
 with which it is pumped into them by the hypertrophied left
 ventricle. There may hemorrhage into the Retina & in con-
 sequence sudden or gradual Amaurosis. Menorrhagia
 Epistaxis & Hemorrhage from the Bladder may also result
 in the last stages of this disease owing to these causes & to
 the ^{very} fluid state of the blood from the presence of ^{excess of} Ammonia in it.
 Puerperal Convulsions may also be associated with albuminuria
 but the albumen passes off after labour as the veins
 become no longer obstructed. On the other hand women may
 have no convulsions during labour, & yet be suffering from

Chronic Bright's disease. Dr. Johnson has ^{two} such cases.

13 Inflammation of the Serous membranes with effusion

14 Bronchitis 15 Pneumonia &c may also result and complicate Bright's disease. Haematuria from the kidney is rare because the Malpighian capillaries become so thickened & tough that their walls only give way with the greatest difficulty. Blood from the bladder occurs in clots & not in casts in the urine.

The Prognosis in cases of Chronic Disquaminate Nephritis is a very doubtful one. If it is the result of Gout or any other well known cause the appropriate treatment of the primary disease will probably cause a diminution of the disquamation. The greater the disquamation the greater the danger. But if the blood becomes purified by appropriate treatment patients may live for years: cases of this disease with chronic albuminuria have been known to last more than 20 years. Brain symptoms are very alarming but a patient may recover from Uraemic convulsions, there is of course however a great danger of their returning. In the latter stages of Pneumonia, Pericarditis, Pleurisy, or any other Inflammation set in, the complication is generally fatal to the patient. Dropsy if it occurs in this disease is a very bad symptom. The occurrence of obstinate Diarrhoea & Vomiting are often preservative, as they are probably the efforts made by Nature

to throw off the super-abundance of Urea in the blood: but if too long continued these symptoms should be checked as they exhaust the patient, but great care must be taken.

The following are the changes which take place in the Kidney:— In the earlier stages of the disease it shows but little outward change, but as the disease progresses it contracts without previously enlarging.

On P.M. Examination the Kidney is found to be contracted & small, the capsule is very adherent, the surface is irregular & has a granular appearance (the granulations being caused by tubules filled with casts).

The substance of the Kidney is firm, the cortical portion is narrowed, on being cut through it also presents a granular appearance (caused in the same way) in some parts.

There is entire desquamation of the epithelium lining some of the tubules. In some of the tubes however a little delicate transparent lining, consisting of a layer of cells with single nuclei, may be observed to have taken the place of the true glandular epithelium. Some of the tubules may be opaque with fibrin & accumulated debris. Mr. Simon mistook the tubes thus denuded for microscopic cysts; which he thought caused atrophy by their pressure. These little cysts may be seen in the Kidney by the unaided eye, they are nothing more than dilated tubules, which being plugged at their

lower extremity with debris of fibrin &c, and in the mem-
 white secretion of water going on above the obstructed part
 become mechanically dilated into cysts by the inward pressure
 of the fluid. The Malpighian capillaries are thickened
 & opaque, & there is invariably considerable hypertrophy
 of the muscular coat of the arteries & these vessels become
 tortuous & dilated. Sometimes there is a collection of
 oil in their cavities. Dr. Johnson at first mistook
 these thickened arteries for tubes. There is no
 thickening of the veins or intertubular plexus. The
 thickening of the afferent arteries & M. Capillaries is thus
 brought about. The circulation in the Malpighian
 capillaries is obstructed owing partly to the morbid
 blood & partly to the glandular junction of the kidney
 becoming impaired by disease of the cells. To meet this
 obstruction the ^{muscular coat} walls of the afferent arteries become hy-
 pertrophied just as the left ventricle does in disease of Aortic
 valves &c. The gland cells being destroyed, the tubules
 contract & this contraction is the cause of the contraction
 of the whole organ because its junction is destroyed. The
 intertubular structure is also thickened, there may
 be effusion of fibrin into it, but the matrix is
 usually increased in quantity to make up for the
 deficiency created by the contraction of the tubules.
 Hensle describes this growth of fibrous tissue around

the tubules as the cause and not the consequence of their contraction. The Treatment of Chronic Desquamative Nephritis consists mainly of attempts to remove the cause of the morbid state of the blood. Thus if it depend upon Gout, a well regulated diet, abstaining from fermented liquors, greasy dishes &c., together with the internal administration of Colchicum will be found most beneficial. And when the disease is known to depend upon any special primary affection the latter should be combated with by the use of appropriate medicines. Steel is most useful in anaemia. If Dyspepsia prove troublesome the use of mineral acids will be required. The Hot Air & Vapor Baths occasionally used, & also the exhibition of mild purgatives every now and then, are most useful remedies.

Diarrhoea is not to be checked unless it begins to exhaust the patient, the reason has been given, do not check the efforts of nature to get rid of the Urea, too soon.

In Head Symptoms the rule is to purge freely and apply cold to the head. The former is best effected by giving Gamboge, Jalap, or Elixerium & producing copious watery stools.

Counter-irritation such as Cupping over the Loins &c is not to be recommended in these Chronic cases, though useful in Acute Cases.

2. The Large White Kidney.

A. Waxy or Amyloid Variety = Chronic Non-Desquamative Nephritis. This may be either the Chronic stage of the Acute Non Desquamative Nephritis, or it may be the sequel of Acute Desquamative Nephritis. The Causes of this disease are the same as those of the Acute Varieties. It is frequently associated with Syphilis, Caries, Necrosis, Scrophula & other morbid States. It may however as the Acute disease arise idiopathically. Virchow believes that the disease commences in the muscular coat of the afferent arteries by a deposition in the ^{transverse muscular fibres} cells of a substance allied to starch. the consequence of this is that their function becomes impaired & is at length destroyed. Dr Johnson however states that the disease is not due to a primary change in the blood vessels, but that they become tortuous, their walls thickened & their cavities dilated owing to the impeded circulation & that their walls contain a fibrinous effusion.

The Symptoms of this disease are the same as those of the Acute Non Desquamative Variety but they occur in an aggravated form. In the last stages death by coma from suppression of urine is much to be dreaded. The urine at first may be of

Natural colour and density, ~~to~~ the specific gravity may be slightly increased or diminished; in the advanced stages however the urine becomes very pale and contains much albumen. There may be no sediment & no tube casts in the urine but in most cases there is a light cloudy deposit containing large and small waxy casts.

The General Symptoms have been already discussed when treating of the Acute form of the disease so that their repetition here is unnecessary.

The Prognosis as a rule is very unfavourable but patients may live for many years and the symptoms become ameliorated by appropriate treatment adapted for each peculiar case and aiming at the removal if possible of the exciting cause such as Caries, Necrosis, etc., when this can be ascertained.

The Lesions found after death are the same as those found in fatal cases of Acute Non Desquamative Nephritis, but owing to the advanced stage of the disease most if not all of the glandular structure is implicated.

The Kidneys are large & smooth, being

increased in size and weight, the capsule is adherent & they have a pale yellowish waxy appearance, the lobular markings are quite lost, the blood vessels obliterated. If Iodine be applied to the cut surface it makes the degenerated vessels stand out in orange colored dots and streaks in the cortical portion and in parallel lines in the medullary portion or cones. The tubules are contracted, but the epithelial cells may be in a state of fatty degeneration and contain oil.

Not unfrequently Amyloid & Fatty Degeneration of the Kidney are found associated in the same case.

The Liver too as well as the Kidney, in such cases presents a lardaceous or bacony appearance. The Spleen is also enlarged and amyloid.

B. Granular, Fat Kidney. The large granular Kidney may be either chronic from the commencement & caused by the same disease as the variety last considered or it may be the result of a severe attack of Acute Desquamative Nephritis. The Rule 'that a large Kidney never becomes a smaller one' holds good in the majority of instances, but it has exceptions, for there may be atrophy after enlargement. Such cases are however

easily distinguished from the Contracted Bright's Kidney. The following is a case in point. A man named Gray who was under the care of Dr. Todd in King's College Hospital had an acute attack of Renal Dropsy, he never got rid of the albumen in his urine. This case proved fatal and after death he was found to have a granular fat kidney which was contracted after having been previously enlarged. In such cases we get large granular casts, fatty casts and large waxy casts in the urine. When the epithelial cells are destroyed by the degeneration of the kidney becomes atrophied & as a symptom of this atrophy we get the large granular waxy casts. But although the granular structure is atrophied the weight & size of the whole organ is increased. There are 2 forms of granulations, namely - 1. The true granular specks of Bright & are convoluted tubules filled with oil & hence called fatty. 2. The granulations on the surface of the contracted kidney. In the granular fat kidney the accumulation of fat is local, but in the mottled variety the fat is distributed throughout the cortex. In the first variety there is a fatty matter in the ^{convoluted} tubules which owing to being filled with this deposit, project, & give rise to the so called granulations. This peculiar granular or fatty matter is deposited at first in the glomeruli

epithelial cells, these however do not degenerate but remain adherent to the basement membrane. They however undergo changes varying from a slight granular opacity to a complete oily or fatty degeneration, this renders them perfectly useless, for there is very little oil in the cells in health & this accumulation destroys their function. The fatty matter escapes into the tubes also & blocks them up: it is peculiarly rich in cholesteroline & if asked upon with alcohol and allowed to evaporate we get the crystals of cholesteroline.

The above changes in the glandular ^{epithelium} structure are associated with gradual atrophy of the cortical & tubular structure. Thus the scanty amount of urine its low specific gravity & the large amount of albumen it contains are accounted for, as also is the scanty deposit. But as the disease advances we get a slight sediment containing waxy casts & some renal epithelial cells crowded with oil globules, together with a number of free oil globules in the urine.

Dropsy is a constant & very dangerous symptom & is generally excessive. ~~During~~ the destruction of the glandular tissue which gradually proceeds there is great danger of suppression of urine, and consequent

come and death. The general health gives way and we get all the symptoms of mentioned when considering the other varieties of Chronic Brights Disease as the glandular texture becomes more & more involved.

C. Mottled Fat Kidney is analogous to Fatty degeneration of the Liver, which is due to excess of oil in the Hepatic cells, the healthy Kidney cells contain very little oil. In this variety the fat is distributed throughout the cortex.

We may have a fatty kidney and no albuminuria this often occurs in the lower animals, it is well known that the London cats have fatty kidneys. Thus whenever Dr. Beale caught one he found it possessed a fatty mottled kidney: but yet they do not suffer from Brights disease and probably this appearance is due to the food they eat. Animals confined in dark cellars also have these kidneys.

During life we cannot diagnose between this and the preceding variety of Brights disease. The Prognosis is just as unfavorable.

The Causes and Symptoms are precisely

Similar to those already considered when treating of the Amyloid & Granular Fat Kidneys, except that Dropsy is seldom seen as a result of the Amyloid Kidney, whereas in this variety it is a very constant and dangerous symptom owing to the obstruction offered to the escape of the urine.

The Treatment of the Chronic Forms of Bright's Disease just considered here calls for a few Remarks

A Change of Air and especially a sea voyage is to be strongly recommended.

Steel is beneficial it diminishes the anæmia, the Tincture of the Perchloride of Iron or the Syrup of the Iodide of Iron are the best forms, the former can be combined with Hydrochlorate of Ammonia or some other ^{diuretic} Salt. ~~of~~

Be very careful of exposure to cold, but we get some Dropsy

Diuretics do not act so well in this disease as they do in Cardiac Dropsy. We may give Digitalis Cream of Tartar or Iodide of Potassium. Squill Pills and Digitalis may be given but they are not so effectual ~~as~~ as in Cardiac Dropsy. Dr. Christison uses Digitalis externally.

Elaterium is useful but it is very exhausting
 Puncturing the legs in severe dropsy may give
 temporary or permanent relief. Incisions
 may however be followed by severe inflamma-
 tion, but the skin may slough unless they are
 made. The quantity of urine excreted is much
 larger after they are made.

Dyspepsia & Diarrhoea if very troublesome
 must be checked.

In Head symptoms purge & apply cold
 to the head. Sometimes they are due to Aneurism.

As a rule an abstemious diet ought to
 be enforced and in Chronic Cases of Bright's
 Disease dependent upon fatty degeneration of
 the Kidney the patient should abstain as
 much as possible from fermented liquors,
 green dishes, potatoes and other starchy
 food.

The patient's life may thus by great care
 be prolonged, but the disease inevitably proves
 fatal sooner or later. The Constitution
 becomes worn out. General Dropsy sets
 in and the serous cavities as well as
 the cellular tissue become involved. After

a brain suppression of urine flow and
that ends the same by the suppression
of coma.

