

On
Granular Degeneration
of the
Kidney.

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It is but of comparatively recent date, that the profession was at all aware of the affection now commonly known as Bright's Disease. There were indeed many scattered facts in medical literature, which, had they been collected, and accurate inductions drawn from them, would certainly have led on to the general principles laid down by Dr Bright. But it was not till the year 1827 that such classification, and induction were made, when Dr Bright announced that, Dropsy, was frequently dependent on a peculiar degeneration of the Kidney, and that this degeneration was attended with a liability to other affections especially of an inflammatory type, and that it was indicated by the presence of albumen in the urine.

Since then several very competent observers among whom may be mentioned Christison, Gregory, Osborne, Beyer, Solon, Faircler, Edmiston &c; have examined with greater minuteness and confirmed the important discovery which he had pointed out.

Thus have we become intimately acquainted with a disease, which is not only of very frequent occurrence now that we can diagnose it, but is manifested by most characteristic and peculiar symptoms which cannot be mistaken.

Previous to our enumerating these symptoms, and considering them in detail, it will be necessary for us to premise a few remarks on the perfectly healthy structure of the kidney, so far as the researches of recent anatomists have pointed out to us, in order that we may the better detect, and understand its various departures from health when they are presented to us.

And first, we would state, that the secreting apparatus of the kidney consists essentially of a series of tubes variously arranged throughout the organ according to their site, and penetrating the entire viscus. They consist of a primary or basement mucous membrane, the inner surface of which is

clothed with spheroidal epithelium, while the outer is lined with a network of capillary vessels. Their internal surface is always covered with this epithelium in the healthy state, having its cell nuclei arranged at nearly equal distances.

But in certain diseased states the tubes are seen stripped of their epithelium, and we are then enabled to detect other nuclei of an oval character adhering to the walls of the basement membrane, which are somewhat smaller than the nuclei of the epithelium cells, and constitute what are called the germinal centres - Gooden or epithelium nuclei - Bowman whose office is the reproduction of new epithelium.

On tracing these tubes from the renal papillae of the kidney into its substance, we find them extending in nearly straight lines, increasing greatly in number as they proceed, by bifurcating at very acute angles till they reach the pyramids; from whence they pass enormously increased in number into the cortical substance. Here there is a complete change in the nature of their distribution, as they at once form a series of most intricate convolutions, and so continue to the end of their course.

The manner in which they terminate was long a

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matter of doubt, but it is now generally agreed that they dilate into a small pouch, which envelopes the Malpighian tuft of vessels. In the perfectly healthy state they maintain a pretty uniform calibre, measuring from $\frac{1}{300}$ to $\frac{1}{200}$ of an inch in diameter according to their situation, being largest at the papilla, and becoming always smaller as they proceed with their ramifications.

But we have every reason to believe that they are capable of modifying their calibre very considerably as circumstances demand, their walls being possessed of more or less inherent elasticity.

The cells of the epithelial lining though naturally spheroidal, are liable to assume a more or less polygonal form from the distension of their walls. They have a regular nucleus attached to their side of a round form. Their size is very variable, some being enormously distended, while others are little larger than the nucleus. The cell wall is very delicate in perfectly healthy organs, but it is sometimes seen preternaturally tough also. There is also sometimes observed such a delicacy of cell wall, that it is almost impossible to recognise an entire cell, the number of free nuclei being so very predominant.

Both these conditions of cell wall are seen to obtain, where no other depression from the natural state

can be detected. I am not aware of any explanation which has been given sufficient to account for these variations in the cell wall, which although certainly deviations from the standard of healthy cell, do not so far as we yet know, alter the urinary secretion in a manner sufficient to prove their incompatibility with health.

That the cells above described had some connexion with the urinary secretion, had long been a common idea; although nothing very definite could be urged in corroboration of it. Recent researches however have placed it beyond a doubt, that they are the active agents of urinary secretion.

May more it would appear certain, that their special office in urinary secretion was the separation, and ultimate elimination of the earthy matter and salts from the blood; the watery constituent of the urine being exuded from the bloodvessels in the Malpighian tufts.

The kidney is a highly vascular organ, the distribution of its artery being very peculiar. After entering the substance of the gland at the hilus, between the vein and the ureter, it sub-divides; the arterial branches occupying the intervals between the cones forming numerous anastomotic ^{arches} branches. These arches again give off many branches, which, having ramified through the cortical substance, terminate in a system of efferent vessels.

The arrangement of the small arteries however is peculiar, inasmuch as they with but few exceptions enter the dilatations above mentioned as the Malpighian bodies, and perform a series of convolutions within them after having subdivided into several branches, which, covering the surfaces of the dilated pouches, end in a set of central vessels. The few which do not subdivide in the capsules, pass at once into the capillaries.

From these central vessels efferent ones arise, which pass out where the artery entered, and end in the capillary plexus. The capillary vessels all coalesce and terminate in small veins which by further uniting, go to form the renal vein.

As for the parenchyma or proper connecting tissue of the kidney, we would only mention that some consider, that there is a delicate fibrous investment extending between the different structures, and compare it to the capsule of Glisson in the Liver - Goodsir, Bowman.

Others again as Toyne think, that it consists of peculiar cells which are supplied with blood vessels and nerves, and have the power of affecting an important change on the blood previous to its undergoing the process of secretion. Again Dr Fairclough in his recent article on the kidney says, that he has never

been able to observe the parenchymal cells of Loquace, either in the healthy or diseased state of the organ, and that he must hesitate about admitting their existence, especially as they are not described with such minuteness as to enable us to distinguish them from the epithelium of the tubes." He again thinks that it is extremely probable, that the capillaries are the main agents in forming the parenchyma, and that the whole or nearly all of the fibrous investment is made up of their walls.

Having thus enumerated the anatomical structure of the kidney, somewhat more in detail than we intended, we shall now come to the consideration of the symptoms of Bright's disease. This affection may commence in two forms, acute and chronic, and the symptoms are liable to vary somewhat according as the disease is of the acute or chronic type.

When acute there is generally pain over the loins, gastric derangement as vomiting, and indigestion, thirst, with sometimes pain over the epigastrium, frequent and often painful micturition, the urine being somewhat less in quantity than usual, sometimes completely suppressed, albuminous, turbid, depositing a sediment on standing, which on microscopic examination

tion is seen to contain blood corpuscles, epithelium cells, more or less broken up and degenerated, and fibrinous casts of the urine tubes. The urine too may, be coloured with blood when voided. The density of the urine may, be about the natural standard, or not infrequently somewhat higher than usual, always however having a tendency to fall as the disease advances.

These symptoms are generally ushered in by a previous rigor, which is referable often to exposure to cold, and which is followed by subsequent febrile excitement, there being restlessness, headache, dry skin, thirst, loss of appetite, rapid pulse &c. And in the course of a day or two several other symptoms supervene, such as anasarca, more especially of the limbs and face, inflammations of the serous sacs, as pleurisy. And if the urine be very scanty or suppressed, coma will also supervene probably with convulsions. But dropsy in some of its forms is by far the most common. These latter affections however, will necessarily be considered among the secondary symptoms, and we shall accordingly postpone what we have to say of them till then.

Of course we are not to expect in every case of

Bright's disease to find all the symptoms present themselves in the order we have here mentioned them, on the contrary, they are very variable; but in most well marked cases, there will be a combination of several of them according to the idiosyncrasy of the patient.

The chronic stage is not characterised by such unequivocal symptoms as the acute form.

It comes on very insidiously, and the patient is generally unaware of his condition, until the disease has already made considerable havoc unless indeed, it be but the continuation or sequela of an acute attack.

The symptoms which most commonly manifest themselves are, frequent micturition, the patient being disturbed during his sleep contrary to his usual habit, scanty or perhaps superabundant pale urine, somewhat coagulable by heat and nitric^{acid}, of low sp. gr., and throwing down a deposit upon standing which may contain casts of the urin tubes, pus or blood corpuscles, oil globules, and degenerated epithelial cells.

And in this form the blood generally considerably altered, the animal solidifiable substances being often much reduced in quantity.

The serum however may not be so much altered as in the acute form, as it frequently contains the nor-

- mal quantity of albumen, unless indeed the urine be loaded with that principle, which is not of common occurrence in the chronic stage of the disease. The patient is generally observed to have a weak anaemic aspect, to be emaciated and drowsy.

And as the disease proceeds or even along with these, a host of secondary symptoms are manifested; as Dyspepsia, Diarrhoea &c, which in the eyes of the patient seem to be the real malady with which he is affected. Although the chronic affection is often simply the remains of the acute, still it is quite capable of existing without the previous occurrence of the acute.

It is indeed the more frequent of the two, and it is surprising to see how long it may exist in a quiescent state. It would be very difficult to say how long the degeneration may go on without its being particularly noticed until some incidental cause excited an exacerbation of the dormant symptoms, but at all events, there is every reason to believe that it ^{may} exist for months or even years without any very striking symptoms, as is evidenced often by tracing back the history of the patient.

We shall now make a few remarks on some of the more common and hence more important of those

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symptoms, which are generally considered as pathognomonic of the affection at issue. And first as to the state of the urine. It is liable to considerable variation at different stages, but is always more or less altered. Thus in the acute form, it is very generally diminished in quantity, ~~as also in quality~~. Sometimes though rarely increased, and sometimes almost natural. But the decrease in quantity is the more common and at the same more serious variation, as if it be nearly or entirely suppressed, which it sometimes is, death in the shape of coma and probably convulsions will inevitably supervene if the secretion be not restored. And in those cases which speedily prove fatal, the urine has not been retained in the bladder merely; for after death that viscus is found either entirely empty, or containing at most a few drops of essentially morbid urine.

And this naturally leads us to the consideration of the qualities of the urine, which we shall find to be very much altered.

First in its containing albumen. This state of the urine has been considered, and consequently employed as one of the most characteristic symptoms of Bright's disease. But it must not be forgotten,

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that the urine is positively coagulable under many other circumstances. It is well known that some people, by a simple error in diet, are liable to have albuminous urine at any time quite independent of Bright's disease. Among these articles of diet may be mentioned, pastry, cheese &c; and in fact any article that is difficult of digestion in each individual idiosyncrasy. The urine is also frequently coagulable in certain conditions of the animal economy, e.g. convalescence from fevers, cystitis, haematuria, sometimes in dyspepsia, sometimes under the action of certain drugs as Mercury, Cantharides, Opium &c, and in some persons it occurs during the latter stage of pregnancy, disappearing again with a coenchment. In short some of high authority consider, that it must occur merely as a symptom of congestion of the kidney, however produced. At all events we have seen that it may obtain during many apparently different circumstances, and consequently conclude, that it is no proof of degeneration of the kidney without several concurrent phenomena. We must not therefore conclude that there is Bright's disease from mere coagulability of the urine, as we have just seen that, ^{that} of itself

It is not so pathognomonic of the affection as many might suppose at first.

We must also take care to apply both heat and nitric acids in testing for albumen, as heat alone may separate earthy salts when they are abundant, and so cause a haziness, - & acid alone may precipitate uric acid from urate of ammonia, and also cause an opalescence. But if the coagulum resist both heat and nitric acid, it must be albumen so far as we yet know.

There are other agents which equally affect coagulability of albumen, such as ferrocyanide of potash, - & corrosive sublimate, but the first two together answer sufficiently for all practical purposes and are always easily accessible.

Notwithstanding however the various circumstances which may impart coagulability to the urine independent of Bright's disease, and accordingly create a possibility of fallacy in diagnosis, still they are not of such weight as to invalidate the importance of coagulability as a diagnostic mark, seeing that we know of no other cause or simple malady as yet, by which the urine is so universally rendered albuminous as by the peculiar state called Bright's disease.

The quantity of albumen varies considerably, but it is

generally abundant in the early stage, not so abundant in the chronic, in short its tendency is rather to decrease than otherwise, as the disease advances. In the chronic form it may be increased at any time by an acute attack supervening upon any exposure. Sometimes it has been seen entirely wanting for a time, and this most frequently in the chronic stage, although not confined to it.

But besides being altered in quantity and containing albumen, there is yet another important change in the urinary secretion, viz, the proportion of the solid ingredients to the watery constituents.

In health the specific gravity varies from 1015 to 1025, by some indeed it is estimated at a higher density than this. In Bright's disease it is sometimes very much altered as shall presently be seen. Thus, in fifty cases where the urine was examined by Gregory, the average density was 1013. But in most acute cases it is much higher than this, being frequently at first not at all below the average of that in health.

In some of a very acute inflammatory type it has been known as high as 1046, while in some chronic cases it has been seen as low as 1004.

The presence of albumen has considerably to do with

the density of the urine. And the fact of its abound-
ing in the acute cases to a much greater extent
than in the chronic forms, goes a good way to
explain the greater density of the former than the
latter in the generality of cases.

The simple extraction of the albumen by coagula-
tion and subsequent filtration, has lessened the spe-
cific gravity to from 8° to 10°. Of course in estimat-
ing the density of the urine, several collateral circum-
stances must not be overlooked.

Thus, it must always be viewed in relation to the
entire quantity of urine secreted, as the Sp. Gr.
depends upon the amount of solid ingredients
in a given quantity. Consequently if the aqueous
portion be augmented, the effect upon the absolute
density of the solids will be the same as if they
were proportionally diminished. But when the
density decreases along with a simultaneous de-
crease of the urine, it is very significant of re-
nal lesion. as we have just seen that the
Sp. Gr. is considerably lower than it is in the
state of absolute ^{health} notwithstanding the addition
of albumen to its natural constituents, we must
infer that there is a material ^{diminution} in its solidifiable

substances, and this we shall see actually to obtain. For the solid contents of healthy urine are estimated by Berzelius at 67 per 1000, but in Bright's disease they are often as low as 24 per 1000. Indeed they have been known as low as 15 per 1000, which we believe to be the lowest yet on record. In this latter case the urine daily discharged amounted to about thirty six ounces daily. Christison.

It is further known, that the urea is diminished in proportion with the other solid ingredients. For of the 67 per 1000 given by Berzelius, thirty according to the same authority consist of urea, whereas in the affection at issue it has come down to 15 per 1000. It does not follow however, that the formation of urea does not take place, on the contrary it is formed as usual, but is retained in the blood as we shall presently see. And this naturally leads to an observation or two on the blood as modified during Bright's disease.

And with reference to the condition of the blood, it is found to vary considerably according as the disease is acute or chronic.

In the early stage, the albumen which is naturally in the proportion of 70 per 1000, is often very much

reduced, and has been found as low as 16 per 1000. -
- Babington). This deficiency has a very marked effect
upon the serum, which in health has Sp. Gr. of 1030,
whereas when there has been much elimination of the
albumen by the urine, it has been seen as low as
about 1013. We would naturally infer then from
this, that the more albuminous the urine, the less
the Sp. Gr. of the blood serum,

And in fact - it is precisely so, for Dr Christon has
shown that there is an exact inverse ratio be-
tween the density of the serum, and the coagula-
bility of the urine in this disease. The serum is
also somewhat milky, and if treated ^{with} sulphuric
ether, yields a small quantity of oil exactly resem-
bling ordinary fat.

There is no decrease of the fibrin however at the com-
mencement of the disease, as it is generally aug-
mented. But it does not vary so much as the
other constituents. It is most frequently decreased
as the disease advances. In fact its proportion is
very liable to modification which is regulated by
the degree of inflammation and buffiness of the
blood, consequently it is generally increased at the
commencement, and decreased as the disease be-

comes Chronic.

Besides there is an unnatural amount of urea in the blood in Bright's disease, from its non-elimination by the kidney. That there is urea in the perfectly healthy blood is now admitted by most physiologists, but it is in an almost inappreciable quantity; whereas here, it may easily be obtained in the serum, as in the serum of ventricles of brain for example.

How far this retention of urea in the blood may be the cause or at least augment the other modifications which it undergoes, it is not easy to say. In the early stage the proportion of the colouring matter is not at all affected. But it is very different in the chronic, for perhaps the most remarkable change here, is in the haematozin. It invariably undergoes great diminution with the advance of the disease, quite independently of any complication, such as haemorrhoids or venesection, which would sufficiently explain this change.

It is known from accurate analysis to decrease to one third its natural standard which is about 7.5 per 1000, affording satisfactory explanation of the leucophlegmatic and dingy aspect of the patient in these cases.

Also the density of the serum is restored to nearly its normal proportion, or it may even exceed it.

But it may fall again at any time in the progress of the disease upon the supervention of sudden reaction, and this state has been noticed to occur invariably with considerable coagulability of the urine. The urea in the chronic form varies in proportion to the amount of water secreted, thus at one time it may almost have disappeared, while at another it may be greater than ever.

The fibrin is also frequently restored to its natural proportion, but is ever liable to increase upon any exacerbation of the symptoms.

Having then attempted to describe shortly the several symptoms enumerated above as essential to Bright's disease, we would now take into consideration several other affections which in general supervene upon the primary.

No doubt the primary may occur uncomplicated, and even thus carry off the patient's life, no secondary affection save such as we shall notice under the head symptoms, ever occurring at all, and these too the most formidable and speedily fatal of all. But it is far more common that sooner

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or later several additional affections make their appearance, and they are all the more important, because one or other of them most frequently kills the patient, and hence ^{all} demands the closest attention of the physician.

Of these anasarca is perhaps the most prominent. Sometimes it is general over the body where it occurs in an acute form. But more frequently it affects only the limbs, and as it proceeds when not subjected to early treatment, it extends to the face and arms. If it be very great, there is laterly effusion into the great cavities. These latter effusions however are not common, unless indeed there be diseased Liver in the one case, and a Pleuritic attack in the other.

If the heart be affected there is sometimes in very general dropsy an effusion into the pericardium, but this is rather rare. That the main cause of the dropsy is defect of the albumen in proportion to the water in the blood we have every reason to believe from the experiments of Haller and Magendie who produced it artificially in rabbits by simple dilution of the latter fluid. It is also seen where defective nutrition has been pushed to a great extent

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as in cases of famine. In such cases it is doubtless owing to defect in the albumen, and other solidifiable substances of the blood. But if anasarca be entirely owing to deficiency of the albumen in proportion to the water of the blood, we would naturally expect that the amount of dropsy would be in proportion to the decrease in question. There are cases however of Bright's disease occurring ever now and again, where they go on for weeks or months together without the superoention of dropsy from first to last.

Nevertheless we cannot help thinking that this is the true explanation of dropsy, as we see it occurring exactly in those circumstances where the due proportion of the solids to the water in the blood is changed. But when we have anasarca occurring in combination with highly coagulable urine, our suspicion that the disease in question is the cause may justly be aroused. We must however remember, that anasarca is a frequent complication of thoracic lesions as emphysema and diseased heart.

It is necessary therefore that we attend particularly to the concomitant symptoms, that we may not be misled. But there is little chance of mistake, as, when the thoracic organs are not at fault, we have

The most decided negative proof from the stethoscope. The aspect of the patient also is quite different in the one case from that which obtains in the other, and is quite characteristic and significant to the practised physician. In concluding what we have to say on this subject we cannot refrain from quoting from Watson four rules laid down by Christison, which are generally acquiesced in both by himself and Prout.

These are 1st That Bright's disease is present in most cases of febrile dropsy, including those which are consequent upon scarlatina.

2nd In all cases of anasarca where the oedematous parts are elastic, and do not pit upon pressure.

3rd In most or all kinds of dropsy attended with diuresis provided the urine be not saccharine. The diuresis here mentioned is of course independent of diuretic medicine.

4th In all dropsies attended with urine of a very low sp. gr. (say below 1010), and not exceeding the natural standard of quantity, whether it be albuminous or no.

We may also say that dropical effusions from Bright's disease differ from all other dropsies, in their containing urea although the proportion is

very small, the largest quantity ever found being about four parts in 1000. But of course we cannot avail ourselves of this phenomenon as a diagnostic symptom.

Another important affection, though they can hardly be called secondary, is what is known as Head Symptom. This affection is all the more important because coma is considered to be the natural mode of termination of Bright's disease when it exists unaccompanied. With regard to the immediate cause of the coma it must be confessed that there is some discrepancy of opinion. As a general rule there is a reciprocal connexion between the coma and suppression of urine. We have every reason to believe that it is sometimes caused by effusion of fluid into the ventricles of the brain, because its accession when dropsy exists, has generally some proportion to the accumulation and extension of the dropsy in other parts of the body, although not necessarily so.

And we have the authority of both Christison and Watson, who state explicitly that when dropsical fluid is allowed to accumulate, drowsiness the first symptom of affection of the head supervenes, and soon passes on to coma unless speedily

controlled; and that the removal of the dropsey will usually remove the drowsiness. But this way of accounting for the supervention of coma is not applicable to all cases. It will not explain those where there is no unusual amount of fluid found in the brain, and where there has been but little dropsey.

In those cases it is usual to refer the symptoms to the action of urea retained in the blood, and we think the accuracy of the reference is quite in accordance with observation, as the coma we have just seen has always some proportion to the partial or entire suppression of urine. Thus we have seen a patient with head symptoms on one day with scanty urine, greatly improved next day by an active diuresis being established, which again in another was suppressed, and fatal coma supervened.

Although what we have just stated with regard to the amount of urine secreted, and the supervention of coma be correct, still it has its exceptions on record. Thus one of Dr Christison's patients voided only two ounces of light urine daily for nine days before his death, still continuing sensible to the last, when he died of inanition.

But there are other head symptoms besides coma

which are apt to manifest themselves, such as apoplexy, epilepsy, convulsions, delirium, and paralysis. And what is very remarkable regarding the whole of these head symptoms is, that, in British practice they are very frequent, while they are comparatively rare in France. And in Dublin meningitis is frequently met with, while it is rare in Edinburgh. While in Edinburgh again convulsions are very frequent, if Bright's disease exist during the pregnant state; such is the experience of practitioners in Edinburgh. — Watson.

Dyspepsia is another very common secondary affection. It generally manifests itself in the shape of vomiting, and may be to such intensity as to cause the rejection of all articles both of food and medicine either in the solid or fluid form. In the less severe cases, there is a sense of weight or pain over the epigastrium with loss of appetite. It is often not so apparent in the acute inflammatory as the more chronic subacute types, but is seldom wanting when the disease is a little advanced, and approaches a termination, adding greatly to the severity of the symptoms. It may even be so severe as to lead to a fatal termination through pure inanition, when from the vomiting nothing is retained in

the stomach. - Christison. There is also flatulence and diarrhoea in many cases which often prove very obstinate and even dangerous. It is generally owing to ulceration of the mucus membrane of the intestines, which after death is found soft and congested. Sometimes the stools are dysenteric, again watery, and sometimes membraniform shreds are seen in them. It is scarcely ever seen in the early stage, being confined almost entirely to the middle and latter stages of the chronic type. It is not so common in Paris nor even in London as in Edinburgh, although the very opposite is the rule in those affections not connected with Bright's disease. - Christison.

Very frequently there is Hepatic disease coexisting with granular degeneration of the kidney. And it is often a matter of doubt and considerable difficulty to determine which is the primary affection. The probability is that they are in many cases nearly simultaneous, as they have both a common pathological condition, and a common exciting cause, which we shall notice under our enumeration of the supposed causes of this affection. When it does exist to any great extent it is a very embarrassing complication leading not only to ascites and its conse-

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quences. In fact it is not very common to meet with much ascites without hepatic disease, and it is easily understood why it should be so, when we recollect the anatomy of the parts concerned.

We have also more or less lesion of the thoracic viscera attending Bright's disease. Thus we have hypertrophy of the heart frequently occurring. When the liver has been found in a state of disease we may be pretty sure that the heart will also be affected, as it is liable to take on diseased action from the very same circumstances as the liver. But it is a question whether the heart affection may not often be explained by merely referring to the impoverished state of the blood. Thus it is not at all improbable, that the poor condition of the blood which most unquestionably exists during Bright's disease, renders the muscular action of the heart somewhat languid and weak from want of due supply of nutrition, and this leading to the slow passage of the blood through the organ, causing again in its turn the heart to take on increased action, and hence the hypertrophy. That this may frequently occur is the more probable when we recollect that, a great many of the hypertrophies met with in this malady are hypertrophies

with dilatation, without any valvular obstruction to explain the hypertrophy. Accordingly we would consider that, when there is no valvular disease coexisting with the hypertrophy, it is owing to the poverty of the blood especially if dilatation of the chambers co-exist with it. Valvular affections are seen also in Bright's disease, and when we have them we have an easy explanation of the hypertrophy. And it has been thought, that valvular disease may be caused by the circulation of salts in ^{the} blood which act as irritants. The irritation in these cases of course is referred to an excess of urea in the blood.

How far this doctrine is plausible we are not prepared to decide.

Pericarditis and Pleurisy are also met with in the disease in question, and are even liable to occur at any stage of the disease from undue exposure they may supervene either in the acute or chronic form, and must be carefully watched, for they are sometimes most insidious in their appearance, and always more in corrigible than when uncomplicated, and sometimes are the immediate cause of death. In fact there would appear to be a predisposition of the serous sacs to take on inflam-

mation during Bright's disease. But this disposition seems to be affected by locality and other circumstances, for as we have already seen of the head symptoms and diarrhoea, so with the predisposition of the serous sacs to inflammatory attacks; they are not seen to obtain alike in all places. Thus these inflammatory attacks are not in French practice so frequent as they are in British. We do not yet know how to explain this apparent anomaly. The pleura is more frequently affected than the pericardium or peritoneum, and is most frequently affected on both sides at the same time. When only one side is affected it is almost always the left.

The Lungs too are very apt to share in the disorder, for there is very frequently more or less Bronchitis which is often intractable, especially if there be effusion of serum at the same time. As the disease goes on and assumes the chronic form, so does the Bronchitis if not checked at its onset. But as it is as frequent in the chronic form when we meet with it as in the acute, we have often no opportunity of cutting it short. There is also sometimes an oedematous state of the Lungs found with Bright's disease. This oedema is characterised by a pale bloodless appearance, and on

section a pale glairy fluid may be expressed.

Phthisis pulmonalis may also occasionally be seen. But in the cases we have seen, the renal affection supervened upon the Phthisis; nor is this at all uncommon. On the contrary we think, that renal affection is a very common complication of Phthisis in its latter stage, and is often the immediate cause of a fatal termination. In corroboration of this we could cite several instances were it necessary.

And we know from Dr Christian's observations that, few cases of anasarca occur during Phthisis which are not connected with coagulable urine and the other symptoms of Bright's disease. And he states that, he has repeatedly found the same state of things when his attention was turned to the kidney not by anasarca, but by dyspepsia, neuralgia, or an unusually leucophlegmatic complexion. We therefore conclude that Phthisis is not to be considered a secondary affection to Bright's disease so much as the converse is true. Rheumatism is also sometimes a secondary complication.

Neuralgia has been complained of, but neither of these affections are certainly so frequent as the

others above mentioned. It is remarkable that when they do occur, there is generally little or no anasarca.

There is also a general deficiency of the perspiration attending this affection comprehensively termed Bright's Disease.

With regard to the ultimate causes of Bright's disease we must admit that there is much ambiguity concerning them. There are ~~two~~ however two theories regarding them, each of which is considered the more probable by its respective advocates. One class maintains, that the disease owes its origin to a poisoned & depraved condition of the blood, while the other avers that the blood has nothing to do with its cause at least in so far as a poison is concerned. The blood theory nevertheless would seem very plausible, inasmuch as the disease in question is frequently seen to manifest itself when there has been long standing chronic diseases. And we know that all chronic diseases when of long standing, have a remarkable effect in impoverishing the blood. We recollect of a case in the Hospital two years ago that exemplifies this very well. The patient was being treated for Lupus of seven years standing, and was attacked with Bright's disease while under the treatment, and that too

a considerable time after he entered the Hospital. Also it is very frequently seen in drunkards, and all persons of unquestionably intemperate habits. And we know that in such persons the blood is very much depraved, often giving them an anaemic and weak aspect. This depravity of the blood may perhaps be owing to an undue balance between the amount of carbonaceous matters taken into the body and the respiration. We have every reason to believe that these carbonaceous matters are often in excess, and deposited in the shape of fat, or at least predispose the kidney to take on the fatty degeneration.

There is now a days little doubt that such is the cause of many fatty livers both at home and abroad, and we can see no reason why the same law should not extend to the kidney, the more so when we recollect, that both organs are often simultaneously affected with the same lesion, and also when we consider the remarkable analogy noticed in their circulation.

Then again intemperance is a very frequent exciting cause of heart disease, and it is believed by some that obstruction there, may originate Bright's disease of itself. How far this is correct we cannot say, it

seems feasible in theory, but we know of no facts in cor-
roboration of such doctrine.

Others again think it may occur quite independently
of any depravity or poison in the blood, as from a
blow over the loins leading to congestion as it would
in any other part of the body. Or again it may be
from exposure to cold. Perhaps this is the most
frequent of all the causes of the affection, and often
happens after the person has been heated and sits
down on the ground or any cold seat, or takes a
large draught of cold water. This may, and is over
causing congestion of the kidney, and leading to
the symptoms of the acute inflammatory form of the
disease which if not duly corrected passes on into
the chronic. Thus many of the chronic cases are
tracable to an acute attack originating under such
circumstances as we have just mentioned.

The chronic cases however are often extremely insidi-
ous in their onset, and their causes are propor-
tionally the more obscure. No doubt habitual
intemperance has much to do with such cases
For we have every reason to believe that the disease
has been existing in a somewhat latent chronic
form in many of those cases where a course of

habitual intemperance has been led, although it may not have attracted the attention of the patient himself. Accordingly it is frequent to see patients ask assistance, not on account of their wine, but because of Dropsy, or Dyspepsia, or some other of the secondary affections above mentioned. Indeed it is thought that intemperance may cause it without either exposure to cold or any other incidental cause.

Dr Simpson in speaking of puerperal convulsions informs us that they are frequently connected with Bright's disease, and that we may almost expect to have convulsions during labour if anasarca has existed for some time. And he has the testimony of other obstetrical practitioners in corroboration of the same statement. Thus we may conclude that the puerperal state may act as a predisposing cause of this malady.

Dr Christison considers the scrofulous diathesis to be a powerful predisposing cause, indeed so much so, that it may be considered to be one of the diseases of the diathesis. But the experience of Watson, & Blou militates with this doctrine; even Dr Bright himself says that the concurrence of scrofulous disease with this affection is rare. There can be no

doubt that Bright's disease does frequently concur with Phthisis, but it is a secondary affection generally when it does occur. We can easily understand however why this disease should occur very frequently in the scrofulous habit, as it argues a weak & athenic depraved state of constitution, and consequently the more on that account liable to take on disease in any organ of the body. In fact we consider that any depraved state of constitution hereditary or ^{acquired} assumed, must act as a powerful predisposing cause to this disease. Thus we see it often in inveterate chronic cutaneous diseases, which have a spoliative effect on the blood, as also after the strength has been undermined with typhoid fevers &c.

Then the period of convalescence from Scarlatina is prone to be complicated with this disease. This may originate from deficiency of perspiration, or also from the increased amount of function thrown upon the kidney at that period. But there would appear to be a greater cause of Bright's disease after Scarlatina than after most other acute affections, at least more than the increased amount of functional activity of the kidney will explain. Accordingly in other most acute affections such as

Pneumonia, Rheumatism &c., we have not the same liability to Kidney disease, although there is often then a greatly increased activity of the Kidney. We may therefore conclude that the period of Scarlatina acts also as a predisposing cause of the disease in question.

It may also originate from a sudden suppression of the catamenial discharge, and from recession of extensive cutaneous diseases especially if they have existed for some time previously, and the recession be sudden. Then it has been thought that age and sex had considerable influence as predisposing causes. But those differences which have been referred to age and sex can all be traced to other causes and circumstances. Thus it occurs more frequently among the working classes than others, and of these the males suffer in greater proportion than the females. But it must be remembered that they are the persons of all others, who are most exposed to its causes such as cold and intemperance. The truth is that it occurs at all ages from the child to the extremest age, and to all classes of society indiscriminately, though it certainly is more frequent among the working

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classes for the reasons just assigned. Finally it has been known to supervene upon muscularialism, and that this state of system is very much predisposed to its attack may well be inferred from the fact, that it has actually been produced in dogs by the administration of this mineral. - Gluge. The same experimentalist avers, that he is of opinion that, the fatty condition of the kidney may be produced at least in dogs by confining them to a strictly fatty diet. This however has not yet been seen in man so far as we are aware, but reasoning from analogy there seems no reason why the same may not extend to man also.

Having then traced the different causes of Bright's disease so far as we are able, a very interesting question arises as to the curability of the affection. This question is very important when we remember that till very recently comparatively speaking it was considered quite incurable. That this supposition is quite wrong we have ^{not} a shadow of a doubt. On the contrary, we think we are right when we aver that one form of it at least is very amenable to treatment, and this is the acute type. Thus we have ourselves seen a complete recovery after Scarlatina and that too un-

are very unpropitious circumstances so far as could be
 judged by all. In short there can be no doubt en-
 tertained on the subject now. We have also under
 our notice at present a case of this affection, and
 he had an attack exactly similar twenty nine years
 ago, which was cured then in the Royal Infirmary
 of Edinburgh, and he has never had a single symp-
 tom of its return till now. And the present attack
 was brought by strong ^{drink} and concurring exposure to cold
 after being very much heated. To be sure it may be
 said of this case, that they could not diagnose Bright's
 disease with sufficient accuracy twenty nine years
 ago to enable us to derive any importance from this
 case as to the curability of the disease. But when
 an intelligent person tells us that he was exactly simi-
 larly affected before, we see no reason why we
 should not accept it as a case in point, especially
 when there is twenty nine ^{years} intervening between the first
 and second attacks, and the second attack is plainly
 traceable to most powerful exciting causes or rather
 combination of causes. It is the opinion of Dr Christison
 that most of those cases which occur during the
 latter stages of pregnancy do recover permanently.
 Of course the pregnant state itself may ^{induce} a somewhat

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similar train of symptoms, but that does not invalidate the doctrine when the pregnancy is clearly the predisposing cause. Complete and perfect recovery however can only be accomplished in those cases which are of the acute inflammatory form. Of the cases we ourselves have seen which were proven to be decidedly fatty, we never saw a complete recovery in fact we never saw a recovery at all. And this doctrine is quite in harmony with the observations of the most experienced among us. Accordingly we are taught to believe, that a complete recovery from the truly fatty degeneration is perhaps unknown in the records of medicine.

A recovery is rare among the habitually intemperate, and in all cases where there is much secondary complications, one or other of them being in general the cause of a fatal termination.

Also we need not be sanguine in our hopes of recovery when it is evident that the constitution of the patient is already considerably undermined by any depressing agency whatsoever. There is always doubt of recovery so long as the urine remains of diminished quantity and density, and the patient is listless and anæmic. Still there are many recoveries when symptoms have often been very unpromising, but the prog-

is always most ^{favourable} in those cases which are least complicated.

The numerous symptoms which we have just described as characteristic of the affection called Bright's disease, are attended with at least two very distinct kinds of renal lesion. The one is clearly owing to an acute or subacute inflammatory action, the other to a fatty degeneration of the organ not of an inflammatory nature, but always more or less chronic. In the first of these lesions the most marked morbid appearance is the great congestion of the organ in the earliest stages of the affection, and in the more advanced cases a general enlargement.

The surface is sometimes smooth, in other cases lobular or granular or butyroidal. Internally there is considerable lesion of the cortical and medullary substance, though mainly of the former, destroying the natural striated appearance and normal colour of the organ, while it imparts somewhat of a yellowish white aspect to it. And upon making an injection, it is found to pass very deficiently, often not at all into those lesions. Thus far we may follow the morbid anatomy of the kidney in this type of the disease with the naked eye, but it is only by

means of the microscope that we are enabled to observe the real change undergone by the organic structure. Thus we discover that the tubuli uriniferi are blocked in many places to complete obstruction with their own epithelial cells, blood discs, pus corpuscles and perhaps some salts as oxalate of lime, lithate of ammonia, uric acid crystals &c, the epithelial cells however being the main cause of obstruction, as they are by far the more numerous. These epithelial cells vary greatly in their appearance some being entire, others degenerated, and these perhaps the greater number, others of very small size some being even reduced to the bare nuclei. Thus it would appear that with the inflammatory type of this disease, there is a premature development and desquamation of the lining cells of the tubules, this leading to their complete obstruction, and by their pressure causing rupture of their walls. Most observers acquiesce in this doctrine, but Gluge considers that the obstruction is rather caused by the ordinary products of inflammation as exudation corpuscles, pus corpuscles and fibrin, and that these are not only deposited in the interior of the tubes, but also perhaps in greater abundance in the parenchyma of the organ external to the tubes. There is no doubt whatever

that the deposit in question is often seen external
 to the tubes, but its occurrence there is doubtless often
 or mostly owing to rupture of the tube walls from
 over distension. We consider it more probable that
 the obstruction of the tubules in most cases at least, is
 caused chiefly by the premature development and
 desquamation of their own epithelial cells. And in
 corroboration of this view we would simply state that
 this increased development and subsequent desquamation
 of cells has its analogue in all other mucous mem-
 branes, and we can see no essential difference between
 the mucous membrane lining the tubes of the kidney
 and the mucous membrane in other parts of the
 body. And we know first from the observations of
 Hensle, and subsequently from Labret, that the essential
 phenomenon of mucous catarrhs, is an increased
 development and desquamation of the cells from
 their surfaces with an accompanying increased dis-
 charge of fluid. Again it is known from the observa-
 tions of Lairdnce that desquamation with all the
 the characters above described has been known
 to have existed for a considerable time without
 our being able with the most minute microscop-
 ical examination to detect any rupture of the tubules

or any other depression from the usual condition of the kidney. And we cannot see how this should occur, were the obstruction caused in the way Gluge accounts for it. However the obstruction is produced, one important phenomenon is the result sooner or later, viz. that the great obstruction of the tubes diminishes very materially the amount of solids in the urinary secretion, while the watery constituent may be secreted in the usual or even in greater quantity than usual for a considerable time. And this tallies well with the doctrine given forth by physiologists, that the proper function of the cells is to secrete the solids, while the watery constituent of the urine is secreted or exuded from the vessels in the Malpighian bodies.

And as the water is secreted and passes along, it carries often with it more or less of the obstructing material, thus affording us a very excellent diagnostic mean. Hence if we make a microscopic examination of the urinary sediment after it has stood for some time, we find the contents of the tubes in the shape of exact casts of their inner surface more or less entire. Of these tubes cast there are two very distinct kinds, so distinct indeed, that by them we are enabled to distinguish between the inflammatory and fatty types of Bright's Disease.

And we shall here describe only those which are characteristic of the inflammatory form, reserving what we have to say of the other kind till we treat of the fatty kidney. These casts then of the inflammatory form consist of degenerated epithelial cells, also their nuclei, and blood discs, one or all of them adhering together on a transparent or granular membraniform substance which is considered to be fibrin. Between the entirely transparent and granular cast there is every intermediate type. Along with these casts will be free nuclei of cells, free cells often degenerated and broken up on their edges, and blood corpuscles, with pus corpuscles, and perhaps some salts. There may even be a few oil globules, as in the perfectly healthy epithelial cell there is some oil, so that an oil globule or so are not to be considered as incompatible with the secretion of a kidney perfectly free from fatty degeneration. The tubes may be in part emptied of their contents by the flow of water, but it does not follow that they shall resume their natural function immediately upon being cleared out. On the contrary they may be permanently deprived of their epithelium cells, and of their power of further development of them. And a microscopic examination at this stage may show the basement

membranes naked, with its own germinal nuclei seen here and there, which we have before mentioned as being considerably smaller than the nuclei of the living cells, and consequently not to be confounded for them.

But the desquamation and subsequent reproduction of the cells may go on for some time, and then we have that state described by Guerdner, viz, that desquamative casts may be found in the urine and subsequent examination detect no variation in organic structure from what is perfectly natural. But this is rare.

The more common result is that the tubes never regain their natural secreting power when they have been much injured, but become shrunken and atrophied. And by the microscope they are seen to be flattened like ribbands. From their transparency the nuclei are seen attached, and appear to be enclosed between two layers of membrane. These casts need not be confounded with those above mentioned as they are much more dense and elastic, broad in the middle and tapering to a point at the ends, and always contain one or more of their small oval nuclei, which we have shown above to differ greatly from the nuclei of the epithelial cells which line the tubes. They have also a tendency to split up

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into fibres exactly like the young fibres of areolar tissue, and Fairclough is of opinion that the whole of the diseased basement membrane splits up ultimately into these fibres and fusiform cells. As these changes go on in the tubes, the vessels, from the compression to which they have been subjected by the obstruction of the tubes, become obliterated also, and the consequence is a considerable degree of atrophy and puckering, chiefly of the cortical substance giving the whole organ that atrophy and irregularity of surface which is so commonly seen in these cases.

The other morbid lesion which we have above mentioned as constituting Bright's disease, consists essentially in an abnormal deposition of fat in the organ. This affection is of a chronic nature, so much so indeed that, it is believed by some to be entirely unconnected with any inflammatory action whatsoever. But regarding its being completely independent of inflammatory action there is yet some discrepancy of opinion. There would appear good reason to conclude that fatty degeneration is sometimes seen in connexion with inflammation, but at the same time is more generally of a non-inflammatory nature. The real lesion is most satisfactorily shown by means of the microscope. And it is seen to consist of an

enormous deposition of fat cells, some of which are free, some aggregated into small masses in the interior of a cell wall. Thus the proper lining of the tubes is often filled with oil globules, so much so indeed that we can hardly perceive a single degenerated epithelial cell without some oil globules adhering to it or enclosed in it.

The epithelial cells are thus loaded with fat globules, and they choke up the tubes as in the other affection, causing rupture of their walls, and complete invasion of the substance of the kidney. The result here is precisely the same as in the inflammatory form, which we need not describe again. The casts in this case however are very different from those in the former. They consist of epithelial cells loaded with oil globules, the oil globules adhering here and there to the agglutinating transparent substance of the cast, which as in the former type consists of fibrine. Many oil globules are seen too floating quite free, and others are seen collected in small masses together enveloped by a thin semitransparent membrane. There is also frequently seen some deposit of salts sometimes crystallised, often amorphous or both combined. But the fat is not confined to the tubes, for every here and there the tubules are ruptured and fat deposited all through the surrounding tissue. And if the organ is analysed at this stage of the

disease, it is found to contain a very undue amount of fat, which circumstance has doubtless won for it the name of Stearosis.

We have then described the different characters by which the two essential forms of Bright's disease may be distinguished without difficulty during life. But we frequently meet with cases which present more or less of both characters at the same time. And this has been so frequently seen, as to lead several accurate observers to consider a diagnosis between the two forms quite impracticable. There can be no doubt however that the two affections do exist quite separately, and are perfectly distinct in their nature. In so far as the desquamation of the lining epithelium of the tubes is concerned, the affections are exactly alike. But the desquamation in one case is free from fat while in the other it is completely clogged with it showing most certainly a decided difference in the pathology of the two affections.

But besides these two affections of the kidney which we have seen to be quite different in their pathology, and easily distinguished during the life of the patient, there are other two morbid lesions, which are known (though not till after the death of the patient) to obtain with albuminuria and the other more prominent symptoms of Bright's

disease. These are first, what is called "waxy degeneration";
 and second, "cystic degeneration". The former is comparatively
 frequent in its occurrence, the latter rare. Of these however
 we shall say but little, both because we know of no
 means of detecting them during the patient's life, and be-
 cause when they do occur they are usually concomitant
 with one or other of the two essential affections, and con-
 sequently will not modify our treatment materially.

The waxy kidney is always enlarged hard and dense, and
 on section seems somewhat transparent, and is of a
 light yellowish colour. The pyramids are preternaturally
 broad at the base, and their striæ meet the cortical
 substance in digitations instead of terminating by a
 well defined semicircular line. The cortical substance
 is not diminished in bulk as we have seen it to be
 in the fatty kidney, but is generally in its natural pro-
 portion. On microscopic examination this lesion is seen
 to consist essentially of a preternatural dilatation and
 thickening of the urine tubes throughout the organ. The
 vesicular texture is here also much destroyed.

With regard to the formation of cysts in the kidney
 very little definite is yet known. They have been mis-
 taken for hydrocels. They sometimes contain fluid,
 sometimes small quantities of oil, again a few granules

but most commonly they contain a clear fluid even although granular excudation be in abundance all around them. Simon thinks that they are formed by an enormous development and hypertrophy of extravasated epithelial cells, while Gaidner considers that they may be formed by the occlusion and isolation of portions of tubes which have not lost their power of secretion. But it is not well understood how or why they are formed as their comparative rarity has precluded a sufficient demonstration of their anatomical character.

As regards the the primary disease the main remedies indicated are bloodletting general and local, counterirritation, diaphoretics, diuretics and astringents.

The practice of general bloodletting must be restricted to those cases which are of an acute inflammatory type, and in these cases it is most efficacious. It must be practised to a considerable extent where the patient is young and robust or somewhat plethoric, and in such cases may be repeated with great advantage in the event of a general well marked reaction.

In those cases which from the first are of a sub-acute form, local depletion will generally be sufficient. But we must be careful not to carry our depletion

to any great extent, as we know that the nature of the disease itself is to impoverish the blood as it advances.

Accordingly we must just go the length of producing a general impression and no farther. In all cases acute or sub-acute, the general or local depletion must be regulated by our careful consideration of the collateral circumstances. And we may add, that we need not have recourse to this measure in an ordinary case of fatty degeneration, unless indeed there be well marked local reaction from some incidental cause, when a local blood letting may be of decided advantage.

Counterirritation of the loins may be used with great propriety in the acute or subacute cases in the shape of blisters or small issues. But their utility is very questionable in those cases which we know to depend exclusively upon fatty degeneration.

Diaphoretics are of the greatest importance in the treatment of Bright's disease. They may be given with marked effect in all forms of the affection. In fact there is no class of means in our command which are of such general application, and possess greater virtue than Diaphoretics. And of these we instance Dover's powder, the warm bath, hot air vapour bath, warm clothing and a somewhat equable warm

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temperature. Of the diaphoretics which are purely in the shape of drugs none will be found to supersede Dover's powder. But we think the application of warm dry air to patient's body is by far preferable to the warm bath as a diaphoretic, both because the fluid is more apt to escape from the patient in a dry heat than in moist, and because it can be applied very easily to the patient in bed without subjecting him to the risk of cold and fatigue, both of which it is very important to obviate in many cases. This we consider as a most important and effectual means of producing diaphoresis, having seen it act admirably when repeated attempts with Dover's powder were quite unsuccessful.

The use of Diuretics in this affection has been doubted by several competent observers as being productive of any advantage. Thus it has been thought that to produce diuresis in Bright's Kidney is apt to cause or keep up the irritation and congestion of the organ, and as a consequence to accelerate the process of disorganization already existing there. But this view must be considered more theoretical than in harmony with observation. There are indeed some cases where the diuretic treatment seemed to do harm, but these are rare and completely counterbalanced by their good and even curative effects

in others. Accordingly we need not despair ourselves of one of our most potent means of treatment, although it did not answer in some particular cases, when it answers so well in others, because we do not see in theory how it should act save by irritating and consequently accelerating the process of disorganisation.

And of these diuretics the best are perhaps digitalis, squill, spirit of nitric ether &c. They act most certainly when given two or three in combination. Thus it may be advantageous when giving them in the liquid form to administer the more concentrated ingredients with those vegetable infusions and decoctions which possess similar properties: such as brown tops juniper berries &c. But in many cases of the primary disease the use of diuretics is not especially indicated, and consequently they can be well treated without having recourse to them at all, especially as they are accounted injurious by some. When however anasarca is a prominent symptom and proves obstinate at the same time, or when there is great suppression of urine threatening death by coma we must try diuretics as a last and often hopeful resource. We would here also mention that when there is great suppression of urine and coma we would do well to try the administration of colchicum. There can be no doubt that this drug has

a specific action on the elimination of urea from the blood. And when the coma is not owing to the pressure of fluid in the cavities of the brain, of which we may have a pretty accurate idea from observing the amount of general dropsy over the body, but is owing to the poisonous influence of the urea retained in that fluid, we may ^{ought} and to administer colchicum and that too with a reasonable hope of success. Thus since Dr McLagan called the attention of the medical world to this power of colchicum, we have seen it administered when the head symptoms were very marked indeed, and with the effect of relieving them completely.

The use of Astringents in the primary affection is rather uncertain. Sometimes they have been seen to check the elimination of albumen, but cannot be much depended on. If we do try them the best will be found in the acetate of lead and Opium pill, or gallic acid.

We come now to speak of the secondary affections the treatment of which is of the utmost importance, both because of their obstinacy and because one or other of them is frequently the cause of a fatal termination. Of course their treatment here cannot differ essentially from their treatment in other circumstances, the main fact to be always prominent before us is their great ob-

stunacy when associated with Bright's disease. If dropsy be very general we must try to remove it by diuretics. And if this mode of treatment be contraindicated we must have recourse to some other way of draining off the abnormal fluid. Drastic purgatives may be tried next, as calomel and croton oil. These when they can be used are often productive of great relief to the patient. But they are frequently contraindicated by diarrhoea already existing. If there is much distension of the limbs we may have recourse to acupuncture carefully made in the impeding parts. And it is astonishing how much relief may be obtained by this mode of procedure. The spot of puncture however must be carefully selected, and the punctures carefully made not very near each other, otherwise erysipelas and sloughing even may occur which are both most intractable when caused by this affection. If the large cavities are so distended as to impede the circulation and respiration, and thus induce imminent danger, and there be no time to try diuretics further if they have already failed, we must tap as a last resource. Some doubts exist as to the propriety of administering Mercury in these cases. It has been thought that, from its alleged property of causing absorption, it should be administered here. But it is questionable whether it possess

the property of causing absorption of fluid at all. We have seen it administered with a view to that end for two months together without any beneficial result whatever, although the mouth was kept gently affected all the while showing that it ^{had} every chance of producing its therapeutic effect in that way if such it possessed at all. Having this however, experience has taught that it is a very unsafe drug in Bright's disease, both because of its excessive action and its untoward results in many instances. Some cases however are on record which seem to date their recovery to the action of this mineral. It is still an unsettled question, nevertheless we would not be hasty in its administration, as we think it more calculated to do mischief than any good in such cases. Vomiting must be counteracted by such administrations as morphia, Chloroform, medicinal naphtha, bismuth etc. And if it can be traced to any particular article of food or medicine, such must be instantly proscribed. If there be much pain over the stomach it will be necessary to apply mustard or leeches or even a blister to the epigastrium. The adoption of such means generally proves successful when the stomach is at fault. When diarrhoea is troublesome we must have recourse to such astringents as the pill of acetate of lead and Opium,

And it may be very advantageous to use a suppository of opium or muric of morphia. When Phthisis, Heart or Liver disease, one or all of them coexist with the disease in question, we must necessarily direct the usual treatment towards them, but we are not going enter upon their special treatment here as in so doing we would only involve our selves in much unnecessary detail. We would in conclusion only mention one other point which is with regard to the dieting of the patient. And we would simply observe that we need not be scrupulously restricting him from certain articles of ^{food} such as fats in cases of fatty degeneration, and from water in cases where anasarca is very general, as experience here again militates strongly with what appears most plausible in theory. As a general rule we may attend pretty generally to the desires and discretion of the patient himself, taking care however that his food be duly nutritive and easily digested, and in due proportion. In the acute stage of the disease it may be well to restrict him to farinaceous diet for some time, and in all cases the use of strong stimulant liquors must be proscribed, except indeed exhaustion positively demand them.

We might now add the cases of Bright's disease which it has been our privilege to see treated in the Hospital, by

way of illustrating what we have said, but we do not see that it is at all necessary.

James Jardine