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On
Bright's Disease

On Bright's Disease.

Before commencing the subject of my thesis I will devote a short time to the consideration of the Anatomy of the kidney, and of the characters of healthy urine. I may, however, premise that I cannot offer any original observations which might help to elucidate any of the points touched upon, but that I will try, briefly and correctly, to give the facts observed and known in regard to Bright's disease.

Without further introduction then I will at once commence with the Anatomy of the kidney.

The kidneys, two in number, are placed one on each side of the spinal column about the level of the last dorsal and upper lumbar vertebræ.

Their

Their shape is quite characteristic. They are more or less compressed anteriorly and posteriorly, convex on the outer, and concave on the inner border. On the inner concave border there is a longitudinal fissure called the hilus, by which the vessels and nerves have their entrance and exit. On opening into the kidney, the hilus is seen to extend into the substance of the organ forming the sinus. This sinus is lined on its sides by the fibrous coat of the kidney which passes in at the hilus, and after lining the sinus is reflected on to the blood vessels forming sheaths for the principal branches entering, and is from them reflected on to the ureter.

The kidney consists of two structures the cortical and the medullary. The cortical substance which is soft and easily lacerated forms the exterior portion of the kidney, and lies immediately beneath the fibrous capsule.

It is of a uniform deep red colour containing a number of small dark points, the "Malpighian bodies." The medullary portion of the kidney is collected into pyramids (of Malpighi) varying in number from 12 to 18, the bases being

directed towards the surface and the apices to the sinus of the gland, the latter where projecting into the sinus being called the papillae. The ureter as it enters the hilus is dilated into the pelvis of the kidney; this pelvis divides generally into three, sometimes into two principal tubes, which again divide and subdivide into smaller tubes called Calices or infundibula. The Calices embrace the prominent portion of the pyramids and into these the papillae project. Small orifices visible on the papillae and being traced into the pyramids are found to be the openings of the tubuli uriniferi. These tubuli pass dividing and subdividing as they go, into the cortical substance of the kidney in which, instead of being straight as in the pyramids, they become convoluted and anastomose freely with one another, and terminate either in a little dilatation which embraces a Malpighian body, or in free closed extremities.

The renal artery divides at the hilus into four or five branches which pass dividing and subdividing, to the pyramids, where they form a

Arcs

series of anastomosing arches. From these arched branches arise which ramify through the cortical substance of the kidney, and end in numerous capillaries which form a network on the uriniferous tubes. They end in small veins which by their union form the renal veins. The Malpighian bodies are formed by an afferent and efferent vessel: the afferent vessel divides into many branches which spread out on the surface of the body and end in its interior in a fine set of vessels from which the efferent vessel springs. These bodies are received into the dilated ends of the uriniferous tubes as formerly mentioned.

Healthy Urine is a pale, amber coloured fluid, having a slightly acid reaction, and a peculiar fragrant odour. Its specific gravity varies greatly, but the average may be considered to be about 1020. The quantity secreted by the adult male averages from thirty to forty ounces daily, but is liable to great variations according to the amount of food and drink, temperature of the weather, and

and the amount of secretion by the skin.
It is usually entirely free from sediment
presenting only a slight mucous cloud.
The analysis of the urine according to
Becquerel yields the following results

Water	967.
Urea	14.230
Uric acid	.468
Coloring matter, mucus and animal extractive	10.167
Salphates Soda	
Potash	
Lime	
Biphosphates Soda	8.135
Magnesia	
Chlorides Sodium	
Potassium	
Hippurate of Soda	
Phosphate of potash	
Silica	Traces

The amount of the urea the principal
constituent of the urine, varies considerably
but taking 35 ounces of urine as the average
quantity

quantity passed during the 24 hours, the total amount of urea excreted at the rate of 14 parts in 1000 will be 24 grains, or nearly half an ounce. Urea exists in very small quantity in the urine of man and warm blooded animals generally, forming only one part in 2000; but in cloudy swelling of cold blooded animals it forms by far the most important ingredient, the urine being in them solid.

Causes. The causes of Bright's disease are not very well ascertained, nor is their modus operandi thoroughly understood, but the following are generally recognised as probable causes.

Cold and Wet. In this as in other diseases the influence of cold and wet as an exciting cause is very generally recognised; but it is mainly in acute cases that this cause is found in operation. Disease of the Heart and Lungs is probably in some cases a cause of the disease, but it is very difficult in many cases to decide whether the diseased condition of the heart or lungs is a cause or a consequence of Bright's disease.

Scarlatina

Scarlatina has been by all observers classed as one of the causes of Bright's disease. All cases of dropsy following Scarlatina cannot be classed as Bright's disease, but undoubtedly very many of them are so. The connection is generally explained by the disturbance occasioned to the function of the skin during the desquamative stage. The occurrence of dropsy is most common after mild cases of Scarlatina, probably because less care is exercised during convalescence, exposure to cold during the desquamative stage being frequently observed to be immediately followed by a dropsical attack).

Intemperance is one of the most important causes of Bright's disease. Very many of the victims to Bright's disease have been "habitual drunkards," and others, though not entitled to the title "habitual drunkard", have nevertheless been in the habit of freely indulging in alcoholic stimulants.

The connection between the abuse of alcohol and disease of the kidneys is a sufficiently obvious one: the long continued overstimulation of the organs by a diuretic so powerful and certain in its operation as alcohol is, being quite sufficient to account

account for it.
Another and perhaps the most common cause of Bright's disease is the "Scrofulous Diathesis". The frequent occurrence of dropsical accumulations during the progress of phthisis is well known; and by examination of the urine during life, as well as by careful inspection of the kidneys after death, great disorganization will in many cases be found.
In many other circumstances albuminuria is found, some of which may possibly predispose to Bright's disease; but those have seem to appear to be the most important causes of that disease.

Symptoms. Acute form. In this form of Bright's disease the symptoms at the outset generally, by the suddenness and severity of their onset, indicate the approach of a dangerous malady. The patient, often after exposure to cold and damp, is seized with the usual symptoms of great febrile reaction. The pulse is frequent and hard, the skin hot and dry. The patient is very restless and complains much of thirst, and headache. The appetite is gone, and the tongue is dry and

and Coated. The urine is soon diminished in quantity, sometimes, though rarely, entirely suppressed. It is highly albuminoids and bloody, the blood being often in the form of clots. Great difficulty is experienced in making water, pain in pelvic the region of the kidneys and across the hypogastrium, the pain being increased on pressure, and often shooting down the thighs and into the perineum. These symptoms are generally accompanied by great sickness and vomiting, and soon, perhaps not for a day or two, dropsical swellings are observed, generally first in the face and limbs. Secondary affections as coma, convulsions, and acute inflammations of the serous membranes in many cases result.

State of the Urine. The urine as I have already mentioned is scanty, bloody, and highly albuminous. It is of a dark colour, the shade varying according to the amount of blood. Its specific gravity is frequently but little changed from that of normal urine, though in some cases it is greatly reduced. The sediment is abundant, of a dark reddish brown colour, and when examined microscopically presents a characteristic

characteristic appearance. It consists of blood corpuscles, renal epithelium, lorie acid, epithelial tube casts which are merely fibrinous moulds of the interior of the tubuli uriniferi containing blood corpuscles and renal epithelium cells, & pus corpuscles. Sometimes the casts are composed entirely of blood, and in some cases they have been observed to contain oil globules. The deposit of urie acid is not characteristic of this disease; but it very frequently occurs. It appears generally after the congestion has been relieved, and continues more or less abundantly until the restoration of the patient to health.

Symptoms of the chronic form. Like other chronic derangements of important viscera chronic Bright's disease may exist for a considerable time without giving any very distinct notice of its presence. Very frequently the first symptom that attracts the patients attention is frequency of micturition - he has to rise once or twice during the night to make water. This may not always depend on the secretion of an

unusually

unusually large secretion of urine, but seems to be caused sometimes by the presentation of some abnormal ingredient. Dr. Christison considers no single symptom so invariable or of so much service in indicating the presence of the disease. Gradual failure of strength and anaemia frequently attract the notice of the patient or his friends.

The disease, however, when established is generally marked by the following symptoms. There is reduction of strength, emaciation, an anaemic appearance of the patient very characteristic of the disease. The skin is dry and unperspiring, the patient is often drowsy, dyspepsia more or less harassing is present, there is great thirst. The dyspeptic symptoms are due partly to irritation of the mucous membrane of the stomach and small intestines caused by the effort to eliminate urea or the products of its decomposition, partly to the irritation produced by sympathy with the organs more immediately affected. A change in the gastric juice may also be produced by the retention of the urea, and this of course would help to account for the presence of the dyspepsia. The appetite is generally diminished; in some cases there

There being absolute loathing of food, or it may be merely capricious and uncertain. The food when taken gives rise to uncomfortable distension of the stomach and intestines, acid eructations. There may be also pain in the stomach, and pyrosis. There is also frequently nausea and vomiting, and diarrhoea alternating with a costive state of the bowels. The tongue is red at the tip and edges, and at the root covered with a creamy fur.

The patient often complains of great uneasiness in making water, pains in the lumbar region; and soonds or later dropsical swellings occur, increasing sometimes to an enormous extent.

But it is from the state of the urine that the most characteristic marks of Bright's disease are to be derived and to it I will now direct my attention.

State of Urine - In the early stage the urine is generally diminished in quantity; it is very rarely increased, and in many cases varies but little from the normal standard. It is sometimes as low in quantity as 8, 12, or 16 ounces; Dr Christison has found it sometimes as low as 2 or 3 ounces, and sometimes been entirely suppressed; but

but this he found always to presage a fatal termination. Its colour is most frequently little changed, Sometimes, however, there is an evident admixture of blood which occasionally occurs in clots. It is often rendered muddy by the presence of fine ~~white~~ light particles, Sometimes there is a sediment of urates, very rarely of phosphates. Its specific gravity is little altered. The most characteristic feature, however, is the presence of an abnormal ingredient albumen. But the presence of albumen does not invariably indicate Bright's disease; for in various circumstances albumen has been found in the urine. The presence of blood or pus in the urine may give occasion to it. It has also been found during pregnancy and in some cases of dyspepsia particularly after eating pastry. After blisters too it has been detected, and it has been found in the urines of those who are undergoing a course of mercury. It varies much in quantity but is generally abundant in the early stage; Sometimes, however, it disappears entirely for a time, but this is more common in the advanced stages of the disease. The relation existing between its chemical

chemical composition and that of urea suggested to M. Solon the idea that it was formed at the expense of the urea, but Dr. Christison's observations show that that is not the case. It is more probable that its presence is owing to some peculiar condition of the kidneys during the progress of the disease. Its presence may be accounted for in another way: that it is owing to a transudation of the serum ~~into the~~ of the blood into the uriniferous tubes and Malpighian capsules.

The quantity of solid ingredients in the urine is diminished both absolutely and relatively to the ~~specific quantity~~ of the urine, the high specific gravity being dependant on the presence of the albumen.

In the advanced stage of the disease the urine is very often increased in quantity, 100 or 130 ounces in some cases being secreted in the day. The supervention of acute diseases, however, or the long continuance of the disease causes a great diminution in the quantity. Its colour is generally pale when in health, and it is slightly turbidly. Its specific gravity sinks as the

as the disease advanced, 1008 or 1010 being very common, Sometimes even as low as 1004. The albumen varies much in quantity, and Sometimes entirely disappears - The Solid Contents are very much diminished.

The microscopic examination of the sediment is of very great importance, for from it direct evidence of disorganization may be obtained. The characteristic appearances consist of what have been called tube casts. These are of four kinds viz. the exudative, (which I have mentioned when speaking of the acute form of the disease) the desquamative, fatty, and the waxy.

The desquamative are the result of the separation of the epithelial cells from the basement membrane. They consist of the epithelial cells either closely packed together, or united by a molecular exudation.

The fatty result in the same way as the desquamative but in them the cells have undergone the fatty transformation - The casts are Sometimes completely filled with oil globules, at others the cells seem only to be in the incipient stage of the fatty degeneration.

The waxy are diaphanous structureless casts consisting

consisting according to Dr Johnson of a substance secreted by the basement membrane after it has lost its cell lining; or as suggested by Dr Bennett of the basement membrane itself chemically altered. All these forms of casts may be found associated in the same kidney.

Important changes take place in the state of the blood; and these I will now briefly consider. In the early stage, when the disease assumes the acute form, if there has been no latent disorganizing process going on previously, the characters generally described as attending on inflammatory disease are found. It coagulates with a firm, buffy, cupped clot. The serum is milky in appearance, and when shaken with Sulphuric ether yields an oily matter not unlike the fatty matter of the cellular tissue. It is greatly reduced in density as was first shown by Dr Bostock, his observations being confirmed by Dr Christison and Dr Gregory. This decrease is very remarkable; the serum which had a density in health estimated at 1029 or 1031 being now as low as 1020 or even 1019: and when

when this occurs there is generally a large quantity of albumen in the urine. The diminution in the amount of the solid contents affects equally the saline and albuminous ingredients. Urea is frequently found in the serum in considerable quantity when the amount of it in the urine is considerably diminished. Urea, however, is not characteristic of the blood in Bright's disease for it has been found in small quantity in the blood of healthy persons, as well as in other diseases such as gout and cholera, but in Bright's disease it is more permanently present. The fibrine is usually increased and the coloring matter in the early stage but little affected.

In the more advanced stages the most marked change in the blood is the diminution of the blood corpuscles. This diminution evinces itself by a corresponding change in the complexion, a change varying of course with the natural tint of the skin yet so characteristic that to a physician at all experienced in this disease it affords an important indication of the morbid condition under

under which the patient is labouring. The blood corpuscles frequently amount to only one third of their normal proportion.
The serum in the advanced stage usually regains its normal specific gravity. Sometimes it even exceeds it. The urea in general disappears only to reappear as the disease approaches to a termination: and the fibrine previously increased generally regains its normal amount unless influenced by the occurrence of some acute disease.

Various secondary disorders occur during the progress of Bright's disease which require consideration. Of these affections by far the most frequent and important is dropsy. Indeed so common is its occurrence that at one time it was considered an essential symptom, but longer experience and more careful observation have shown that idea to be erroneous, many cases running their course without any dropsical accumulations, and others presenting it only at a very advanced period of the disease. The dropsy which accompanies renal disease is most

most frequently general, appearing first the ankles and feet, thence gradually extending to the trunk, upper extremities, and face, and ultimately, if allowed to increase, invading the various serous sacs. When the disease begins in the acute form dropsy is generally developed in a few days, and in chronic cases the occurrence of acute symptoms generally ensures its appearance.

In acute cases Frerichs considered the dropsy to be the consequence of the paralysis of the capillaries of the skin and subcutaneous tissue excited alone by exposure to cold. But unless there had been previously existing disease in the kidney it does not seem likely that paralysis of the capillaries alone would cause dropsy: there must therefore evidently be some other cause in operation. The retention of the urea in the blood being well known to have a poisonous effect, either directly or by its decomposition, may furnish the cause. For it may, either by acting directly on the walls or indirectly on the nervous system, cause relaxation of the capillaries, a condition which

which is known to exist in dropsy, and which, by retarding the circulation, must favour the transudation of serum.

In the chronic form, however, there are more causes in operation. The urea again of course exerts its influence, but it materially assisted by the watery state of the blood, and the relaxed condition of the smaller arteries and capillaries caused by the impaired nutrition.

A secondary disorder now more formidable or at least threatening more immediate danger to life than dropsy is known by the general name of head symptoms. The approach of this series of symptoms is generally in chronic cases very gradual. There is at first unusual drowsiness, often accompanied by headache and delirium, which gradually increases till it deepens into profound coma. Epileptic convulsions are of occasional occurrence. In other cases convulsions are the first symptoms which direct our attention to the head; these convulsions are followed by delirium or coma, each convulsion leaving the patient more delirious or comatose, until, at last,

fatal

fatal coma supervenes. In other cases a hemiplegic attack precedes the fatal coma; but this is rare. These symptoms are usually associated with a scanty secretion of urine, and large quantities of urea are found in the blood; hence the occurrence of these symptoms has generally been thought to depend on the poisonous influence of the urea. But Frerichs supposes the poisonous agent to be, not the urea itself, but carbonate of ammonia, the result of the decomposition of urea in the blood. This theory he bases on the results of observations on patients labouring under uræmic poisoning, and on the experiments he performed on dogs. In patients labouring under uræmic poisoning he found the air expired by them to contain carbonate of ammonia in quantity proportioned to the intensity of the symptoms. He also detected carbonate of ammonia in the blood.

Two series of experiments were performed by him to support this doctrine. In the first series he injected urea into the blood of animals upon whom the kidneys had been previously removed. In from an hour and a quarter to eight

eight hours symptoms of uraemic poisoning occurred, and simultaneously carbonate of ammonia was found in the expired air. Death occurred in from two and a half to ten hours. Ammonia was detected in the blood, contents of the stomach, and bile. In another series of experiments carbonate of ammonia was injected into the blood; and this was followed immediately by convulsions, quickly succeeded by stupor. Carbonate of ammonia being again detected in the expired air. On the cessation of the exhalation of carbonate of ammonia the symptoms ceased; but were again produced on injection of carbonate of ammonia.

These experiments certainly favour the idea that it is not the urea that is the cause of the symptoms; but frequently even in cases of great suppression of the urine carbonate of ammonia cannot be detected in the air expired by the patient, and it has, besides, been found both in the air expired by, and the blood of healthy persons.

Dr. Hammond of Philadelphia also performed a series of experiments of this point. He injected urea

urea, urea mixed with vesical mucus, and carbonate of Ammonia into the blood of animals whose kidneys had not been removed. Slight uneasiness was produced in every case, the symptoms coming on more immediately and more violently after the injection of carbonate of Ammonia; but the animals speedily recovered. No Ammonia could be detected in the expired air except when the carbonate of ammonia was injected.

In his second series of experiments Dr. Hammond, after removing the kidneys, injected the same substances into the blood. After the injection of the urea convulsions came on in from three quarters of an hour to an hour, and proved fatal in six or eight hours. No Ammonia could be found in the bloods, nor was any Ammoniacal odour perceived during the examination of the bodies. After injection of the Carbonate of Ammonia the same symptoms were observed earlier, and were accompanied by vomiting. Ammonia was detected both in the expired air and vomited matters.

Dr. Watson thinks that the wasting condition of the

the blood may have some effect in producing the coma; and an explanation similar to this was suggested by Dr. Rees.

Coma is not necessarily connected with the extent of the dropsical accumulation; but of course if allowed to go on uncontrolled, it will ultimately, by pressure, produce coma.

Dyspepsia is a very common occurrence in this disease - I considered it when speaking of the Symptoms.

Diarrhoea is another very common secondary affection. It is generally the result of great irritability of the mucous membrane of the intestines, and increased mucous secretion, though sometimes ulceration is present.

Pulmonary disease also frequently occurs often only in the form of slight oedema; but sometimes bronchitis and even pneumonia are met with.

Inflammation of the serous membranes is also found occurring generally as pleurisy or peritonitis.

Chronic Rheumatism was found by Dr. Christison to be of very common occurrence.

It is

seated more commonly in the muscles than the joints. It is not generally met with when the dropsical effusion is great.

Cardiac disease is frequently found coexistent with Bright's disease. I have mentioned this as one of the causes of Bright's disease, but it is perhaps more commonly a consequence. Hypertrophy of the left side of the heart is the most common form in which it occurs, often, however, accompanied by valvular disease. The probability, as pointed out by Dr Bright, is that this affection is produced by the changes in the blood causing it to act as too strong a stimulant to the hearts action.

Disease of the liver is found in a very large proportion of cases of Bright's disease, and considering the frequency of intemperance as a cause of both affections it is natural that they should frequently be met with together.

It may often be found enlarged by palpation and percussion, but sometimes it is contracted and indurated. Whenever ascites is the predominant dropsical affection there is great probability that the liver is affected.

Morbid Anatomy.

1. Inflammatory form. The kidneys are considerably enlarged and increased in weight. They are smooth on the surface, and their capsule is easily separated. Their vascularity is increased; their colour varying from a bright red to a dark brown. Their surface is covered with dark spots shown by Mr. Bowman to be caused by blood being extravasated into the convoluted portions of the tubes. When cut into the cortical substance is seen to be like the surface congested, and the ecchymosed spots are here also visible. The Medullary portion of the kidney is usually dark coloured, the bodies of the cones are compressed by the cortical substance, and their bases spread out in it. The mucous membrane of the pelvis and ureter is generally much congested.

On microscopic examination the convoluted tubes are found to be filled by a fibrinous exudation in which are entangled epithelial cells and this on being squeezed out resembles the casts found in the urine. The straight tubes are generally normal in appearance, though some are found filled with exudation

in

in the same way as the convoluted ones.

In the more chronic ~~state~~ the kidney is mottled in appearance the congestion having diminished, the extravasated blood is absorbed and the exudation pulls discharged by the urine gradually disintegrates, in some cases undergoing the fatty or purulent transformation. This by degrees causes obstruction and atrophy of the tubes the organ thus becoming smaller and smaller, and in the end causing death.

2. Waxy Form. The kidney in this form of the disease is larger and heavier than in health. Its capsule can be easily removed, its surface is pale and marked here and there with red stellate shaped depots. On section the cut surface is smooth and translucent - The cortical substance is relatively increased in size, of a pale waxy appearance, but containing scattered here and there shining bodies - the Malpighian bodies: the cones are well marked and natural in appearance

On microscopic examination the Malpighian bodies are seen to be pale and semi transparent, and

And the convoluted are filled by a substance which is sometimes epithelium undergoing a fatty transformation and sometimes has no appreciable structure.

On brushing over the section with a solution of Iodine the whole assumes the colour of the Iodine; but the Malpighian bodies assume a reddish or orange colour which becomes changed to a purplish or sometimes a blue hue on the addition of Sulphuric acid.

This degeneration has been found by Meckel and others to commence in the muscular coat of the smaller arteries, and from it spreads to the other coats diminishing the calibre of the vessel, and then spreads to the structures supplied by the arteries.

3. Fatty Form. This may be a result of the inflammatory form, but is more frequently independent of it. It occurs most frequently in individuals advanced in life suffering from Cardiac and Pulmonary disorders, or who have been addicted to the use of stimulants. It is frequently found associated with fatty degeneration

degeneration of other organs as of the heart and liver.

The kidney is usually enlarged, bloodless, and of a light colour. Its surface may be smooth or irregular from hypertrophy of the fibrous tissue causing contraction round the convoluted tubes. The surface is sometimes of a mottled appearance from the accumulation of fatty particles which have escaped by the bursting of the over distended tubes.

The tubes are more or less obstructed by the epithelial cells lining their basement membrane which by their size distend the tubes and compress the surrounding textures.

Such appear to be the three forms of disease most commonly met with in Bright's disease. Though separate and distinct from each other they may be met with conjoined in the same kidney. Thus the kidney may be found the seat of both the fatty and waxy form of the disease, or it may be found in one part presenting the characters of the inflammatory form, and in another of fatty degeneration.

Treatment.

1. Acute Form. In few cases of this affection will a severe antiphlogistic treatment be necessary. Confinement to bed will usually be necessary. The diet should be light, consisting mainly of farinaceous matters. Free action of the skin and bowels should be secured. For obtaining free action of the skin the hot air bath will be found very serviceable; but where it cannot be easily employed the warm bath may be advantageously substituted. Diaphoretic medicines may be used to aid the operation of the baths, and the diaphoretic recommended by Dr. Johnson as the most serviceable is the Antimonial wine in small doses repeated every three or four hours.

A purgative which will be found very useful in many cases is the compound jalap in doses of a scruple or half a drachm every day or every two days.

In many cases nothing more will be necessary but in others more severe means must be had recourse to. Cupping of the loins will generally alleviate

relieve the severe pain sometimes complained of, and mitigate the severity of the "head symptoms" if they have occurred. Venesection is seldom necessary, cupping on the loins generally having the desired effect. The patient must be careful during convalescence not to expose himself too early to cold or to anything which might occasion a relapse of the disease. Iron may often be used during convalescence with great advantage.

2. Chronic Form. In this form also the functions of the Skin and bowels must be attended to. In many cases, however, an irritable state of the small intestine exists in which cases the use of purgatives must be cautiously watched.

The existence of dropsy is very frequently the most troublesome feature in the disease. An attempt must be made to get rid of this some way or other and the most natural seems to be by the employment of medicines to stimulate the kidneys to action. But the use of diuretics has been objected to on the ground

ground that exciting the kidneys to increased action would tend to increase the disease. The dropsy, however, is caused by obstruction in the secreting tubes presenting a mechanical obstacle to the escape of water, and it accordingly seems probable that by increasing the flow the obstructive accumulations may be removed. Whether this is the case or not diuretics have repeatedly been given with the best results as regards the removal of the dropsy, and without producing any bad result whatever.

If diuretics fail to reduce the swelling, or have not been employed, purgative remedies may be used. Among the best of these is the compound jalap powder, or croton oil or elaterium may be used. But spontaneous diarrhoea may prevent the employment of cathartics, and diuretics cannot in some cases be got to act, and in such instances the hot air bath will sometimes be found beneficial. In some cases, however, puncture of the distended parts may be necessary and it will be found generally to give great relief.

But the most important part of the treatment consists in attention to the general

condition

condition of the patient. The use of nutritious diet combined with the employment of iron or other tonic will very frequently be found of great service.

The various secondary diseases which may arise in the course of the disease will require special treatment.

I have thus cursorily glanced at the various points of interest in Bright's disease, hastily and imperfectly no doubt, but I hope in the main correctly.

George Oliver Thomson