ing matter in the media in which it grows, and the bacillus or micrococcus prodigiosus, which secretes a red colouring matter, if cultivated at a high temperature loses the property of secreting colouring matter at all. The function of these micro-organisms can therefore be altered by artificial means, and this alteration in function is inherited through countless generations. It may be assumed, therefore—though this is merely a hypothesis—that the weaker virus (B) is so altered by the manipulations (drying, etc.) to which it is subjected as to lose the power of secreting a large quantity of toxic substances. That the weak virus does not completely lose the power of secreting toxic substances is proved by the fact that though life is greatly prolonged the inoculated animals do perish ultimately when a large quantity of the virus is injected.

Conclusions.—1. The inflammatory process consecutive to the introduction of the bacilli of quarter-evil under the guinea pig's skin is a protective process, and serves a useful purpose.

2. The destruction of micro-organisms at the point of inoculation is carried out entirely by the amœboid cells present in the inflammatory exudation.

Note.—I beg to be allowed to express my best thanks to my friend, Mr. T. C. Beadles, who kindly drew most of the original pictures for me from my preparations.

TWO CLINICAL LECTURES ON ALBUMINURIA.

Delivered at Guy's Hospital.

By JAMES F. GOODHART, M.D., F.R.C.P.,
Physician to the Hospital.

LECTURE II.—THE VAGARIES OF RENAL DISEASE.

THE vagaries of renal disease is a very interesting subject to the physician, few more so. He is ever being puzzled by them, and the subject is one therefore of immediate importance.

The first point I will insist upon is the frequency with which serious disease of the kidney fails in symptoms. Cases of this kind are so numerous that it almost seems unnecessary to give any details, but I will just note a few. One case I have already quoted in the previous lecture. Another was a young man, aged 24, who had had syphilis, and who had a much enlarged liver and spleen. His urine was copiously albuminous, and one could not doubt that this was due to a nephritis of some sort. Yet he seemed in perfect health at that time, and so he ever afterwards remained; and although the albumen remained for a year or more, it ultimately all disappeared, and there was good reason to suppose that the disease was due to a patchy affection such as I described in my former lecture, for gummata formed now and again in various parts of his body. I regard the case as a good illustration of the value of our visceral reserves. Take another case: a young fellow was under my care in John Ward, in 1886, with what was supposed to be acute nephritis. He had rather extreme dropsy, and after some weeks of treatment he left the hospital, as so many of these cases do, with his urine still albuminous. Very opportunely for the purpose of this lecture, he turned up the other day. Since he left the hospital he says that he has been very well, and he has enlisted in a cavalry regiment in which he is now serving. When we came to examine him we found his urine was still albuminous, the albumen being in some quantity; the heart's impulse was beyond the nipple; the pulse was somewhat hard; and there is no doubt that, notwithstanding his apparent health, he is the subject of chronic parenchymatous nephritis. Take another case of a different sort. A little girl whom I saw with Dr. Roper, of Lewisham, had had scarlatina; and within a few days after hæmaturia supervened, and then suppression. She lay in bed with absolutely no symptoms of renal disease except the two ounces or so of bloody urine—all she had passed in the many hours preceding. Her condition was one of simple exhaustion, and as she lay one could hardly believe her condition to be desperate; yet she was dead before many hours had passed, and the kidney, which by Dr. Roper's kindness I had an opportunity of examining, was one of the most extreme examples of glomerular nephritis I have ever seen. I remember a similar case

in a young adult in the out-patient room at Guy's Hospital. He was admitted and died very shortly afterwards, and here too the kidney was in an extreme condition of this kind. Of subacute cases again there are many in which the symptoms are urinary only. I have seen several where the attention has been drawn to the urine solely by the occurrence of hæmaturia, and the case has run its course, and sometimes a long one, without the occurrence of dropsy at any time. I am drawing just now upon my experience in children, because at that time of life renal disease without dropsy would be regarded by many as decidedly uncommon, and I will carry this record of child life still further, even into the region of the most chronic forms of disease. Here, as everyone knows in the adult, dropsy is often absent; one does not expect it so to be in children; but then one must at the same time say that the most chronic form of disease (the granular kidney) is not met with in childhood. However this may be, it is possible to overlook very chronic cases in children by reason of this very absence of symptoms, as the following striking cases will show.

A little boy, aged 6 years, was brought up by hand, and when the bottle was given up, he developed an intense thirst and polyuria, which had never subsided, and when I saw him he was drinking as much as a quart of water during the night, and the quantity by day was so great that it was not known. In early infancy he had had occasional attacks of sickness after excitement, and at three years a bad attack of sickness and fever, which some thought cerebral, others gastric. Later on he had an attack which Dr. Dring had very little doubt was meningitic in character; thereafter he had bad night terrors for more than a year, and latterly he had developed rather severe tetany.

He was a miserable little specimen, with a dry, wrinkled skin, which never perspired; he weighed only 31 lbs.; he was unhealthily precocious; his teeth were decayed; his heart and lungs normal; his retinæ normal; and I could find nothing tangible to explain the malnutrition until his urine was examined. This was found to be of specific gravity 1005, and to contain a good deal of albumen. He went on, Dr. Dring told me, for twelve weeks, the polyuria remaining on the whole the same, the albumen sometimes disappearing; but paroxysmally, almost punctually, once a month, he became worse: the urine became scanty, and contained so much albumen as to be nearly solid, and at the same time he would get a severe attack of what could only be called tetanus, so violent was the opisthotonos. He died in one of these attacks. Dr. Dring prevailed on the parents to allow a *post-mortem* examination, and this we made. The nervous system was quite healthy. The heart was widely dilated, large, and flabby. The kidneys were shrivelled and small, their capsules adherent and thick.

To complete the history of this case, and also of my most striking experience of chronic renal disease in young children, I may say that some few weeks after the death of this child, one of his first cousins was brought to me, because the parents feared it was affected in the same way. This child was a girl, aged 6½ years, who, like the other, had since weaning developed an intense thirst. When 2½ years, it was seen by Dr. Gee, as also again when 3 years old. Dr. Gee kindly told me that on the first occasion the urine was 1003; and on the second also 1003, with a trace of albumen. When I saw it three years and a half later, it was drinking six pints of fluid in the twenty-four hours, and, like its relative, it was a mite of a child for its age, and with a like harsh dry skin, which never sweated. The urine looked like water, was of a specific gravity 1004, and contained a sixth of albumen. Again, I cannot doubt, with this history before me, and that of the other case also, that this too is a case of chronic nephritis, but if so it is one without any characteristic symptoms.

Now these several cases together suggest that dropsy is an accident rather than any true measure of the acuteness of the disease, and the cases that are met with in the wards of a hospital confirm this in a very emphatic manner. A large proportion of the cases which enter a hospital come in with dropsy, and a history of recent illness, and are dubbed in consequence "acute" nephritis. The usual classification of Bright's disease is into "acute," "chronic parenchymatous," and "granular;" and the only, or at any rate the rough and ready, method of distinction between the acute and chronic parenchymatous is the duration of the dropsy. If the dropsy be recent, the case is called acute; if it be of long standing, then the disease is called chronic; but this criterion is practically useless; at any rate, the large majority of the patients who enter the hospital at the onset of the anasarca, or within a short while after it, are not well when they leave, and in conse-

quence of this fact (and I do not think there can be any dispute about it) one of two conclusions presents itself: either that which I have just put forward—that the criterion made use of has played us false, and that the case supposed to be acute is not really so; or that acute cases accompanied by dropsy are likely to do badly. The latter alternative I reject, because it is not true of young subjects. And to show how important is this matter of age, let me say that of fifty-seven cases of renal disease associated with dropsy admitted into Guy's Hospital, which I analysed some time ago, forty left the hospital passing albumen still, and ten only left well, while of these ten seven were under 16 years of age. Whatever, then, may be the explanation, there can be no question that the age of the patient is, as a general rule, more helpful for prognosis than is the date of the onset of the dropsy. Upon this rule you will find me acting daily in the wards. When I am asked about the diagnosis, prognosis, or even treatment—for all are involved—of a case of renal anasarca, I ask what is the age of the patient. If this be under, say, twenty-five, there is a fair chance of the disease being acute, and the case is treated accordingly; if the case be of more advanced age, the treatment will require the consideration which I propose to give it towards the end of this lecture.

Another feature that may be called a vagary is intermission in the passage of albumen. It is not perhaps the rule, but it is exceedingly common. I alluded to this before, but it is puzzling enough to induce me to speak of it again; it applies to blood equally with albumen. Blood will come and go in the course of an attack of nephritis without any corresponding variation in the course of the symptoms, and without our being able to get any hint of value upon the course of the disease; albumen in like manner. I have seen a case of nephritis run on for months, with the urine containing now so much albumen as to be nearly solid; and, again, for several days perhaps hardly a trace. We do not know what the meaning of these variations is, but as I have already said, oscillation is a feature of all function, and these cases seem to me quite parallel with the extreme and unusual fluctuations that occur in the course of some febrile processes, and with which we are all familiar. These fluctuations of the temperature are not in themselves critical—indeed, they tend to appear when the vigour of the fever has spent its force; and so perhaps it is with these nephritic changes. Indeed, I think that if any conclusion is justified from the circumstance, it would be that the disease is then of a mild type, and is likely to do well eventually; and this is no contradiction to the position I have already taken up, that some cases of intermittent albuminuria end in a definite nephritis.

Another vagary that occurs to me is the occasional rapid recovery of cases that had seemed to have gone beyond the hope of it. This I should not suppose to be common to any marked degree, and yet in some measure it is, for who has not seen cases which, from the severity of the albuminuria, and the extent of the dropsy, might have been predicted not to be likely to live beyond a few weeks, and who have slowly pulled out of their graver troubles, and survived as chronic invalids for perhaps many years. The two most marked cases, however, of rapid recovery that I have seen were both in children, and both were boys. One, a child of $4\frac{1}{2}$ years, was taken ill at the end of January, and at the end of May he was still passing much albumen, and his condition was still such as to cause grave anxiety. Within a week or ten days of this time, however, he improved so rapidly that all the albumen had gone, and his general condition had visibly bettered in corresponding fashion. I may anticipate thus much and say that we thought the improvement dated from an increase of the amount of whisky he was taking, and the introduction of meat into his diet. The other case was a boy, aged $3\frac{1}{2}$ years, who was in the Evelina Hospital for ten months. The anasarca that this child suffered from was extreme, and the albumen also was in large amount, often as much as a third, and even a half. He had been ill for six weeks before he was admitted, and for four months afterwards he remained in much the same state as when he came in. I ought to say, however, that from the first the albumen showed the tendency to variation to which I have already drawn attention; one day it would be as much as a third, and perhaps the next a mere cloud. After four months of treatment his general condition decidedly improved, although the albuminuria remained much the same, and this for another four months when the albumen was still as much as a sixth. It then fell at once to a twenty-fourth, and within a few days had still further fallen to a mere trace, and at

that it remained when he left the hospital. Cases of this kind are of exceeding interest from two points of view; in the first place, they are most puzzling when you come to answer the question, What was the nature of the disease? This last boy's bed-letter is headed, as you might suppose, from what I have said, "acute nephritis;" and if we interpret that in dead-house terms, he had a large white kidney. I do not think that I had any doubt on that point for some six or, at any rate, four months out of his stay in the hospital. But what is one to say now? Improvements of this kind are rapid enough to make one almost doubt whether there was any structural change, and I could certainly forgive a "liver doctor" were he to discourse in such a case upon some prolonged functional disturbance of that mighty organ as well explaining the intermissions, the preliminary improvement in health, and the final rapid cessation of the albuminuria. Such cases as these are also interesting when we come to discuss the question of treatment, but this will come presently.

Another deviation from the natural course, so to speak, of nephritis is the occasional substitution of a state of low tension for high. You all know by this time that the pulse of renal disease is a hard one, or, as it is called, one of high tension; and you also know that this condition fails for the most part in lardaceous disease of the viscera; but it also fails sometimes in other cases of nephritis, and when it does so the point is of importance. I first learnt the value of this from a lecture of Dr. Broadbent's, and I pass it on to you with an emphatic testimony to its worth. Dr. Broadbent remarked that when with albuminuria this state of low tension exists the case is likely to do badly. Speaking from memory I will not be sure that I include the whole of his position in this matter, but substantially this was the point. Let me illustrate it by a case or two.

Some two or three years ago I was called into the country to see, with my friend Mr. Fraser, of Romford, a lady of whom the following history may be told. She was 41 years of age, and had had some rather prolonged uterine trouble months before; but from this she had been for some time free, and, indeed, had, under Mr. Fraser's care, been rapidly regaining her health. For a fortnight, however, before I saw her, she had been losing her appetite and ground again; and vomiting had come on, ascribed by her to the appearance of her catamenial period, but by Mr. Fraser quite rightly to the presence of albumen, which had now for the first time been found in her urine. The condition at the time of our visit was as follows: Very pale, and face puffy; she felt exceedingly ill, yet had no pain anywhere; she was quite collected, but very restless, and her whole demeanour betokened extreme exhaustion.

There was no dropsy, but a urinous odour about her breath, and the urine was clear, pale, scanty, and when boiled became solid with albumen. But the state of the circulation is the interesting point. The heart's impulse could not be felt; the sounds were feeble, and there was an occasional feebler and shorter beat, although it hardly amounted to the stagger that is so often met with in cases of renal disease. The pulse at the wrist was 80, and was quite soft and feeble. I remarked at the time that the case seemed to me to be a typical one of renal disease with low tension, and this point weighed heavily in arriving, as we did, at a very unfavourable prognosis. So badly, indeed, did we think of her that it was deemed advisable not to leave her, the house being some miles in the country and out of reach. And the wisdom of this decision was shown by the sequel, for the poor woman died in the course of the night. Now, I do not mean to convey that all such cases die as rapidly as this. But even so, the prognosis is not good. I have seen several of a more protracted kind, who, although living a long time, never really showed any material improvement, and I will give a short note of one of these. In the autumn of 1887 I saw with Mr. Sandford Arnott, of Brixton, a young man, aged 24, who had enjoyed exceptional health. So much so, that he had been good as a rifleman, as a cricketer, and as a football player, and as such he had been careless of exposure. He had felt some pain in his back for two months, nothing much; and for a fortnight had felt nauseated, and dropsy had supervened. For this he had sought advice, but he had not at any time noticed anything wrong with his urine. He was a pale, cedematous man. He said that he felt perfectly well, and only complained of the dropsy, he did not quite see the force of being kept in bed. His urine turned solid on boiling, but his pulse was soft and his heart sounds also; there was nothing whatever of a renal character about them. I gave a guarded prognosis, on account of the excessive amount of albu-

men in the urine and the want of tension in the pulse; and here, again, the result justified the opinion that we had formed. He lived about sixteen months after that time, and was under Mr. Arnott all that time, and, although all sorts of remedies were tried, his symptoms never abated one jot, and he gradually became worn out.

These are the chief points that can be taken up within the limits of our time, for there is still another question that I wish particularly to introduce to your notice, and it is this: "Is the so-called parenchymatous nephritis always inflammatory in its nature?" The importance of this is in its relation to treatment. I am very doubtful whether it is always a true nephritis, and for these reasons: 1. The appearance of the kidney so affected is very peculiar. 2. Very similar ones are caused by acute poisoning with alcohol, and I have shown that these cases, or at any rate some of them, are associated with acute albuminuria. 3. A somewhat similar condition is produced by other poisons, such as arsenic or the better known phosphorus. 4. Phthisis is prone to be associated with the same, and so, also, may anæmia be. Now some, if not all, of these are difficult to associate with anything of the nature of inflammation, and a degenerative process seems to harmonise better with what is known of the variety of circumstances which seem in some way or other to produce it. Then, again, the rapid recovery that is seen in some cases, and to which I have already alluded, is not easy to reconcile with an inflammatory disease, whereas a simple degeneration of the epithelial surfaces is not only no bar to the rapid recovery, but may even be said to favour it.

Now this opens up the question of the best treatment of these cases. The treatment of acute cases is not doubtful; they must be kept warm and their kidneys eased of their work, except that of filtering, as much as possible. And the various measures that follow upon this cannot be called in question. Such cases are kept in bed, have sudorifics and hydragogue aperients, and their diet is restricted to non-nitrogenous matters in chief. And perhaps, I may say, as I have been dwelling on the other aspect of renal disease, that even acute cases are often slow, very slow, in recovery, and we must not lose patience too soon if the patient be on the mend, however tardy it may be. I have known this improvement so slow as to take a year, and yet to be so continuous as to be practically getting well all that time and to have been a complete recovery in the end.

But what is the best treatment for chronic parenchymatous nephritis? I see two classes of cases, those which are treated and those that are let alone. In the one class the patient is kept to his bed, is rigidly dieted to the exclusion of strong meats and drinks; they are sweated and purged upon occasion, and at the end of many weeks or months they leave the hospital with "improved" written at the head of their report. They are improved in some respects; generally the dropsy for which they came into the hospital is less or gone, but the albuminuria is still much the same. Those of the other group have general directions given them to keep themselves warm, to live sparsely, to take a tonic and an occasional aperient; directions which they generally attend to very little. They continue their work all the time, and yet they go on for a long time. And I find it difficult to say, from the experience to be gained in the wards, that they could have done better had they adopted the more orthodox plan. It is always a thankless task—as I have said elsewhere—to question the value of any particular treatment by drugs, for he who would attempt to find out the legitimate range of the effects of a drug for this or that disease—in that in so doing he almost necessarily circumscribes the range of action of the enthusiast—will probably be said not to believe in treatment. But it is well to ask ourselves occasionally what we are really sure of, for, unless we do, there is a certainty of our being ultimately effaced by routine, and there are few things worse than that for the patient. And I incline to think that routine has laid too much hold upon us in renal disease. That we should study the individual before we attempt to treat his disease is true, more or less, of all diseases, but I believe it is never more true than for renal disease. For there is no drug of which we can say that it will "go for" the inflammation; there is no drug that I know of that can be depended upon to lessen the output of albumen. Thus it is that we have to depend upon indirect measures, such as dieting, flushing the pipes, sweating and purging, and tonics. And it is in just the reactions to these measures that the individualism of the patient appears. And I should be glad to hear it stated on authority, what it is difficult to find in books, that even such simple

measures as these, valuable as they are in their place, are measures often of severity, to be applied with judgment, and are not to be distributed like an advertisement handbill to every case of Bright's disease. Who cannot recall the memory of cases where pulv. jalap. co. has done unmitigated harm? where vapour baths, instead of relieving, have increased the distress? where fluid diet as a means to diuresis has repeatedly upset what little power of digestion remained to the patient? where individualism revolted at the upset of habit? And I must confess, for my own part, that for these chronic cases I believe that a too restricted diet is far too generally prescribed.

I cannot say that I have seen much good done by cutting out all meat as well as the other more highly nitrogenised articles from the food of these cases; and I think I have seen some improve on an ordinary mixed diet taken in moderation, by the judicious and watchful use of stimulants, and by the administration of maltine and cod-liver oil; and I would say the same, although with far more limited application, for lingering cases of acute disease. For cases that are really acute I am a firm believer in the alkaline treatment advocated with special insistence by Sir William Roberts; in a milk diet varied as much as possible within its limits; in prolonged rest and warmth in bed. Where this treatment is well borne, as it is in some cases even for many months, and the albuminuria is gradually lessening, the treatment is obviously doing good, and there is no need to question its value. But I have in my mind cases where it has not so obviously done good—where a milk diet, to the exclusion of all other albuminous articles of diet, has not been well tolerated—and I apply to the works written by the men of light and leading, and I find no suspicion of a suggestion that a good slice of red meat and a little stout, or maybe a glass of good port, have in their experience ever been beneficial. And, although it may be said that no author could risk his reputation in legislating for exceptional cases, I am inclined to ask whether such as I have alluded to are so very exceptional, and whether for lingering acute and chronic cases the results of the orthodox treatment are sufficiently satisfactory to allow of a rest-and-be-thankful attitude. In talking of chronic cases, I must guard myself by saying that I am speaking only of "chronic parenchymatous nephritis;" the granular kidney would require distinct and separate consideration, and there are no doubt many such which are the better treated by allowing the patient but a very limited indulgence, at any rate in red meats. But even in such we can very easily push a good rule too far, and here, as in other cases, the utmost judgment is required to do the best for the individual as well as for his disease.

There is one other point in the treatment of chronic renal dropsy which is, I think, often overdone, namely, confinement to bed. Are such cases the better for being kept in bed? I do not think they are; at least, the comparison of the two classes of cases I have already alluded to is but niggardly in showing the benefit, if it does follow. Hospital patients settle this question without any difficulty on our part, for most of them cannot afford to remain in the hospital long, and so their period of bed is curtailed, and for those who would stay, the hospital is unable to find the requisite accommodation for any but a limited period. My own rule of practice, therefore, is this: for all cases a preliminary rest in bed for, say, two or three weeks. This enables us to determine the nature of the disease and its probable course; but when once this has been determined and the chronicity of the complaint settled, provided that the patient be clad warmly and all imprudent exposure guarded against, I think that a certain amount of exercise is beneficial.

A RECENT number of the *Correio Medico* of Lisbon gives some further particulars with regard to the arrest of Dr. Vicente Urbino de Freitas, Professor of Physiology, at Oporto on suspicion of having poisoned several members of his wife's family, particularly a nephew who died in the beginning of April. His illness and that of two other children belonging to the same family came on after eating sweets and almonds, which were sent to them by post. The total number of murders of which he is accused is seven. The motive for the alleged crime is said to be the acquisition of a large property by the removal of the nearest heirs. As Dr. de Freitas is one of the leading members of the medical profession in Portugal, the case has naturally created a great sensation among his countrymen.