REMARKS ON ALBUMINURIA A FREQUENT RESULT OF SEWAGE POISONING.

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It is notorious that a great variety of diseases may result from drain poisons. With our present system of drainage a town sewer may contain, not only excremental matter in various stages of decomposition, but with this may be combined the specific contagia of such communicable diseases as cholera, typhoid, scarlet fever, erysipelas, diphtheria, etc. That typhoid fever, some forms of diarrhoea and dysentery, diphtheria and various forms of sore throat, not presenting the specific characters of diphtheria, may result from defective drainage is a matter of daily observation. I have seen several cases of profuse purulent discharge from the inflamed mucous membrane of the fauces demonstrably the result of septic sewer poisoning. In other cases, with less apparent inflammation of the mucous membrane, the lymphatics beneath the jaw have become swollen and painful, and in one case this resulted in an abscess.

Pleuro-pneumonia is another form of acute disease which not rarely may be traced to the same cause. I have seen many instances of this. Last summer I was asked by a friend to see his groom in a mews at the West End of London. The young man had been in good health until the day before, when, without previous exposure to cold, he was seized with a rigor. I found him with a temperature of 104° , the pulse and breathing were rapid, and he had pain in the right side of the chest. Although the physical signs had not then become developed, I felt sure that the disease would prove to be pleuro-pneumonia, and I at once sent him to the nearest hospital, St. George's, where, under the care of Dr. Whipple, the disease took the usual course, and ended in a speedy and complete convalescence. He had come up from the country with the rest of his master's establishment a fortnight before, and had slept in a room close by a filthy untrapped closet. Looking upon this as the septic source of his disease, I had a double reason for insisting upon his prompt removal to the hospital: first, that he might have better attendance; and, secondly, that he might escape from the poisonous atmosphere in which his disease had been contracted.

The coachman, who had come up at the same time, and who occupied an adjoining room, after feeling unwell for some days, got an abscess in one eyelid.

The coachman's mother, who was acting as housekeeper and nurse, immediately after the removal of the groom, had a rigor, followed by severe pain in the limbs; temperature, 102° . I sent her at once into King's College Hospital, where, in a few days, the pain ceased, the temperature became normal, and she was convalescent.

There can, I think, be no question that these three distinct forms of illness, occurring within a few days of each other, were the result of septicæmia, from the one common source of drain poisoning; and the master, on being informed of the insanitary condition of the premises occupied by his servants, at once gave orders for the defective drainage to be made good.

In addition to other forms of disease, the result of drain poisoning, I have met with a number of cases of *albuminuria* which have been clearly traceable to that cause, and the main object of this communication is to direct attention to the fact that amongst the many causes of blood contamination and consequent albuminuria, sewage poisoning is a by no means infrequent one.

The occurrence of a case of typhoid or diphtheria in a house would, as a matter of course, excite attention to the drainage and the water and milk supply. I am anxious to show that, in the absence of other probable exciting causes of albuminuria, the possibility of sewer poisoning should be constantly borne in mind. It is needless to insist upon the practical importance of discovering the exciting cause of a disease, and thereby enabling the patient to avoid continued exposure to the morbid agency.

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CASE I.—The following typical case was seen by me with Mr. Galton, of Brixton, and Dr. Langford, of East End, Finchley, on January 3rd, 1887. Mr. L. H., aged 40, had been ailing on and off since August, 1886, but he had been worse during the last month. There had been soreness of the throat and neck, with occasional rigor and a temperature of 102° . A week before my visit the urine had been tested and found highly albuminous. It was now turbid with urates; specific gravity 1030; contained (as ascertained by Esbach's method) 7 grammes per litre of albumen, and when cleared by warmth many small hyaline casts, with some epithelial and leucocyte casts, were seen. The urine was scanty, the pulse full and throbbing; no œdema. The patient was of temperate habits, he had not been exposed to cold, and in the absence of other apparent exciting cause I expressed my conviction that drain poisoning had been the cause of the sore-throat, occasional rigors, and albuminuria. On subsequent inquiry, it was found that sewer gases had been escaping into his house from two untrapped waste pipes, one connected with a washing basin in a lavatory, the other with a bath, and both going direct into the drain. At the time of my visit the patient was staying at the house of a relative, and he remained there until he recovered. He was treated in the usual way by rest in bed, milk diet, warm baths, and purgatives. In about a week the albumen began to decrease; in three weeks it had entirely disappeared, and it has not recurred. I saw him in May last year and in January of the present year, with Mr. Galton, for another complaint, and on each occasion the urine was found to be quite normal.

It is highly probable that if the cause of this man's illness had not been discovered and removed, continued exposure to the sewer poison would have resulted in an incurable disorganisation of the kidneys, as it had done in several cases that have come under my observation.

I will now give an outline sketch of three of these cases, omitting dates and details, the publication of which might give pain to the relations and others connected with the cases.

CASE II.—A national schoolmaster consulted me at my house. He had been out of health for a year. For six months the urine had been blood-tinged. Now specific gravity 1010, slightly blood-tinged, albumen 3 grammes per litre, many epithelial casts, and some blood-tinged. There was a double aortic murmur at the base and a single systolic mitral at the apex. A modified collapsing pulse (see Chapter xxxv of my *Medical Lectures and Essays* "On the diagnosis of co-existing aortic and mitral incompetence"). The legs were œdematous; there was much dyspnoea; he was pale and emaciated, and hopelessly ill. It is probable that the double valvular disease was a result of uræmic endocarditis. He was living in the basement of a schoolhouse, where there was conclusive evidence of a blocked drain in the fact that after a rainfall the area was always flooded. His wife had suffered from dysentery soon after they entered the house four years before, and often since from diarrhoea. The doctor who attended her for the dysentery said they ought not to remain in the ill-drained house. I wrote to the clergyman who sent him to me, and expressed my conviction that the illness of his schoolmaster was caused by the insanitary condition of the schoolhouse. The poor man was a total abstainer, and had been exposed to no other probable exciting cause of disease.

CASE III.—Mr. W., aged 35, had enjoyed uninterrupted good health until, two years before I saw him (in December, 1887), he went to live in a recently built house a few miles from London. From that time he began to suffer from disorder of the stomach and bowels, with almost constant diarrhoea. On two occasions, in 1886 and 1887, while he was away in Scotland for three weeks, these troublesome symptoms entirely passed away, but they reappeared within a few days after his return home. Six weeks before my visit general dropsy appeared, and then the urine, which had not before been examined, was found to contain a large amount of albumen. It was of the rather light colour indicative of chronic disease, specific gravity 1020, and contained fifteen grammes of albumen per litre—the largest amount I have ever found. It deposited a cloudy sediment containing numerous hyaline and oily casts, with scattered oily cells. In the absence of other probable exciting cause of the renal disease, I inquired about the drainage. There were two closets in the small house—one on the ground floor, the other on the first floor near the patient's bedroom. The patient's wife had occasionally noticed a bad smell, and a friend who often visited them had complained of an unpleasant "earthy smell" whenever he

entered the house. A case of typhoid fever had recently occurred on the premises. I expressed a decided opinion that a drain poison was the cause of the renal disease, and advised that the condition of the drainage should be thoroughly investigated.

I have since learnt from the gentleman whom I met in consultation, and from the patient's wife, that after my visit the drainage was examined, with the following result. Peppermint water having been poured into the upstairs closet was at once detected by its odour in the hall; and beneath the hall floor there was found a defective joint in the soil pipe from the closet, so that sewage had escaped into the earth upon which the floor of the hall rested. The sitting room, which was generally occupied by the patient and his wife—they have no children—opened into the small hall. Here then is the explanation of the "earthy smell" which had often been noticed; and I have no doubt that the chronic diarrhoea and the albuminuria were directly due to the same cause. The fact that the health of the patient's wife, who had been even more continuously exposed to the same poison, had not apparently suffered, is quite consistent with this explanation of the husband's illness. We have frequent opportunities of observing that out of a number of persons exposed to the same morbid agency, only a small proportion become seriously ill. Additional evidence that the diarrhoea was excited by the sewer poison is afforded by the fact that this symptom, which had continued until the time of my visit, and for some days afterwards, ceased almost immediately after he left home to stay with a friend for five weeks. The defective drainage was made good during his absence, and during the fortnight since his return home there has been no return of the diarrhoea. His general condition, too, is reported to have improved, and the albumen has diminished by one-third.

CASE IV.—Miss B., aged 35, had been more or less ill since she had undertaken the management of a country hotel six months before I saw her. During the last six weeks the urine, which had not before been examined, was found to be blood-tinged. At the time of my visit the urine was brightly blood-tinged, specific gravity 1012, contained albumen (8 grammes per litre), and deposited granular and hyaline casts and oily cells. The secretion was very scanty. The patient was very pallid and feeble; there was frequent vomiting; temperature 102°; much dyspnoea, with a rapid and feeble pulse. The prognosis was most unfavourable. When I saw her a second time three days later, the symptoms were worse; there was almost complete suppression of urine, and she died on the following day.

This lady was in good health when she took up her residence in the hotel. The drainage was found to be bad, and the drains were opened and repaired while she remained in the house. I have no doubt that the illness, which commenced soon after, and which culminated in fatal degeneration of the kidney, was the result of drain poisoning.

The medical attendant who sent me the account of the defective drainage which was discovered in connection with Case 3, ended his report by saying: "I very much doubt whether the profession at large is sufficiently alive to this subtle cause of albuminuria."

It is hoped that the publication of these illustrative cases may serve to direct more general attention to this frequent, though often unsuspected, source of renal disease.

In connection with this subject, it is not without interest to remark that amongst the numerous diseases which may result from defective drainage and consequent sewage poisoning, diphtheria is, in a very large proportion of cases, associated with albuminuria, a fact which Dr. Wade was the first to make known.

The history of such cases as have been here briefly recorded serves to illustrate a principle which cannot be too much insisted upon, namely, that the treatment of symptoms by drugs forms but a small part of the art of healing, and that one of the main objects of rational medicine is to trace disease to its cause. What a melancholy exhibition of unscientific impotence is the attempt to arrest by opiates and other astringents a diarrhoea, the result of perpetually inhaling a septic drain poison!

It can scarcely be doubted that the diarrhoea and the albuminuria having such an origin are the result of a physiological effort by the bowel and the kidney to eject the poison and its noxious products from the system; and it is obvious that an essential condition of successful treatment in such cases is the discovery and removal, or avoidance, of the exciting cause of the symptoms.

ST. THOMAS'S HOSPITAL was visited by the Queen of Sweden on Tuesday last.

LECTURES

ON

SUPPURATION AND SEPTIC DISEASES.

Delivered at the Royal College of Surgeons, February, 1888.

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LECTURE II.

WE have thus found that these pyogenic cocci are constantly present in suppurative affections; that they can cause suppuration both in animals and in man, as evidenced by experiments, and also by the microscopical observation of the changes which occur at the seat of infection; and, further, that true acute suppuration does not occur naturally when these organisms are absent. It would therefore appear as if, with the discovery of the pyogenic organisms, the etiology of acute suppurative affections was satisfactorily settled. This, however, is hardly the case, for the following considerations, among others, render it evident that in most cases other factors in addition to the micro-organisms must come into play. Thus we find a great variety of morbid processes caused by the same organisms. The staphylococcus pyogenes aureus can set up a superficial inflammation of the skin, a boil, an abscess, acute ulcerative endocarditis, or even pyæmia; and the streptococcus pyogenes causes sometimes phlegmonous inflammation, sometimes peritonitis, sometimes puerperal fever, and sometimes pyæmia. Then, again, we have the fact, on which I have not as yet dwelt, that, in order to produce these suppurative affections in animals, various conditions, such as the injection of large numbers of the micro-organisms, are essential.

That these organisms are not of themselves able in most cases to set up these suppurative diseases is evident also from the fact that they are frequently present in the blood without producing any suppurative affections. Thus Ogston states that in cases of septicæmia in man the micrococci are present in the blood, and are excreted in a living state in the urine, and he makes no mention of the occurrence of secondary abscesses. Ogston's statement has been confirmed by von Eiselsberg, who examined the blood of almost all cases in Billroth's *clinique* who were suffering from septic fever, and was able to demonstrate the presence of staphylococci and streptococci, most frequently of staphylococcus pyogenes albus, in the blood; and yet apparently no abscesses formed. In the case of acute osteo-myelitis also Garré has found the pyogenic staphylococci in the blood, although the patients did not suffer from abscesses in more than one situation. In connection with acute osteo-myelitis, perhaps the most interesting observations as showing that these organisms may exist in the blood without doing any harm are those in which children have been born suffering from this disease while the mothers, through whose blood only the organisms could have come, have apparently been in good health. As an example of this I may mention a case published by Rosenbach in a paper on acute osteo-myelitis.

E. A., aged 30, was delivered of her fifth child in June, 1858; she had been married ten years, and all her other children were living and healthy when born; she was not aware of having suffered any fright or injury to account for the disease in the child's leg. The latter, a full-grown boy, was born dead at full time, and had apparently been alive quite recently. Attention was at once drawn to the right leg, which was swollen and showed distinct fluctuation both in front and behind. Immediately below the patella there was a bulla on the skin; the whole leg had a marked erysipelatous character, and on making an incision a large quantity of pus was evacuated, and it was then found that the greater portion of the soft parts of the leg was destroyed, and that there was scarcely any muscular substance to be seen. Further investigation showed that almost the whole of the periosteum of the tibia was detached and the bone was in a state of necrosis. At the lower part a small portion of the periosteum was inflamed, but still adhering to the bone; at the upper part the epiphysis of the tibia was almost entirely separated from the