actinomycosis, and was clinically diagnosed as such before any micro-organism was even looked for.

Moreover, the arrangement of the micro-organisms in the tissues, the true branching, the uneven staining of the protoplasm, and the tendency to form swellings at the ends of the threads; all these points leave no doubt that it was a streptothrix infection (See Fig. 2).

As already said, I only found a single object resembling a club in the pus from one of the abscesses, but absolutely nothing else during life or *post mortem*. What the clubs are I do not venture to say, but I do not believe they are degeneration forms; for if tissues from actinomycotic cattle are stained by Gram's method a beautiful radial arrangement of clubs stained deep violet is shown, but I have never seen any mycelial thread stained.

I have seen two cases of human actinomycosis, and examined tissues from three others, and in only one case in which quantities of pus were coughed up were the clubs visible, and easily seen by squeezing out one of the "granules" found in the pus, and examining with a low power. In the other three cases the appearances were precisely similar to those in the present case.

The extracorporeal relations of these streptothricæ and their mode of infecting the animal are still unexplained, but there have been a number of researches, especially those of Jensen and Johne, cited by Crookshank, which point to their having origin amongst the cereals. Several experiments by different investigators tend to show a possible connection between the tubercle and Timothy grass bacilli and actinomycetes. For instance, Lubarsch and Schulze produced actinomycotic-like growths in animals from the Timothy grass bacillus and Eppinger's streptothrix. Bates produced mycelial growths with clubs in animals by injecting tubercle bacilli into the brain. The most extraordinary results were those of Friedrich and Nösske, who by injecting definite quantities of tubercle bacilli into the left ventricle of rabbits, produced a growth of tubercle bacilli, especially in the kidneys, composed of a dense mass of bacilli surrounded by a ring of clubs.

These experiments taken together seem to me to suggest a possibility of our finding the primary source of tubercle bacilli amongst the cereals or some other members of the vegetable kingdom.

In conclusion I wish to thank Dr. Wigham for the time and trouble he has spent in the photo-micrograph department on the photographs.

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NOTE ON THE DIALYSIS OF THE TOXINS THROUGH COLLODION WALLS.

BY

M. ARMAND RUFFER, and M. CRENDIROPOULOU,
M.D. M.D.

THE details of our technique for the dialysis of living cultures have been previously described in this JOURNAL.¹ It is sufficient to remind the reader that it consists in cultivating a given microbe in a collodion sac suspended in some cultivating medium. The object of our present investigations was to see whether mild toxins dialyse, partially or wholly, through the walls of a collodion sac, and whether they then retain their pathogenic properties. The microbe chosen was the bacillus pyocyaneus, because its pathogenic properties had been already studied by several observers and one of us (R.), and because it secretes a colouring matter rendering its recognition easy.

We have observed that toxins pass through the collodion walls in small quantities, but that the time they take in doing

so is comparatively long, depending on the thickness of the tube and on the nature of the liquid in which the sac is suspended.

A comparison of toxin filtered through a Chamberland candle with toxin obtained by dialysis, showed that the first had greater pathogenic properties than the second. Nevertheless, we succeeded in reproducing with the latter all the symptoms without exception, typical arthritis even, provided the quantity injected was sufficiently large. A guinea-pig, for instance, injected with 20 c.cm. (per kilog. weight) of filtered toxin died in three hours, but more than double the quantity of the toxin obtained through dialysis of a culture of the same age and the same breed was necessary in order to kill an animal of the same weight in forty-eight hours or thereabouts. Even under such conditions death was not constant.

Nevertheless, whenever the dose of toxin obtained by dialysis exceeded 20 c.cm. (per kilog. weight) the animals died from cachexia after a shorter or longer period.

The pathogenic properties of the dialysed substances varied according to the length of the dialysis. The toxins dialysed from living cultures during ten to thirteen days, a short period of fever, diarrhoea, and sleepiness predominated, though diarrhoea was less frequently present than the other symptoms. Convulsions occurred but rarely, and were produced only by toxins which had dialysed during a period of thirty to forty days.

The dialysed toxin injected in the dose of 5 to 10 c.cm. (per kilog. weight) produced no or hardly any apparent symptoms, but conferred immunity. The colouring matter (pyocyanine) dialysed only when the sac was not too thick.

We have stated already that the nature of the liquid surrounding the sac of collodion had great influence on the amount of toxin which dialysed through. We noted that if a collodion sac filled with a bouillon culture was suspended in distilled water, the surrounding water became far more toxic than when the surrounding medium was bouillon or peptonised water. The naked-eye characters of the cultures also differed according to whether these were immersed in one or other of the liquids. The cultures made in sacs suspended in bouillon, for instance, lost the greater part of their water, become viscous, and resemble those made in collodion sacs introduced into an animal's peritoneum. The bacilli appeared deformed, many became granular, others assumed a coccil form, and those seemingly normal were less vigorously motile than usual.

We have studied only casually, so to speak, the virulence of bacilli in collodion sacs, and in the few experiments we have made this virulence appeared to follow no regular rules.

To resume, the various toxins of the bacillus pyocyaneus dialyse, but not in their entirety. The time they take in thus dialysing is comparative long, and their pathogenic properties vary according to the length of the dialysis.

It is extremely probable that the immunising substances are among the first to dialyse. Advantage might possibly be taken of this property in the manufacturing of vaccines.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, November 3rd, 1900, p. 1305.

A CASE OF RENAL COLIC ATTENDED BY THE PASSAGE OF CASTS OF THE URETER (URETERITIS MEMBRANACEA).

By J. A. HENTON WHITE, M.D., B.S., F.R.C.S. EDIN.,
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IT is well known that renal colic may be caused by other conditions than the passage of a renal calculus, and such causes as the passage of uric acid or oxalate of lime crystals, tuberculous *débris*, or hydatids from the kidney have been recorded, and to these psorospermiosis has recently been added.

The passage of casts derived from the mucous lining of the ureter itself seems, if one may judge by the absence of literature on the subject, to be a rare occurrence, and the following case is therefore interesting.

History.—Mrs. P., a lady of just over 60, was first seen by me about fifteen months ago for repeated attacks of agonising pain in the left loin,

which had been gradually increasing in severity for twenty years. There was nothing remarkable in her family history, nor had she previously had any serious illness. Her family consisted of ten children, including twins, and the youngest was 15 years of age. The patient was of a very nervous temperament, and, despite the attacks described below, had been too diffident to consult a medical man.

Symptoms.—Twenty years ago she first began to feel pain in her left loin, but attributed it to indigestion or rheumatism. This pain has gradually got worse, and is now always present to some extent. Three years ago she began to have "attacks," at first about every two or three weeks, but with increasing frequency, till when first seen fifteen months ago they came on six or seven times a week on an average. During a bad attack "the pain in the left loin becomes agonising, and shoots down the front of the abdomen to the inner side of the left thigh." She "rolls about in agony, and becomes bathed in sweat, and frequently vomits." The duration of the attacks varies, but usually they last two or three hours, and leave her very collapsed. Such was the nature of her attacks fifteen months ago. Curiously, she did not suspect renal trouble, and had never noticed her urine, but said she micturated too frequently, especially during an attack.

Condition on Examination.—Great tenderness was present below the left lower ribs posteriorly. Bimanual palpation of the kidney was difficult on account of the great rigidity of the abdominal walls, and the kidney could not be distinctly felt to be enlarged. Tenderness and rigidity were also noted along the course of the ureter. She said she had never had blood in her urine, and that walking about or riding in an omnibus did not increase the pain unless she had an attack on when she went to bed. I diagnosed an encysted renal calculus provisionally. On examining her urine the same evening, I found it neutral in reaction; a haze of albumen was also present, and microscopically a few leucocytes were seen, but no pus.

Description of Casts.—A few days later I saw her in a typical attack of colic as described above, and on examining the next specimen of urine passed, I found it slightly acid with a smoky tinge, and containing a distinct cloud of albumen and a few blood cells. The most remarkable objects, however, were a number of semitransparent mucoid strings about an inch long, and obviously derived from the ureter. She had never noticed these previously, but during the last fifteen months they have always followed a bad attack of colic. Microscopically they are hollow, elongated, cylindrical bodies of clear mucus held together by a few threads of fibrin, and contain a few small granules and the remains of a few epithelial cells, which occasionally show a transitional character. From the flimsiness of the casts it was difficult to believe they could mechanically cause any serious obstruction.

Treatment.—She was put on an alkaline mixture containing 2 grs. of potassium iodide three times a day, and at once began to improve, and soon was able to walk about, and this summer (1900) even went for a summer holiday, which she had been unable to do for three years. During her absence, however, she left off the mixture, and had several bad attacks of colic. On her return I thought I would try an acid mixture, and gave her some nitrohydrochloric acid with belladonna, but she did not improve, and I was obliged to return to the old mixture, when she again ceased to have the spasms. She has now been under observation for fifteen months, and instead of getting attacks of colic every two or three days she will go a month without a bad attack. During the spasms she gets relief from chlorodyne and belladonna draughts, and tells me that before consulting me she took large quantities of spirits during her attacks with considerable relief.

This case is paralleled by one recorded by Professor von Jaksch.¹ In his case, however, the patient had previously passed a renal calculus, and this was followed by periodical attacks of colic attended by the passage of casts of the ureter 10 cm. long. His patient was relieved by rendering the urine acid, whereas no relief followed in my case after the administration of mineral acids. Probably the iodide was the active ingredient, and produced its beneficial effects by rendering the secretion of the ureteral mucous membrane more fluid and less coagulable than before.

Von Jaksch compares the condition to Curschmann's spirals in certain forms of bronchitis, and to cases of membranous colitis in which casts of the colon are passed. Fenwick, of New Zealand,² has related a case in which a membranous cast of the gall bladder and duct produced attacks of biliary colic.

Besides von Jaksch's case I am unable to find further records of ureteral membranous casts. In my own case, as in von Jaksch's, I think it very probable that an encysted renal calculus may be present, and this by irritating the renal plexus produces nutritive disorders of the ureteral mucous membrane on that side. It is difficult, in view of the apparently unilateral nature of the disease and its long duration to suspect a microbic origin, at any rate without strong bacteriological evidence. The colic is probably due to irregular peristalsis of the ureter produced by the irritation of the separating casts, and not to ureteral obstruction.

In a similar case, supposing relief could not be obtained medicinally, and in view of acute pain caused by the passage of the casts, it is possible that an exploratory nephrotomy might be necessary in order to discover any possible source of irritation, such as a stone; and, failing relief from this, even nephrectomy might be necessary. Israel³ describes a case of ureteritis attended with renal colic in which this procedure was necessary.

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A CASE IN WHICH MOVABLE KIDNEY PRODUCED THE USUAL SYMPTOMS OF HEPATIC COLIC:

SUCCESSFULLY TREATED BY NEPHRORRHAPHY.

By MACPHERSON LAWRIE, M.D.,

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C. G., aged 39, a patient of Dr. Allden (Bridport), consulted me on September 26th, 1899. She had been more or less in bad health for the previous ten years. She was weak, thin, and badly nourished, and complained of severe pain, principally over the region of the gall bladder and liver. This pain was intermittent in character, but the attacks were frequent, almost daily and almost every week she was laid up and unable to perform her duties. These attacks were accompanied by sickness, nausea, and vomiting; the bowels were constipated, her complexion sallow, and she had the worn, anxious expression of chronic ill-health. She was afraid to take almost any kind of nourishment, and the slightest indiscretion was followed by renewed suffering. The attacks were usually associated with fever, and on more than one occasion there was a considerable rise of temperature.

While under my observation she developed an attack of jaundice with much pain and the other symptoms already enumerated. On examination there was great tenderness over the epigastrium but no definite swelling could be demonstrated. The right kidney was freely movable.

For a considerable length of time medical treatment had been systematically carried out, followed by more or less benefit, but she was never really well, and it was sometimes necessary to administer morphine for the relief of pain. Medicine having been of only temporary assistance, and as the state of the kidney was clear evidence of an abnormal condition, I recommended surgical interference with a view of fixing that organ in its proper position.

The operation was performed on December 10th, 1899, in the usual way by a lumbar incision, and stitching the kidney to the deep muscles of the back by means of three Chinese silk sutures. The operation gave no trouble, and was followed by a rapid recovery, and in a few weeks she went home. All the troublesome symptoms at once disappeared. She had no return of pain, sickness, fever, or jaundice. I saw her on September 27th, 1900, more than nine months afterwards, when she had gained considerably in weight, looked well and strong; in fact, I did not know her as the same woman, and she told me she could do anything and eat anything.

The interest of this case lies in the evidence it affords that the ordinary symptoms of hepatic colic may be produced by movable kidney, a fact which has not been generally recognised by most well-known authorities on the liver. In the *BRITISH MEDICAL JOURNAL* of last year, Dr. McLagan and Mr. Treves published a series of three similar cases, in which the evidence pointed strongly to the presence of gall stones, and where a movable kidney had been noted. In each of these cases the abdomen was opened, and closed after the gall bladder had been unsuccessfully explored for stone, and the patients were completely cured by stitching the kidney into its proper position.

THE SEX OF PATIENTS SUFFERING FROM GASTRIC ULCER.

By R. DE S. STAWELL, M.B., F.R.C.S.,
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In connection with the letters of Drs. Saundby and Pye-Smith on this subject, may I venture to give some figures I collected a few years ago from my old hospital records?

In 7,700 *post-mortem* examinations of which full notes were preserved, I found the presence of gastric ulcer recorded in 96—55 males and 41 females. These figures are strikingly like those quoted in Dr. Pye-Smith's edition of Fagge's *Medicine*—59 males and 46 females, and Lebert's observations—57