complex composition. It contains creasote, turpentine, paraffin, and eupione, and is obtained by the destructive distillation of *Pinus Sylvestris*. Carbolic acid has largely taken the place of this cruder compound; but Dr. Whitley says that there are virtues possessed by tar which are not equally enjoyed by its more fashionable rivals. In oakum we have a form of tar-dressing which I heartily recommend to those engaged in hospital-work.

THE DANGERS OF LEAD-STYLES IN THE TREATMENT OF LACRYMAL OBSTRUCTION.

Read in the Section of Ophthalmology.

By A. EMRYS-JONES, M.D.,

Surgeon to the Royal Eye Hospital, Manchester.

I WILL only occupy the time of the Section for a very few minutes, in relating a case that occurred in my practice at the Eye Hospital, which illustrates the dangers that may occur occasionally, even when following out a recognised method of treatment.

On February 16th, 1884, Wm. H., aged 35, was admitted an in-patient to the Royal Eye Hospital. He said his left eye had been troubling him for five months with constant watering and discharge of matter. On admission, I found distension of the left lacrymal sac, and, at the same date, the duct was "Webered" in the ordinary way; there was abundant hæmorrhage. For the four succeeding days, Robertson's silver probes were passed, night and morning, without any difficulty. As he had only been taken into the hospital on account of the distance he came, we considered it advisable to introduce a lead-style, of the usual size and shape, and send him home. On February 20th, this was done, and I saw nothing of him again until March 7th, *i.e.*, in about a fortnight. He then said that he felt his eye painful on his way home; the eyelids were swollen and puffy; and, in a day or two, there was a very profuse discharge. His doctor was sent for, and he removed the style. On examination, I found total necrosis of the left cornea, intense purulent discharge, and thickening of the conjunctiva.

You will all admit that this is a most unpleasant result, and to the patient a most disastrous one; and the very possibility of such an occurrence compels me to bring it to your notice. I have searched diligently for a similar case, but have not succeeded in finding one, and I sincerely hope that this is unique.

Lead-styles have been highly recommended, on account of their pliability, and the ease with which they can be made to fit any duct; and I have never before met with anything to suspect danger, nor am I at present prepared to say it was the particular composition of the probe that produced the mischief.

There was nothing about the size or the shape of the probe uncommon, and I do not think there was any infection about it. We know that considerable purulent discharge may occur from the duct, without implicating in the least the conjunctiva and cornea.

In this case, there may possibly have been a slight abrasion of the conjunctiva, which would prove a starting-point for violent purulent conjunctivitis, implicating the cornea secondarily. I shall be glad to hear the opinion of any of the members present.

Dr. ANDREW (Shrewsbury) thought it very doubtful if the bad result of Mr. Jones's case was due to the probe, as the action of lead on the secretions was certainly rather beneficial than otherwise. One case that occurred in his practice, of a tangle-tent breaking off, caused very little disturbance after remaining in several months.

NOTES ON TRAUMATIC TETANUS.

Read in the Section of Physiology and Pathology.

By A. W. HARE, M.B.,

Senior President of the Royal Medical Society of Edinburgh; Assistant to the Professor of Surgery in University of Edinburgh.

THERE has been for some years difference of opinion amongst pathologists as to the true nature of the changes present in tetanus; some authors holding that the lesion is wholly nervous, others looking upon it as a humoral disease.

A large number of very careful researches¹ on this point have shown that, in some of the central organs of the nervous system, as the spinal cord and medulla oblongata, as well as in the peripheral nerves,

changes take place, of the nature of an increase in the connective tissue elements; and, in certain parts, also, a breaking down of grey nerve-elements has been observed.

Dr. Coats comes to the following conclusion in his *Manual of Pathology*: "The cause of the irritation in tetanus is not at all clear. It seems likely, however, that here, also, there is an irritant in the blood, just as there is in hydrophobia" (page 467). In this, he distinctly supports a humoral theory, and agrees with the views of Billroth,² Richardson,³ Bauer,⁴ and Poland.⁵

On the other hand, some valuable cases, pointing rather to a purely nervous cause, appear in Dr. Macdougall's very interesting papers in the *Lancet* (July 19th and 26th, 1884), in which the occasional value of the resection of nerves in such cases is well exemplified.

Returning, however, to the humoral theory, the question has still to be settled as to what the nature of the irritant may be, which is thus assumed to circulate in the blood-stream; and to this point I wish shortly to draw attention.

In the first place, in regard to this theory, are there any comparative considerations which would lead us to the idea that the irritant so circulating in the blood is of the nature of a micro-organism? I believe there are. If we take, for instance, the case of anthrax artificially produced in the mouse,⁶ we shall find that, amongst other symptoms, we have some of a distinctly tetanic character, especially as the disease approaches its fatal issue. This is presaged by increasing frequency of spasms affecting various groups of muscles, and, finally, chiefly affecting those of respiration. The spasm which proves fatal passes on, without any intervening relaxation, into rigor mortis. We have here a disease, which is on all hands now acknowledged to be due to a micro-organism, and a disease which, in its later stages, presents a singular resemblance to tetanus, as it occurs in the human subject.

Many other equally analogous conditions are found amongst micro-organismal diseases which can be produced on animals; but this analogy alone, taken with the conclusion of so many pathologists that the disease is of a humoral nature, clearly defines the direction which future investigations as to tetanus in the human subject must take.

As a step in this direction, very imperfect though it be, I shall beg to lay before you some observations made on a case of traumatic tetanus which occurred recently in the wards of the Edinburgh Royal Infirmary, under the charge of Professor Chiene, to whose kindness, and to the kind assistance of Dr. Mackay, the resident surgeon, I am indebted for the opportunity of investigating the case, and of bringing it now under your notice.

Six days after the operation, which was one for the radical cure of hernia, it was noticed that the wound had become septic. Four days later, the patient experienced slight stiffness of the lower jaw, which was at the time attributed to his having caught cold. The case was a rapid one; for, within thirty-six hours, tetanus in one of its severest forms was distinctly established; and, notwithstanding the administration of chloral and bromide of potassium, the fatal issue occurred within forty-eight hours after the commencement of the attack. At that time, preparations were complete for examining the patient's blood, with a view of detecting micro-organisms, if present; this was necessarily postponed for a time. Thirty minutes after death, however, blood was obtained from a vein in the neck which had been divided in the operation of laryngo-tracheotomy. This was spread on cover-glasses in thin layers, dried, and stained with methyl-violet. It was found that micro-organisms were abundantly present, and the drawings before you show their characters. There are also drawings of the discharge from the wound, which was loaded with micro-organisms; and of sections of tissue taken from the anterior abdominal wall. The last, however, is an observation of no great value, as the tissue could not be obtained till twenty hours after death. The microscopic specimens from which these drawings are taken are now placed under the microscopes for inspection.

Through the kindness of Dr. Sims Woodhead, I was enabled to observe the effects of the blood and discharge from the wound, respectively, when inoculated into rabbits. The inoculation of blood from the patient was quite without effect; that of the discharge produced a passing erythema only.

The negative results thus obtained do not, however, affect the general question of the causation of traumatic tetanus in the human subject; nor the probability that, in the case just cited, the organisms observed in the blood were in some way connected with the occurrence of the disease. This observation is merely brought before the Section

² *Surgical Pathology and Therapeutics*, 1881, p. 389.

³ *Transactions Epidemiological Society of London*, vol. i, p. 28.

⁴ *Ziemssen's Cyclopaedia*, vol. xiv.

⁵ Article "Tetanus," in *Holmes's System of Surgery*.

⁶ See Koch, *Traumatic Infective Diseases*, New Sydenham Society, p. 34.

¹ Rokitsky, *Sitzungsberichte der Wien. Akad.*, 1857; Rose, in Pitha and Billroth's *Handbuch der Chirurgie*; Lockhart Clarke, *Med.-Chir. Trans.*, 1865. Coats, *Med.-Chir. Trans.*, 1878.