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.

as one suggesting a new line of investigation in cases of the sort, and as likely to lead to a clearer explanation of the origin of some of these cases. The rarity of such cases, which the antiseptic system of surgery has done so much to produce, must be my excuse for having brought so short a record before the Association; but I do so in the belief that, if observations in the direction indicated be made on the isolated cases which do occur, much of interest may be found out, and valuable indications may be established on which to base a system of treatment.

ON THE DESIRABILITY OF ESTABLISHING BACTERIOLOGICAL LABORATORIES IN CONNECTION WITH HOSPITAL WARDS.

Read in the Section of Physiology and Pathology.

By JOHN CHIENE, F.R.C.S.E.,
Professor of Surgery in the University of Edinburgh.

THE present paper must be looked on as the direct outcome of that read before the Association, at its meeting last year in Liverpool, by Dr. Dreschfeld. To any one who heard that paper, which treated in so thorough a manner of the relations of micro-organisms to disease, three facts became at once apparent; that,

1. Much work has been, and is being, done as regards this question.
2. Much more remains to be done.
3. A great deal of this work is being done abroad.

In these researches, the United Kingdom is not taking the position which its high standing in other departments of science would warrant one in anticipating. We know much already about anthrax, tuberculosis, ague, pneumonia, relapsing fever, erysipelas, and glanders; and here we must pay a tribute to the work of Dr. Greenfield, the President of this Section, whose researches on anthrax may be pointed to as one of the achievements of this country in the domain of micro-organismal pathology.

There remains, however, a whole series of diseases of which we at present know but little, and which are now being investigated; such are pyæmia, septicæmia, syphilis, typhoid, typhus and scarlet fevers, diphtheria, and others. On inquiring how this country can take a greater share in these investigations, one is at once met by the assertion that it is largely handicapped by the repressive action of the Vivisection Act; and thus has arisen a form of paralysis, or at least paresis, amongst our scientific workers. This form of paralysis is, however, quite an unnecessary result; for, notwithstanding these restrictions, some useful work may be accomplished.

Dr. Dreschfeld clearly points out some directions in which this may be done, and, amongst others, directs our attention to such subjects as the possibility of altering micro-organisms by repeated cultivation in nutrient media, either as regards their form or their function; the question where their spores lie dormant, in the air, in water, in the soil, or in food, thus opening the whole question of infection and contagion; and how long they retain vitality, how they enter the body, and how they can be most easily destroyed.

As regards these most important questions, much can undoubtedly be done without the aid of vivisection, and there are two ways in which these investigations may receive valuable assistance, namely:

- A. The institution of bacteriological laboratories; rooms set apart for the study of these lower forms of plant-life.
- B. The transmission to such laboratories of morbid materials, collected from cases in which micro-organisms may play a causative part; and their thorough examination.

The laboratories, to be most efficient, should be placed where the micro-organisms occur—namely, in hospitals; and in connection with each hospital a small room fitted with the few necessities for this class of study could be easily established, and placed under the superintendence of the medical staff. In the great centres of medical education, this is already accomplished; but in the numerous provincial hospitals a vast amount of most valuable material is being constantly wasted; where, if such laboratories existed, and were conducted by the resident surgeons or junior practitioners of the neighbourhood, much valuable material would be gained.

The cost of such a room is trifling. If gas and water be laid on, it merely remains to fit up a set of sterilising and incubating apparatus, such as that devised by Koch; and to provide the necessary glassware. This can be done for £10.

Much can be accomplished in the cultivation and study of micro-organisms with an ordinary microscope. The interesting and valuable work of botanical classification may thus be advanced, and the general physiological tendencies of various organisms observed. If, however,

delicate and absolutely reliable results are to be attained, a powerful instrument must be added to the fittings of the laboratory. The most desirable is the microscope of Zeiss of Jena, which, fitted with Abbé's condenser and a one-twelfth inch oil immersion-lens, costs about £30. So powerful a microscope is, however, by no means essential.

Could the hospital authorities be persuaded of the importance of such a step, the withdrawal of a single bed for a year would more than cover the primary cost of a most useful adjunct to hospital efficiency, and the subsequent cost would be very small indeed. If such laboratories could be founded, more attention would be paid to giving the requisite instruction to students in the medical schools; and they would thus pass out with the requisite knowledge for undertaking the work.

Turning now to the second aspect of this question, we shall find that many medical men, who have neither time nor opportunity to carry out such studies themselves, are yet quite prepared to act as collectors of material from any interesting cases which occur in their practice. The method I have devised is to make use of capillary lymph-tubes to collect blood and morbid fluids, which are at once sealed up hermetically, having been previously sterilised by soaking in absolute alcohol. These are transmitted by post in small wooden cases, securely fastened, and with a label attached for the address. These can be supplied in any quantity, containing six tubes, and with a label attached, at a cost of less than three farthings each. In the case, there is room for a small scroll of paper, which prevents the tubes from shaking about, and supplies room for a few short notes of the case from which the morbid products are collected. The whole goes through the post without any risk, and, as experience has proved, with results which leave nothing to be desired.

If it be thought desirable to send tissues, they must be removed with antiseptic precautions, and dropped immediately into molten paraffin; and thus they can be transmitted without fear of contamination. In conclusion, I believe this question to be one of vital importance at the present juncture; and I would propose that this Section should approach the Association with a plea for the importance of encouraging this sort of work. I would suggest that a committee be appointed, on the basis of the Collective Investigation Committee, with powers to grant funds for setting up a certain number of centres for carrying on the work, and for supplying tubes to medical men all over the country who are willing to transmit material to the various centres, where it can be thoroughly investigated—in many cases, it may be, with the aid of a vivisection-licence. I may mention, in this connection, that Mr. Hallam, the head of the Veterinary Department in India, and a Fellow of our Edinburgh College, proposes making arrangements for carrying out such a plan in the districts of that country, in connection with diseases of the lower animals; and it would be well if, in this country, a subject which is the great question of the day in medical science might obtain that amount of attention which it deserves, and which will supply fields for labour of no less scientific interest than of practical utility, the magnitude of which is as yet beyond computation.

A NEW AND SIMPLE ANTIPYRETIC.

By LAUCHLAN AITKEN, M.D., ROME.

A LITTLE more than a year ago, the attention of physicians in Italy was drawn to a new and simple cure for ague by Dr. Maglieri, in a short article which appeared in one of the Italian medical journals (*Il Morgagni*, 1882, p. 751). The remedy was merely a decoction of lemon; and Dr. Maglieri heard of it originally from his uncle, a farmer, who had frequently used it to the benefit of some of his farm-labourers, the victims of malarial affections, which had resisted better known means of cure. In his notice of its effects, Dr. Maglieri pointed out that it was probably the method alone of preparing the lemon decoction which gave it the value it apparently possessed, as, in this land of malaria and of lemon-trees, the ordinary juice of the fruit must have been employed many millions of times in different forms of ague, without any great effect having ever been ascribed to it by patients or physicians. Dr. Maglieri had himself used it successfully, not only in cases of chronic malarial cachexy, but also in pernicious malarial fevers; and it was the happy issue of some of his experiments, in such dangerous illnesses, that induced him to publish the article mentioned. The remedy was adopted soon afterwards, at the request of Professor Tommasi-Crudeli, who had read Dr. Maglieri's notice, by a large landed proprietor near Rome; and the results obtained by him, too, in severe cases of malarial infection, were very surprising, and were mentioned in a letter to the Minister of Agriculture