

(dated Dec. 7th, 1889).—*Royal Engineers* (Fortress and Railway Forces): 2nd Lanarkshire (the St. Helen's): Surgeon E. F. Hall, M.D., to be Surgeon-Major, ranking as Major (dated Dec. 7th, 1889).—*Rifle*: 7th (Clackmannan and Kinross) Volunteer Battalion, Princess Louise's (Argyll and Sutherland Highlanders): Thomas Milne, M.D., to be Acting Surgeon (dated Dec. 7th, 1889).

**NURSING SISTERS IN THE ARMY.**—A Royal Warrant has been issued by the Secretary for War directing that in future candidates must be over twenty-five and under thirty-five years of age, and have had at least three years' preliminary training and service in a civil hospital. They are not to continue in the service after reaching the age of sixty.

## Correspondence.

"Audi alteram partem."

### COLOUR TESTS FOR RAILWAY SERVANTS.

To the Editors of THE LANCET.

SIRS,—As it appears that this subject has recently caused and is still causing some discussion both in the lay and medical press, and that none of the tests hitherto proposed seem to satisfy all parties, I should feel obliged if you would kindly allow me to describe a simple piece of apparatus which I constructed some time ago, and with which I have tested several drivers and guards. The point to be ascertained really is, "Can drivers and guards readily distinguish red and green lights under varying conditions of the atmosphere at distances ranging roughly from fifty yards to a mile?" That a man can recognise a mass of red or a mass of green placed close to him goes for little. The area of illumination of a lamp, as it appears to us, is inversely proportionate to the square of its distance from us; and therefore by placing immediately in front of a coloured lamp fixed, say, six yards from us a screen perforated with different-sized apertures, we can mathematically reproduce the effect of a lamp of a given size at different distances; and this is the principle on which my test is based. A man examined by this method is placed under (practically) exactly the same conditions as if he were taken out on to the line and asked to look at different signal lights—some near, some far off, and some in groups. It should be borne in mind that heavy smokers—and I think I am not wrong in assuming that engine-drivers consume a good deal of tobacco—sometimes become the subjects of a central scotoma, with a corresponding amount of colour-blindness; so that central coloured rays (such as those emanating from a six-inch lamp at 800 yards), which would be focused at a point corresponding to the affected region of the fundus, would not be recognised, though the rays from the same lamp held only a few yards off would be judged quite correctly, as they would then impinge on more peripheral portions of the retina. My instrument consists essentially of a lamp contained in a light-tight lantern, having in it a circular aperture one inch in diameter. About two inches in front of this aperture is a metal screen six inches square, also pierced with a corresponding hole of the same size as that in the lantern. Between the screen and the lantern (and attached to the former) is a brass carrier holding a red and a green glass, and so arranged that either may at will be placed in the field by a slight movement of the finger of the operator. In front of the screen is a metal disc, with a number of holes of different sizes bored through it, and disposed at equal distances near its margin. On rotating the disc the holes are brought one after another opposite the illuminated area, and act like "stops" in a photographic lens. The result of this is to limit the "coloured light" seen by the examinee to the size of the apertures in the disc, and to represent to his eye a lamp of a given size at successively increasing or decreasing distances. The red and green glasses are changed about each time at the operator's pleasure. One segment of the disc is devoted to another phase of the test, and is perforated with groups of holes in various relations to each other. These are supposed to represent tail lights of distant trains. The examinee must be able to see not only their colour, but also their number and positions. Finally, a second disc is placed in front of the first, and is fitted with a series of neutral tint

glasses of different intensities, to present the appearance of various degrees of fog. The whole apparatus stands in a dark room on a level with, and at a distance of six yards from, the examinee's eyes, which are each tested separately. I think if Mr. Stretton were to see my arrangement he would be satisfied that the test is a fair one.

I shall be happy to allow any gentleman interested in the subject an opportunity of inspecting the test if he will communicate with me. Meanwhile I shall be glad to receive any expression of opinion on the method I have so imperfectly described.

I am, Sirs, yours obediently,  
Seymour-street, W., Dec. 10th, 1889. A. ST. CLAIR BUXTON.

To the Editors of THE LANCET.

SIRS,—I admit the advantage which would be gained by using lamps with coloured glasses in testing colour vision, but these are obviously not readily used in a consulting-room. If the railway companies were willing to appoint someone on purpose to test the vision of their *employés*, lamps, railway signals, high and low lights in various combinations and distances might be used. Until this or some similar method is adopted I am not without hope that my instrument, simple though it be, may prove of use to the railway surgeon as a practical test for colour-blindness in railway *employés*. From men working practically on railways I learn that the distance the lights can be distinguished so as to recognise what train is advancing or receding, and whether it is a mail, a slow, or goods train, varies from over a mile to twenty or thirty yards. These facts alone are, I think, sufficient to show that any system which involves the use of railway lamps as a test for colour vision, to be of real service for these varying distances for different combinations of lights, would absorb almost all the time of a person experienced in testing for errors in refraction, colour vision, or visual acuity.

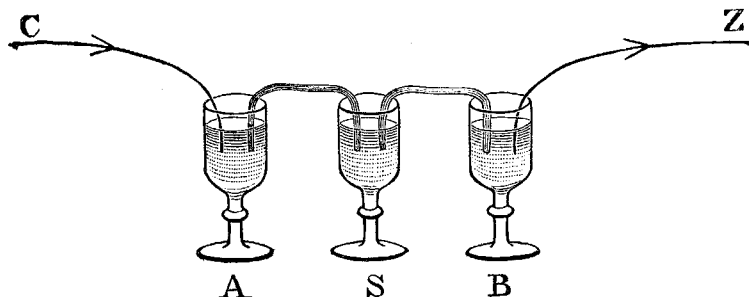
I am, Sirs, yours faithfully,  
Carlisle, Dec. 9th, 1889. H. A. LEDIARD.

### THE TREATMENT OF CANCER BY ELECTRICITY.

To the Editors of THE LANCET.

SIRS,—Dr. Steavenson appears, from his letter in your issue of Dec. 7th, to have misunderstood my paper. He has, I have no doubt unintentionally, misrepresented my deductions drawn from experimental evidence. He states in his letter that "the experiments brought forward by Dr. Parsons to prove that no change takes place between the poles, &c." Now, I have never said that *no change* takes place. I will quote my words as they were printed: "All these experiments demonstrated in a conclusive way that the passage of a constant current does not cause any *decomposition* between the poles, although there must of necessity be an exchange of atoms between the molecules." I actually state that there is a change in the interpolar region, but no decomposition. Dr. Steavenson's views appear to me to be fallacious, and his own experiments help to prove my deductions and to refute his own theories. I will endeavour to make this clear. When a constant current is passed through any given portion of the body, acids are found to appear at the positive pole and bases at the negative pole, and they are found at the poles only, and not in the space between them. Water furnishes the simplest example of this decomposition of molecules, when hydrogen appears at the negative and oxygen at the positive poles. Is this *decomposition* confined to the area in contact with the poles, or does it take place throughout the area between them? It was this very important question, from a practical point of view, that I tried to elucidate by experiment. To put it in a practical form: Supposing a tumour is buried in the liver, and one pole from a battery is placed on the right hypochondrium, while the other is placed in such a position on the back that the current between them passes through the liver. We find acids and bases at their respective poles on the skin resulting from the decomposition of molecules. Are these acids and bases derived from the tissues in contact with the poles only, or do the whole of the deeper parts traversed by the current participate in the decomposition? I devised the following experiment to try to ascertain what happened, using the same diagram. The three cups, A, S, B, were filled with a standard

solution of iodide of potash, and connected together by a stout lamp-wick saturated in the solution. The two platinum electrodes from a battery were then brought, one into each of the end glasses, A and B. The experiment arranged in this way presents in one respect a similarity to the application of the current to the body. Because there are only two poles, and the acids and bases appear in their neighbourhood only in the two end glasses, the centre glass, S, contains no pole, and it can therefore be used to represent the deeper parts of the body away from the poles, and called the interpolar region. After passing a constant



current for some time, I found that the iodide of potash in the end glasses, A and B, was decomposed into iodine and potash, while in the centre glass no decomposition had taken place. It still contained as much iodide of potash as before. Dr. Steavenson does not say whether he has tried this experiment in the same way, or whether he obtained a similar result. But he alters the experiment and connects the glasses with copper wires, and of course a different result follows. If copper wires be used to connect the glasses, there are two poles in each glass instead of one pole in each of the end glasses. The centre glass, instead of containing no pole, actually contains two. It therefore ceases to represent the interpolar region. The experiment thus carried out by Dr. Steavenson is utterly useless for elucidating the point under discussion. His third experiment, as well as his second, prove in a remarkable way my contention that "there is no decomposition between the poles, although there must of necessity be an exchange of atoms between the molecules." To take his third experiment as the best example, he places dilute sulphuric acid in the centre glass, S, and a solution of chloride of barium in the two end glasses, A and B. Now what happens after the passage of the current? The dilute sulphuric acid, instead of decomposing, exchanges its atoms of hydrogen for atoms of barium, and forms sulphate of barium, which remains in the centre glass undecomposed. This proves the two very points that I contend for, that there is an exchange of atoms by the molecules, but no decomposition in the interpolar region. My clinical experience, when ether is given, is quite the reverse of Dr. Steavenson's theory that electrical shocks cause inhibition of the heart. I passed 600 milliamperes across the pneumogastric in the neck in a case of Dr. Burton's, and the circulation, if anything, improved. By comparing the action of the constant current on cancer with that by the interrupted voltaic current, I find that the former produces a destruction of tissues, both healthy and morbid, close to the poles, while the cells in the interpolar region retain their vitality; that the interrupted voltaic current apparently causes atrophy of the morbid cells from pole to pole in the path of the current, if the details of the application are efficiently carried out.

I am, Sirs, yours faithfully,

Collingham-place, S.W., Dec. 9th, 1889. J. INGLIS PARSONS.

### THE MORTON LECTURE ON CANCER.

To the Editors of THE LANCET.

SIRS,—In reference to the letter of Mr. Marshall in your issue of Saturday last, and also to that of Dr. Inglis Parsons of the preceding week, may I be permitted to call attention to a short paper of mine on the intimate nature of Cancer, which I published in THE LANCET of 1863, vol. ii., page 713, in which I expressed views on this point almost identical with those which these two able writers have so recently done, and which views were further commented on by me in 1868.<sup>1</sup> I am sure we have all read Mr. Marshall's closely reasoned lecture with the deepest interest, and also gladly

welcome Dr. Parsons' suggestions; and further feel of how little real consequence it is who may have first taken a particular view of the subject so long as it is true, whilst I am quite aware that some other author or authors may have preceded myself in the thoughts I have there expressed. But whilst I feel sure that we all care little except for the true elucidation of this dire disease, yet as a question of precedence has been raised, it seems to be but justice to myself to point to the above paper of mine published so long ago as 1863. I am, Sirs, yours faithfully,

Norwich, Dec. 9th, 1889.

PETER EADE, M.D., &c.

### COMPULSORY VACCINATION.

To the Editors of THE LANCET.

SIRS,—You have now been good enough to honour me with a third paragraph in your journal under the above heading. In the first you were misled into attributing to me what I did not say. In the second you withdrew that error, and promised to comment on what I did say. In the third you do so comment, promising that your readers will be thus enabled "to judge of the accuracy" of my assertions. Your comment on my assertion, that in the Perth Infirmary in 1887 there were eight revaccinated cases of small-pox with two deaths, consists of a counter-assertion by Dr. Graham that of the eight cases information as to the revaccination was wanting in five, and that in two more the revaccination had only immediately preceded the attack; and that the two deaths were taken from these seven cases. I can only reply that this account of events now two years old differs materially from that given at the time by Mr. P. Campbell, one of the directors of the Perth Infirmary. The following extract from a letter of his, dated Perth, Nov. 15th, 1887, now lying before me, was the authority for my statement:—

"As you are desirous of knowing about the patients who had small-pox in the Perth Infirmary, I made inquiries of the house surgeon this morning. Of the eight patients, six recovered and two died; all had been at least twice vaccinated, and some of them three times. The two who died had been twice vaccinated, but the one was far gone with heart disease and the other had a complication of troubles as well as small-pox."

Your readers, whilst judging of my accuracy, will not fail to judge of the discrepancy of these two accounts. Clearly, on Nov. 15th, 1887, the house surgeon had no doubt as to the revaccination of all his eight cases. And the complications then alleged by the house surgeon as explanation of the two deaths are unknown now, or at least unmentioned, by Dr. Graham. I might therefore follow your example, and call on your readers to judge of the accuracy of Dr. Graham. But I prefer to avoid a phrase which might seem to reflect on the truthfulness of a gentleman quite unknown to me. Evidence, indisputable and undisputed, of the failure of revaccination to protect from small-pox lies so ready to my hand that I have no need and no desire to specially defend any particular disputed case. My object in asking the insertion of this letter is simply to defend my own "accuracy," and to show that I did not make the statement in question without good and sound authority.

I am, Sirs, yours obediently,

ALFRED MILNES, M.A., F.S.S.

Goldhurst-terrace, N.W., Dec. 8th, 1889.

### LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

*Appointment of a Lecturer on Diseases of Children at Liverpool University College.*

DR. PETER DAVIDSON has been elected Lecturer on Diseases of Children at the Medical Faculty, University College, Liverpool. He has had considerable practical experience in the department of medicine on which he will lecture, having been for some years past honorary physician to the Infirmary for Children, honorary medical officer to the Bluecoat Hospital, and medical officer to the Industrial Schools, Liverpool.

*Cases of Longevity.*

Some weeks ago there appeared in THE LANCET notes of extraordinary longevity in a man who resided in

<sup>1</sup> THE LANCET, vol. i., page 603.