ment of fluid in the tubes to a standstill. I have looked in vain for evidence of a transfer of fluid in the opposite direction, that is from the inner towards the outer surface, a transfer that might indicate action of the glands with which the skin of the frog is studded. Inactive skins, especially from the weakly frogs, obtained during the breeding season, are not uncommon, but though I have occasionally observed a slight rise of the fluid in the tube towards the outer surface at the commencement of an experiment, I have never observed any corresponding fall or even diminution in the rate of rise of fluid in the tube towards the inner surface. Even with pilocarpine no such effect could be obtained. It is possible that in such cases as the one shown in Fig. 2, one is really only reading the difference between two transfers, the absorptive overbalancing the secretory, and one would expect the former to have the upper hand in the excised skin; for while the secretory cells have double work, namely, first to manufacture a special product out of what pabulum they can find in the lymph spaces of the bloodless skin, and secondly to pour it forth, the absorptive cells on the other hand have merely to pick up a supply of bland fluid and pass it on; so that as the life processes of the starved cells run down, we might expect the stream from the absorptive cells, with their easier task, to swamp that from the secretory cells throughout the course of the experiment.

The idea that this fluid transfer may be of electro-osmotic origin has naturally occurred to me. The frog skin current which Engelmann⁴ attempted to make serve the purpose of a motor of secretion, might be called in, upon the return journey of its circuit, to do the work of absorption. Indeed, with electrical currents circulating as they do in the skin,⁵ the question of outward or inward transfer of fluid would have become one of relative "porosity" in the two directions. With equal resistance to fluid transfer in the two directions, theoretically, there need be no passage of fluid across the skin; with unequal "porosity" there might be movement of fluid along current lines coinciding with lines of lesser filtration resistance. Unfortunately the skin offers a greater filtration resistance from without inwards than in the reverse direction. Again, if what I have observed be of electro-osmotic origin, the coupling up by a good conductor of the fluids on the two sides of the skin should increase the rapidity of fluid transfer from without inwards, by diminishing the amount of current flowing *in the skin against* the direction of the absorption stream. When I have done this I have failed to find any effect, though an included galvanometer gave evidence of the normal skin current. I do not, therefore, see how the electrical hypothesis can be made to suit the case.

The facts I have observed, then, seem to point to the conclusion that it is possible to have a true absorptive process taking place without the aid of ordinary osmotic action. That intestinal absorption is governed by other laws than those of ordinary osmosis has long been known. I am at present engaged upon work with the intestine upon the same lines as that detailed above, and the results so far tend to show that a non-osmotic vital absorption is there also capable of demonstration.

NOTE ON THE KNEE-JERK IN THE CONDITION OF SUPER-VENOSITY.

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I HAVE observed that the knee-jerks are absent in some cases of emphysema with bronchitis where the blood has become venous to an extreme degree. Dr. Penberthy and Dr. Collins assisted me in the investigation of the cases alluded to. As the patients we observed were near death when the knee-jerks were absent, I hesitate to come to the conclusion that they were absent as a mere consequence of extreme super-venosity. Dr. James Harry Sequeira has given me notes of the case of a girl, aged 9, suffering from diphtheria, who was tracheotomised (successfully) at midnight on account of urgent respiratory difficulty producing cyanosis. Before the operation, her knee-jerks were absent; next day, when she was breath-

ing easily, cyanosis having disappeared, the jerks were obtained, and they were elicitable until her discharge about a month after the operation. (This patient was under the care of my colleague, Dr. Stephen Mackenzie).

Dr. Risien Russell, at my suggestion, examined the knee-jerks of a dog artificially asphyxiated by clamping its trachea; the animal's knee-jerks became exaggerated until knee-clonus was produced; but in the third stage of asphyxia no reaction could be obtained. As (Hitzig, Franck, Pitres, Russell) asphyxia diminishes, and in an extreme degree annuls the excitability of the motor cortex, it may be that the preliminary exaggeration of the knee-jerk observed by Dr. Russell was owing to loss of cerebral control upon lumbar centres, and that these strongly organised spinal centres succumbed later to the poisonous influence of super-venous blood than did the controlling cerebral motor centres.

This communication is merely preliminary, and thus qualifications to foregoing statements are not given, and certain objections, some very obvious, are not stated. One reason for writing this note is to suggest that when oxygen is administered to cyanosed patients their knee-jerks should be tested before the gas is given, and also afterwards. If successfully used, that is, if the patient's blood becomes well oxygenated, it is possible that knee-jerks, unobtainable before administration of the gas, may be elicitable afterwards.

If super-venosity is a cause of loss of the knee-jerks, the fact may be important with regard to the apoplectic state, and possibly somewhat with regard also to post-epileptic coma. In some cases of apoplexy from cerebral hæmorrhage,¹ the knee-jerks are lost, in others not. It is worth while in all cases of apoplexy or coma to note the degree of super-venosity, and to investigate, in regard to it, the state of the patients as to tendon-reactions and superficial reflexes.

A CASE OF INTERMITTENT FEVER WITH UNEXPLAINED HIGH TEMPERATURE.

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It has seemed to me proper to place on record the following case, which is reported by my late house-physician, Dr. J. H. Sequeira, on account of the extraordinary high thermometric readings. It will occur, no doubt, to many to doubt the genuineness of the temperatures registered, but there can, I think, be no doubt as to the accuracy of the observations. I am always very sceptical of extraordinary temperatures, and in a paper read at the Clinical Society in 1881 exposed a case in which a temperature of 120.8° F. was registered. At the same meeting the late Dr. Mahomed mentioned a case in which a fictitious temperature of 128° was recorded. Cases, however, of temperatures, believed to be genuine, of 122° (possibly 125°) by Mr. J. W. Teale, and of 130° by Dr. Little, of Dublin, have been published.

Expressing my doubts as to the genuineness of the temperature recorded in the present case, extraordinary care was taken by Dr. Sequeira and the nurses to prevent any manipulation or fraud, and the high readings of the thermometer were all taken when the thermometer was held by the observer in one or other axilla. On one or more occasions two thermometers were simultaneously placed in the same axilla, and were found to correspond, a point of considerable importance where fraud is suspected. It was, as a rule, impossible to take the temperature in the mouth, as the patient was in the condition of a rigor, but when so taken it was raised proportionately.

E. G., aged 27, was admitted to the London Hospital on October 2nd, 1891, under my care. He was born in Malta, but had been to nearly all parts of the world as a sailor during the previous eleven years. Eighteen months before admission, while in Colombo, he had his first attack of shivering fits. He was in hospital there two months; he has also been under treatment in several hospitals—at Dublin, Sierra Leone, and Rotterdam. The present attack began on September 28th, 1891, with slight shivering, loss of power in the legs, headache, and lassitude. On admission his general health was good. The liver was not enlarged, but there was some tenderness over the right hypochondrium. The splenic dullness extended to the costal margin. The pulse was 70 per minute: there were no abnormal signs in the heart or lungs. Intelligence was good; Nothing abnormal was to be observed in the retina. On the evening of

⁴ *Pflüger's Archiv*, Bd. VI, 1872.

⁵ V. Rosenthal, *Reichert u. du Bois-Reymond's Archiv*, 1885, p. 311.

¹ Buzzard, *Medical Press and Circular*, March 12th, 1890.

his admission the temperature was normal. On October 3rd, at 7.30 P.M., the patient had a strong rigor; shivering lasted about thirty minutes. The temperature at 4 P.M. was 102° F.; at 8 P.M. it was 107.2°. The pulse was only 68, soft and easily compressible. Profuse sweating followed, the bed-linen being saturated. The patient was drowsy afterwards. At 8.30 the temperature was 99.2°, and at 9 P.M. was normal. He appeared weak. The blood examined at the time showed two granule masses containing black pigment. On October 4th the temperature at 4 P.M. was 101.6°. At 7.30 P.M. he became very hot and the temperature was taken. The thermometer registered 110.8°. At 8 P.M., the thermometer being held in the axilla, the patient remaining quiet and carefully watched by the house-physician, the temperature registered was 112.8°. Sweating commenced and soaked the blankets. At 8.30 the temperature was 98°. Throughout this time the pulse was 88.

On October 5th the same temperature was registered at 8 P.M. No shivering occurred on this occasion. The temperature fell to normal within twenty minutes. On October 9th a similar reading of the thermometer was made. On October 10th two thermometers were tried in the same axilla, and at 5.45 P.M. both registered 109°. Five grains of quinine were given every four hours. On October 11th a reading of 112.8° was taken, and on October 14th, 113.8°. The time occupied in the return to the normal line in some instances barely exceeded five minutes. Shivering was not always present; the pulse never exceeded 100 per minute. The spleen was never found enlarged at the time of the fits. On the

night of October 16th the patient seemed in a semi-conscious condition. The respirations were shallow, and 80 per minute, the pulse being only 84. He did not flinch on being pricked with a pin, and there was no reflex on touching the cornea. The knee-jerks were present, and there was speedy recovery of consciousness and a normal rhythm of respiration on the application of the faradic current to the lower extremities. The temperature was normal till October 30th, when a thermometric reading of 112.6° was taken in the mouth twice. Violent shivering

occurred, the temperature five minutes after being 97.6°. He was bathed in sweat throughout the night, and slept badly. On October 31st a draught of 20 grains of sulphate of zinc was ordered to be administered at the onset of any fit, but there were no abnormal temperatures or symptoms observed during the remaining fortnight the patient was in hospital.

The rigors which occurred were very severe, and a short hot stage was followed by profuse sweats. Except on one occasion, the patient did not seem profoundly ill when the high temperatures were recorded—nothing approaching the grave condition of patients the subjects of hyperpyrexia in rheumatic or enteric fever. The periods of hyperpyrexia were, however, exceedingly brief, and this may be taken as an explanation of their innocuousness. On one occasion the nurse found a temperature of 112° F., and went immediately to inform the sister of the ward. On the arrival of the latter, within five minutes the temperature was below normal—97.6° F. As recorded in the notes, no enlargement of the spleen accompanied the attacks. I examined the blood on several occasions, but never detected melanæmia, though some pigment was observed by Dr. Sequeira on one occasion, nor could I detect any changes in the red corpuscles.

It is well known that relatively high temperatures (106° to 107° F.) are not rare in ague, and it is possible that in this case abnormally excitable thermic centres may have been excited or inhibited by a poison which commonly produces great, though brief, disturbances of temperature. I, for my own part, keep "an open mind" on the subject, and leave others to draw their own conclusions.

ON THE USE OF OXYGEN AND STRYCHNINE IN PNEUMONIA.

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THE following facts concerning the treatment of a fatal case of influenza, complicated by pneumonia, are invested with so much interest by Dr. Lauder Brunton and Dr. Prickett's paper on the use of oxygen and strychnine in pneumonia, that I have no hesitation in bringing them under the notice of your readers.

Mrs. C., a widowed lady, aged 57, began to suffer early in October from eczema seborrhœicum. The eruption spread successively from the scalp to the vulva. On the inner surface of the labia it assumed a pustular form, and gave rise to the most distressing symptoms, rendering necessary the use of sedatives, which, in their turn, seemed to produce some small degree of mental disturbance. Her strength was so much reduced by pain and sleeplessness that the appearance on January 13th of symptoms of influenza invested the case with a peculiarly threatening aspect. The temperature rose rapidly to 103° F., was accompanied by coughing, but found little explanation in the condition of the lungs, the signs there being limited to the presence of numerous mucous râles at both bases. Without any further increase of temperature or other premonitory signs, acute delirium suddenly supervened. It opened by a pseudo-epileptic fit, and was marked by restlessness, excitement, and violence, maniacal in their intensity, and that only the free use of sedatives could control. With the cessation of delirium came a period of general prostration and semi-consciousness. Food could only be administered with great difficulty. The breathing was superficial and frequent, the bronchi obstructed with secretion, finding no relief in abortive attempts at expectoration. The pulse became rapid and weak, and signs of threatening asphyxia added to the gravity of the patient's condition. A hurried examination now seemed to reveal a small area of dullness at the right base. A fatal issue seemed imminent, and was indeed anticipated by a colleague called in consultation. Every means of recovery, however, had not been exhausted, so I determined to try the effect of strychnine in stimulating the respiratory centres. I injected subcutaneously 3ij of the liq. strych. The result being apparently satisfactory, as indicated by a few effectual efforts at expectoration, a stronger pulse and increased consciousness, I repeated the dose at the