

committee to examine and report as speedily as possible upon the question.

The committee consisted of Colonel Paton, Deputy Quartermaster-General of the Army, Staff-Surgeon (now retired Inspector-General) James Anderson, and myself, who then occupied the office of Inspector-General of Prisons. Dr. Anderson was well acquainted with the fort, having had charge of the 2nd European Fusiliers when in the garrison, and I then possessed a less intimate acquaintance with it, as mentioned above. The committee was appointed in July, 1858, and, after much consideration and examination, submitted a report of the results of their inquiry early in September of the same year. The matters specially inquired into were the drainage of the fort, its water-supply, and conservancy arrangements, which were all found to be extremely defective. The objectionable state of all these was detailed, and remedies were suggested for their improvement. The strength of the garrison at that time, including all hands, was 5170 souls.

We recommended that the garrison surgeon and assistant-surgeon should be *ex-officio* the sanitary officers of the fort, and bring all matters affecting its healthiness to the immediate notice of the military authorities. Dr. Campbell had proposed a special sanitary officer, a view in which we were unable to concur, as it was clearly a part, and a very important part, of the duties of the garrison medical staff. Our conclusions included the entire reconstruction of the drains and releveling of the enceinte of the fort, so as to secure the removal of all impurities at once; the extension of the water-supply of the garrison by the formation of special tanks or reservoirs for the storage of water for drinking and cooking, and by the pumping up and filtration, with the aid of steam-power, of a sufficiency of river water for all cleansing and conservancy purposes; the provision of a plunge-bath, and the reconstruction of the latrines and lavatories; the reduction of the vegetation in the fort; the more free use of charcoal as a deodorant and disinfectant; an entire change in the urinals, and the daily removal of all excrementitious matters; improvements in the garrison cells; the ordure of the fort, which was not carried off by the *Cunette*, to be transported to a distance down the river in a properly constructed covered filth boat; and the *Cunette* being strictly confined to its proper use in time of peace, and more thoroughly cleansed and scoured than it then was.

The cordial thanks of the Government of India were conveyed to the committee for the thorough manner in which the duty was performed and for the clear and able manner in which the results of their investigation were embodied in the report.² Immediate orders were issued to the Public Works Department to carry out all the recommendations that were practicable with the least possible delay, and thus commenced measures which have not since been relaxed, to secure the healthiness of Fort William. The table printed by Dr. Marston shows how quickly the good effects of those measures were experienced as respects cholera, and that it preceded by several years the introduction of the filtered water of the Calcutta Municipality. I entirely concur with that officer in considering that the improvement of the health of the troops in Fort William was due to sanitary improvement all round, and not to any single cause, however important.

I may possibly take another opportunity of stating my views on the cholera portion of the question, for I recently had an opportunity of again seeing that disease in Paris during the present epidemic, when I found not the smallest difference between its ordinary course and characteristics as I witnessed them half a century ago in the same city, and as I found them a few weeks since.

The pathology of cholera is still a sealed book, and until the mystery of its origin is revealed we must, I am afraid, be content to rely on prophylactic measures to prevent its introduction or extension. These were as well understood thirty years ago as they are now, as can be proved from published records, should it be necessary. Continental nations are now realising the inefficacy, and even danger, of quarantine regulations as they are, and can only be carried out. The circulars recently issued on the subject at home and abroad have added nothing whatever to our knowledge of the matter, and are not likely to do so in existing circumstances.

I am, Sir, yours faithfully,

F. J. MOUAT, M.D.

Durham Villas, Kensington, W., Jan. 5th, 1885.

FRACTURES OF THE SKULL, FOLLOWED BY COLLECTIONS OF CEREBRO-SPINAL FLUID BENEATH THE SCALP.

To the Editor of THE LANCET.

SIR,—Since my friend Mr. Godlee has directed attention to my papers on this rare condition, and has brought before the Pathological Society two cases bearing upon the subject, I should be glad to be allowed to make a few further comments on the circumstances with which this phenomenon is associated. My four short papers have been published in the Guy's Hospital Reports for 1876, 1878, 1881, and 1884, and have hitherto (as Mr. Godlee suggested) escaped the notice of the profession in this country, though the first case attracted the attention of Professor Verneuil in Paris, who published some comments upon it. In these papers I gradually arrived at more decided opinions, and in my later papers I ventured on two definite conclusions—viz.: 1. That simple fractures of the skull, followed by tumours of cerebro-spinal fluid beneath the scalp, occur only in children. 2. That when cerebro-spinal fluid escapes in quantity from the vertex (whether the fracture be simple or compound) the ventricle of the brain has been laid open. The first of these conclusions is borne out by the record of all the published cases, and I reasoned out its truth for the future in the following way: The skulls of children are flexible, and when the bones are fractured the edges of the fracture may be driven far into the brain without damage of the scalp. In adults, on the other hand, owing to the rigidity of the bones, one fractured edge will almost certainly cut through the scalp before the other can penetrate far into the brain.

The second conclusion, though contrary to the ordinary teaching, which supposes that in the majority of cases cerebro-spinal fluid escapes from the subarachnoid space, is nevertheless supported by all post-mortem evidence; and I would here suggest that in suspected cases, to prevent error after death, the brain and its covering ought to be hardened for some months in spirit (as was done in both my cases) before being examined. Again, compound fractures of the skull, with injury to the brain and without escape of cerebro-spinal fluid, are common, the reason of this being that the subarachnoid space on being injured rapidly throws out a greenish solid lymph, which glues up its cavity.

I would submit that neither of Mr. Godlee's interesting cases was a true case of cephal-hydrocele, and that they ought not to be included in any table of such cases. In neither was the fluid withdrawn, the clear, faintly albuminous, watery, cerebro-spinal fluid, though it would appear from the post-mortem examination in the first case that the conditions were present which might eventually have led to such a tumour being formed after the blood and inflammatory products had been absorbed.

The pulsation of a tumour beneath the scalp will occur whenever there is a direct and free communication through the bone between the tumour on the outside and the contents of the skull, whether that tumour be soft, solid, cerebro-spinal fluid, serum, or blood. In this respect a comparison may be drawn between the pulsation occurring with a hole in the calvaria and the impulse on coughing communicated to all tumours, fluid or gaseous, which have a free communication with the abdominal cavity, the impulse from within being felt externally where the wall is deficient. The diagnosis of cerebro-spinal fluid tumour must rest on other grounds than pulsation and increase in size when the child cries. I pointed out that there was a peculiar thinness (for lack of a better word) in the feeling of fluctuation, and a tendency to displacement, which allows the gap in the bone to be distinctly felt. Moreover, the tumour may be translucent, and there is an absence of fever such as is present when the tumour contains pus. As regards treatment, I insisted in my first paper, in 1876, upon the wisdom of leaving these cases as much as possible to nature. Aspiration cannot assist the cure, and appears to add seriously to the danger. It is, therefore, only justifiable as a means of diagnosis, and then is best performed with the needle of a hypodermic syringe.

Now that attention is being drawn to this class of head injuries, it is to be hoped that observers will carefully distinguish between the serum of blood-clot and the watery, barely albuminous, cerebro-spinal fluid.—Yours truly,

R. CLEMENT LUCAS, B.S., F.R.C.S.

Finsbury-square, Jan. 10th, 1885.

² Minute of Military Department, Government of India, Oct. 7th, 1858.