

THE QUEEN is expected to visit Netley almost immediately to inspect the invalids from the Gold Coast, and it is anticipated that Her Majesty will take that opportunity of viewing the *Victor Emanuel* hospital ship.

THE Council of the College of Surgeons has awarded the Jacksonian Prize for 1873 to Mr. Butlin, the Surgical Registrar at St. Bartholomew's Hospital, for his essay on "Ununited Fractures."

THE CIVIL SERVICE ESTIMATES.

By the time this number of THE LANCET is in the hands of its readers they will have learnt from the mouth of the Chancellor of the Exchequer what surplus he has to deal with, how it has been produced, and how he elects to dispose of it. In so far as the surplus, whatever it may be, is to result from economised expenditure, it does not appear from the bulky Parliamentary Paper before us that on the cost of the civil administration of the kingdom any material reduction is contemplated. For the financial year 1873-74 the gross amount of the Civil Service Estimates was £19,044,117; for the current year the requirement is £18,800,661, the difference being only £243,456 on the economical side of the account. These sums are inclusive of the Revenue Departments, which alone cost seven millions and a half to work. Excluding the Revenue Departments, we have an estimated expenditure of £11,286,978, distributed under the following seven branches of administration:— I. Public Works and Buildings, £1,297,178; II. Salaries and Expenses of Public Departments, £1,933,356; III. Law and Justice, £4,332,607; IV. Education, Science, and Art, £2,577,398; V. Colonial, Consular, and other Foreign Services, £586,763; VI. Superannuations, Pensions, and Gratuities, £528,196; and VII. Miscellaneous, Special, and Temporary Objects, £31,480. In this last class figures a sum of £700 for a year's maintenance and education of Prince Alamayou Simyen, the son of the late King Theodore of Abyssinia. Happily, we seem to have got out of the Ashantee war without any "white elephants" of the Abyssinian sort being thrown on our hands.

In only one of the above classes (Class IV.) is there an increased charge; on all the others there is a decrease; the net gain on the whole being £306,036.

Subjoined are some details of the year's expenditure, which are likely to be of interest to professional readers, the items being grouped under the office or department to which the service is subordinate:—

LOCAL GOVERNMENT BOARD.

Inspectorate for general purposes: 27 inspectors, sub-inspectors, and assistant-inspectors	£16,300
Travelling expenses and allowances	9,518
Moiety of salaries of Poor-law medical officers; including cost of drugs, medical appliances, and per-case payments, but excluding extra medical fees and fees for midwifery and surgical operations	127,000
Moiety of salaries of medical officers of health, and of inspectors of nuisances, under the Sanitary Acts	70,000
Medical officer of the Board	2,000
Inspector and assistant medical officer	1,100
Inspector and assistant medical officer for general sanitary purposes	1,000
Inspector and assistant medical officer for Poor-law purposes	700
Eight medical inspectors	5,075
Legal assistant to medical officer	934
Travelling and personal expenses of inspectors	4,100
Vaccination inspection and expenses	10,132

HOME OFFICE.

Factories inspection: 54 inspectors, assistant-inspectors, and sub-inspectors... ..	19,513
Travelling expenses and allowances	4,852
Fees to certifying surgeons under the Factories Acts	1,600
Mines inspection: 26 inspectors and assistant-inspectors	14,088
Travelling expenses and allowances	6,500
Burial-grounds inspection: one medical inspector	800
Travelling expenses	200

PRIVY COUNCIL OFFICE.

Auxiliary scientific investigations concerning the causes and processes of disease	2,000
Expenses under the Pharmacy Act	150
Quarantine expenses	2,824
Veterinary department	11,580

BOARD OF TRADE.

Fees for special services to medical inspectors ...	60
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Under the head of "temporary commissions" a sum of £900 stands for the completion of the work of the Rivers Pollution Inquiry Commission. The Commissioners are preparing their final report, and they had expected to complete it by this time; but they now find themselves unable to promise its publication before the middle of the present year. This report will be looked for with much interest, as it is expected to deal at large with the important question of water-supply, both for domestic and industrial purposes; and to give the results of investigations into the latest inventions for the purification of town sewage.

In respect of expenditure devoted to kindred purposes in the three divisions of the kingdom, we note that the total cost of the Local Government Board in England is £369,699; of the corresponding department in Ireland, £109,297; and of the Scottish Board of Supervision for Relief of the Poor and for Public Health, £18,248. The imperial share of the cost of registration of marriages, births, and deaths in England is £43,455, in Scotland £6605, and in Ireland £15,452. The supervision of lunatic asylums involves a charge of £14,935 in England, of £5930 in Scotland, and of £3832 in Ireland.

Correspondence.

"Audi alteram partem."

EXAMINATION AND VERIFICATION OF THE BODY OF THE LATE DR. LIVINGSTONE.

To the Editor of THE LANCET.

SIR,—For many years there has probably been no single individual on whom a greater amount of interest has been concentrated throughout the world than Livingstone. Naturally the excitement has been greatest in Britain. In America it has perhaps been all but equal; and wherever British interests extend, the doings, and latterly the fate of this remarkable man have thrilled alike on the hearts and tongues of all who prize some of the most marked features of modern civilisation. Giving every credit to our great philanthropists, to our Houses of Lords and Commons, no single human being has struck more deeply at the roots of all that remained in modern times of the curse of slavery than this simple-minded, noble-hearted missionary, who has served God and man with such force, power, and enduring energy as have never perhaps been exceeded by any other human being.

It is not in the province of such a journal as yours to

comment specially on such themes, and much less is it in mine to refer specially to them in your pages. I cannot, however, but remind you that Livingstone, besides his holy occupation, belonged to our profession. In my own mind I have a strong impression that a considerable portion of his great works resulted from that part of the education which he imbibed in our professional schools, and I therefore look with pride to the fact that his name must ever be enrolled as one of the most remarkable men in our ranks.

Many doubts have attended the movements of our great explorer in his latter years, which will probably be soon cleared up, as his papers become collected and collated. And within the last few months many have hesitated to believe that he was dead. Above all, it seemed beyond ordinary probability that his remains would have been brought from Central Africa to our heart of London. That a body was on its way from this all but mythical region could hardly be doubted after the examination at Zanzibar of the remains; but many were sceptical as to this dead frame being that of Livingstone. Up to within a few days, I may say until between 5 and 6 o'clock this afternoon, even the closest believers in his story felt in the position that they could not affirm more than was the general rumour.

Happily, it was borne in mind by many old friends that he had one condition of body which would mark the identification of his remains even if years and years had elapsed. The skeleton of the human frame being the last part which decays and falls into impalpable dust, it was thought by those who knew some part of his physical condition that if it should be proved, on anatomical examination, the remains of an old ununited fracture in his left humerus (arm bone) could be recognised, all doubt on the subject would be settled at once and for ever.

It has fallen to my lot to have the honour of being selected to make the crucial examination to this end, and I have accordingly performed that duty. From what I have seen I am much impressed with the ingenious manner in which those who have contrived to secure that the body should be carried through the long distance from where Livingstone died until it could reach a place where transit was comparatively easy, accomplished their task. The lower limbs were so severed from the trunk that the length of the bulk of package was reduced to a little over four feet. The soft tissues seem to have been removed to a great extent from the bones, and these latter were so disposed that by doubling and otherwise the shortening was accomplished. The abdominal viscera were absent, and so were those of the chest, including, of course, heart and lungs. There had been made a large opening in front of the abdomen, and through that the native operators had ingeniously contrived to remove the contents of the chest as well as of the abdomen. The skin over chest, sternum, and ribs had been untouched.

Before these points were clearly ascertained, some coarse tapes had to be loosened, which set free some rough linen material—a striped coloured bit of cotton cloth, such as might have been an attractive material for the natives, among whom Livingstone travelled,—a coarse cotton shirt, which doubtless belonged to the traveller's scanty wardrobe, and in particular a large portion of the bark of a tree, which had formed the principal part of the package—the case thereof no doubt. The skin of the trunk, from the pelvis to the crown of the head, had been untouched. Everywhere was that shrivelling which might have been expected after salting, baking in the sun, and eleven months of time. The features of the face could not be recognised. The hair on the scalp was plentiful, and much longer than he wore it when last in England. A moustache could not be recognised, but whiskers were in abundance. The forehead was in shape such as we are familiar with from memory, and from the pictures and busts now extant. The circumference of the cranium, from the occiput to the brow, was $23\frac{1}{2}$ in., which was recognised by some present to be in accordance with such measurements when alive.

In particular the arms attracted attention. They lay as

if placed in ordinary fashion, each down by the side. The skin and tissues under were on each side shrunk almost to skeleton bulk, and at a glance to practised eyes—there were five, I may say six, professional men present—the state of the left arm was such as to convince everyone present who had examined it during life, that the limb was Livingstone's. Exactly in the region of the attachment of the deltoid to the humerus, there were the indications of an oblique fracture. On moving the arm there were the indications of the ununited fracture. A closer investigation and dissection displayed the false joint which had long ago been so well recognised by those who had examined the arm in former days. The Rev. Dr. Moffat, and in particular, Dr. Kirk, late of Zanzibar, and Dr. Loudon, of Hamilton, in Scotland, at once recognised the condition. Having myself been consulted regarding the state of the limb when Livingstone was last in London, I was convinced that the remains of the great traveller lay before us. Thousands of heads with a like large circumference might have been under similar scrutiny; the skeletons of hundreds of thousands might have been so; the humerus in each might have been perfect; if one or both had been broken during life it would have united again in such a manner that a tyro could easily have detected the peculiarity. The condition of ununited fracture in this locality is exceedingly rare. I say this from my personal professional experience, and that such a specimen should have turned up in London from the centre of Africa, excepting in the body of Dr. Livingstone, where it was known by competent authorities to have existed, is beyond human credibility. It must not be supposed by those who are not professionally acquainted with this kind of lesion—which often causes so much interest to the practical surgeon—that a fracture and new joint of the kind now referred to could have been of recent date or made for a purpose. There were in reality all the indications which the experienced pathologist recognises as infallible, such as the attenuated condition of the two great fragments (common under such circumstances), and the semblance of a new joint, but actually there was a small fragment detached from the others which bore out Livingstone's own view that the bones had been “crunched into splinters.” Having had ample opportunity of examining the arm during life, and conversing with Livingstone on the subject, and being one of those who entertained hopes that the last reports of Livingstone's death might, like others, prove false, I approached the examination with an anxious feeling regarding this great and most peculiar crucial test. The first glance at the left arm set my mind at rest, and that, with the further examination, made me as positive as to the identity of these remains as that there has been among us in modern times one of the greatest men of the human race—David Livingstone.

The accompanying extract from Dr. Livingstone's “Missionary Travels and Researches in South Africa,” published in 1857, will be read with peculiar interest at the present date. It bears specially upon the matter now in question. The physiology referred to has, I know, attracted special attention from the late Sir Benjamin Brodie and others, and the pathos of his statement of how he meant to have kept the tale of the occurrence “in store to tell my grandchildren when in my dotage,” must touch the heart of all who have sympathy with the life-story of this modern hero.

I remain, Sir, your obedient servant,

WM. FERGUSSON.

George-street, Hanover-square, April 15th, 1874.

Extract from “Missionary Travels and Researches in South Africa.” By DAVID LIVINGSTONE, LL.D., D.C.L., &c.

“Returning towards Kuruman, I selected the beautiful valley of Mabotsa (lat. $25^{\circ} 14'$ south, long. $26^{\circ} 30' 3''$) as the site of a missionary station, and thither I removed in 1843. There an occurrence took place, concerning which I have frequently been questioned in England, and which, but for the importunities of friends, I meant to have kept in store to tell my children when in my dotage. The Bakatla of the village Mabotsa were much troubled by lions, which leaped into the cattle-pens by night and destroyed their cows. They even attacked the herds in open day. This was so unusual an occurrence that the people believed that they were bewitched—‘given,’ as they said, ‘into the power of the lions by a neighbouring tribe.’ They went once to attack the animals, but, being rather a cowardly people compared

to Bechuanas in general on such occasions, they returned without killing any.

"It is well known that if one in a troop of lions is killed, the others take the hint and leave that part of the country. So the next time the herds were attacked, I went with the people, in order to encourage them to rid themselves of the annoyance by destroying one of the marauders. We found the lions on a small hill, about a quarter of a mile in length, and covered with trees. A circle of men was formed round it, and they gradually closed up, ascending pretty near to each other. Being down below on the plain with a native schoolmaster named Mebálwe, a most excellent man, I saw one of the lions sitting on a piece of rock within the now closed circle of men. Mebálwe fired at him before I could, and the ball struck the rock on which the animal was sitting. He bit at the spot struck, as a dog does at a stick or stone thrown at him; then leaping away, broke through the opening circle and escaped unhurt. The men were afraid to attack him, perhaps on account of their belief in witchcraft. When the circle was reformed, we saw two other lions in it, but we were afraid to fire lest we should strike the men, and they allowed the beasts to burst through also. If the Bakatla had acted according to the custom of the country, they would have speared the lions in their attempt to get out. Seeing we could not get them to kill one of the lions, we bent our footsteps towards the village. In going round the end of the hill, however, I saw one of the beasts sitting on a piece of rock as before, but this time he had a little bush in front. Being about thirty yards off, I took a good aim at his body through the bush, and fired both barrels into it. The men then called out, 'He is shot! he is shot!' Others cried, 'He has been shot by another man too; let us go to him!' I did not see any one else shoot at him, but I saw the lion's tail erected in anger behind the bush, and turning to the people, said, 'Stop a little till I load again.' When in the act of ramming down the bullets, I heard a shout. Starting, and looking half round, I saw the lion just in the act of springing upon me. I was upon a little height; he caught my shoulder as he sprang, and we both came to the ground below together. Growling horribly close to my ear, he shook me as a terrier-dog does a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake of the cat. It caused a sort of dreaminess in which there was no sense of pain nor feeling of terror, though quite conscious of all that was happening. It was like what patients partially under the influence of chloroform describe, who see all the operation, but feel not the knife. This singular condition was not the result of any mental process. The shake annihilated fear, and allowed no sense of horror in looking round at the beast. This peculiar state is probably produced in all animals killed by the carnivora, and, if so, is a merciful provision by our benevolent Creator for lessening the pain of death. Turning round to relieve myself of the weight, as he had one paw on the back of my head, I saw his eyes directed to Mebálwe, who was trying to shoot him, at a distance of ten or fifteen yards. His gun, a flint one, missed fire in both barrels; the lion immediately left me, and attacking Mebálwe, bit his thigh. Another man, whose life I had saved before, after he had been tossed by a buffalo, attempted to spear the lion while he was biting Mebálwe. He left Mebálwe, and caught this man by the shoulder, but at that moment the bullets he had received took effect, and he fell down dead. The whole was the work of a few moments, and must have been his paroxysm of dying rage. In order to take out the charm from him, the Bakatla on the following day made a huge bonfire over the carcass, which was declared to be that of the largest lion they had ever seen. Besides crunching the bone into splinters, he left eleven teeth wounds on the upper part of my arm. A wound from this animal's tooth resembles a gunshot wound; it is generally followed by a great deal of sloughing and discharge, and pains are felt in the part periodically ever afterwards. I had on a tartan jacket on the occasion, and I believe that it wiped off all the virus from the teeth that pierced the flesh, for my two companions in this affray have both suffered from the peculiar pains, while I have escaped with only the inconvenience of a false joint in my limb. The man whose shoulder was wounded showed me his wound actually burst forth afresh on the same month of the following year. This curious point deserves the attention of inquirers."

PROFESSOR PETTENKOFER ON THE EAST LONDON CHOLERA OUTBREAK OF 1866.

To the Editor of THE LANCET.

SIR,—Your correspondent "X." compels me to break the silence I have hitherto maintained respecting the reiteration by Professor Pettenkofer of the statements to which he refers. "X." has still to learn that there is a kind of reasoning to which an answer should not be needed, and of this kind is the particular reasoning of Professor Pettenkofer which appears to have puzzled him. When Professor Pettenkofer persistently attributes to a person with whom he chances to disagree a statement which involves an obvious absurdity, as per example that the water of a river runs up-stream, it surely should be apparent that the learned professor puts himself outside the limits of serious, and, indeed, of courteous argument. When again he adopts an argument which implies that there is as much reason to believe in coal-gas becoming a localising cause of cholera as in a water-supply so becoming, it ought not to be necessary to show that such reasoning is fallacious. Professor Pettenkofer is not in the least relieved from the responsibility of this reasoning because it is founded upon assertions of Dr. Letheby, and is simply a repetition of certain arguments of that gentleman. As it would appear, however, that there are persons who cannot see their way clearly through arguments of this kind, I presume that it is incumbent upon me, however unwillingly, now that I am appealed to by "X.," to come to their assistance. The task is fortunately brief, for I begrudge the time to be given to it. Life is not sufficiently long to admit of being wasted on fictitious reasonings of the sort under consideration.

First as to the question of the river Lea running against its course:—Professor Pettenkofer says, in his article on Cholera in Ships, "a single choleraic evacuation is supposed to have poisoned the river Lea, to have gone up stream," &c. I, in my official report, described "the discharges of the first two patients who died of epidemic cholera in the east district of London," and the sewage of a house in which a fatal case of choleraic diarrhoea had occurred, as passing into the river Lea in a part of its course where the river was a *locked* navigable canal, the water in which had usually only such motion as is given by the influx and efflux of the tide when the latter rises above the level of the ponded water. That the up-current from the influx of the tide extended beyond the works of the East London Water Company was simply matter of observation. The canal at the time of the outbreak of cholera was a vast cess-pool receiving the sewage of a large population, and which had not been flushed for several months by the lower lock gates being left open during an ebb tide.

As to the gas question, Professor Pettenkofer, quoting from Dr. Letheby, says:—"Had the idea arisen anywhere that there was a connexion between cholera and the supply of gas, just as much coincidence could be shown in reference to the Commercial Gas Company, as in reference to the East London Waterworks Company, with the additional fact that the first case of cholera occurred in the gas factory." Professor Pettenkofer may be exonerated from any suspicion of knowing what the facts were of this asserted coincidence of area of the Commercial Gas Company's district of supply and the area of the cholera outbreak in East London, but he cannot be excused for adopting an argument which implies that the evidence of the transmissibility of cholera through a water-supply is of the same character as if it had been assumed that cholera could be transmitted through a gas-supply. But even granting for a moment the assumption of possible transmission of cholera through a gas-supply, how do the facts stand in relation to the East London outbreak of cholera? They stand thus:—The area of the outbreak at the time of the outbreak received its gas-supply from *four* different gas companies—the Commercial, the Ratcliff, the Victoria Dock (now amalgamated with another Company), and the West Ham. Two of these companies distributed their supplies to that portion of the area of the outbreak which lay to the west of the river Lea and Bow Creek, the other to that portion which lay to the east of the same stream and creek. The incidence of the outbreak was greatest within the district of the Ratcliff Gas