

aneously pretty well, but he cannot wink with the right alone. The right side of the lips has also some slight power of movement, and the right buccinator contracts feebly on the finger introduced between it and the gums. There is also some movement of the ala nasi on the right in sniffing; otherwise the whole right side of the face seems flabby and expressionless. The cornea is clear; the eye waters only slightly on exposure on a cold day; the movements of the eyeball are good, and the sensation of the paralysed side of the face is perfect. There is a pretty distinct deviation of the uvula to the left; no deviation of the tongue. On testing with the faradaic battery no response could be obtained in the paralysed muscles, even when using strong currents. Ordinary strengths of the galvanic battery likewise failed to secure contractions. On getting up to twenty-seven or thirty elements, and using an interrupting handle well soaked in salt water, the slightest recognisable quivering was produced in some fibres of the orbicularis in the lower lid, and in the orbicularis at the angle of the mouth. During this testing marked contractions of the muscles of mastication sometimes occurred." Dr. Finlayson again reports on November 8th: "No distinct change since above note. The sense of taste was not tried last time, and the boy does not seem very ready to give assistance in this testing."

It is somewhat surprising that in such a case as this there was not extension of the disease to the brain or its membranes. In cases where sequestra have been found after death in the inner wall of the mastoid process, in contact with the dura mater, but without injuring the intracranial contents, there has usually been found localised thickening of the dura mater. Probably thickening of the dura mater also exists in this boy in the region of the posterior surface of the petrous bone—a conservative process of nature, by which a barrier is erected against the propagation inwards of the purulent disease. It is very curious to see how the inflammatory process has caused death and separation of only the hard ivory-like osseous tissue which forms the encapsulating walls of the labyrinthine cavities, as if these walls were separate and distinct, which they are not, from the adjoining more cancellated bone. The disease has really provided us with a preparation which the anatomist finds it difficult and tedious to prepare by dissection.

It only remains for me to say that while a number of cases are on record of individual sections of the osseous labyrinth, especially the cochlea, being exfoliated, there are comparatively few cases recorded of an exfoliated labyrinth having its various parts so well represented as in this specimen. A pretty complete specimen which was placed in the museum of the London College of Surgeons, but has since disappeared, is mentioned in Toynbee's book, and is fully described in the eighth volume of the Pathological Society's Transactions. Wilde also describes one in his "Aural Surgery" (p. 377), and refers to it as "one of the most extraordinary pathological specimens of diseased bone perhaps in existence." In the *British Medical Journal* of June 13th, 1885, Dr. Pye of London describes a specimen removed from the mastoid process somewhat similar to the one I have described. Another case is related in the same journal by Dr. Phillips of Bolton on July 4th, 1885. In his paper Dr. Pye gives an interesting account of the more important recorded cases of necrosis of the labyrinth, both partial and complete.

ON THE OCCURRENCE OF A POISONOUS PTOMAIN IN MILK.

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FROM time to time one reads or hears of people who having partaken of certain milks or ices, and even cheeses, are afterwards the subjects of symptoms indicative of an irritant poison. I am at the time of writing unable to quote instances of such with any accuracy, but readers of THE LANCET will doubtless be able to recall several such cases. During the past few months my attention has been devoted to an inquiry into the circumstances of a case of the kind.

On August 3rd, 1886, certain men in the British Infantry section of the Station Hospital, Meean Meer, were

seized with nausea, vomiting, dryness of the fauces, with a sense of constriction, colic, purging, and in some few a tendency to collapse, while in others there was a disposition towards stupor. On the same day nine out of ten men in the military prison were affected with similar symptoms in greater or less severity. Under simple treatment all the cases recovered. The circumstance naturally attracted the attention of the medical officers, and on inquiry it was found that the only men affected in hospital were those upon "milk" or "low milk" diets. Also it was noted that the one prisoner who had been free of the symptoms was a man who, not liking the taste of his milk at breakfast, had refused to drink it. Curiously enough, the others remarked nothing to be wrong with the taste or smell. This common factor in the dieting of the two groups of men directed suspicion towards the milk supplied. Further, it was noticed that the milk supplied to the British Infantry section of the hospital and to the military prison were from one and the same contractor, while the milk sent to the Artillery section of the hospital came from another contractor, and amongst the Artillery sick no similar symptoms had followed the drinking of the milk. Unfortunately, none of the suspected milk remained from the hospital, but the unconsumed pint remained at the prison. As officiating staff surgeon at the time, I inquired into the matter, and secured the residue of the milk. The contractor was reported to the commissariat officer, and fined on the strength of the circumstantial evidence. Analysis of the sample of milk left gave the following result: Sp. gr. 1025; solids not fat, 9.6; caseine, 4.1; fat, 3.9; milk sugar, 5.04. It was pronounced therefore to be a fairly good milk. I inspected the premises of the contractor (a native), and examined all his utensils and his cows. His premises, while not being all one could wish, were yet good for a native of his class. However, I unhesitatingly condemned the condition of two of his pans, which were markedly unclean, emitting a repulsive odour, and evidently had been unwashed for some days. Though unable to extract in so many words the fact that these vessels had been used to store the milk in on the morning in question, the presumption was that they had been. The weather at the time was very hot, and specially favourable to organic decomposition, fermentative or otherwise. The cows appeared healthy, well nourished, and the udders quite free from fissures, sores, &c. Reflection on this case led me to try to isolate, if possible, and if such existed, any organic poisonous product from the milk under suspicion. Further consideration favoured the belief that any such product must be a ptomaine.

As the quantity of milk for disposal was small after the ordinary analysis had been finished, I adopted the following method. The milk, being coagulated, was filtered. The filtrate was nearly colourless and acid. This was neutralised and made feebly alkaline by potassium hydrate, and afterwards well shaken up with ether. This was now allowed to stand for awhile, and the ethereal stratum removed by a pipette, and then allowed to evaporate spontaneously. After the completion of this process a moist semi-crystallised residue was left. This appeared to be aqueous, probably the result of a certain amount of water which the ether had taken up. This concentrated residue had a mawkish sickly odour, and a strongly pungent taste when put on the tongue. Trying some carefully myself, I was soon after conscious of marked nausea and dryness of the fauces, followed by headache. Though without the prominent symptoms obtained from the original milk, I suspected I had more or less reached the *fons et origo mali*. Following the idea up, I gave all the remaining residue after evaporation to a small pariah dog belonging to one of my servants. The effects were pronounced: the dog was within fifteen minutes purged, vomiting, and obviously ill. He gradually recovered, and six hours later I had him killed. The stomach and intestines, though containing a serous and frothy fluid, were quite free of congestion or inflammatory action.

Deeming this result so satisfactory, I decided to follow up the inquiry and see whether this product was always present in milk, and, if so, under what circumstances. Taking six samples of fresh milk, I tested them all in the above manner, and in each case failed to procure any toxic residue. To see whether time or degeneration of its constituents was the essential factor for its formation from milk, I obtained a gallon of fresh milk, and by analysis assured myself of its goodness. This I placed in eight clean glass stoppered bottles, and put the same in a room having a mean tem-

perature of 80° F. From time to time, usually every twenty days, a bottle was opened and the milk examined for the ptomaine, as before explained. Negative results were always obtained until Oct. 19th, when bottle No. 6 was examined and yielded a white acicular crystalline substance having the same odour and taste as that found in the originally suspected milk. Its action on myself and on four dogs and a cat was identical—namely, nausea, vomiting, purging, thirst, frontal headache, and collapse. Bottles 7 and 8 yielded the same product. My means at command are too imperfect to enter into any precise analysis as to the exact nature of this product. I believe it to be a ptomaine, and to which I offer the name “lactotoxine.” How and why it is formed seem obscure. It is evidently an effect of decomposition. Microscopical examination of the milk showed no specific organisms on which to father it beyond some common forms of oidium and penicillium. The milk was not unpleasant to taste or smell.

The literature on this topic at my command is so limited that I am unable to refer to the writings of others; but that ptomaines, or similar bodies, do exist in organic fluids under certain circumstances is probable, and it is only by patient and careful investigation as to their causation and composition that we may hope to unravel some frequent but obscure forms of dietetic poisoning. As but an indifferent contribution to this subject, and with a keen sense of its imperfections, I somewhat hesitatingly furnish this paper; but, in conclusion, would remark how well this case illustrates one of the many difficulties we in India have in guarding the soldier from the dirty habits and carelessness of the native food contractors. Notwithstanding the care taken in hospitals to see the milk drawn from the cows on the premises, and under supervision, yet on this occasion some evasion of the precautions must have occurred either by mixture of stale milk with fresh, or by employment of unclean vessels. That the cows themselves were not to blame is supported by the fact that on the next day the very same animals gave milk unproductive of toxic effects.

Meeran Meer, Punjab.

NOTES ON A CASE OF UNUNITED FRACTURE OF THE FEMUR.

By ROBT. W. LEEMING, B.A., M.B. CANTAB., M.R.C.S.

THE following notes may prove of interest as showing the success attending the use of ivory pegs in ununited fracture of a large bone like the femur, and the power of recovery in youth after severe injury.

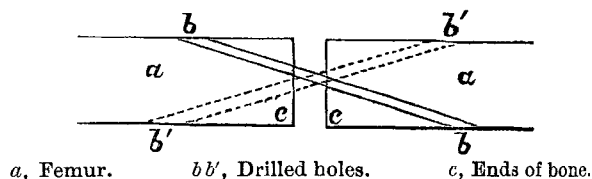
On Sept. 27th, 1884, J. B.—, aged twelve years, an errand boy, was admitted into the Kendal Hospital suffering from injuries received on the railway. From a subsequent account by himself, he was standing on the metals, when a waggon coming up behind him knocked him down, and “he thinks ran over him.”

On admission, there was a large open wound over the lumbo-sacral region, about four inches and a half in diameter; just below the left trochanter was a second wound, two inches and a half in diameter, showing the tendons &c. perfect and uninjured, and having a long subcutaneous connexion with a similar opening on the outer side of the thigh a short distance above the knee. The right thigh had sustained a compound comminuted fracture at the junction of the upper and middle thirds of the femur. All the wounds, especially that at the seat of fracture, were thoroughly washed out with carbolic acid (1 in 40) and dressed with iodoform wool. The fractured limb was extended to its original length, and placed on a bracketed Liston's splint. The temperature was 96.6°; the pulse 136, small and feeble. The patient was ordered brandy, and a mixture containing carbonate of ammonia and digitalis every two hours.

The temperature gradually rose to 104° on Oct. 1st, after which date both that and the rapidity of the pulse subsided, till on the 10th both became normal, and remained so. On the third day a gangrenous slough had formed over the seat of fracture, and the veins showed great congestion around. Hot fomentations were applied, and the slough separated on Oct. 3rd, when all the wounds assumed a healthy appearance. Owing to the frequent dressings required by the wound on the back it was quite impossible to keep the limb in perfect position, more especially as there was a fragment over an

inch in length lying between the ends of the broken bone. It was therefore decided to keep the parts in as good position as possible until the wound on the back was healed. This proved a very tedious process, and was not completed till the beginning of March, and then only by the aid of skin-grafting.

At 12 noon on March 10th the patient was placed under chloroform, when examination showed the end of the lower fragment to be drawn backwards and upwards towards the ischial tuberosity, and firmly fixed in that position, while the upper fragment was tilted forwards. An incision was made the full length of the cicatrix, and a second one at right angles to the first meeting it in the middle, when a fragment of dead bone an inch and a half in length was removed. The upper end of the lower fragment was so firmly embedded in connective tissue that the greatest difficulty was experienced in reaching it. This was done by means of the finger-nail and a blunt-pointed instrument to avoid risk of hæmorrhage, the whole circumference of the bone from the wound upwards having to be stripped before any reduction could be effected. When this was done the end was sawn off, and the upper fragment was treated in the same manner, its end also having to be stripped for some considerable length before it could be brought into apposition. Having been under chloroform for more than an hour, it was found necessary to proceed no further for the present; the limb was therefore placed on a back splint and firmly bandaged, with the ends of the bone in contact. The lad stood the operation remarkably well, the temperature being highest (100.4°) on the 13th and 14th; but as the position was not maintained, it was determined to try ivory pegs as a *dernier ressort* before amputation. On the morning of the 16th the boy was placed on a fracture board and encased in plaster-of-Paris, strengthened with bell wire, from the shoulders downwards, with the exception of the anterior parts of the chest and abdomen, the second limb, and an opening eight by six inches in extent over the wound. By these means the body and limb were completely



fixed, and he could be moved when required without injury. In the afternoon of the same day, under chloroform, several strands of strong silk were passed beneath the lower fragment, which was then drawn forwards and held in position by an assistant, while the upper fragment was depressed till accurate contact was secured. Holes were then drilled through both ends of the bone in opposite directions, as is shown in the above diagram. Into these holes two ivory pegs, each two inches in length, were driven, their crossed direction preventing any displacement; the wound was then closed and dressed with iodoform wool as before. On the 26th the temperature rose for the first time to 102.6°, and as it remained high a large portion of the plaster in the neighbourhood of the wound was removed, as it had become saturated with discharge, and a fall of temperature followed; this was on April 2nd. A large amount of callus had by this time been formed, the diameter of the bone at this part being nearly four inches; and a few days later all the plaster was removed and the bracketed splint again brought into use. On May 9th the temperature suddenly rose to 104.4° without any apparent cause; the exhibition of quinine caused a fall, which was again followed by a rise on successive days. On the 16th a small red swelling, not unlike a boil, was observed near the cicatrix; while examining this, half of one of the ivory pegs was expelled spontaneously, falling some distance from the limb. After this the temperature remained normal, and in about a fortnight the second half of the peg came away through the same opening. The ivory shows deep marks of absorption over the whole surface, and as more than twelve months have now elapsed since the operation, it seems very probable that the other peg has by this time been absorbed. On July 16th he was discharged cured, being able to walk easily with a thick sole to his boot, and even to ride on horseback.

The two points which seem of most importance in this case are the difficulty in keeping the broken limb in position and the absorption of the pegs. From experience the splint