

damp sponge applied over the aneurism. Twenty cells were used, but, as there was no apparent result, the needles were withdrawn after three-quarters of an hour.

For two months there was no return of the pain, and the aneurism gradually got harder. On July 18th there was a severe thunderstorm in Leeds. The patient was much frightened, being up the greater part of the night. The next day the pain returned and the pulsation was increased. As these persisted, on July 23rd the operation, performed in the same manner as that of May 3rd, was repeated for two hours and three-quarters, chloroform being administered the whole time. The symptoms both during and following the application of the galvanism were the same as on the previous occasion. She has since been almost free from pain, and the aneurism has been gradually getting harder and more solid. She has now (Nov. 1st) been working for a fortnight as a mill cook, and, notwithstanding the hard work, there is only the slightest pulsation. I have strongly urged her to give up her heavy work, and hope that in a few months more the aneurism will be entirely consolidated.

Remarks.—1. It is advantageous to give the patient chloroform before commencing the operation, as, without it, it is impossible to prolong the operation for a sufficient time. 2. The needles should be well insulated to avoid burning the skin round that connected with the negative pole. 3. The current should be passed for at least two hours; very probably twice that time would be advantageous. 4. The operation by the insertion of needles connected with the negative pole had, in my hands, no effect whatever. 5. The patient should be kept quiet in bed after the galvano-puncture. Unfortunately in my case she was obliged to get up soon after, and never stayed in bed for more than three days. More prolonged rest would, I believe, have led to a more satisfactory result.

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ON

CERTAIN PHYSICAL CAUSES THAT INFLUENCE THE CLIMATE AND PUBLIC HEALTH OF INDIA.

By J. FAYRER, M.D.

LIEUT.-COL. CORBETT, of the Bengal army, has recently published a work "On the Climate and Resources of Upper India," which is of considerable interest, for the opinions therein expressed are the result of much thought and scientific research, though to a certain extent they seem to be rather theoretical than practical. He asserts, and proves inferentially, that the climate and physical conditions of Upper India have undergone material changes during a recent period; that it has become hotter and drier than in former years, and, consequently, the health of the people and the productiveness of the soil have deteriorated; and that these important changes are due, not to natural, but induced causes, resulting from our own erroneous interpretation or perversion of natural laws in their misapplication to agriculture, forestry, and irrigation. He argues that the alleged changes may be ascribed to—1st, increased surface drainage; 2ndly, defective agriculture; 3rdly, denudation of the surface of the country of trees and other vegetation; 4thly, and above all, to artificial irrigation by canals.

With reference to the first, he argues that increased surface drainage exhausts the natural supply of moisture, diverting it from the soil, and either causing it to be carried off to increase the volume of the rivers and render the lower country liable to inundation, or to collect in profitless marshes or jheels (tanks), which prove detrimental to health by impregnating the atmosphere with malaria, and impoverish the soil by diverting the required moisture.

With reference to agriculture, he argues that the land is imperfectly tilled and deprived of manure, but especially of the natural or green manure, for, though the ashes of certain plants and grasses are frequently returned to the soil, the fibrous or organic parts are most generally used for other purposes; that the surface of the soil, instead of being properly broken up and moistened through its capil-

lary attraction for water, is caked and hardened into a dense crust, which checks both radiation and absorption of heat; increases its reflecting and heating properties, adds to the desiccating power of the west winds, and tends to render the ground unproductive or altogether sterile; and that water as now used, in lieu of causing the beneficial results which should accrue from its due and perfect absorption by and penetration into the soil, becomes the source of evil.

With reference to the destruction of trees and vegetation, whereby the natural moisture of the soil and air is impaired, the dry, hot winds are unchecked and untempered, and the heat and dryness increased, he also speaks in strong terms of disapproval.

But the strongest link in the chain of his argument is artificial irrigation, which he maintains is productive of evil, and asserts to be not only needless, but noxious, wherever the natural rainfall exceeds ten inches annually. To quote his own words (pp. 65, 66): "What has irrigation done for the country? It has signally failed to do all that was foretold of it. Famines have been more frequent and more severe since canals were made. Droughts are greater than they previously were. The air of the whole country is more arid and injurious to animal and vegetable life than it formerly was, from the cutting down of forest trees for burning bricks and lime for the canals and other canal purposes, and to clear land for irrigation. A great amount of land has become covered with 'reh,' and is by many persons considered to be permanently sterilised. There is very good reason to fear there is not a single acre of land that has been irrigated by canals for ten years whose produce has not very considerably diminished."

Colonel Corbett admits that for the first two or three years after irrigation has been brought into play it increases the crops, but that it eventually reduces the productive powers of the land, and that not the least evil of its effects is the causation of that peculiar saline efflorescence on the surface of the land called reh (salts of sodium) which sterilises the soil completely. The summing-up of his argument, in fact, seems to show that, instead of doing good by our expenditure on irrigation works, we have been creating and perpetuating an evil; he appeals to facts, and bases his views on observation and experiment.

With regard to increased surface drainage, defective agriculture and the destruction of trees, I think he is scientifically correct, and is borne out by facts.

The denudation of a country of its forest trees and vegetation is well known to have a potent influence in altering both the climate and the soil, not only by depriving both of moisture, and the earth of vegetable matter (humus), but by excessively desiccating both the air and the soil.

That this has gone on, indeed is going on, to a great extent in India, there is little doubt, the demand for wood as fuel and for other purposes being on the increase; and Colonel Corbett might have added the destruction of wood cut to supply the railroads, as well as to other works, with fuel.

There can be, I think, little doubt that if the destruction of trees be not altogether checked the west winds will gradually become hotter and the climate drier than it ever has been. It is often observed how completely the hot west wind of April or May, which blows fiercely, say, at Seetapore in Oude, is tempered to a comparatively cool, gentle, and moist breeze when it comes within the influence of the forest vegetation of the Terai, a few miles further north-east.

With reference to canal irrigation, I would express an opinion with more reserve. Colonel Corbett's arguments are cogent, and his facts appear conclusive; but I should be inclined to attribute some of the evil consequences assigned by him to irrigation rather to an imperfect application of the principle than to the system itself.

There are large areas of country where the heat is great and the natural supply of water by rainfall or river small. Surely the carrying of an artery of water through such districts (if divested of those drawbacks he so well describes as the result of bad cultivation and improper utilisation of the water, and of undue surface drainage) could do only good. Who that has seen the memorial garden at Cawnpore—an oasis of verdure in a comparative desert—could deny to that small conduit of water by which it is watered from the great canal, the merit of fertilising and improving so much of the soil. Surely, what is true on a small

may be so on a large scale. I should like to have further evidence than that adduced by Col. Corbett before I can convince myself that the *principle* of canal irrigation is altogether a mistake, though I quite admit that the present mode of working it may be wrong.

One important inference from his work I would briefly refer to is the light that may be thrown on the etiology of the endemic malarious fever that is now, and has for some years been devastating parts of Lower Bengal; how far, for example, the increased surface drainage in Upper India may have been concerned in causing an overdue supply of water, and consequently a water-logged and malarious state of part of Bengal. It certainly deserves the serious consideration of those who may be deputed to inquire into the causation, origin, and pathology of this disease.

In conclusion, I would remark that this work suggests the expediency of further inquiry; and that, with regard to some of the points raised, interference might be beneficially exercised. With agriculture the Government could best deal by promoting the extension of scientific instruction in that subject, introducing it generally into the Government schools and colleges, and instituting model farms, where experiments might be made on a large scale in reference to agriculture in general and irrigation in particular. On the very important question of vegetation, the forest laws might interfere, not only in preventing destruction, but in furthering the planting, of trees, and in regulating the extent of the areas where their distribution is desirable.

Colonel Corbett's book is a valuable contribution to our knowledge of the physical conditions that influence the climate, the soil, the produce, and the people of India, and, as such, especially in its sanitary bearings on the public health of so many millions of people, it merits the attention of the physician not less than that of the administrator.

TURNING AFTER CRANIOTOMY.

By S. WORDSWORTH POOLE, M.D. ABERD., L.R.C.S.E.

A CASE like the following is happily uncommon in the practice of a country surgeon, as an experience of above 3000 assures me, and its perusal may afford some useful lessons to those who are not yet perfect in the obstetric art.

On the 10th of April last I was called in to see a very diminutive person in the ninth month of pregnancy, a primipara, and thirty-two years of age. There were present slight pains, and a sanious discharge, but the os was impervious to a catheter, the cervix being small, with merely a depression in its centre. The brim of the pelvis was blocked up by an unyielding bony mass, simulating the foetal head as it might lie when firmly impacted. The diagnostic difference was this, that it was continuous with the coccyx and sacrum. This discovery led to an examination of the spine, which was found to be deeply incurvated below the loins. The legs were found to be greatly deformed, the tibiae being enlarged and bowed inwards. Yet the husband was ignorant of the distortion of her figure, and it was not till some days after her death that he told me he remembered that she always took care, when dressing and undressing, to have her limbs concealed from his view.

On the 12th the nurse showed me veritable brain-matter escaping from the os, which, however, was not open enough to admit the point of the forefinger. The pains were still very slight and infrequent; the pulse was good, and the mind cheerful, and so I deemed it prudent not to make incisions and bring on delivery until I saw what could be effected by nature through powerful uterine efforts. These supervened on the 14th, and about six hours after I attended her, and found the os large enough to admit one finger, and just within it was a piece of jagged bone, evidently part of the cranium. The promontory of the sacrum was very close to the pubis, not an inch and a half apart, but the outlet was roomy enough. As the history was clearly that of rickets, not osteomalacia, I could not hope for any yielding of the bones, and anticipated the worst result.

The woman was put under chloroform, and the delivery at once proceeded with. Barnes's bags, so often useful, were here out of the question, as the head would have prevented their insertion, at any rate their retention; so with a hernia knife I made three incisions, and extricated the presenting bone, twisting it off with the fingers. The craniotomy forceps were then fixed, and the crotchet was passed inside the cranium and made fast to a distant point, and by drawing on the two simultaneously the head was pulled down as far as possible, but the scalp constantly gave way, and the bones had to be twisted and removed in fragments, chiefly by the fingers.

After an hour and a half the whole cranium was delivered, and operations were delayed to give both patient and attendants a rest.

As it seemed a very uncertain undertaking to fix a blunt hook in the axilla, and thus drag down the trunk, I passed the left hand, as being the smaller, slowly through the os and brim, and attempted to grasp a foot, employing external version at the same time. Though my hand is small, it was impossible to rotate the wrist, which was painfully gripped between the sacrum and pubis, and a foot could not be seized. I then introduced the right hand and caught one foot, which was drawn through the outlet, and the blunt hook fixed over the opposite groin, after which the delivery was tolerably easy. The state of the foetus may be judged of from the fact that, on moderate traction on the thighs, the skin gave way and became completely inverted over the feet.

The placenta was firmly adherent, and for a third time the unfortunate creature had to be subjected to the introduction of the hand. She suffered no pain, however, being completely anæsthetised for three hours. The uterus contracted well, and there was not the slightest hæmorrhage. For forty-eight hours after delivery the pulse remained at about 120, and then fell to 100, and the urine kept constantly dribbling away. There seemed some chance of recovery until the fourth day, when tympanites and vomiting set in, and the patient rapidly sank. On examining the vagina there was found a good deal of sloughing.

Though I do not reproach myself for the fatal termination of this case, it is pretty clear that a better chance would have been afforded had the foetus been turned before extracting the skull; indeed, it seems evident to me that but for one great risk—namely, the giving way of the neck, and consequent leaving the head in the womb, this method would be the best after craniotomy in all cases where version was possible. In the above instance it would have answered, though the risk would have been considerable from the decayed condition of the foetal muscles and ligaments.

As a country surgeon is not often able to make public his opinions, I take this opportunity of expressing mine on the question of craniotomy *versus* the induction of premature labour, which is always causing some discussion, though I am at a loss to comprehend how any educated man in his right mind can take the side of the former. I conceive my experience of both sufficient to warrant me in stating that the latter is quite as safe for the mother as the former, and that an accoucheur who deliberately neglects to induce labour at or about the seventh month, knowing that the only alternative is perforating the skull, is guilty of infanticide.

It does not very frequently happen that a patient's estimation of the advantages of the operation can be so markedly expressed as in the following case, which was published in THE LANCET some four years ago. A woman having a pelvis two inches and a half in the antero-posterior diameter had been delivered of six still-born children, some by version, some by forceps, some by craniotomy. I induced labour at six months and a half. The child was born alive, and lived for three years. The mother emigrated to America, where she was delivered again at the ninth month of a dead child, to her own great risk, and she is now on her way home to undergo the same proceeding which resulted so happily for her before.

With one other remark I shall conclude. I have found chloroform to be the best if not the only preventive of laceration of the perineum so common in primiparæ over twenty-five, whether the forceps are employed or not.

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