

which skirt its northern boundary. The central tahsils of the division, which are but scantily watered, are all healthy. Kurrur has for its north-eastern boundary the Sewalick or Sub-Himalayan range, but Naraingarh crosses that range, and includes a portion of the Dhun, in which the lovely but little frequented lakes of Morni are situated. This locality is very malarious, and I doubt not the death-rate of the whole subdivision is thereby affected.

The character of the fever, which thus in ordinary years determines the standard of public health is essentially a true intermittent. Now and again waves of a very deadly contagious type of remittent or continued fever sweep over the division, but that which steadily and uninterruptedly, year by year, mows down from 12 to 15 per thousand of the population, is at its commencement, a simple and readily curable intermittent. Inadequate means are taken to check its recurrence, sooner or later organic disease of liver or spleen complicates the case, when the fever may or may not change in type and become remittent, but, at any rate, there is a certain and complete loss of health pursuant to the organic change, and death from general anasarca sooner or later ensues. Such is usually the history of the numerous cases which present themselves for treatment at the District Charitable Dispensaries, too late in most instances to be benefited by medicine. Many lives might yearly be saved were quinine in large quantities available for distribution in the affected districts, but as to eradicating the malady, or even making a *marked* impression on its prevalence, so long as jungle, canal and river exist, I believe to be a hopeless task.

The year 1870 has happily been marked by an almost complete abeyance of cholera. Twenty-five cases are noted as having occurred in the town of Sadhaura, in the Naraingarh tahsil, but I strongly suspect an error in diagnosis as no other cases were reported from that pargana. There is a tinge of truth, however, in it, as the deaths from diarrhoea were greatly in excess of those of any other town. Of a total of 88 cases reported in town and country, 31 occurred in the month of September (*vide abstracts*.)

The parallel of European statistics is here maintained, and mortality increases with density of population. Diarrhoea and cholera carried off conjointly 282 or 2.43 per thousand in cities, and 1,652 or 1.80 per thousand in country.

Small-pox existed in the division, more especially in the Shahabad, Sadhaura, and Amballa parganas, and city of Amballa, throughout the year, but it did not gain an ascendancy, and was altogether dormant in several of the parganas, Mulana, Jagadhri, Mustafabad, Rupur, Morinda, and Mubarakpur. From April to July inclusive, were the months of greatest prevalence in cities, (*vide Abstract A*) but in rural districts it seemed pretty equally diffused over the several months of the year, fluctuating between a maximum of 119 in September, and a minimum of 40 in February, (*vide Abstract B*.) Only 122 casualties were reported in towns from small-pox, or 1.05 per mille of the population, against 995 or 1.08 per mille in country.

The season was so exceptionally free from the scourge that any very great difference in the mortality of town and rural population cannot be expected. During epidemic visitations here or elsewhere, however, the disparity is enormously in favor of the latter.

Diseases of the lungs, which may be held to embrace all those affections, characterized by "cough," whether due or not to pulmonary causes, rank third in order of fatality, and are pretty equally diffused throughout the year in towns, but in country are slightly more prevalent during the rains and cold weather. The mortality is represented by 1.24 for towns and 1.19 for country per mille. The death-rate of the aged, which, as I shall presently show, attains its maximum in the cold season, may be presumed to owe its increase to pulmonary complaints.

The mortality from child birth is so inappreciable, as scarcely to require comment. That this increases in proportion to the civilization of communities is an axiom which has long held sway, but I presume that no one will be prepared to regard the death-rate from this cause as an actual measure of the enlightenment of a people. We should rather look to the mode of life, *i. e.*, the simple unstimulating food, the occupation and the freedom from restraint, of the humbler classes, as rendering them more physically fit to endure suffering and fatigue, than to their degree of mental development, as affecting the mortality of parturition.

It cannot be conceived that the accidents of labour, to which the mortality is mainly due, occur less frequently amongst the women of India than amongst those of the west, and this being conceded, we are driven to the conclusion that the physical stamina of the former enables them better to withstand the shock and after-effects of unnatural labour. The same remark will apply to the peasantry of Great Britain, as compared with the middle and upper classes.

Diseases, unrecognised by the registering agency throughout the division, I have been obliged to class as "other diseases" in the accompanying abstracts. In towns they cause a mortality, exceeding by 1.18 that of the country.

(*To be continued.*)

AGUE AND ITS SEQUELÆ.

By Assistant Surgeon B. EVERS, M. B., 18th Regiment, N. I.

(*Continued from page 87.*)

UNDER the head of the sequelæ of ague I propose to make a few remarks on those more common derangements of health resulting from the action of the malarial poison. The first of these derangements is congestion of certain of the viscera. The organs that suffer most in this way are the spleen and liver, but whether affection of these glands is due purely to their acting as diverticula to the general circulation during the cold stage of a paroxysm of ague, or to some specific action exerted on them by the poison, cannot be stated with certainty. I am inclined, however, to favour the view that a specific action does exist, and that although morbid changes, similar to those that occur in these organs, may be observed in almost every other gland, the too frequent and constant affection of the spleen and liver leads me to think that they are in some way more prone to the action of the poison of malaria, than any other of the viscera. It is true that the constitution of the individual, the season of the year, &c., do in a good measure determine which organ of the body is to be attacked, for on certain occasions the whole force of the poison appears to be directed against the lungs, kidneys, &c., yet what everybody expects to see in an ague locality is disease of the spleen and liver. Who that has seen anything of ague is not familiar with that enlargement of the spleen known as the "ague-cake?" Congestive enlargement of the liver is also very common, and often exists conjointly with disease of the spleen. Any affection of the liver may escape the notice of a non-professional observer, but the educated eye and hand can never fail to detect it. In disease of the liver again, when that is the primary affection, what so common as tumefaction of the spleen? The symptoms of affection of one gland may predominate over those of the other, but in almost every case both organs are affected, and disease of the liver or spleen *per se*, as a sequel to ague, is comparatively rare. May not the functions of these glands have some influence in rendering them more susceptible to the action of malaria, both being important blood-forming organs? Do they furnish that material to the blood, which, if not removed by the poison of malaria, would prove antagonistic to it, and a substitute for which we endeavour to find in quina?

The blood being deprived of this principle, there is an increased demand on the blood-forming functions of the spleen and liver, increased activity of function leading to an increased determination of blood to these organs. Under a normal stimulus, this would be purely reparative, but when the stimulus is due to the presence of a poison in the vital fluid, congestions, more particularly of those organs immediately concerned as blood-formers, result; and in this we have the first link of those more serious charges that subsequently affect these organs.

The pancreas and kidneys are also liable to suffer congestion from the action of malaria, but from their situation, this is not easily demonstrable—the kidneys there can be no doubt do suffer, for chronic Bright's disease, tending ultimately to general anasarca and ascites, is not uncommon.

Inflammations of the spleen and liver when they occur in connection with ague are most frequently sub-acute in character. On this subject the author of the "Researches on disease in India" states,—“the inflammatory action which supervenes, is generally of a slow or chronic nature, and attended with great congestion and obstructed circulation in the viscus.” When acute inflammation of these organs does occur, some cause other than merely malarial poisoning, is superadded. Inflammation of the spleen very seldom indeed goes on to suppuration, while on the other hand abscess of the liver is by no means uncommon. When suppurative changes are induced in the liver the progress of the disease is most insidious;—dull aching pain in the right hypochondrium, with occasional feverishness, and chills, are the symptoms that present themselves; the tongue is generally loaded, and sometimes covered by an almost black fur, especially in the early morning. The pain is not always confined to the hypochondrium, but extends along the whole front of the abdomen, and this symptom, I have known more than one patient, set down as rheumatism of the abdominal muscles. Slowly, but too surely, the pain and uneasiness, and fulness in the side, increase, and where abscess is diagnosed, and surgical interference becomes necessary, our patient's state of health is probably such as to afford but a very poor chance of recovery.

Sub-acute inflammation of the spleen and liver is again to be noticed in every case where retrograde changes are taking place, and as I stated previously, here the paroxysms of ague recur again and again, and it is only after these changes have been completed that the inflammatory symptoms and the paroxysms cease.

The pancreas also, more frequently than is suspected, becomes sub-acutely inflamed. When disease of the pancreas is present, there is a steadily progressing emaciation, very frequently unaccompanied by any signs of splenic or hepatic complication, and do what you will, the anæmia and emaciation persist. At *post-mortem* examinations I have found this organ evidently undergoing atrophy, having a shrivelled, knotty appearance, and in consistence being almost as firm as a cotton rope. Prior to this stage of atrophy there is, I believe, a stage of hypertrophy, and it is during this stage that the patient complains of pain in the back and loins, in short, believes, that he is suffering simply from lumbago;—the history of these cases is a history of ague, and that together with the obstinate anæmia and emaciation present serve to diagnose them from cases of muscular rheumatism pure and simple.

I have also seen the parotid glands suffer from inflammation induced by the malarial poison, and so rapid has been the course of the disease, that suppuration has occurred in less than three days. A recruit was admitted into hospital complaining of having had “fever” (ague), and for about twenty-four days he suffered from regular *bonâ fide* attacks of quotidian ague; then of a sudden both parotids became enlarged, and abscesses rapidly formed in them. It could not be that the ague paroxysms were simply symptomatic of inflammation slowly progressing

in these glands, for not one symptom pointed to any affection of these bodies previous to their sudden enlargement. Again, this sudden affection of the glands could hardly be referred to metastasis of rheumatism or some kindred disease, for there was not the faintest shadow of a rheumatic taint. I had the opportunity of attending two other cases of this kind during the last year:—in one, that of a male patient, only one gland was affected; in the other (a young widow), both glands were implicated;—these two cases made good recoveries, and so far as the man is concerned I can state that he has never since then suffered from ague, while previous to this affection of the gland he was more or less an ague subject. The case of the recruit ended fatally. I am of opinion that this affection of the parotids was due purely to the action of the malarial poison. Chronic *enlargements* of the spleen and liver are very common indeed in protracted cases of ague. The most common form of enlargement, is that known as the “waxy,” and on this subject only I intend to offer a few remarks. Rarely indeed are both glands enlarged to the same extent, their size in relation to each other varying according as one or other has been primarily affected. What strikes us most, apart from any increase in the size of the organ affected, is the remarkable increase in weight, and it is because of this that the patient complains of a dull dragging pain in the side. In one case that I examined, the liver weighed 6lbs. 11oz. 4 drachms, and the spleen 2lbs. 1oz.

The spleen appears to be affected by this form of enlargement more frequently than the liver;—in some cases the whole abdominal cavity appears to be filled by this viscus.

The changes in these organs appear to be induced by the deposition in them of a material, that, by its reactions, is evidently allied with the amyloid compounds. This new material is in the first instance, I believe, albuminoid, and only by a still further degenerative process does it become amyloid; and it is during its albuminoid stage that it is amenable to remedies, such as the ointment of the biniodide of mercury and the hydrochlorate of ammonia. The deposition of this albuminoid substance takes place most likely during the cold stages of paroxysms of ague, when all the vessels in the viscera are brought to their utmost state of distension by the intense congestion present; accumulation of this exuded matter subsequently leads to pressure upon, and occlusion of, the minute vessels, more especially as the muscular coats of the vessels themselves are similarly affected; then induration of the organ with ultimate obliteration of its normal texture takes place gradually, commencing with the terminal ramifications of the arteries. This exudation is probably also due to some lesion of the organic nerves, brought about by the action of the malarial poison. The clinical history of cases of “waxy” enlargement is rather obscure; the symptoms present are an anæmic or cachectic state of body, and decided emaciation. So marked is the falling off in flesh that the patient's legs appear to have dwindled to “riding-rods,” and his arms are mere “eel-skins stuffed.” When the spleen is the seat of the disease, the expression of the face is anxious, the patient is nervous, and yields readily to tears; the voice is generally whining, and the skin, more especially of the face, discoloured, and dark patches are to be seen across the bridge of the nose and on the cheeks. There is also a tendency to passive hæmorrhages from the nose, bowels, &c. Again, when the liver is affected, the complexion assumes a dull muddy hue, the expression of the face is stolid or sullen, and the bowels are generally sluggish. I have no doubt that together with “waxy” enlargement of the spleen and liver, there exists also a tuberculated condition of the pancreas, and it is to this organ being implicated I believe the emaciation is chiefly attributable.

On the treatment of ague I have not much to say. In no

case are depletory measures necessary, and in no case ought mercurials to be administered. The days of "bleeding and drenching," thank God! have happily passed away, and every thing that once came under the head of "active treatment," "decided measures," &c., is now very justly condemned, for there can be no doubt that even in the European, the type of constitution is very considerably changed. Quina ranks first in importance among our antiperiodics, and say what people may, there can be no doubt of its value in ague. In my practice I generally combine it with the chlorate of potash, and at the same time I allow my patient at least three ounces of spirit or wine per diem—the marked benefit accruing from the use of spirits I can speak of with some certainty, for I base my suggestion on the observation of upwards of 500 cases. It may sound like boasting, but I guarantee to treat all my cases of ague during the year, with half the sanctioned allowance of quina, if I am allowed a liberal supply of country spirits. At one time I found it necessary in quotidians to repeat my doses of quina (7 grs.) until I had carried the quantity up to 70 grains, before the paroxysms could be prevented recurring, but now by allowing the patient a fair amount of spirits, I seldom use more than half that quantity. When quina dissolved in the mineral acids, appears not to be tolerated by the system, I have been able to administer it with comfort and advantage to the patient, by combining it with some of the vegetable acids, or by using the powder plain. In other cases, again, quina appears to act slowly and feebly, and here I have been obliged to combine it with biberine and narcotine. When the paroxysms cease to recur, and the patient may be considered convalescent, strychnia and iron will be found of great use in improving the general health of the patient.

A nutritious diet in every case is an essential in the treatment of ague.

As regards arsenic, I have no doubt that it has been employed with advantage in ague, but I have never found it necessary to have recourse to it. I confess my ignorance of its therapeutic action.

To have recourse to the "katkarina" powder, &c., instead of quina, when this last is available, would certainly be praiseworthy as an act of economy, but it would be economy practised at the expense of the patient's health, and probably his life.

In cases where with the symptoms of congestion of the spleen or liver, you have superadded feverishness and some embarrassment of respiration, your patient telling you that he is afraid to breath freely, because he gets "a catch" in the affected side, I have found nothing so useful as small doses ($\frac{1}{16}$ th of a grain) of the tartrate of antimony, carried up to six doses generally, a very safe introduction to the quina treatment. The emetic action of the drug is not required; in fact, care should be taken to avoid such a mishap, for if a slightly deeper inspiration than usual causes the patient so much agony that he feels "afraid to take a deep breath," we can imagine what torture the act of retching would be to him. The tartrate of antimony is a most valuable sedative and tranquillizer of the pulmonary and cardiac branches of the pneumogastric nerves; and by its action as a diaphoretic it moistens and removes that harsh feel, that the feverish state imparts to the skin. I have tried ipecacuanba in small doses in place of the tartrate of antimony, but have not found it so useful. Locally, to soothe any tenderness in the splenic or hepatic regions, I employ a mixture of the tinctures of digitalis and arnica. Take equal parts of the tinctures, and let this stand for some hours in a flat dish, until a syrupy compound is obtained, and paint this over the affected part two or three times a day; this is a most soothing application, and I believe, it also checks any tendency to inflammation.

Chronic enlargements of the liver or spleen I always treat with the hydrochlorate of ammonia. I have found it much more efficacious than that much-vaunted remedy, the bromide of potassium. I use the hydrochlorate in 20 grain doses, three times a day. It is a most valuable deobstruent, and assists in the metamorphosis and removal of tissue. I am of opinion, however, that it can only be employed with advantage before the deposits in the spleen or liver have become "waxy." The albuminoid stage is the one in which it ought to be administered. Very nearly ten years ago, during my pupilage, I first learned the value of this drug from Mr. Ambrose Blacklock, Deputy Inspector-General of Hospitals in the Madras Presidency.

The local application of the ointment of the biniodide of mercury, I have also found very useful; but of this I must also state that it is only at a certain stage of the disease that it proves serviceable.

FRACTURE OF THE BASE OF THE SKULL; RECOVERY.

By R. T. LYONS, *Assistant Surgeon, Bengal Medical Service.*

WILLIAM S—, boatswain of the ship "Atlanta," aged 32 years, was admitted into the Presidency General Hospital on the forenoon of the 21st January, 1871. It was reported that he had fallen from a height of 8 feet into the hold of the ship: he fell head foremost, upon the left side of the head, and was taken up insensible, with blood flowing from the left ear. The captain of the ship, who brought him into hospital, stated that the blood escaped from the interior of the left ear, and that some time after the boatswain vomited blood. He was brought into hospital on the day following that of the accident. He was partially insensible, but capable of being roused and of imperfectly replying to enquiries; he complained of a severe pain in the left side and fore part of the head. Some dry blood was seen in both nostrils, and on left ear and helix; but there were no external marks of injury beyond a small bruise on the left temple, a trifling bruise on the left helix and a little swelling about the left ear. The pulse was of good strength, but slow; the pupils of both eyes equally active and normal. The chief circumstance noticed was that he was drowsy and fell off into a deep sleep directly conversation with him ceased. I saw him in the evening: his condition was the same as above described. The dried blood had not been removed from the nostrils and left ear. The skin was warm—99°. The nurse reported that he could not be prevailed upon to take food. He had had a black draught on admission. I now ordered that his hair, which was long, should be cut, and cold lotion be applied to the head: and also 5 grains of the ammonio-sulphate of iron dissolved in an ounce of water be given every 3rd hour, with the forlorn hope of preventing further escape of blood into the interior of the cranium. His diet to consist of milk.

On the following morning, 22nd January, he was in much the same general state. The nurse reported that he had been very quiet all night, and had slept remarkably well! She had succeeded in getting him to take his medicine, and swallow 4 pints of milk during the night. When roused, he observed that the pain in the head was less severe. The tongue was dry and brown; the breath offensive; the respirations 15 in number, shallow and difficult to count; pulse 45; temperature in axilla 98.6; the bowels had not been moved. The face was also observed to be slightly drawn to the right side; the left half of the lips was also considered to be paralysed, and he was totally unable to whistle when requested to do so; it was also observed that he was unable to close the left eye, but able to