

lowing up these observations in Calcutta, failed, it is true, to discover the constant coincidence of these two conditions; their observations tended rather to show a connexion between the amount of carbonic acid present and the rainfall, the period of elevation of the former corresponding with the period of greatest dampness of the soil; but, inasmuch as they extended over a single year only, the observations cannot be taken, as the reporters are careful themselves to point out, as conclusive. They established, however, the interesting fact that in the same soil, within a very circumscribed area, the changes in progress (as indicated by the amount of carbonic acid present) may vary, at least in degree, very materially. Thus, at two points of observation, within fifty yards of each other, the amount of carbonic acid six feet from the surface (per 1000 volumes of air) averaged in the one case $9\frac{1}{2}$, whilst in the other it averaged only 6, volumes. So that, as the observers say, if the processes in operation in the soil have any influence on health, the people inhabiting one end of a building will be exposed to different hygienic conditions from those living at the other end. This discovery cannot fail to remind us of the frequent peculiar localisation, already spoken of, of cholera outbreaks; how, for instance, at Meerut in 1867, the 3rd Buffs were literally more than decimated, whilst the 19th Hussars and the Sepoys, living apparently under the same hygienic conditions, were as healthy as if in England.

Turning, however, from these observations, of whose true import we are as yet wholly in ignorance, we come upon the undoubted fact that, of all the causes ever suggested to account for the origin or spread of the disease this one of impurity of soil, as a living fact in cholera's endemic home, stands out with the most glaring distinctness. We know that the plains of Bengal have been formed, and are still being formed, by the gradually accumulating mud brought down by the Brahmapootra and the Ganges—mud which, largely consisting of putrescible animal and vegetable matters, exposed to sun and rain, continues to decompose; and that, moreover, systems of drainage and refuse-removal being until recent years unknown, the soil around villages, stations, and highways of religious pilgrimage—soil it may be devoid of vegetation, and having the ground water a foot or two only from the surface, is thoroughly saturated with human excrement, the accumulated pollution of thousands of years. Of these facts, and of their admitted significance, almost every page of Indian sanitary reports teems with instances; and, *à propos* both of the pollution of the soil and of one means of its depollution, I would refer to a most suggestive remark by the Bengal Sanitary Commissioner, when in a recent report, speaking of one of his districts, he says:—"The dreaded Terai is again becoming inhabited and healthy, just in proportion as the soil is cultivated, and the decomposable matter in it taken out." Again, from a report of the Health Officer of Calcutta:—"Though the chief thoroughfares are cleansed, the city in its inward parts has its soil saturated with excrement." Or, in reference to Pooree, the seat of the Juggernath pilgrimage:—"The difficulty in dealing with this holy city lies in the fact that it has long been used up. The whole soil is so polluted that nothing short of deserting it would be a sufficient protection from cholera."

The noxious condition of the soil is, in short, undoubted; and it is a condition, it is clear, which, far from being involved in mystery, as was once supposed, may, unless under circumstances of soil and subsoil specially favourable to their self-purification, by neglect in the proper removal of effete matters, be speedily manufactured, so to say, by any considerable collection of human beings. Thus the hill stations of India, once usually free from epidemics of cholera, in spite of the necessarily frequent importations of the disease, have lately suffered from the scourge severely. The want of sanitary appliances in these stations is notorious. "Being generally on ridges and near ravines," says the Royal Commission on the Sanitary State of the Indian Army, as long ago as 1863, "great facilities are offered for perpetrating all kinds of nuisance." And at Simla, the mountain sanatorium of Bengal, where, in the words of the Commissioners, "the climate is extremely healthy," but where the grossest sanitary defects have long existed, sickness had been increasing during 1874 and 1875 in an alarming and progressive ratio. In the latter year, the general unhealthiness culminated in so severe an outburst of cholera that the temporary abandonment of the station was contemplated. The attack was concentrated on that part of the station enclosing a ravine such as those previously referred to.

The remedy suggested in this case reminds us of the custom in the army when the troops are in the field or in military stations abroad. If cholera or fever break out the order is to march. The encampment may be moved only a very short distance; the water-supply may be the same; the same "epidemic influence" in the atmosphere, if such existed apart from any fixed and purely local polluting agency, would scarcely be escaped; and yet the movement, with due care in the selection of the new site, is almost always successful, sick men and infected bedding and clothing notwithstanding. Can anything be more suggestive?

Pettenkofer's views on the etiology of cholera and typhoid fever have not met with general acceptance; and in so far as the special significance which he attaches to the variations of the subsoil water-level is concerned, they have perhaps, in this country and in India, been in a measure disproved. But that part of his theory which most concerns us—the impurity of the soil from animal impregnation—is by no means touched by the adverse observations to which his views have been subjected; on the contrary, they merely prove that he has raised to a major position a factor that should hold a subservient place. Beyond this, his observations have even received confirmation. Buchanan's researches for instance, often quoted in refutation of Pettenkofer's views, prove that by the permanent drying of the subsoil the mortality from both cholera and typhoid fever is diminished. But this permanent lowering of the subsoil water is quite a different matter from that occasional fall which Pettenkofer in his theory contemplates. The one would result in the ventilation and, to some extent, permanent purification of the soil; the other would only afford increased facilities for the decomposition of impurities already collected. Buchanan's report, again, appears to contain, in one or two instances, some evidence of increased fatality of typhoid fever during the actual progress of sewerage works, as at Croydon and Penzance; and this, I dare say, would correspond with the experience of many observers. The fact, I need scarcely point out, is strongly corroborative of Pettenkofer's theory.

Time will not permit a closer investigation of Pettenkofer's views, interesting as they are, and closely as they bear upon the subject matter before us. When, for instance, he journeyed to Gibraltar and Malta to inquire into the circumstances of the cholera epidemics there, how suggestive the reply of the medical officer at the former place. "Our rock," said Mr. Inglett, "is not a rock in your sense; it is a sponge impregnated and soaked with every kind of sewage." And the same might have been said with almost equal truth of Malta. It will be remembered that at both these stations, with naturally exceedingly healthy climates, epidemics of cholera and yellow fever have proved most destructive, whilst typhoid fever is, or until lately has been, an endemic and fatal malady.

(To be concluded.)

NOTES OF A

CASE OF INTRA-CARDIAC THROMBOSIS.

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By thrombosis, as is well known, is meant a local coagulation of blood during life either in the heart or a vessel; the resulting clot is named a thrombus. The causes are: Anything which impedes or retards the blood current; valvular and other organic diseases of the heart; pressure on its cavities, or mere feeble cardiac action; also, the blood condition sequential to fevers and chronic wasting affections, diseases of the lungs, such as pneumonia, croup, and rheumatic fever; dilatation of vessels, particularly in aneurism, varicose veins, and distended venous plexuses; certain conditions of the blood; hyperinosis or increased proportion of fibrin arising in various acute inflammatory affections, and pregnancy; probably, also, pyæmia and allied states, and anæmia. Increased heat of the blood, either local or general, has been looked upon by Richardson and others as a probable cause of thrombosis. The puerperal state also, which gave rise to the following example of the affection, very frequently originates the thrombal stagnation. In many in-

stances more than one cause has contributed to the clotting process. The effects of thrombosis will vary with the rapidity of its production, its seat, and its extent. The dangers are, that it may give rise to serious obstruction of the circulation and interference with the heart's action. When its seat is in the pulmonary artery, it may prove even instantaneously fatal. Portions of a clot may become detached and lodged in one of the main orifices, or in an arterial trunk; or particles (so-called emboli) may be conveyed from the main clot into the smaller vessels of the brain, and various other organs. The softening of a clot may poison the blood generally. A very important part has been played by thrombosis in the pulmonary artery in women who have died suddenly after parturition. The following case occurred in my practice:—

Mrs. L—, aged thirty-three years and a half, was delivered of her fifth child on the 9th May, 1873. Her first was by forceps, the remaining ones by natural course. After the fifth, which was safely gone through, there was slight post-partum flooding, which was soon checked. She progressed favourably until the evening of the fifth day, when, at her request, she was allowed to have her clothes on and recline on her bed; but she did more than this, and put her feet to the ground for a short time. On the same evening she was disturbed and excited by her cook coming into her room in a passion, but did not complain until the following morning, when, at my visit, I was forcibly struck by the state of her weak intermittent pulse. There was no murmur accompanying the heart's action, which was rapid and irregular, or pain or dyspnoea; but there was considerable pain and tenderness over right half of uterus, also some hæmorrhagic discharge of a bright-red colour, which commenced on the previous evening, but did not continue very long. Turpentine fomentations and, afterwards, mustard poultices were applied, which relieved her. Bark and carbonate of ammonia in five-grain doses was given three times a day, with good beef-tea; and perfect quietude was enjoined, considering, from the cardiac symptoms, that thrombosis had taken place.

On the seventh day after her confinement the symptoms were the same; the uterine discharge was of a darker colour, but not offensive. Two-grain doses of quinine, with opium and belladonna, were given every four hours, and three ounces of brandy in the twenty-four hours. The carbonate of ammonia was increased to ten-grain doses every four hours; the outward applications were also continued.

On the eighth day the uterine symptoms were considerably diminished, and the discharge ceased. Morphia was given to procure sufficient sleep.

A consultation with Dr. Robert Lee, who had attended her family, was held at this juncture. He considered the cardiac symptoms to be due to nervousness, and did not attach very serious importance to them, but approved of the treatment. She improved considerably in her general state during the following days, and the intermission in her pulse decreased in frequency. She expressed a great wish to be allowed to sit up in bed, which she did for little while; at this time the intermission was only 1 in 60.

On the fifteenth day after her confinement, she complained of dyspnoea and weight over the region of the heart; its action had become rapid and irregular again, with intermission in the pulse every third beat; there was also increased cardiac dulness towards the right. The bark and ammonia, after being diminished in quantity with the brandy, were increased to the previous doses. The brandy was given every two hours, also quinine. This increase of her symptoms was no doubt brought about by her being allowed to sit up in bed on the previous day. She was again requested to keep the reclining posture for some time to come, and a gradual improvement took place.

In a fortnight after this she was conveyed on a couch to the drawing-room (which is a large, airy one), and enjoined to keep the horizontal posture for some months to come, and the same treatment continued.

On June 23rd her bad symptoms returned. The heart's action became weak and rapid, resembling the foetal heart. Quinine and sulphate of zinc were given, as well as the bark and ammonia; the opium and belladonna had been omitted some time. She complained of great restlessness and inability to lie in any one position, with a sense of fluttering, and as if the heart's action had stopped. There was a somewhat dusky lividity of face, and distension of external jugulars, and fulness of neck.

Dr. Walshe was called in consultation, and he pronounced it a case of decided intra-cardiac thrombosis of the right

heart, manifestly of great danger. There was rapid irregular action of the heart; no murmur; with increased dulness to the right of the sternum; distension of external jugulars; and a spongy tumidness of the base of the neck. She was directed to keep the horizontal posture for several months, and to take the following pills in addition to her former mixture: valerianate of zinc, phosphate of iron, and extract of nux vomica. To have light, nourishing diet, and fresh air from windows. This course was persevered in with success, only interrupted by an attack of hysteria, brought on by a thunderstorm. Menstruation took place, and after several months she was well enough to be removed to St. Leonards, where she improved still more rapidly, and returned home quite restored. She has since given birth to another child, which she went through satisfactorily, and, although rather weak, she maintains tolerably good health, being able to walk about fairly. There is, however, a weakened condition of the heart's action, no murmur being perceptible at the last examination.

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ON THE ENDEMIC BILIOUS FEVER OF THE WEST INDIES, TREATED WITH ELATERIUM.

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THE fevers peculiar to the West Indies are generally considered as—(1) intermittent; (2) remittent; and (3) yellow fever. There is, however, another which is quite independent of these, yet may be conveniently grouped with Nos. 1 and 2. It is to this I would now call the attention of the profession, and more particularly those of our number who purpose practising in tropical climates, as the disease does not seem to have received the observation which it certainly merits, and will accordingly form the subject of this paper. Yellow fever is a disease so totally removed from the others in its characters that it is needless to discuss it here; and the same may be said of typhus and typhoid, both of which are to be found (the latter commonly), as well as variola, all of which present, so far as my experience is concerned, precisely similar features to those which obtain in Europe.

The fever I allude to may be safely termed the endemic bilious fever of this climate. It is a true fever, running a marked pyrexial course, but quite distinct from either intermittent or remittent fevers, there being no apyrexial interval, and nothing indicative of a periodic type.

People have been so constantly taught to associate malaria with fevers in the tropics that this complaint is always declared to be dependent on it, whereas its true source is not considered, and it receives unsuitable treatment accordingly. This malady is so common in some of the islands that it will be met with in three-fourths of the cases of fever; it occurs in both young and old to an equal extent, and in itself is never fatal.

I shall now proceed to examine the symptoms of this affection. The patient will be found to have a temperature of 105° or more, which does not materially fluctuate so long as the disease lasts, and the pulse will range from 100 to 130 beats per minute. Tongue invariably coated with a white or dirty-white fur, and there may or may not be general jaundice, although the conjunctivæ will, on close examination, be almost always found yellow. In severe cases the prostration is great, and the surface of the body bathed in perspiration; delirium also is sometimes present. On examining the state of the abdominal viscera in typical cases, not the slightest changes will be manifested; respiration hurried; urine almost normal, excepting where there is jaundice, when the usual changes will be noticed. The bowels are always constipated. There is no absolute pain throughout the body, although patients will often refer to a "feeling of heaviness" about the head; indeed, in this region, sharp shooting pains will often be complained of. Such then is the typical state of a patient affected with a fever, which may last from three or four days to as many weeks, although it must be remembered that when the time exceeds ten days complications are to be sought after; for the average duration of an ordinary case is, in my experience,