

III. *Sketch of the health of the district.*—On 10th January, the Civil Surgeon reported that “fever has somewhat abated in town and district;” and again on the 18th, that cases of acute fever were of rare occurrence either in town or district, the attendance being composed almost entirely of chronic cases of intermittent fever and the usual sequelæ. In his report of 27th January, the Civil Surgeon remarked that the state of the public health had somewhat improved, though the attendance was larger than before, on account of the thorough and efficient inspection of the dispensaries.

On 8th February, he reported the fever “to be in abeyance;” and on the 18th, the attendance was reported to be falling off, not so much from diminution of sickness as from the indolence and misconduct of the native doctors in charge of the dispensaries. From the inspection reports, submitted with the Civil Surgeon’s letter of 25th February, it is evident that sickness was decreasing, and the state of the public health improving. During the early part of March, the health of the Mungleote circle was somewhat improved. In the other circles sickness is reported to have been less; but towards the end of the month sickness increased throughout the greater part of the district. In the month of April, fresh outbreaks were reported from the Mungleote circle. In the other circles the state of sickness was much the same as before. The reports for May indicate that sickness was very prevalent. From June, however, the sickness began to abate, and the attendance at the dispensaries to decrease; though towards the north-west of the district sickness was increasing, as at Bhedia, Pogram, Dinnothpore. These places were almost on the borders of Beerbhoom. In the beginning of July, the improvement in the public health continued (in spite of a few fresh attacks) up to the middle of August. About this time dengue was prevalent in Burdwan, and prostrated many who had already been weakened by the epidemic fever. There were several cases of sporadic cholera. In the beginning of August sickness was stationary, but towards the end it began to increase, and kept on increasing in the first two weeks of September. In the middle of September, however, some improvement took place, which continued till the beginning of October. Dengue decreased and cholera almost disappeared. In the town, however, there was great sickness, several severe cases were treated at the charitable dispensary; and also at the people’s homes. From the town the sickness extended to the district, and we find that fresh attacks of a remittent type, accompanied with severe head symptoms and hepatic affections, were reported from the different circles. In the latter half of October and November, the fever was at its worst both in town and district. From December it began to abate. The year 1872 was not so bad as the year before. The fever was of a milder type, and followed by less mortality.

IV.—*The number of dispensaries opened and closed during the year.*—Under the 25th heading have been given the number and locality of dispensaries open on 1st January. As sickness increased at any place, or broke out afresh in localities not affected before, new dispensaries were opened. On the contrary, whenever sickness abated at any place and the attendance became very small, such dispensaries were closed up. Thus, out of the seven dispensaries in the Mungleote circle open on 1st January, five were closed, *viz.*, the two dispensaries at Mungleote itself, and Aroor, Mahattah, and Dainhat. In the Burdwan circle, out of the eight dispensaries, only one was closed, *viz.*, Seraitiker. In the Roynah circle, six of the ten dispensaries were shut up, *viz.*, Merul, Katnabad, Dhalun, Jotesreeram, Khundghose, and Polason. Most of these dispensaries were closed only for a short time, and had to be reopened when sickness began again to increase. The number of dispensaries opened during the year was very large, *viz.*, 80; but they were not all open at one time. The largest number of dispensaries open and in full operation at one time was 56, in the month of December. The dispensaries were divided into four circles,

viz., the Mungleote circle, including North Burdwan, under Sub-Assistant Surgeon C. N. Biswas; the Bood-Bood circle, including West and South-West Burdwan, under Assistant Surgeon K. G. Gupta, who was succeeded by Sub-Assistant Surgeon D. B. Dutt; the Burdwan circle, including Central and West Burdwan, under Assistant Surgeon Robinson, who was relieved by Assistant Surgeon B. L. Dutt; and the Jehanabad circle, including the whole of South Burdwan, under Assistant Surgeon Ghose, who was relieved by Assistant Surgeon Roy.

The dispensaries were not distributed equally and pretty fairly all over the district, as a glance at a sketch map giving the dispensaries will show. The Mungleote circle, which had suffered very severely in 1871, had not its full complement, while in south Burdwan, dispensaries were located too near each other. Thus Bamoneah, Digulgram, and Aklokee, each in the charge of a Sub-Assistant Surgeon, were within 3 and 4 miles of each other. These three Sub-Assistant Surgeons, had not full scope for work or usefulness. The map also shows that in and about Burdwan were too many dispensaries, while many outlying villages had not any dispensaries within convenient and walkable distances.

Out of the 80 dispensaries opened during the year, 25 were closed, as the health of the villages, where they were established, improved. These 25 dispensaries were not closed in the sense that the establishments left the district altogether, but simply removed to new villages where there was more sickness, and consequently a greater and more urgent demand for medical aid.

In connection with dispensaries should be mentioned the establishment of food depôts. The object was to give food and clothing to the destitute. On 31st December 1871 only three food depôts were open within the Burdwan municipality. Towards the end of January food relief measures commenced on a regular systematic scale, and were extended to the mofussil.

There were 33 depôts opened during the year, and the total number relieved amounted to 105,748. The daily average attendance was 280.17, and the total expenditure was Rs. 5,630-8-8.

The medical officers on special duty in the district were—

5 Assistant Surgeons.

21 Sub-Assistant Surgeons.

97 Native doctors and compounders.

It has been very truly remarked “that never before have remedial measures on such a large scale been adopted.”

(To be continued.)

NOTES OF A CASE OF CHOLERA TREATED BY THE HYPODERMIC INJECTION OF CHLORAL HYDRATE.

By Surgeon A. R. HALL, in Medical Charge A. 16 R. A.

PRIVATE P. F., aged 36, service 14 years, time in India six years, single, was admitted into the Buffs’ Hospital at 6 a.m. on the 21st August. He said he had been purged a great deal during the night, but had no pain, and as he was on guard, he waited till morning before reporting himself sick. On admission, he was vomiting frequently, often purged, skin felt cold and moist, and his voice was squeaky. He had some dilute sulphuric acid given him, but he could not retain it, and became worse. About 10-30 a.m. Surgeon-Major Collis of the Buffs came to me, and said that a man had been admitted into Hospital, and that there was very little doubt that he had cholera, and very kindly offered to put the case under my charge, as he knew that I was anxious to treat one. I immediately went with Dr. Collis to his hospital, and found the patient in collapse. He had the regular choleraic voice, fingers blue and wrinkled, pulse barely perceptible at the wrist (although the heart was beating strongly), frequent vomiting and purging, skin and breath cold, eyes shrunk, and cramps in the legs; had passed no urine in the morning. One scruple of chloral hydrate was given him by mouth, in 3 oz. of water but he vomited it up. I therefore determined to administer

the remedy hypodermically, and, at 11-30, fifty minims of water, holding in solution five grains of chloral hydrate, were injected in two places under the skin of the right arm. (The syringe used holds 25 minims.) He complained very much of thirst and was given soda water to drink; but he craved for cold water, so was allowed to drink as much as he liked of it. Shortly after these injections the cramp ceased, and the vomiting diminished. His hands and feet became warmer, and the pulse was better felt at the wrists. At 12-10 vomiting increased in frequency, he was purged more, and his hands became colder. $2\frac{1}{2}$ grains of chloral, in 25 minims of water were injected under the skin of the left arm. The vomiting again subsided, his temperature rose, and he went to sleep, and slept for about one hour. At 1-40, $2\frac{1}{2}$ grains more were injected under the skin of the left arm, and he slept again. At 4 p.m., hands and feet much warmer, temperature in axilla 97.4° F., voice more natural, pulse good. He passed a small quantity of urine, which contained a good deal of albumen; the vomiting had ceased; passed two choleraic stools, but small in quantity. Sat up in bed, and drank off a bowl full of water, which he retained. At 7-30 p.m., he said he felt much better, pulse 102, pretty full, hand and feet warm, purging slight, no vomiting, no cramps. The next day (August 22nd) he had slight purging. The temperature in the morning was normal, but increased in the evening to $99^{\circ}.6$ F. He passed large quantities of urine during the day. He had beef tea, chicken broth, milk, arrowroot, &c., and as much water, and soda water as he liked to drink. Had five grains of quinine in the evening. The next day (23rd), he felt quite well, and was put on chicken diet. Five grains of quinine were given him twice during the day; he was kept in hospital till the 30th, when he was discharged to duty. Not a sign of ulceration was observed where the punctures were made in the skin of the arms. They were a little sore for two days after, and that was all the inconvenience he suffered.

REMARKS.—This is the only case of cholera I have had an opportunity of treating for more than three years, and although much cannot be proved by a single case, still the results were so very satisfactory, that I am in hopes, by publishing them, medical men may be induced to give this plan of treatment an extended trial.

In May 1869, I wrote a paper entitled, *Thoughts about cholera*, which appeared in "The Indian Annals of Medical Science"; (March 1870, No. XXVI.)—

In that paper I attempted to prove that cholera was the most intense form of a malarious or paroxysmal fever. Arguing from the experiments of Brown Sequard, and my own sensation experienced during an attack of the disease, I arrived at the conclusion that in the cold stage, or so-called collapse, the sympathetic and pneumogastric nerves principally are *intensely irritated*, and that all the symptoms observed are caused by this state of irritation. I therefore recommended that the principle which should be aimed at in the treatment was to get the nervous system as soon as possible under the influence of pure sedatives, so as to enable the heart, which in collapse can be heard to be beating forcibly, to relax its fibres sufficiently to get a normal supply of blood, and the arteries to resume their proper calibre, and distribute it to the lungs and surface of the body; and I pointed out that the quantity of fluid poured out from the coats of the stomach probably did not allow any medicine to be properly absorbed, and I recommended that sedatives should be given hypodermically. In my opinion, the collapsed patient is not dying of nervous exhaustion; he is being *suffocated*, as surely, but not so quickly, as if his head was being held under water, and unless the spasms that are causing contraction of the muscular coats of the arteries are relaxed by sedatives, he will probably die. I believe that the irritation of the

sympathetic nerves is so great that the "*inhibitory*" action of the pneumogastrics on the heart is not allowed to take effect, *although these nerves are also irritated*, which I think is the cause of the peculiar choleraic voice. I attempt to explain this by suggesting, that although the *dilators* of the larynx are in a state of contraction, the principal constrictor, the *crico-thyroid*, which gets its nerve force from the excited nerve centre (the *medulla oblongata*) through the *short* superior laryngeal nerve, is thereby caused to contract *more strongly* than the dilators, whose nerve force has to travel through the *long* inferior laryngeal, and that the squeaky, husky voice is produced in this way.

I think that the vomiting and purging (the contents of stomach and intestines being *spasmodically* ejected) are solely produced by the irritated *medulla oblongata*, and sympathetic nerve; but that the serum ejected has acquired peculiar properties (somewhat as the saliva of a dog does in rabies) which when introduced into a healthy man's stomach, or applied to another mucous surface, will often communicate the disease. With regard to Moreau's experiments on the abdominal sympathetic, it has been stated that Drs. Lewis and Cunningham found that they could not obtain the cholera flux when they completely divided (or paralysed) that nerve, but did get it when they only *partially divided* (*that is irritated*) it.

When I wrote the paper above referred to, I had never used chloral hydrate, and did not know what its real therapeutic action was. I enumerated the sedatives, as given in Dr. Headland's "Action of Medicines," which I thought would probably be useful, *viz.*, tartar emetic, ipecacuanha, digitalis, aconite, hydrocyanic acid, and some others. But tartar emetic and ipecacuanha are too irritating to the *skin itself* for hypodermic injections, and digitalis has been proved by Dr. Fothergill to be a direct cardiac stimulant. I procured Dr. Fothergill's prize essay last year, and Surgeon-Major Collis and myself performed a lot of experiments on hill frogs, weighing about 1lb each, to verify his assertions. We also tried the effects of many other drugs during the month of August 1872. We found that hydrocyanic acid and chloral hydrate caused the death of the frogs, with the heart in most *complete diastole*, thereby proving that they are about the most powerful cardiac sedatives that we possess. Any one, with a little trouble, can test the truth of this for himself.

I hope that what I have written will induce medical officers to give this method a trial. As I write, I hear from my friend, Dr. Higginson, Civil Surgeon of Kheri, in Oudh, that he has treated thirteen cases of collapse by the hypodermic injection of chloral, and that they *all recovered*. This is certainly a good beginning.

Giving the drug by the mouth does not allow it a fair chance, and apparently not much is required to set the system under its influence. If a strong solution is used, I doubt very much if it can be absorbed through the areolar tissue. Dr. Mac-Reddie, Civil Surgeon of Hurdui, Oudh, in his paper published in the "*Indian Medical Gazette*" for December 1872, states that he dissolved 20 grains of chloral in 60 minims of water; but that he was disappointed in the results, and sloughing was produced by the injections. I am inclined to think that the solution was much too strong. Ten grains, dissolved in one hundred minims of water, will probably be enough in most cases, and by diluting it to this extent, the chances of ulceration of the punctures are much diminished, if not altogether avoided.

SEETAPORE, OUDH, September 24th, 1873.

Rainfall of 1873 in Bengal.—The rainfall of 1873 in Bengal has fallen short of the average of past years by about 22 inches. A very general famine is anticipated.