

THE MADRAS
MONTHLY JOURNAL
OF
MEDICAL SCIENCE,

VOLUME FIFTH.

JANUARY—JUNE 1872.

MADRAS:
Published and Sold
BY CALEB FOSTER,
FOSTER PRESS, 23, RUNDALL'S ROAD, VEPERY.

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OF
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No. XXV.—JANUARY, 1872.

ORIGINAL ESSAYS.

ART. I.—*Medico-Statistical Report of the 19th M. N. I., for the years 1866, 1867, 1868, 1869 and 1870.* By Assistant-Surgeon G. WILLIAMSON, M.D.

(Communicated by the Inspector General Indian Medical Department)

DURING the five and half years that this Report covers, this corps has been located at Samulcottah for three years ending 1st December 1868, at Kurnool two years ending 3rd January 1870, a few weeks at Madras, and the remainder of the time at Singapore. It has been kept up to full strength of native commissioned rank and file, which was 770, taking the strength of the regiment on the last day of each year.

In January 1866, the date on which I took Medical charge, it was spread throughout the town of Samulcottah, and the Lines were in process of being built, the regiment having come up a year previously from Masulipatam, where it had undergone a disaster more serious than most corps have had to encounter, in the cyclone of December 1864, in which forty men, and the greater portion of the women and children, had been washed away and drowned; all their property was completely destroyed, and they came up to Samulcottah in a most destitute condition, so much so that

Government promised that the corps should remain at that station for four years.

During the year the Lines were built, and as the duties were light, the men somewhat recovered from the shock ; but there was above the average of mortality during the year. Dr. Howell, who was in Medical charge of the regiment during 1865, makes the following remarks for that year :— “The greater number of fatal cases occurred amongst men who had undergone great privation and exposure during the cyclone of 1864, and who had fallen into an anæmic condition associated with great mental despondency ;” and I think that they were also applicable to 1866, as the mortality was so much greater in this year than in the two succeeding years in which the regiment remained at the station ; the anæmic condition was remarkable among many of the cases treated in hospital. Unfortunately, the case book that was in use with the regiment during its stay at Samulcottah was lost, and I am therefore prevented from giving any of the cases in detail. I find, however, in my annual report for the year, that I dwell upon the cases of intermittent fever attended with paralysis and anæmia. The cases of paralysis, or rather paraplegia coming on during the attack of fever, or succeeding it, were remarkable ; and I have not seen any mention of it in works on Tropical Diseases. Morehead mentions paraplegia coming on connected with cachectic conditions, but he does not say what had induced the cachexia, whether malaria had anything to do with it or not. Some of the cases observed by Dr. Howell appear to have been of an inflammatory nature, as he sometimes uses the term myelitis ; but the cases that came under my observation appeared more to be caused by dropsical effusion into the serous membrane surrounding the cord from weakened circulation ; the complete absence of pain in loins or thighs, or derangement of the urinary organs or sphincters showed there was no inflammation, and the treatment found most efficacious, iron, quina, iodide of potash, and stimulating embrocations, would not have been suitable for inflammation. The cases were mostly protracted, and some required change of air, but they all eventually recovered, and were returned for duty, which I can scarcely think would have been the case had inflammation been present. I do not understand why the lesion should have been localized in the serous membrane surrounding the cord. During my stay at Doomoogoodium,

in the Upper Godavery, where intermittent fever of a severe type occurred amongst weakly and badly fed coolies, dropsical effusions into the peritoneum were not uncommon; but in these cases, anasarca also showed itself in the limbs, more especially in the lower extremities, from gravitation. Most of these cases were lost sight of on their leaving the hospital, but a few that I saw after they had been at the coast, returned robust and healthy, comparatively speaking, showing that no structural change or organic disease had been set up. These, with the paraplegic cases in the regiment, may both be ascribed to weakened circulation and cachexia. There were eighteen cases of paralysis during the year, but some of them were readmissions.

The total admissions for the year were 428, equal to 543 per mille; of these, intermittent fever was by far the most common cause, no less than 124 cases, being 29 per cent. of total admissions; percentage of deaths to admissions under this heading were 1.61.

Phlegmon and abscesses were the next most prevalent disorders; 53 cases in all, being at the rate of 12 per cent. on total admissions. Ulcers and contusions numbered 43, being at the rate of 10.4 per cent. on total admissions.

Scabies was very prevalent; 33 cases, or 8 per cent. on total admissions.

Cholera was very prevalent during the months of July and August at Coconada and Rajahmundry. It visited Samulcottah, but did not appear in an epidemic form in the regiment; four men were attacked and one died. There were five cases amongst the families, three of whom died, so that the mortality of the total was a little under 50 per cent.

The most sickly months of the year were August, which had an average of thirteen daily sick; September, 14; January, 19; and February, 15. The two most healthy months were April, average daily sick five; and May, six.

The deaths during the year were ten in hospital and three out; they could not be ascribed to any common atmospheric cause, such as malaria or other organic emanations; they were as follows:—

Intermittent fever	...	...	...	2
Anasarca	...	...	...	2
Dyspepsia	...	...	...	1

Hæmorrhoids	...	...	...	...	1
Cholera	...	...	...	...	1
Pneumonia...	...	...	...	...	1
Hypertrophy of heart	...	...	...	...	1
Antæmia	...	...	...	...	1

Eight men were sent on sick certificate ; one man was discharged for medical reasons.

There were 237 cases vaccinated, including men, women and children.

The following gives the ages of the men on the 31st December 1866 :—

Under 20 years	...	...	...	...	142
20 do and under 25	...	...	...	...	121
25 do do	30	...	...	...	242
30 do do	35	...	...	...	166
35 do do	40	..	...	...	51
40 and upwards	...	...	...	...	49

771

By the end of 1866, all the men were huted in the lines ; the huts were more capacious than sepoy's huts generally are, the streets were wide, and the situation on the side of a hill was such as to permit the water to run quickly away. On three sides of the lines there were wide open plains, which allowed free ventilation of the place ; on the fourth side the village of Samulcottah abutted. The duty at the station continued to be very light, and a portion of the Banda and Kirwee prize-money was issued ; food and bazaar articles usually wanted by sepoy's were cheap and plentiful, so that the regiment was in a most favourable position to recruit its strength.

The admissions this year were unusually small, 325 or 41·4 per mille, and there were only two deaths, or '61 per cent. to total admissions.

There were two cases that occurred during this year worthy of note from the peculiarity of the accidents and the serious results.

First Case.—During a very boisterous rainy night at the commencement of the south-west monsoon, a man was returning to his house from 8 o'clock roll-call ; he was running and stooping forwards, as the rain was beating in his face.

The night was excessively dark, so that he could not see any obstacles in his way, and he thus ran against the parapet of a well about $2\frac{1}{2}$ feet high. He dropt into the well, falling thirty feet. There was only a foot of water at the bottom ; the circumference of the well was only three feet, so he must have descended with his back downwards, and thus have fallen with his back on the surface of the water, as there were no external signs of injury, but symptoms of concussion of the spinal cord. He remained two hours in the well before he could attract notice, but was at last taken out and conveyed to hospital. I was called to see him at half-past ten o'clock, when I found him suffering from paraplegia and from cold and shock. He took an opiate with some arrack and hot water, was well covered up, and next morning was much better, but found that he could not use his legs, and that he could not micturate. Attempts were made to pass the catheter, which failed when under the influence of chloroform ; so he was thoroughly narcotized with opium, had a warm bath, and the catheter was then passed and retained in the bladder until the spasm passed off. The muscular coats of the bladder remained partially paralyzed, so that to assist himself to make water he used always to press on his abdomen with his hand, and if he neglected too long to pass water, the catheter had to be introduced to relieve him. He remained three months in hospital and improved a very little ; his general health at all times was good ; he was granted sick leave to Masulipatam, and was at last discharged.

Second Case.—This one is curious from the large amount of injury that arose from what appeared a most trivial wound in the sole of the foot. A man presented himself at hospital one morning with a slight superficial wound in the centre of the sole of his foot, which he said had been caused by treading on a fish bone. It looked a little swollen and inflamed, and a poultice was put on to assist in bringing away any piece of bone that might have remained, although none was found on examination. Next day the wound had much improved, but all the outer side of foot, from the roots of the toes to the outer malleolus and the parts over it, was swollen and tender. Leeches and fomentations were applied, but in a day or two there were unmistakable signs that all the parts mentioned were going to slough ; there was complete sphacelus of the skin, subcutaneous tissue, and fascia, from the toes to two inches above malleo-

lus, and the muscles and tendons were most completely dissected out: the man fell away much in health and strength, so much so, that he had to get some arrack, and be placed under chloroform each time the wound was dressed, otherwise he fainted. Had the morbid process gone further, so as to have required amputation, I should have performed Syme's operation, as a sufficiently good flap could have been obtained from the inner side of foot; however, such a proceeding was not necessary, as with careful dressing, followed by strapping, he got well. He was discharged as his foot remained stiff. Since that case happened, I have seen two somewhat similar, but not so severe; the one occurred to a policeman on the Upper Godavery, who stumbled against a small stick, the end of which passed in between the second and third toes; and the other case happened to a horsekeeper at Kurnool, whose two outer toes were crushed by a horse treading upon them. In both sloughs formed over the outer part of foot and ankle.

Intermittent fever was, as usual, by far the most common complaint: 83 cases in all, or 25.5 per cent. on total admissions into hospital; there were no deaths from this cause.

Ulcers and contusions come next in frequency: 37 in all, or 11 per cent. on total admissions.

Furunculus is the next most numerous: 27 cases, or 8.9 per cent. on total admissions.

Pblegmon and abscesses were 25, or 8 per cent. on total admissions.

The most sickly months of the year were January, with an average of 14 daily sick; July, 13; August, 12; and September 13.

The most healthy months were February, March and May: each had a daily average of seven.

There were two deaths in, and one out of hospital; the causes of those in, were diarrhæa and hæmoptysis. Five men were sent on sick certificate to their native villages for the following causes:—

Primary Syphilis	...	...	...	1
Febris Cont.	...	...	...	1
Feb. Intermit.	...	...	...	1
Asthma	...	...	...	2

One short-service man was discharged from the service for medical reasons. 171 of the men, women, and children, were vaccinated during the year.

In January of this year I was suddenly ordered to take medical charge of the coolies employed on the Upper Godavery Works, which were at that time being vigorously pushed on, the average number of coolies employed being about 6,000. I rejoined the regiment in August, and we marched from Samulcottah on the 1st December for Kurnool.

Nothing worthy of note occurred during the time I was with the regiment, except a case of midwifery. I was called to see the wife of a musician, who had been in labour two days. The shoulder was presenting and pressing down into pelvis, which was roomy and of good dimensions. The arm of the child had presented, and had been cut off by the old woman who was first called to the case; the parts were hot and swollen, and the woman was feverish and low; the pains were still coming on regularly, although weak. After putting the patient under the influence of chloroform, and clearing the rectum and bladder, I delivered the child by the operation for evisceration, but peritonitis set up next day, and the patient died three days after the operation. Had I been called to this case in the first instance, I am confident that the child and mother might have been saved by podalic version. The mother's pelvis was large and wide, and the child of natural size, so that the position of the foetus was the only hindrance to labour. I have seen three such cases during my service. In one I was fortunately called early, and succeeded in turning the child, which was born alive; in the third case, the child was eviscerated, and the mother recovered. It is in cases especially like these, when malposition of the child is the only hindrance to labour, that so much life could be saved, if natives could only be induced to call in aid at once. The difficulty appears, but they will always be unwilling to bring their wives to hospital so long as there is no detached, secluded ward to place the patient in. At the Kurnool Dispensary, of which I often had charge when resident there, there were always a number of policemen, peons, &c., about the hospital, which prevented women using the establishment so freely as they otherwise would, and I was told that many more midwifery cases would have applied for relief had there been a secluded ward.

The average annual strength of the regiment was 768, and total admissions into hospital 467, or 634 per mille.

Intermittent fever was again the most common cause of admission: 138 cases, or 29·5 per cent. on total admissions; two deaths occurred, or 1·4 of causes admitted under this heading.

There were 59 admissions under the headings Phlegmon and Abscesses, being at the rate of 12·5 per cent. on total admissions. Under Ch. Rheumatism there were 55 admissions, or 11·7 per cent. on total admissions.

The most sickly time of year was, as usual, the latter part; there were more admissions in December on account of the regiment being on the line of march.

The monthly admissions were as follows:—

January... ..	27	July	30
February	24	August	42
March	34	September	50
April	24	October	55
May	38	November	40
June	25	December	68

Six deaths happened in hospital from the following causes, and one death out of hospital:—

Apoplexy	1
Feb. Intermit.	2
Anasarca	1
Dysentery	1
Anæmia	1
Phthisis P.	1 Died on s.l. at Ellore.

Nine cases were sent on sick leave for the following diseases:—

Anæmia	2
Paralysis	2
Feb. Intermit	2
Influenza	2
Bronchitis	1

Fifty-eight cases were vaccinated, including men, women and children.

The Right Wing left Samulcottah on the 15th November 1868, and marching the whole way, arrived all well at Kurnool on the 25th December. On the 1st December the

Head-quarters and Left Wing left Samulcottah by canal boats, and proceeded via Bezwarrah by that mode of transit, to Nannoor, a village nine miles from Kurnool; total distance 228 miles. The wing went by ordinary marches in thirty days, the families always went on the day previous, except on two occasions, once when the march was only two miles, and the second time when there was a long march of twenty-two miles through jungle and over a high ghaut; on this journey the men were broken off and permitted to go with their bandies; they started at 4 o'clock in the morning, and the last bandy did not reach the next camp until 6 o'clock the same day. We halted next day, and then passed on to the vicinity of Nundial, where we also halted; the camp was pitched near a small village, Nunipilly, which was reported healthy at the time. From Nundial we passed on in four marches to Nannoor.

On the 6th January, the fourth morning after our departure from Nunipilly, it was reported that five cases of cholera had occurred at that village within thirty hours of our departure, and as we had so recently passed through, it was thought advisable, in communication with the authorities at Kurnool, that we should not proceed into cantonment for three days. With that view the camp was moved to more open ground and spread out as much as possible. The approximate numbers of individuals in camp was 2,016.

On the night of the 7th January, five days after leaving Nunipilly, a recruit was brought to hospital suffering from cholera, and died after an illness of thirty hours. Up to this date the wing had been remarkably free from bowel complaints of any kind, only two slight cases of dysentery having come to hospital; no other cases of the like amongst the followers came to my knowledge. On the morning of the 14th January, the next case happened in a bandyman, who was found in a collapsed state, and died four hours after being brought to hospital. The bandy men were most unwilling to give each other assistance, unless related, and those taken ill during the night were left exposed until morning, when they were found and taken to hospital; the consequence was, that some died without any treatment. On the 17th January the third and fourth cases occurred, and from this date the daily admissions increased until the 21st, when they had reached thirteen a day; from this date the admissions gradually decreased until the 24th,

when three cases only were admitted. They again increased to the climax of the epidemic; on the 26th, 27th and 28th, the admissions were respectively 12, 15, and 13, they then gradually decreased until 5th February, on which date the last patient was admitted. The epidemic thus lasted from first admission to last twenty-nine days.

On the 26th January the weather became warmer, the sepoys were much depressed, and were very anxious that their families should be placed under house-cover, and as the epidemic was on the increase, I therefore thought it advisable to break up the camp into two divisions. To do so it was necessary to ask for further medical aid, as the nearest water was five miles distant. On the 4th February assistance came, and two camps were made, but the epidemic had abated before the separation took place.

The infection, I think, was picked up at Nunipilly, and the five days passed between the date of leaving that village and the first case was a period of incubation. Everything had been conducive to a healthy march, the wing had come from a cheap country, it was well known that the sepoys saved money at Samulcottah, and were in a position to live well, that they did so was shown by the numbers of fowls and sheep bought on the way. Instalments of pay were regularly issued, so that there should be no cause to stint themselves.

Amongst the adults there was a marked absence of cramps, in no one case were they what might be called severe, and the first stage was of short duration, in some cases almost absent.

The children passed quickly through the stages of collapse, which in them was succeeded by a febrile attack, and most of the fatal cases died comatose in this stage. Only two adults, a bandyman and a bearer, died comatose in the third stage.

The treatment generally adopted was stimulation internally by a mixture containing arrack, ammonia, æther and decoct. chillies. Turpentine friction and application of warmth externally.

For excessive vomiting, creasote, acetate of lead, and effervescing draughts containing hydrocyamic acid were given, and in some cases found useful.

Arrowroot conjee and broth were given at intervals, and

cold water to relieve thirst. Five cases were treated with a mixture containing

Carbolic Acid ℥ iii. and Sulph. dil. ℥ xx.

Tinct. Hyoscyam. ℥ xv.; Aquæ ℥ ii.

two cases died and the other recovered.

I give three cases, the notes were taken by myself at each visit, as I was anxious to watch particularly the effects of the Carbolic Acid.

30th January, 2-30 P. M.—Recruit boy Mootoosawmy, admitted with sunken face, eyes a little sunken but not injected, pulse soft and of good volume, tongue moist and warm. Has passed three large congee-like motions and has eaten nothing all day. Feels nausea and is thirsty, has not vomited, voice a little husky. Walked from last camp this morning, distance four miles, skin dry and warm, made urine at 10 o'clock.

Carbolic Acid mixt. ℥ ii. every hour.

Conjee, cold water frictions and warmth externally.

7-30 P. M.—Has vomited twice, pulse very small and thready, body warm, feet cold, voice husky but good, complains of slight pain in abdomen. Bowels not moved, eyes injected, great thirst, no perspiration. Has had four doses.

Med. and treat. cont.

31st Jany. 2 A. M.—Body warm, hands and feet cold, has vomited once after taking medicine, expresses himself better, voice and pulse stronger. Has not slept, pain has gone, one scanty motion was passed in his clothes. Has had seven doses.

Treat. cont.

5-30 A. M.—Pulse small, voice good, has vomited once, complains of pain in chest and a tight sensation in chest and pain in abdomen. Has had one dose. Carbolic mixt. stopped, and a mixture containing arrack, ammonia, æther and decoct. chillies substituted.

8-30 A. M.—Doing well, all medicines stopped.

6-30 P. M.—Passed urine.

31st January, 2 A. M.—Private Gooriah, 11 years service, æt. 29 years, has just come to hospital. Features a little drawn, voice a little husky, eyes injected, has had four motions since midnight, ears blocked, skin warm, pulse good but feels weak. Has made urine at each motion, no vomiting or thirst. His evening meal consisted of meat-

curry and rice, but did not eat much. Has just passed a rice-water motion, very watery.

Carbolic Acid mixt. \mathfrak{z} ii. every hour.

5-30 A. M.—At 3 A. M. the dresser reports pulse good, skin warm and natural, vomited once watery matter, no motion. 4 A. M. twice purged; copious, liquid, rice-water stools; was once sick, pulse lower than before, voice weaker.

He is now weaker, body warm, pulse very small and thready. Has just had a copious watery motion with traces of undigested food, voice husky, has had four doses of carbolic acid since admission, no pain, conjee and cold water has been given internally. Friction and warmth externally.

Treat. cont.

8-30 A. M.—Has had several scanty motions like thick conjee and clear water. Retains medicine and conjee for a short time, and then ejects it; body warm, extremities inclined to be cold and clammy, pains in lower extremities relieved by rubbing, voice husky, pulse scarcely perceptible. Has had seven doses of carbolic acid since admission. Friction, hot bottles, &c., have been continued. This patient was orderly to a girl taken sick on the 21st instant.

11 A. M.—Is in a state of collapse, ejects everything he takes.

Hydrocyanic Acid dil. \mathfrak{m} iv. in effervescing draught s.s.

Stimulating mixture to alternate with carbolic acid mixture every hour.

Noon.—Passes scanty motions in his clothes, pulse perceptible in axilla.

2-20 P. M.—Died.

1st February, 1-30 P. M.—Private Papiab, 11 years service, 29 years of age, attended muster this morning, when he felt giddy and fell out. Took some conjee during the morning and had two watery motions, also vomited some watery matter twice. Face not much altered, eyes natural, pulse small, quick and thready, lower extremities warm, hands inclined to be warm. Has slight pain in calves, voice slightly changed. Is thirsty, lies quietly, and appears to doze. Passed urine at 5 A. M. Comes from a bandy in which a case occurred ten days ago.

Carbolic Acid mixt. \mathfrak{z} ii. every hour.
and other usual treatment.

4-30 P. M.—Body warm, no pain, vomited twice and has been purged five times, all watery, pulseless and quiet, face sunken, voice husky. Had four doses of carbolic acid, and took a little conjee.

Treat. cont.

7-30 P. M.—Much in the same state, a little restless since last visit, no vomiting or purging, complained of pains in loins at 6-30 P. M., which were relieved by sinapisms. Has had four doses.

Treat. cont.

2nd, 12-15 A. M.—Very low, no pulse at wrist, perceptible in axilla, extremities cold, no pain, no purging, but vomits occasionally. Has had three doses.

Carbolic Acid mixt. to be stopped, and stimulating mixture substituted.

3rd, 6-30 A. M.—Low but body warmer, face changed for the better, voice very weak but says he feels better, vomited three times.

Conjee, cold water and stimulants.

11-15 A. M.—Doing well, pulse just perceptible at wrist.

Treat. cont.

4 P. M.—Passed 2 oz. urine, retains conjee and medicines. Medicine stopped.

5 P. M.—Passed urine.

8 P. M.—Passed a bilious motion.

With the exception of the cartmen, patients were generally brought quickly to hospital; no case that I know of died out of hospital, except a recruit boy, who had been reported sick, but died before admission. Of the thirty-seven women treated, some belonged to the Gosha caste, but they were all brought to hospital at an early stage of the disease, and appeared anxious to come under treatment.

The clothes used by the patients were boiled in chatties, dried, and sprinkled with McDougall's powder before being returned to the patient or the friends.

The tents which formed the hospital were changed to clean ground every day, and the straw that had been used as bedding burned. The greater part of the evacuations were passed into the straw. Bed pans and open chatties were provided, but it was difficult to make the attendants see that they were used. The three sweepers who were entertained ran away from fear of infection.

Camping ground was changed every three or four days; this was found necessary, as it was impossible to the followers of so large a camp to use the latrines that were dug.

During the night, opportunity was taken to go to the ground around the camp, and I was informed that some of the women dug holes under the bandies or tents, and used them as necessaries; for this reason the bandies were always moved on to clean ground as often as possible.

The bandies were always drawn up in each camp in rows, ten paces between each bandy and forty paces between each row. The bandies in which cases occurred were separated, and the people belonging to them kept apart as much as possible; the men of the infected bandies took their turn of duty, as the patrol work round the camp made duty severe. Again, where there was only one water-supply, as occurred in some camps, the infected bandies met those who were not tainted at the well, so that the isolation of those tainted was not by any means complete.

On account of water, all the camps (nine) were near villages, except one. I only heard of one village into which disease spread; there were fifteen cases, three died, but the information was not reliable.

The head-quarters and left wing were kept five days in quarantine, and then marched into Kurnool in three easy stages. They arrived there on the 12th February 1869.

Attached to the end of this Report will be found a copy of the last daily report, giving the numbers of men, women, and children attacked, and the mortality.

Kurnool is situated in Lat. 15°46' north, and Long. 78°6' east, and is 900 feet above the level of the sea. The fort is situated on a promontory formed by the junction of the rivers Toongaboodra and Hindry; these form its northern, eastern, and southern boundaries: to the westward plains of black cotton soil, on which cholum and cotton are grown, stretch away for miles. The cantonment is more immediately bounded on the west by the canal, which in this part has high banks which shut in the view; it is distant from the fort about one and a quarter miles; the intervening space is occupied by the regimental lines, and the houses inhabited by the European residents. The soil is black cotton, but at the depth of two or three feet more or less stratified rock is found, and in many spots the rock comes to the surface. For want of other material, the houses all over the district are

built with stone and have flat mud roofs; the lines are also built in this manner, and during the hotter months of the year they become excessively hot and uncomfortable places of abode. From the levelness of the surrounding country, and want of forest tracts, the temperature at this station during the months of April and May ranges very high; it receives the full force of the hot winds, and there are occasional dust storms, which bring no relief. Towards the latter end of May, there are severe thunder-storms accompanied with rains which usher in the south-west monsoon. It falls plentifully, and the weather becomes again pleasant. The north-east monsoon can scarcely be said to reach Kur-nool, a few heavy showers being the most that can be expected. Rainfall during the year 22 inches.

Water is supplied by channels that are fed from the canal, it is good: 4 oz. of water boiled down gave 4 grains of deposit; this, on incineration, turned somewhat black, but no smell could be detected, nor did the powder perceptibly, by the scales I had, lose weight. During the hotter months the canal does not run, and water has to be obtained from the small stream that flows in the bed of the river; it was somewhat polluted by cattle being taken to it to drink, and by the washing of clothes.

The lines were in an isolated position, about 300 yards away from the houses of the fort; on three sides they were open, on the fourth they joined a village which was placed between them and the Toongabudra river. The ground on which they stood had been used for the purpose about thirty years; before that, it was a cultivation field. It was the highest ground between the two rivers, but was too flat for good drainage. Each street had a large made drain running through the centre; they all passed into a large one, which took the sewage away about 200 yards, and it then ran over fields. From the huts, small drains ran into the central ones. This system of drainage was adopted in the year 1866; previous to that time, outside of each hut there was an excavation in the ground into which the sewage ran, and as it accumulated it was removed by sweepers.

Each hut had a small compound, in which cooking, washing, &c., was done; there was also a privy, which was cleaned out by a sweeper entertained by the sepoy himself: a native officer inspected the compounds, and made a report to the Quarter Master.

The lines were kept clean by a conservancy establishment, superintended by a havildar, naigue, and three old sepoys; the rubbish was carted away, and sold as manure. Water was turned on regularly every day, and the drains were flushed for some hours.

The hospital was one that had originally been built for Europeans, and was consequently the best that I have ever seen for a native regiment; so capacious was it, that it is now converted into the Judge's court house.

The dimensions of the wards were as follows:—

				Superficial area.	Cubic contents.	Accommo- dation.
Main ward	...	...	...	2400	52800	24
Special „	...	...	...	960	21120	11
2nd „	...	...	...	125	1812	1

The floor of the hospital was raised two and a half feet above the surrounding ground. After we entered Kurnool cholera still remained with the regiment, and we lost six men, the last fatal case occurring on 25th April: it was also present in the Jail and Fort, but did not reach an epidemic form. After that date the regiment remained healthy; at no one time were there more than thirty men in hospital; on many occasions, the sick reports dwindled to twelve and under.

The duties were very light; with the exception of occasional guards to convey stores towards Secunderabad and Ghooty, the men only had regimental duties to perform.

Number of nights in bed.	{	Havildars	...	...	12½
		Naigues	...	...	6¾
		Privates	...	...	11¼

The annual average strength of the corps was 767, and there were 444 admissions into hospital, being equal to 5 78 per mille.

Intermittent fever and febricula numbered 165 cases, or 39 per cent. on total admissions.

Chronic rheumatism occurred in 55 cases, or equalled 12·6 on total admissions.

Conjunctivitis occurred in 31 cases, being 7 per cent. on total admissions.

Cholera occurred in 27 cases, or 6 per cent. on total admissions. There were fifteen deaths from this cause.

The most sickly months were August, with a daily average sick of 13·33; September, 13·17; and December, with 16·09.

Twenty deaths happened during the year from the following causes:—

Cholera	...	...	...	...	15
Sunstroke	...	...	...	...	1
Pulmonary extravasation	...	...	...	...	1
Abscess of cellular tissue	...	...	...	...	1
Ague	...	...	...	...	1
Hernia after operation	...	...	...	...	1

Two men were sent on sick certificate to their native villages, one for chronic rheumatism, and one for tonsillitis.

One man was discharged previous to serving for pension on account of secondary syphilis.

One hundred and sixteen cases were vaccinated amongst the men, women and children.

During 1870 the regiment remained at Kurnool, the duties still continued light, and the regiment remained healthy. There were 433 admissions, and the annual strength of fighting men was 686; the admissions were equal to 633 per mille; and there were 166 cases of intermittent fever, equal to 38 per cent. on total admissions, and three deaths, equal to 1·5 per cent. of admissions under this heading.

Thirty-one cases of conjunctivitis came into hospital, being at the rate of 7 per cent. on total admissions.

Twenty-nine cases of secondary syphilis, or 6·9 on total admissions.

Twenty-eight cases of chronic rheumatism, or 6·6 per cent. on total admissions.

Seven cases of small-pox were admitted; they were all modified, and did well, as will be seen from the following table. September, October and November were the most sickly months.

Admissions.				Admissions.			
January	...	...	34	July	...	...	25
February	...	...	29	August	...	...	35
March	...	...	30	September	...	...	50
April	...	...	34	October	...	...	51
May	...	...	23	November	...	...	66
June	...	...	24	December	...	...	32

There were four deaths in hospital and one out, deaths in hospital to total admissions being at the rate of one per cent. The causes of death were—ague, three; beriberi, one. The man who died out of hospital had dysentery, and died in the detail hospital at Kamptee.

Two short-service men were discharged for medical reasons, one for leprosy, and one secondary syphilis.

Five cases were sent to their native village for change of air. Two secondary syphilis, one paralysis, one bronchitis, and one conjunctivitis.

One hundred and sixty-one cases were vaccinated amongst the men, women and children.

I will finish this Report with an interesting case of beriberi, the symptoms of which at one time so resembled those of aortic aneurism, that Dr. Blacklock and myself were both deceived, and the disease was changed accordingly; the man is now on sick leave to his native village, and I am told by his friends, is doing well.

25th December 1870.—Private Abdul Rezae, æt. 33, 15 years' service, admitted on the 21st instant suffering from general debility and œdema of face and hands; has suffered much from fever since the regiment came to this station. He is anæmic, and has the beriberi cachexia. Since admission has been taking the following medicines:—

℞ Potas. Acet. gr. x.
Tinct. Scillæ ℥ xx.
Aquæ ℥ i.
t. d. s.

℞ Tinct. Cardamom. Co. ℥ ss.
Tinct. Gentian. Co. ℥ i.
Potas. Bicarb. gr. x.
Bitter Infusion ℥ iss.
t. d. s.

During the last 24 hours has passed only 8 oz. of turbid sherry-coloured urine. His bowels were opened twice yesterday. Appetite bad. Œdema in limbs much increased. Fomentations to kidneys, and lower limbs to be bandaged.

℞ Potas. Acet. gr. x.
Tinct. Scillæ ℥ x.
Spir. Nitric. Æther. ℥ xx.
Liq. Amon. Acet. ℥ ii.
Camph. Mixt. ℥ i.

To be taken every three hours.

26th.—Has passed 8 oz. urine; remains much in same state.

Med. cont.

Haust. Purg. ℥ iv.

27th.—Has passed 10 oz. of lighter coloured urine with less sediment, and he says he feels better.

Med. cont.

28th.—Has passed 12 oz. of lighter coloured urine.

Med. cont.

This man was left behind with the right wing at Kurnool, and again came under my care on that wing joining headquarters yesterday.

During the journey from Kurnool, he had dysentery and diarrhoea, but is now better; during the last 24 hours, has only passed $3\frac{1}{2}$ oz. of brandy-coloured urine, has had two good motions, appetite bad, and œdema present in limbs. Kidneys to be fomented and lower limbs bandaged.

Acet. Potash gr. x. ℞. Inf. Gentian ℥ iss.
four times a day. Spr. Ammon. Aromat. ℥ xx.
t. d. s.

29th January 1871.—Has passed 8 oz. urine, same colour, sp. gr. 1020, acid reaction, and no sediment or cloudiness; on the application of heat and nitric acid there were no signs of albumen.

There is much palpitation of heart, the impulse of which can be seen all over thorax; there is a roughness heard with the first sound; skin dry. Belladonna plaster to cardiac region, fomentation to kidneys, and bandages to lower extremities.

℞ Inf. Gentian. ℥ iss.
Spr. Ammon. Aromat. ℥ xx.
Liq. Acet. Ammon. ℥ ii.
t. d. s.

30th.—Has passed 8 oz. urine, palpitation continues.

Treatment continued.

Vespere.—œdema has increased in the hands, arms and chest, and he complains of oppression in breathing.

Med. cont.

1st Feb.—Œdema has increased about arms and neck, and the left pulse is stronger than the right; there is a faint bruit heard behind between the scapulæ: these symptoms lead me to think there is a thoracic aneurism, and that the œdema of face and arms is caused by pressure on the vena cava superior.

Has passed 4 oz. urine of high colour during last twenty-four hours. Slept badly last night, and is altogether weaker.

Bread, mutton and three ounces arrack.

This morning this case was changed to aneurism of descending aorta.

2nd.—Œdema of left arm is much better to-day, and the right also is a little less; slept well last night. Took 12 oz. bread and some broth. Has passed 5 oz. urine.

Diet cont.

3rd.—Is in good spirits and can sit up for a little while, passed 8 oz. urine.

6th.—Has passed 9 oz. urine, and was sitting up in bed this morning at visit; he is improving fast, though the palpitation and œdema are still troublesome.

Diet cont.

10th.—For the last few days has been passing 18 oz. urine, which is of a better colour.

Diet cont.

20th.—Now walks about, palpitation has gone, and œdema much less.

Discharged and sent on sick leave to Guntoor for ten months.

Average Weights and Heights of the Three Companies at Head Quarters on the 7th June 1871.

Company.	B 76	C 82	D 78	Band and Drummers 18.
Height.	5 feet 6 inch.	5 feet 6 inch.	5 feet 6 inch.	...
Weight.	121 lb.	119 lb.	118 lb.	129 lb.

ART. II.—*Case of Fracture of the Skull; subsequent removal of a large portion of the parietal bone; open shoulder joint, excision of the head of humerus. Recovery.* By J. F. FITZPATRICK, M. D., Civil Surgeon Kurnool.

THE following short summary of this case is, I trust, sufficiently interesting to warrant publication. Sashiah, æt. 30, caste Brahmin, occupation Police Head Constable, was admitted into hospital on the morning of the 22nd August 1871, having been attacked on the previous night by a brother Policeman while on duty in the village of Kulloor, about one mile from Kurnool.

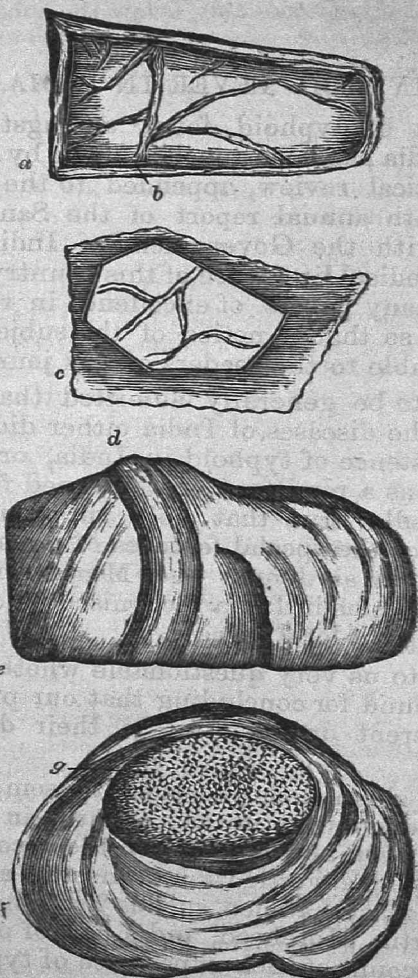
Symptoms and appearances on admission.—Surface of body covered with blood, cold and death-like, pulseless; articulates rationally but is scarcely audible; right side of head and ear severely hacked; there being numerous cuts, some three to four inches long; most part of the pinna of the ear wanting, parietal bone fractured immediately behind its articulation with the frontal, the fracture extending from the anterior inferior angle, upwards, about three inches, the anterior edge being depressed exactly to the extent of the thickness of the posterior, from which latter two or three fissures pass backwards about one inch. The left eye is completely destroyed by a cut which fractured the external angle of orbit, and which passing to the inner canthus, divided the globe. Right shoulder joint laid open by one clean sweeping cut commencing beneath the acromial process, dividing all the structures in front and outer side, opening the joint, and slicing off a portion of the articular end of the bone, leaving the vessels and nerves of axilla intact. Index and middle finger of right-hand separated at their metacarpal extremities, and the thumb at the first palmar articular articulation. Compound comminuted fracture of the index of left hand; three cuts on right side, about four to five inches long, completely dividing the false ribs but not penetrating, with other minor wounds on right thigh and hand. The weapon which caused the injuries was a heavy native tulwar.

Treatment.—For some thirty hours after admission small doses were administered of diffusible stimulants, nourishment, with the application of external warmth. When reaction had set in, about 2-30 on 23rd, the head of the humerus was freed from its few remaining attachments, turned

out, and sawn off immediately below the tuberosities. No vessels were divided; edges of primary wound were now pared, brought together, and retained by sutures and straps, the arm being well supported and kept in position by pads and figure 8 bandage. The other wounds were attended to as their nature required; the fracture of skull was not interfered with, there being no head symptoms; carbolic acid lotion was applied over all. The after treatment consisted of the free use of the lotion, poultices, strict attention to cleanliness, the administration of purgatives when necessary, and tonics. The pieces of parietal bone shown in the diagrams were removed when completely loosened, viz, one on September 5th, the other on the 16th, when the middle meningeal artery was exposed, strongly pulsating. The space then rapidly filled up with granulations. On the 25th of September, one month after operation on shoulder joint, the wound united perfectly, and other injuries having healed, the patient became convalescent from that date.

Remarks.—In reviewing this case, one must naturally feel surprised at the miraculous escape—1st, from the extent of fracture of skull and its seat over middle meningeal artery, without laceration of the coats of the vessel; 2nd, that the arm was almost severed at the shoulder joint, yet the vessels and nerves of axilla were not divided; 3rd, that the ribs could get completely cut through without penetration and injury to internal viscera. Such a combination of serious and aggravated wounds occurring without a fatal termination, is, I imagine, seldom seen; yet here is one of those instances in which there is perfect recovery, perfect as far as nature and art could possibly accomplish after the mutilation received. A wound laying the shoulder joint so completely open, and giving an opportunity of practising the conservative power of resection over amputation for primary injury (other than gun-shot wounds), is not of frequent occurrence, and my expectations as to the result of the operation here have been more than realized.

The treatment of the other injuries was simply on the expectant principle, removing all sources of irritation that might thwart or interfere with the natural curative process. The diet throughout was that of the patient's caste, viz., rice, milk, vegetables, and very probably this restriction to such unstimulating food assisted in no small degree to the favorable termination, though it must undoubtedly be the means of prolonging convalescence.



- a. Portion of parietal bone removed on September 4th; view of inner surface.
 b. Groove for middle meningeal artery.
 c. Portion of parietal removed on 15th September.
 d. Front view of head of humerus.
 e. Line through which saw passed.
 f. View of upper surface of head of bone.
 g. The portion of articular end sliced off by the injury received.

TYPHOID FEVER IN INDIA.

THE subject of typhoid fever amongst European troops in India has been touched upon by Dr. Bryden in his statistical review, appended to the lately published seventh annual report of the Sanitary Commissioner with the Government of India, and the periodical medical literature of this country has of late contained many papers of excellence in reference to this disease, so that a notice of the subject may not be unacceptable to the readers of this journal.

It seems to be generally admitted that the older writers on the diseases of India either did not recognize the existence of typhoid in India, or that they described it as a remittent or continued fever, for it is undoubtedly true that only subsequent to the description of the special features of enteric fever by such observers as Jenner and Murchison, has the medical profession in India recognised its existence as a distinct type of local disease.

It seems to us very questionable whether we have any real ground for concluding that our predecessors were indifferent or unskilful in their diagnosis of disease.

India has claimed the services of some very eminent men—men who in any country in the world would have been noteworthy for their conscientious and painstaking investigation of disease, and yet it is a remarkable fact that men, such as Twining, Annesley, Ainslie, Martin, Morehead, and a host of others, have left us no account of their experience of typhoid fever in India.

The question must therefore again be asked whether the disease existed so commonly in former years as it has done since communication with England has

been frequent and rapid. Dr. Bryden, who, if he has any failing, is apt perhaps to generalise too sweepingly from insufficient data, declares that the disease is not new to India, and that "the continued fever from which boys die, is in almost every instance true typhoid fever."

It is as well to note that this rash generalisation is tantamount to accusing every medical officer of H. M.'s service of inability to distinguish genuine typhoid fever when he sees it, considering that since the year 1859 the disease has had a recognised place in army medical nomenclature.

According to Bryden, typhoid fever may be expected to show itself in every Regiment coming to India during the first hot season, "not," he says, "because of a special poisoning derived from the locality in which it may be placed, but because in the young when the influence of heat tells on the nervous system, infiltration of Peyer's glands follows, the characteristic eruption is manifested, and the fever pursues its course and ends in resolution or death."

Now the truth is, so far as we know anything about it, typhoid fever is mainly a disease of young adult life, whether in England or in this country, and that it is a disease far commoner in cool or temperate climates, where the hypothetical action of heat on the nervous system and Peyer's glands can have nothing whatever to do in its production.

Dr. Bryden does not however deny the existence of a special poison in typhoid fever. While he asserts that the disease has "no geography," and is of universal occurrence, he believes that it is contagious in the same degree as erysipelas or the non-specific "cachexies of our jails," whatever the latter may be. Dr. Bryden, while admitting the existence of a zymotic element in typhoid fever, seems to be under the impression that the disease is due to the conditions of a hot weather service in India. This

strikes us as being somewhat illogical. If there is a zymotic element in the production of the disease, and if the disease be most frequently witnessed in newly arrived troops, as the testimony of all observers confirms, then it seems to us not in any way improbable that the special contagium may be brought out by new bodies of troops from the country in which it flourishes best, to India, where it tends to speedy decay. And as regards hot weather having anything to do with the development of this form of fever, we believe Dr. Bryden to be entirely wrong in his generalisations. In Europe, typhoid is a disease of the autumnal or cold weather, if it be influenced at all by season, and in this country we have seen two distinct epidemics of it at Ootacamund, where the climate is always temperate, and the elevation nearly 8,000 feet above the sea. It has prevailed also more extensively at Bangalore, a temperate climate (not specially in the hot months) than in any other station of this Presidency.

The facts in support of the view that the contagium of typhoid is frequently imported are remarkably strong. Mr. Cornish in his paper published in Vol. IV., (1862) of the *Madras Quarterly Journal*, gives the instance of the 1st Royal Regt. at Secunderabad beginning to sicken with typhoid immediately on arrival, although the Regiment which had preceded it in the occupation of the barracks had no typhoid. The same thing happened at St. Thomas' Mount, where the disease was apparently introduced by a battery newly arrived from England. H. M. 63rd Regt., we learn from the admirable reports by Asst-Surgn. J. B. Hanna, M. D., and Thomas O'Farell, M. A., M. D., began to suffer immediately on coming to India, for before the arrival of the Regiment at Hazeerbagh, a woman sickened with typhoid fever, and the disease subsequently prevailed to a considerable extent in the corps.

But one of the most conclusive cases of this nature may be found in the history of H. M.'s 89th Regt. now at Cannanore. This corps came to India in November 1870, and had been stationed at Fermoy, where typhoid fever was known to prevail in the depôt of the 9th Regiment. On the voyage out, one of the women of the 89th Regiment sickened with typhoid, and was landed at Bombay, where she died. The Regiment came on from Bombay in a small steamer to Cannanore, and landed there on the 6th November. A woman was suffering from typhoid fever when the Regiment landed; a child died on the 11th November, and another case was admitted on the 24th. In December and January 1871 the disease became common amongst the men, including the two detachments of the corps sent to garrison Calicut and Malliapooram.

In this case there is a continuous history of typhoid from the day the Regiment left Fermoy in Ireland to the decadence of the disease in the latter part of 1871. And to show that the conditions of the locality had nothing to do with its appearance, it may be as well to note that not a single case of the disease had been seen in the 1st Royals which preceded the 89th at Cannanore during 1869 and 1870, and it is equally worthy of remark that the disease prevailed in the detachment at Calicut and Malliapooram, as well as at head-quarters.

Now, if it be a fact that typhoid fever was brought out by the 89th Regiment from Ireland in 1870, there can be no doubt that similar importations might have occurred in the case of other regiments, or drafts of troops, and that in the latter case great difficulties would be found in tracing the successive steps of importation. In both the 63rd and 89th Regiments, *women* were the first sufferers, and it is not unreasonable to suppose that the class of soldiers' wives

would pack away woollen and other articles of dress which might possibly have been the vehicle of the contagium.

In regard to the general conditions which predispose to typhoid fever, we have very little accurate knowledge. Undoubtedly the secretions of the body of an infected person may be looked upon as capable of reproducing the disease, should air, water, and food be subjected to contamination by them, but the special infective power does not appear to be so highly developed, as in the contagia of the several varieties of typhus fever. It exercises its influence chiefly on the young, for Murchison has shown that the proportion of persons over thirty years of age attacked is less than 7 per cent. of the whole. It seems also fairly well established that a person suffers from typhoid but once in his life, and that those who have gone through the disease, are not susceptible to any further attack. The typhoid contagium leaves a permanent influence on the human body, and there is some reason to think that it not unfrequently lays the foundation of tubercular disease of the lungs, though in this respect further evidence is wanting.

With reference to the influence of ordinary insanitary conditions in the production of this fever, we must, notwithstanding the positive statements of many leading sanitarians, exercise great caution and judgment before we commit ourselves to an opinion. We have here in India the remarkable fact that the natives of the country, whose lives from the cradle to the grave are passed amidst filth and disorders, are not liable to the disease. Dr. Bryden says, "in the records of the native army I do not know of a single death attributed to typhoid, which is not open to the suspicion that it has been wrongly diagnosed or carelessly returned; and out of 41,246 deaths among the jail population, which I have recorded between 1859 and 1870, I do not know of any death

which may have been returned as typhoid which is not equally liable to the same suspicion."

The vital statistics of the native army and jails of this Presidency will, we believe, tell the same tale. In the native army there must always be a doubt as to the true nature of fatal fevers, because the pathological changes in the intestine characteristic of typhoid cannot be verified, as in the case of European troops, but in jails where post-mortem examinations are the rule, there is no history of the presence of disease that can be described as enteric fever. We are quite ready to admit that natives may suffer from typhoid fever, and, if we mistake not, Ewart has described such cases; but we hold with Dr. Bryden that the disease is one of great rarity amongst the natives of this country, who exist under insanitary abominations such as European troops are prohibited from, in a great measure. And as regards the great readiness of young recruits, or newly arrived regiments to suffer from this malady, we believe the explanation to be the simple one, that the troops bring the "zymes" of the disease with them from the country where it may be endemic.

It is a fact beyond dispute, that scarlet fever was so imported by women and children in 1860, and that it flourished for a while as an epidemic in the temperate climate of Bangalore, becoming extinguished much sooner in the hotter stations of the Carnatic.

The typhoid contagium has, we believe, no indefinite life in India. It flourishes best, according to our experience, in temperate climates, such as Bangalore, the Neilgherry Hills, and Hazeerbaugh, and just as cholera migrates periodically beyond the bounds of its endemic area, so do the constant additions to the European army in India tend to bring in an accession of 'zymes' in a condition of vital activity.

A MARE'S NEST.

A Daniel come to judgment! aye! a Daniel!

"OUR MEDICAL ADVISERS," in all the magnitude of large type, are the subject of an editorial which appeared early last month in one of the Madras daily newspapers. The writer (to compare small men with great), like Sir Charles Trevelyan, is of opinion that "all of us require looking after," and that medical men form no exception to the canon. He wonders, however, that officers of the Indian Medical Department have hitherto been excepted in the operation of that salutary rule.

"In these days," he writes, "of high-pressure examinations, there is scarcely a career the members of which have not periodically to adduce evidence that they are up to the mark, and competent to perform their duties; but by a strange fatality, the very calling of all others in which it is essential a man should not get rusty, forms an exception to the general rule. * * * * It is the doctor alone (we speak only of the service) who lies under no check whatever of any practical value." The learned editor, however, has, from the profound depths of his own moral consciousness, raised a phantom for the purpose of demolishing it. With kind concern and amiable anxiety in behalf of both doctors and doctored, he wishes for that which was long ago provided. So far back as the 7th November 1864, the Medical Warrant for the Indian Armies was issued by Sir Charles Wood from the India Office, and its twenty-third paragraph prescribes that "Assistant Surgeons of twelve years' service from the date of first commission (of which two years shall have been passed in charge of a native regiment), who shall have passed the prescribed examination in professional subjects, will be promoted to the rank of Surgeon." For twelve years, then, after his introduction into the service, every Assistant Surgeon can scarcely help regarding

himself still a student, preparing for an ordeal, through which he must pass before he can obtain promotion to a superior grade; and we trust that our contemporary will feel all the comfort which the knowledge of so strong an incentive to diligent and successful study is calculated to inspire.

But the editor of the *Times* also betrays unaccountable, and even incredible ignorance of the constitution of the Medical Department. He states,—“in other professions fear of detection will, in the absence of a higher motive, keep the discontented man up to the collar. The military officer who leaves his company or regiment to look after itself, will very soon be brought to book by his seniors; the collector who lets matters slide in the district, will be practically reminded of the existence of a Board of Revenue before many weeks are over; the judge who slurs over judgments, will in all probability receive a *billet doux* from the High Court requiring prompt and serious attention. But the medical man can go his own way without fear of molestation, and if he feels inclined to be idle, why—heaven help the patients, for there is no remedy! * * * * * We think a system of supervision and control is necessary.” But a system of control and supervision is already in operation. Is there not an Inspector General of the Department? And a staff of Deputy Inspectors General? Are not these officers purposely appointed to superintend all executive officers under them,—to see that they perform their duties properly,—and to keep them up to the mark in the knowledge and practice of their profession? Or does our contemporary imagine that the administrative officers are a mere *nominis umbra*, and a body of sinecurists? Or would he venture still further, and insinuate that inspections are a mere sham, and that Deputy Inspectors General fail to do what is required of them. We are very certain that no Civil or Regimental

Surgeon in a single station can neglect his duty, or shew himself wanting in practical acquaintance with medicine and surgery, without soon coming under the cognizance and the lash of his official superior. And so confident are we that their inspectorial functions are faithfully discharged by the administrative grades, that we believe the Medical Department may challenge comparison with all other branches of the service. Till our contemporary can prove to us that there is a larger proportion of apathetic and incompetent Civil Surgeons than negligent military officers, perfunctory collectors, and "judges who slur over their judgments," he will not be in a position to throw a stone at the administrative ranks of the Medical Service.

The present is a suitable opportunity for referring cursorily to the examinations of candidates for promotion to the rank of Surgeon. We need scarcely assert that in these tests of their fitness for preferment, Assistant Surgeons should not be subjected to catch-questions and questions of a speculative character. The object of the ordeal is to plumb the acquaintance of the examinees with the Practice of Medicine and Surgery and with General Pathology. The examinations should therefore be pre-eminently practical. And it was a wise provision of the Warrant that the *Inspector General* should issue the questions. Generally the senior officer of the Department, his position furnishes the best pledge that the questions will be practical and appropriate, and such as to elicit a candidate's familiarity with the practice of his profession, and his ability to meet with promptitude and credit the emergencies in which he may be at any time placed. From him, too, it is reasonable to expect that all queries in pathology will have reference to established facts and principles, and not demand information regarding moot theories, which are often exploded by the lapse of time.

REVIEW.

Report of the Sanitary Commissioner of Madras for the year 1870.

WE resume our notice of Mr. Cornish's Sanitary Report for 1870.

On the 1st January 1870, the strength of the Native Army was 31,743. There were 436 deaths during the year, being at the rate of 13·8 per thousand, and 815 were invalided, in the ratio of 25·8 per mille.

On the subject of invaliding, Mr. Cornish remarks as follows:

"The expression "invaliding," as regards the Native Army, has not the same significance as it has with reference to British Troops. By the terms of his enlistment a native soldier is entitled to a small life pension after fifteen years of service, and to higher rates of pension after further periods of service. As a matter of fact, a great many men who have been unfortunate in promotion, or who have got tired of the service, seek to claim their pensions so soon as they are attainable, and their individual fitness for further effective service has to be decided by Boards of Medical Officers. In practice, it is found that the sepoy rarely attempts to obtain his discharge until he has put in the qualifying period of service for a pension, and when this has been accomplished, and the inducements to remain in the service are few, the desire to retire into civil life becomes very general. As a native soldier cannot claim a discharge except on account of inefficiency or ill-health, it follows that the "invaliding" list of the Native Army includes the discharges which in the British Army would be classed as "time-expired," "pensioned," &c."

We should much wish to see some alteration in the pension regulations, and invite a reconsideration of the subject from a medical stand-point. It is our belief that the tendency to malingering is encouraged by the regulation which obliges a sepoy to prove physical unfitness to the satisfaction of a medical board, before he can claim the minimum pension of four rupees a month, after 15 years' service. Any of the circumstances, pointed out by Mr. Cornish, may produce a strong desire, in the sepoy, to leave the service

with a small pension, and retire into civil life. To succeed in his object, he must first prove physical disqualification, to the satisfaction of the regimental medical officer, and afterwards to that of an Invaliding Board. The desire to get sick and weakly, constantly operating on a mind dispirited by disappointment or misfortune, soon brings about a marked deterioration in health, especially if this all-absorbing wish be attended with under feeding, voluntary or involuntary. The tone of the Native Army would be improved, and contentment promoted, by substituting, for the present regulation, one which allowed every sepoy to claim his minimum pension, say, after 20 years' service, without reference to medical grounds, on condition that, should state necessity arise, he would be liable to be called on to do garrison duty. A few thousands of such men, properly organized, would make a valuable reserve in times of disturbance; and as their interests would be bound up with those of the Government, they would, in all probability, be found active and zealous supporters of order, should disturbers of peace require to be put down.

Mr. Cornish, in two paragraphs, brings to notice the bad system of housing our native troops, and dovetails his condemnation of sepoys' lines, with a touching allusion to the proverbial generosity of the Madras sepoy to his poor relations, many of whom hang on to him with the tenacity of barnacles. We quote them, *in extenso*, and we do so in the hope that something may be done to provide our sepoys with better accommodation, at the cost of the state.

“With all the great public expenditure that has been going on of late years for the improvement of the accommodation of the British Troops, hardly any thing has been done in the way of housing the Native Army. The sepoys' “lines,” or huts, are very much what they were three-quarters of a century ago, in regard to building materials, ventilation, drainage, &c. Of late years, if new lines have had to be built, some care has been given to the selection of a suitable site, and the buildings have been distributed over a wider space; but with the exception of the Native Infantry Barracks at Perambore and Royapooram, and the New Sapper Lines at Bangalore and Secunderabad, I do not know of an instance where the construction of houses for Native Troops has been influenced by sanitary considerations.

The habit of the Madras sepoy has always been to surround himself not only with his immediate kith and kin, but with distant relations and connections who can advance any family claims on his

generosity. As a consequence, the sepoy's huts are nearly always overcrowded, and the sepoys themselves frequently impoverished and brought into low health from their really honorable efforts to support a number of persons who have family claims upon them. The state of things here alluded to is common to all native families in India (who require no Poor Law to compel them to support the weak and incapable of their families), but it presses with peculiar hardship upon the sepoy, whose income is inelastic, and who feels a moral obligation to supply his relatives with food and shelter, irrespective of the number of mouths to be fed, or the prices of food."

We are glad to find that the wing of the 31st Regiment Light Infantry which was stationed at a very malarious station, Sumbulpore, was provided with new lines, on high ground, a change which was followed by a marked improvement in the health of the men. Bangalore, on the other hand, is a station in which our sepoys suffer much from fever. Much of this sickness is preventable, and is mainly due to the vicious system of hutting. Mr. Cornish says—

"Nothing has been done for the Native corps during the year. Their lines are placed on sloping ground, and might easily be well drained; but the houses themselves are old, too close together, and scarcely fit for habitation. The whole area should be laid out anew, and decent houses put up in place of the present huts."

Under the head of Jails, we learn that there were 9,503 prisoners in custody, on the 31st December 1870, the average strength for the year being very little above this figure, namely, 9,579, and the death-rate 26 5 per thousand. We are gratified to find that there have been less sickness and fewer deaths, in the Madras Jails, in 1870 than in any previous year, and we concur in attributing this improvement to the humanity of the Government, which has spent much money in providing the prisoners with better accommodation and an improved dietary. A more telling fact could not be cited to prove the beneficent administration of the British Government in recent times, than its care of the prisoners,—a care which has resulted in a great saving of life and marked diminution of sickness and suffering. Ten years ago the death-rate was 93 per thousand; from 1863 to 1866 it ranged from 101 to 126 per thousand; in 1867, the year in which the newly-erected Central Jails relieved, to a great extent, the overcrowding of District Jails, and in which the prisoners began to feel the benefit of a new and improved dietary, it fell to 53 per thousand. In-

1870 the mortality rate fell to 26·5 per thousand, and there is a likelihood that it may go down still further.

We have brought together the following figures, in order to shew at a glance the relative death-rate for 1870, among the following classes :

In the European Army ...	19·2	per thousand
In the Native Army ...	13·8	do
Civil population	18·5	do
Police	13·5	do
Prisoners	26·5	do

Although the death-rate among prisoners appears high when compared with that of other classes of the population, the figures already cited in a previous paragraph, will satisfy our readers that there has been a remarkable decrease in the death-rate, since the prisoners have been provided with better food and more room. In 1865, the death-rate, sad to say, was 126·3 per thousand; but in 1870, after the introduction of improvements by which the prisoners were provided with less impure air, with better food, and pure water, it fell to only 26 per thousand. These figures are a full and sufficient answer to those who, from time to time, have raised an outcry against pampering our prisoners, and they must satisfy all right-minded and impartial minds that the recently effected improvements were absolutely necessary to wipe out a very black blot from our prison administration, seeing that, under former insanitary conditions and surroundings, our prisoners were literally decimated with scurvy and its allies, and that, in the majority of cases, a prolonged term of imprisonment was tantamount to a sentence of death. We do not forget Mr. Cornish's share in bringing prominently to notice, in 1864, in the pages of the old *Quarterly Medical Journal*, the great defects in prison dietaries in the Madras Presidency; and it is partly to the adoption of his valuable suggestions that so many lives have been saved in our jails. We must allow Mr. Cornish to speak for himself on this point.

“The system of dieting prisoners in this part of India, before I collected and arranged evidence as to the food of the people of Southern India and prison dietaries, by order of the Secretary of State for India, was of the crudest. A fixed grain ration was allowed, and a small sum of money per diem for the purchase of every other article of food, firing materials, and cooking pots. Such a system led to great abuses, and very frequently to the

deprivation of the prisoners of some essential ingredient of their food, whereby they fell into a low state of health, and ultimately fell ill of some form of disease resulting from defective nutrition. In many jails, even in healthy seasons, with no epidemic disease abroad, it was impracticable to keep the mortality down lower than ten per cent. of the average strength. Frequently in bad seasons, with a general scarcity of food, a large percentage of the prisoners would be found to be in a feeble state of health on admission, and with a defective dietary while undergoing imprisonment ; the results in such cases were most disastrous."

We observe that there are six Central Jails, namely those at Rajahmundry, Trichinopoly, Vellore, Salem, Coimbatore and Cannanore, and their salubrity, over the thirty-one District Jails, is illustrated by the following figures :

	Strength.	Sick-rate.	Death-rate.
6 Central Jails.....	3,979	462·6	20 8
31 District do . . .	5,600	928·9	30·5

These ratios are valuable, as they shew the necessity that exists for closely attending to the sanitary condition of District Jails, for removing faults of construction, and doing our best to provide the prisoners with pure air, pure water, and good food. We trust that our brother officers who, as superintendents of District Jails, have already done so much to reduce the sick and death-rate of their respective jails, will not rest satisfied until they bring up their jails, in point of salubrity, to the standard already reached by the superintendents of five out of the six Central Jails. The present condition and management of our jails present such a contrast to the old style, that we beg leave to quote the picture, painted by a Bengal medical officer, in a late number of the *Calcutta Review*, of the past state of the jails of his presidency. The picture will, doubtless, be recognized by many who were in medical charge of Madras jails about ten years ago. "Disorder ; neglect of prison discipline ; immoral idleness of prisoners ; non-observance of the decencies of life ; bribery, and corruption of prison officers ; all manner of abuses of authority and management ; numberless illegalities ; ridicule and contempt of medical counsels ; neglect of sanitation ; indifference to human suffering, and reckless disregard of human life." It is a comfort to turn from this harrowing picture, and to read that our jails "are all, more or less, models of order, discipline, cleanliness, and efficient sanitary control," thanks to an enlightened and a humane government.

In glancing at the death-rate of District Jails, we observe a marked disparity in this respect. Chingleput shews only 4.6 per thousand, Cuddalore 6.6, Kurnool 6.8, Masulipatam 10.4, Coimbatore 14.6, while the Madras Penitentiary shews 40.9, Tanjore 101.7, Rajahmundry 56, Trichinopoly 59, Nellore and Mangalore 54, Tranquebar 50, Calicut 44, Madura 47. We have picked out Tanjore jail, because it presents the highest death-rate, and dived into the appendix, in the hope of being able to account for the high rate of mortality. The only information we can light upon is this: "Undue sickness and mortality between June and November. The cause I cannot indicate. A large number of prisoners fell into an anæmic state, and to such, bowel-complaint and dropsy readily proved fatal. The jail is badly situated, but all official visitors have reported favourably on its internal arrangements." We think that the Inspector General of Jails should pay special attention to those jails in which the mortality exceeds 20 per thousand, and by frequent inspections, determine the cause of excessive mortality. On all such points, the medical profession in India would feel thankful to be enlightened, and we feel sure that the local Government would gladly gratify such a wish and help to remove these death spots from the face of the land.

From figures furnished by the Inspector General of Jails, we learn that 18,035 prisoners were received into jails, either by transfer or as new admissions, during 1870; and that 14,468 were liberated, leaving about 9,500 as the number generally under confinement. Mr. Cornish remarks that "the jail populations change, on the average, about thrice in the year." We cannot be far wrong in supposing that the great majority of the 14,468 individuals liberated during 1870, were short-term prisoners, sentenced either to confinement with hard labour, or to simple imprisonment without labour. 18,035 admissions seem a large number to pass into jails in one year. We should like to see these classified according to districts, nature of offence, and amount of punishment. In 1864, the Whipping Act was introduced, in the hope that the magistracy would be able, by resorting to the lash for petty offences, to lessen the number of small offenders in our jails; and we venture to ask, if this Act has fulfilled the expectations of its framers. Is it not possible, so to amend our penal laws as to substitute fines, police surveillance, enforced labour on public works,

or anything else, for short-term imprisonment, in order to keep minor offenders out of jail? Simple imprisonment we believe to be a device for increasing expenditure, without any corresponding return for the outlay incurred in feeding, lodging, and guarding prisoners. Overcrowding would be prevented by keeping minor offenders out of jail, diseases springing from this cause would decline, expense would be reduced, and the risk of inoculation of novices, by association with hardened criminals, would be obviated. At present we have about 15,000 minor offenders passing yearly out of our jails, who, doubtless, carry away with them a moral taint which rapidly develops into crime,—in those who are predisposed to evil-doing. Our rulers, who have already done so much for the criminal classes, are surely philanthropic enough to make some further experiments to prevent 15,000 persons from annually filtering through our jails and carrying away with them lessons derived from evil association. It will not be an unwise policy to keep the prison doors “barred on the outside as well as on the inside.”

Besides the Lock Hospital at Madras, which has done much good in lessening the amount of venereal diseases both among European and Native troops, we learn that there are eight Lock Hospitals in the following stations occupied by European troops, namely: Bangalore, Bellary, Cannanore, Kamptee, Secunderabad, Trichinopoly, Thyetmyo, and Wellington.

Between them, they have received, under treatment, 1,040 diseased women, and, to this extent, they have helped to check the extension of disease among men.

We must bring this notice to a close with a short reference to the chapter on vital statistics. We gather, that the population of our presidency is about 26 millions, and that, according to the imperfect returns received, the ratios of births and deaths to the population are as follows:

Births.....	18·1 per thousand.
Deaths.....	18·5

”

Mr. Cornish thinks that the registration of vital statistics will improve. He has calculated the ratios of births and deaths from the actuals of the last six months of 1870, during which period the registration was less imperfect, and

he gives us 21·4 births and 18·5 deaths per thousand as the result. These numbers even are not correct. Mr. Cornish thinks that the ratio of births, judging from European standards, should amount to 30 per thousand. This figure has been reached in only one out of 21 districts, namely in that of Tanjore, where the ratio is 31·4 births to every thousand of the population. Chingleput and Salem districts shew 27, and a decimal per thousand. The ratio gradually declines until we come to Cuddapah and Coimbatore, in which districts it amounts to a little more than 15 per thousand. The registration in these districts must be very defective. Probably only half the births has been reported.

The death ratios also vary in the twenty-one districts. In Ganjam and Vizagapatam districts, where no epidemic prevailed, the death-rate was a little more than 13 per thousand; 15 per thousand is the rate for Neilgherries, Coimbatore, Nellore, Cuddapah and Madura; 19 for Kurnool, North Arcot, Chingleput, Kistna and Trichinopoly; 26 for the town of Madras, and 27·1 for Godavery. It is a pity that these returns are not reliable.

Mr. Cornish, we observe, stoutly maintains that irrigation does not increase fever, and that sea air antagonizes malaria. The people of the Godavery district believe that fever is now more prevalent than it was before irrigation, but Mr. Cornish doubts this, and marshals figures and arguments in disproof. He relies principally on the following facts: (a) mortality from fever is great in November, December, and January, months in which the north-east wind blows, charged with malaria, from the dense jungles through which it passes before reaching Godavery district; (b) fever mortality is just as high in the hilly parts of the district during these three months, as it is in the irrigated delta; (c) in five irrigated taluqs, the fever mortality for the past five years has been 8·12 per thousand, and in four non-irrigated taluqs 11·05 per thousand. These are stubborn facts in favour of Mr. Cornish's view that irrigation does not increase fever. He thinks we must look elsewhere, "to the highly malarious wind passing over unwholesome tracts of land, instead of sea." It is a noteworthy coincidence of opinion that the inhabitants of Kurnool attribute the great prevalence of malarious fever to the canal dug by the Madras Irrigation Company in that district.

Gantz's People's Almanac—Gantz's Pocket Book—Adelphi Press Calendar, published by Messrs. GANTZ BROTHERS, Madras.

THESE well-known publications have reached us, and we are glad to be able to say that these numbers in all respects come up to and in some respects surpass those that have been published in previous years. The *People's Almanac* contains a large amount of recent valuable matter in the Orders of Government concerning Privilege leave and Furlough, &c., and the book will prove valuable for reference to those in the Mofussil who are unable to lay their hands upon Gazettes and Government Orders. The corrections are made up to the end of the past year, and information is well up to date. A few errors exist in one or two places, as for instance in the *Almanac*, where we find that the 1st January (Monday) is said to be the Anniversary of the *Circumcision* or *The first Sunday after Christmas*. This, we conclude, has resulted from copying the *Almanac* of the previous year, when New Year's Day fell upon a Sunday.

The *Pocket Book* is a useful companion to business men; its contents appear to be an abridgment of that of its more ponderous brother above referred to, and it in turn follows the bad example set by its elder brother of making misstatements.

The *Adelphi Press Calendar* will prove a useful addition to the walls of offices. On a sheet of paper is displayed the *Almanac* in the centre, and the space around is filled in with matter important for office men to refer to when pressed for time, and who are prevented from consulting larger and more complicated works. We are much pleased with these publications, and for a small sum the public may become possessed of works which will be valuable to them as residents in the Madras Presidency.

MEDICAL MISCELLANY.

*A Medical Thermometer.** By E. SEGUIN, M. D., New York.

It is no secret that we have a *medical thermometry*, and, as yet, *no medical thermometer*. So far, physicians have borrowed their instruments from physicists, and with them, and an indomitable perseverance, have extracted the elements and principles of the new science from the chaos of figures juxtaposed as equivalents from Fahrenheit, Réaumur, and Centigrade. As on a battle-field, many lives have been sacrificed since five-and-twenty years, so in taking temperatures, reducing one scale into another, writing figures, drawing curves and diagrams, summing up the products of the most intricate traces into general laws of thermo-physiology, and special laws of thermo-pathology, which will pass, like so many victories, to posterity under the name of General Wunderlich and others, who evolved the truth from the million of observations of the thousand nameless observers.

This was good to begin with, in the heroic times of thermometry. But since this mode of diagnosis has become popular, we shall have to simplify its instruments and method of recording observations, to lower it to the vulgar heroism—heroism yet, after all—of the daily laborers in physic, who are willing to use the new method of diagnosis, provided it is made as expeditious as it already is effective. Let us, therefore, admire the monuments of the Titanic period of thermometry, like the Treatise of Wunderlich “On the temperature in Disease,” etc., but entertain no illusion as to its fate. If its instruments and procedures are not simplified, it will remain the privilege of a few hospital dictators, instead of extending its benefits to the whole profession.

The simplification must bear upon the instruments and upon the method of recording the data, and I would, unless better advice prevails, express the want of the profession in the matter thus:—

A. Medical thermometers; B. Medical scale of temperature, with plain writing, instead of drawings of the records of temperature; at least in private practice. Inseparability of the records of the three vital signs, temperature, pulse, breathing. These records

* Read before the New York Medical Library and Journal Association, 16th June, 1871.

written *en suite*, like any other form of observation, collected in septenary groups.

(a) Thermometers cannot be called medical so long as they do not fit the requirements of the profession. For one of these requirements we want to take the general and local temperature, therefore we must have a thermometer adaptable to cavities, and another to surface,—have not surgeons more than one knife?

(b.) For another requirement,—can thermometers really be called *medical* whose scale is not based upon the *thermal status of man*? In other words, what has the freezing point of mercury, or the melting point of ice, to do with our own calorificity? The second proposition enunciates the absurdity of the present situation.

Thermo-physiology has found the temperature of a healthy man to be at the axilla (a convenient and decent place, too) 98.6° Fahr. = 37° Cent., with due regard to the oscillations integral to life itself. Practically this is the 0° temperature of medical thermometry,—the *norme*.

Objections may be raised against taking this *norme* as the standard measure of the medical thermometer on account of the diurnal variations, the idiosyncrasies, or the differences between the results obtained by the fever thermometer in several cavities, and by the surface thermometer at distant points of the periphery; but they have less weight than those raised against taking the pulse at the wrist as the standard measure of the general circulation.

The only possible objection to this standard would be the eventuality of a future displacement of the thermal point of health.

This objection is serious, but not formidable. Indeed, such a displacement has already taken place, at least theoretically; since, in 1835, Brechet announced it to be 36.9° Centigrade = 98.5° Fahr.; and in 1871 we accept, on the authority of Wunderlich, 98.6° F. = 37° Centigrade as the basis of medical thermometry. (Are calendars less useful since their errors have been corrected?) Now, supposing the German calculation to be proved incorrect in its turn, what of it? The error could have come in two ways: Either Wunderlich, whom we trusted, did err, and his calculations in regard to the mean temperature of the human body, and his conclusions would be quashed (as were those of the Julian calendar); or the thermal conditions of man would have undergone some alteration which would have displaced our mean temperature lower or higher than the *norme* of Wunderlich, 98.6° F. = 37° C. If such possible alteration, ever so insensible in its march, should happen, the discrepancy between Nature and the standard measure would soon be detected. A new standard measure would be established, by transferring the *norme*—*zero* health—lower or higher

on the thermal scale; and eventually, by repeating this transference, to meet the changes of human temperature in the course of ages.

These successive norms of human temperature would stand like the pylones of Egyptian hydrometry, instead of impediments to progress—as the landmarks of the gradual decolorification of our race—a series of physiological monuments, unequalled by any other discovery for its importance upon the “Natural History of Man.”

There is a deal more to say on Physiological Thermometry, but I make haste to contract this note to the present engrossing topic, “thermometry rendered accessible to any conscientious physician, and through him to mothers and medical attendants.” For it is of no use to preach thermometry to the great mass of practitioners, whose time is mortgaged for bread to their families and charity to the needy, if, to apply the instruments, read, understand, and transfer their results from arithmetical scales to drawn traces, exacts an expenditure of hours to be found nowhere in their twenty-four.

Therefore, the question of taking and registering the products of clinical thermometry *in no time* contains in reality the *to be or not to be* of medical thermometry itself.

And it is almost equally useless for the family physician to ask a mother or nurse to take and note the temperature at stated hours, when his experience tells him that, in spite of the most minute explanations and directions, the minds of nine-tenths of them will not comprehend what their senses cannot perceive, viz., the correlation of a scale of temperature calculated upon the thermal conditions of water or mercury, with the scale of temperature of the human blood.

Therefore, the question of putting in the hands of mothers and nurses thermometers whose scale corresponds with that of human temperature, implies that of the possibility for the physician of having assistants or substitutes, wherever the study of temperature helps to solve the problems of life or death: that, too, is the *to be or not to be* of medical thermometry.

Under the pressure of this double dilemma, and in the faith that “*anything good must be possible*,” I have caused a *meter of human heat* to be made, which is neither Fahrenheit’s, Réaumur’s nor Celsius’ instrument. Let it be called by its destination, “The Medical Thermometer,” whose zero temperature corresponds to the average health-point of the human body, whose (centigrade) degrees run up for fever, and down for depression of vitality, with minor divisions of a fifth of a degree, themselves easily divisible by sight in tenths. Let us now see how it works.

The physician, having warmed it in his hand or pocket almost to zero (more if it is the fever, less if it is the surface instrument),

sees either mark the temperature looked for in two or three minutes, two more being added to make sure of the result.

Or if he leaves it to an attendant, with instructions to use it at stated places and times, he first makes him familiar with the zero standard of health ; then with the fever significance of a rise above zero ; then with the warning of depression expressed by the fall of the mercury below zero ; and finally with the writing of the temperature *just as it reads on the stem* of the instrument.

With mothers it is different ; I think it our duty to teach every one of them among our patients who can be taught, not only the use, but the philosophy of prophylactic thermometry ; by which they would be rendered competent to foresee, and often to ward off, perils that the thermometer predicts always several hours in advance, as the barometer does the storms. Then let the hour of family trials come, zymotic or contagious diseases invade the home circle, and by your side you have the faithful woman. Neighbours, quacks, and mediums proffer in vain their nostrums, she stands by her thermometer, knowing that a calm record of a day's fever brings more hope than a dishevelled therapeutics.

B. After a medical thermometer, the next desideratum was "a mode of recording the temperature so simple that almost anybody could write it *as it passes* on the instrument." The mode of recording the temperature by waves of lines may remain the favorite for hospital records, but for private practice and for the study of isolated cases it is desirable to have a direct transfer of the figures of the thermometer written *en suite* like book-matter. This is what I have aimed at. It is no invention ; a simple arrangement of the symptoms in their chronological order, susceptible of improvement at the hand of any one desirous of spreading the art and practice of medical thermometry. There it is in blank forms. (See page 58.)

The first line is given to number, name, age, sex, and septenary. The second is divided in seven cells for the numeration of the septenaries, beginning with the first of the disease. The third line is divided into fourteen cells for the morning (M) and evening (E) observations, besides a supplementary cell for the sum of the temperature of this septenary ; each record is written under the day of the disease it belongs to, eventually leaving blank several of the first days of the disease which have not been observed.

These records run up and down the zero line of health, which separates horizontally in two this third division, exactly as the temperature passes up and down the zero point in the thermometer itself. On this double line can be read, at one glance, the daily remissions and exacerbations, the acme or the collapse, the effervescence and the deservescence, besides the possible relation of the latter phenomena to the doctrine of the crisis. (To use this line to record the surface thermometry, the M and E are altered into the

initials of the two points of the surface under comparison) The fourth line, divided in eight cells, gives the daily average of the observations recorded in the third, *plus* the septenary average. The fifth line records the pulse, and the sixth the respiration. Every new septenary comes *en suite* of this, without repetition of the headings, of course.

The plan of this diagram, which embraces (a) the temperature, (b) the pulse, (c) the respiration, (d) the critical periods, will be found acceptable; but its material arrangement may and must be improved by practical men; I know it and wish it.

However, leaving the details to take care of themselves, I conclude. Thermometry is the question of the present hour; towards it all foreseeing eyes are turned. It is ineluctably wedded to medicine by its force of prognosis and diagnosis. By the mathematics of its data, and the positivism of its method of observation, it has already discovered the normal point of human health, some laws of general pathology, and not a few of special diseases. Higher, it has identified physiology with the other physical sciences, by rendering mathematically demonstrable the degagement of heat by muscular movement, the influence of the nervous system on the production of warmth, and the convertibility of human heat into physical and intellectual activity.

This and more has been done, in a few years, by a few men, with instruments made for another kind of work. But who knows what medical (human, must I say) thermometry could do, when the simplicity of its procedure, the adaptability of its instruments, the number of its devotees, will permit its application, not only to the treatment, but to the prevention of disease, and especially to the high supervision of the training of the youth, in reference to the dosing of air, moisture, heat, light, food, exercise, studies, in the sickly conditions of the growing stage. Then we will begin to understand that, for physicians, thermometry is not only knowledge, but social power.

But I must end here, just where the subject-matter of thermometry begins to assume its grandeur.—*N. Y. Med. Record.*

No.	NAME.	AGE.	SEX.	DISEASE.	SEPTENARY.				
	DAYS.	I	II	III	IV	V	VI	VII	1st.
	Fever.	M—E—M—E—M—E	M—E—M—E—M—E	M—E—M—E—M—E	M—E—M—E—M—E	M—E—M—E—M—E	M—E—M—E—M—E	M—E—M—E—M—E	Total up.
	Zero Health	—	—	—	—	—	—	—	
	Depression	—	—	—	—	—	—	—	Total down.
	Temperature.	—	—	—	—	—	—	—	
	Daily average.....	.....	.....	.....	.....	.....	.....	.....	Average of temperature.
	Pulse.....	.....	.....	.....	.....	.....	.....	.....	Id. of pulse.
	Respiration.....	.....	.....	.....	.....	.....	.....	.....	Id. of breathing.

—N. Y. Med. Record.

A Case of Acute Atrophy of the Liver, with Remarks. By
W. M. CHAMBERLAIN, M. D., New York.

THE following history is incomplete in many points connected with the scientific inquiries which it suggests. The extreme rarity of the disease, and the peculiar circumstances of its invasion, prevented the early recognition of its essential nature. Thus, while the therapeutic indications were fairly met, the pathological elements were not fully appreciated until the autopsy had been made, and it was then too late to recover them.

Perhaps enough of interest remains to warrant publication. The reader, who may desire to pursue the subject, is referred to

Rokitansky ; Path. Anatomy ; Bd. iii.

Lebert ; Ueber Icterus Typhoides ; Virchow's Archiv. 1854.

Frerichs ; Diseases of Liver. Sydenham Soc. Ed.

Bollinger ; Deutsches Archiv für Klin. Med., Dec. 1868.

Kohts ; Icterus bei Phosphorvergiftung. Deutsches Archiv für

Klin. Med., December 1868 ;

and to the chapters of Budd, Niemeyer, and Murchison.

Mrs. C., a married lady, 22 years old, healthy and well developed, about 5 ft. 2 inches in height, weighing from 120 to 130 lbs., had reached the middle of the ninth month of her second pregnancy, without any special disturbance of her health.

Her previous confinement occurred during the progress of an attack of diphtheria, and was not under my observation ; but it is said that for several weeks afterwards she suffered from an extremely irritable stomach, and for a long time rejected almost all the food which she took.

She lived in a cleanly and elevated portion of the city, in a well-appointed house, and no local or contiguous sources of disease were noted.

On Friday June 23rd, she took a considerable walk, and on Saturday was much occupied with her domestic affairs. On Sunday she began to suffer from a diarrhœa, with tenesmus, and on Monday the 26th I first saw her at 9 A. M.

The dejections were of a light drab color, contained no blood and but little mucus. They were neither large, frequent, nor very fluid ; but the tenesmus was quite urgent. There was marked heat of the skin, acidity of the stomach, gastralgia, and thirst ; pulse about 120. No notable error in diet, or anything which should have caused a catarrhal attack, was reported.

The urine was abundant and apparently normal ; being carefully boiled and treated with a third of its bulk of strong nitric acid, no albumen was found. Slight effervescence, with ammoniacal odor

and deepened color, indicated an excess of urates. Believing that the symptoms indicated a sympathetic irritation from pressure of the uterus on the lower bowel, she was advised to keep the recumbent position with hips raised on a pillow, to drink Vichy as an antacid and diluent, and a suppository of a quarter of a grain of morphia was placed in the rectum.

She was much relieved, and slept well on Monday night, and on Tuesday morning was comparatively comfortable; but the pulse remained high, and there had been three or four movements of the bowels, preserving the characters above named. The treatment was continued, and occasional five-grain doses of Dover's Powder were added. Having spoken to her of the possibility that labor might be hastened, I was not surprised on Wednesday morning at 8 to be informed that it had begun. Nothing appeared unusual when I first saw her on that day, except the pulse, which was 120, full and soft—and the temperature, which was 103°. On remarking this, her husband informed me that he had often counted her pulse at 85 when she was perfectly well and calm, and that it became rapid with every slight disturbance. Her pains increased in frequency, were not remarkable for force; but by 10 A. M. were attended with unusual suffering, and chloroform was employed, 15 or 20 drops at a time at intervals from 10½ to 12. She was never entirely unconscious. At 12½, dilatation being complete and the head in the basin, the membranes were ruptured, and delivery followed with the third subsequent pain. Labor was thus comparatively brief, and unmarked by any complication. The child, a small male, not evidently premature, did not breathe well, and was allowed to remain attached to the undelivered placenta for fifteen minutes or more, while various methods were employed to stimulate his respiration. Finally the after-birth was delivered with but little hæmorrhage; the uterus contracted firmly; the patient was thoroughly bathed and changed.

The condition of the child continued so unsatisfactory that I remained for two hours in attendance on him. Then returning to the mother I found her very restless, complaining of pain in the bowels, with a hot skin and a pulse of 120. The uterus was small and firm, the flow moderate—the after-pains slight. Surprised at the return of a disease whose exciting cause had, as I thought, been removed, I directed a suppository (¼ grain of morphia) to be placed in the rectum, and the compound powder of ipecac. in five-grain doses once in three hours. At 8 P. M., finding her much relieved, I left her for the night, with orders that the powders should be continued; and if there should be much pain, the suppositories also employed. She had in the three preceding days used several of the latter, and knew their composition and their effect. During the afternoon there had been two rather free movements of the bowels, which seemed unusual, but presented the same appearance as those

which preceded labor. There were three more considerable evacuations during the night. Fifteen grains of Dover's Powder were administered, and four suppositories introduced, but the nurse asserts that two of them were immediately returned undissolved. Thus she retained $1\frac{1}{2}$ grs. of powdered opium and $\frac{1}{2}$ gr. of morphine—perhaps the equivalent of $4\frac{1}{2}$ grs. of opium, between 8 P.M. and 4 A.M., being sleepless and in pain—which was referred principally to the rectum. - I saw her at 7 A.M. Thursday. She was apparently semi-narcotized; the pupils equally and strongly contracted; respirations from 9 to 12 per minute; pulse 100; temperature 102° . Sleep was continuous, if undisturbed, but she would answer every question, however quietly spoken, and maintain indefinitely a perfectly rational conversation in well-chosen and clearly articulated words, with many little turns of wit and fancy; then she would sleep again, and when roused say that she was "very tired, but free from pain."

Diarrhoea appeared to be suspended; the bladder had been twice evacuated during the night; lochia scanty; uterus firm; no tympanitis or tenderness on pressure. It appeared as if she had taken a full dose of opium, much to her advantage; but as the last instalment had been given three or more hours previously, its effects would probably soon begin to pass away. There was some nausea and much pruritus, particularly about the nose. She remained in this condition all day—the effect of the morphine just about as manifest at 4 P.M. as at 7 A.M., the nausea gradually increasing; two movements of the bowels only.

At 7 P.M. Drs. Livingston and Stephen Rogers saw her in consultation. No definite theory of the disease was established; an expectant attitude maintained; no apprehensions of a serious nature were felt by us. Coffee was given by the mouth, and $\frac{1}{80}$ th of a grain of atropine hypodermically. It was believed that the diarrhoea and tenesmus were sufficiently controlled for the time, as but two or three evacuations had taken place through the day, and that the effect of the morphine would pass away during the night.

The lochia were very scanty; no urine had been passed since the early morning. It was therefore drawn by the catheter, and found to be scanty, feebly acid, and dark-colored. The mind remained perfectly clear; the pupils had returned to nearly normal size; somnolence was less marked, but nausea more urgent. An intense acidity of the stomach was complained of; the fluid vomited was very dark-colored, and grew more abundant and darker as the night went on, until it resembled clear and strong coffee, but contained no gummy or granular matter.

Sinapisms to the epigastrium—lime-water with milk, ice, and iced champagne and brandy, failed to prevent a return of intense retching about every two hours, and toward morning I gave her a few

whiffs of chloroform as each paroxysm approached. This seemed to relieve her most.

On Friday morning there was well-marked icteric stain of the skin, sclerotic, and of the scanty urine; there was a sense of great prostration and oppression without any acute pain, the mind remaining clear and hopeful. In consultation the prognosis was thought to be very grave. As the day advanced, the pupils grew unnaturally wide open, the pulse accelerated and weakened; there was marked coolness of the surface; at 4 P.M. the temperature had fallen to $96\frac{1}{2}^{\circ}$ the skin icteric, with dark mottling. Prompt and thorough stimulation by dry heat, friction, etc., had but temporary good effect. An ounce and a half of brandy was given in small instalments, and, by quelling the efforts at vomiting with chloroform, it was retained. Up to this time, questions were answered promptly, and generally correctly; but now paroxysms of maniacal excitement, with much jactitation, began, and grew constantly more severe. Nothing but chloroform exercised the least control over them. A few inspirations from an open handkerchief sufficed, and it was administered about every half-hour during the night. The vulva had been assiduously fomented through the whole day, but the lochia were absolutely suspended, catheter brought but an ounce or two of dark urine. There had been occasional discharges per rectum through the day.

Dr. Jacobi was added to the council. The urine was again tested with heat and nitric acid, and now showed a moderate amount of albumen. Dr. Rogers reported, from the microscopic examination of a previous specimen, the presence of a few epithelial casts; and of the vomit, that it did not contain a single blood corpuscle. It was sufficiently evident that some animal poison was disturbing all the centres of life. She had taken little or no food since the beginning of the attack. It was now quite sure that she would vomit whatever might be introduced by the mouth, and return whatever might be placed in the rectum.

There seemed to be small prospect of advantage from any form of medication. The abdomen and back were encircled with a large fomentation of Fol. Digitals, covered with oiled silk. The jactitation was so incessant and extreme that this was removed after two hours, in the last of which there were two profuse and thin movements from the bowels, without any apparent effect upon the maniacal excitement. Chloroform was continued, being administered at intervals of half an hour through the night until morning, when mania was gradually replaced by coma.

Daylight showed intense icterus, with purplish patches on the neck; frequent regurgitations of black vomit occurred, the facial and laryngeal muscles successively became paralyzed, catalytic heat was developed, the surface was bathed in warm perspiration, the

pulse was large through the morning, but became irregular in the afternoon; a slight convulsion occurred at 6 P. M., and she died at 8.

Autopsy at 2 P. M. Sunday, 18 hours after death, and 16 hours after the ice envelope. Examination of the abdomen only permitted. Present: Drs. Livingston, Rogers, Jacobi, Noeggerath, Pooley, and myself. Rigor mortis moderate; skin of a light orange color; abdominal fat very yellow; abdominal muscles of a dark red; cavity of the abdomen quite dry; peritoneal surfaces every where smooth and glistening; no lymph; no adhesions; large omentum beautifully spread over the intestines, in which there was a moderate amount of air. There had been no post-mortem purging, and there was no fluid in the large intestine.

There was more fluid and less air in the small intestine. The stomach was half filled with fluid, and capped by the liver, which had rounded itself backward beneath the diaphragm so as to be entirely out of sight. Removing the stomach, it was found to contain two or three pints of fluid like the vomit of the two preceding days—the same in the duodenum and jejunum. The internal coat of the stomach was free from disease—neither capillary injection nor softening.

The liver was of a lighter color than normal, its surface smooth, not wrinkled, its substance a little less firm than natural. It weighed 2 pounds 8 ounces avoirdupois, or 40 ounces. The weight of the body being about 120 pounds, that of the liver was as 1 : 48. [Bartholin gives the relative weight of healthy livers as 1 : 36, Haller, 1 : 25. Frerichs asserts that it may vary in healthy human subjects between 1 : 17 and 1 : 48, and Bidder & Schmidt find a variation in healthy animals of from 1 : 14 to 1 : 38.] On section, the cut surface was of a generally light color, the lobules not well defined, but the centre of each was marked by a blackish stain in the situation of the intra-lobular vessels. The conditions of firmness, color, etc., were nearly uniform throughout; but the whole organ was thin, and the left lobe particularly so. The spleen rather small, lobulated, firm, normal color. Mucous surface of intestines healthy, as far as examined. Uterus firm, globose, rising two inches above the crest of the pubes; cavity lined with a dark smegma, the surface beneath being quite smooth, the site of placental attachment hardly discernible. Broad ligament, ovaries, and bladder normal. Kidneys, normal size, firm, dark-colored; section showing the cortical substance well defined from the tubular, but the calyx of each Malpighian cone showed beneath its lining membrane a chocolate-colored extravasation, following up nearly to the cortical substance [identically described by La Roche as an occasional lesion of yellow fever].

In the left kidney a little catarrhal semi-purulent fluid could be expressed from the tubes. From the microscopic examination of

the liver Dr. Jacobi reports, "Hepatic cells much shrunken, enveloped and compressed by young cells and connective tissue, and an excess of oil-globules." Dr. Rogers reports:—"Hepatic cells broken down, enveloped in oil-globules of various size, their nuclei wanting." Probably Dr. Rogers' section was from a portion further advanced in disease.

A certificate was rendered—"Death by Cholæmia and Uræmia from Acute Atrophy of the Liver."

We have here death after six days; with icterus, black vomit, coma, suppression of urine, and extravasations into liver and kidneys, with a distinctly febrile invasion. Thus the case is sufficiently assimilated to yellow fever to have passed unquestioned as a typical case of that disease if it had occurred in the course of an epidemic (vid. La Roche on Yellow Fever). Had the patient taken a poisonous dose of phosphorus there would have been essentially the same ante-mortem and post-mortem phenomena (according to Bollinger and Kolts, *Vide Deutsches Archiv für Klinische Medicin*, December 1868). The same post-mortem appearances result from icterus rapidly developed in the course of typhus or scarlet fever, or pyæmia (Murchison and Budd on the Liver). Also from poison of serpents (Budd), and from an intense local malaria (vide report of four cases occurring all in one family and one house in Limerick, Ireland, in 1834, copied by Budd; and the epidemic of 1858 in the island of Martinique, mentioned by Murchison.)

From the cases of acute atrophy of the liver detailed by Frerichs, it is distinguished by the slow approach of the cerebral disturbance, here confined to the last three days; while it is in most other respects quite similar, particularly in the microscopic elements of the liver. It is to be regretted that the existence of tyrosine and leucine was not suspected, and therefore not demonstrated.

The decrease in size of the liver does not appear to be strictly pathognomonic; as the liver of inanition after stricture of the œsophagus is considerably smaller (Frerichs). "It is a question, whether the condition of the liver in acute atrophy be the cause of all the formidable symptoms with which it is associated" (Murchison).

"The secretion of bile may be suppressed, and the secreting substance of the liver more or less disorganised, without any process of inflammation; these may result from powerful and depressing emotions, more frequently are produced by some poison, introduced from without or engendered by faulty digestion or assimilation" (Budd).

Frerichs has collected reports of 31 cases, of which 26 were under 30; 22 were females, and 11 were pregnant females, all of whom aborted in the course of the disease. Thus, youth, the female sex, and pregnancy are clearly predisposing causes, and abortion of pregnant females a nearly uniform consequence. Pro-

fuse uterine hemorrhage attended several cases. Similar observations are made by Scanzoni and Kitwisch and Lebert.

With regard to prognosis, Frerichs says it "almost invariably terminates in death." Murchison, "All treatment has hitherto been found unsatisfactory."

Acute atrophy of the liver is a rare disease, or at least seldom diagnosticated.

Murchison found but one case in 15,000 admissions to the London Fever Hospital. Frerichs has been able to collect from all literature but 31 cases. Prof. Loomis has seen one case.

It is worth remark that the child in this case, at the end of a full month, remains icteric, with costive bowels, a tendency to heavy and prolonged sleep, and a strong sulphurous odor exhaling from the skin. These conditions are now slowly passing away, it nurses well, and is gaining weight.—*N. Y. Med. Record.*

A Simple Dressing for Fracture of the Clavicle.

DR. LEWIS A. SAYRE, of New York (*Am. Practitioner*), has finally reduced the treatment of this fracture to *two strips of adhesive plaster, without any axillary pad*; and as such he now gives it to the profession as the simplest and most efficacious plan yet devised.

His method of keeping the inner portion of the clavicle from riding over the outer portion is by *putting the clavicular portion of the pectoralis major muscle on the stretch*, and compelling it to *pull the clavicle in place*, and thus overcome the tendency of the clavicular portion of the sterno-cleido-mastoid to elevate it, which it will always do unless this precaution is taken. After drawing the arm backward and retaining it there by a strip of adhesive plaster, pass another piece of plaster from the *well shoulder across the back*, and by pressing the elbow well forward and inward, the first plaster around the middle of the arm is made to act as a *fulcrum*, and the shoulder is necessarily carried *upward, outward, and backward*; and the plaster, being carried over the elbow and forearm (which is flexed across the chest) to the opposite shoulder, the place of starting, and then secured by pins or stitches, permanently retains the parts in position.

Dr. Sayre formerly commenced the first plaster on the inner side of the biceps; but he found that that muscle would roll around and the plaster would lose its hold, requiring to be renewed occasionally; and if it completely encircled the arm for the purpose of a stronger attachment, it would arrest the circulation, and thus prove dangerous.

He uses strong and good adhesive plaster (Maw's moleskin is the best) cut into two strips, three to four inches wide (narrower for children). By this plan of treatment the patient is only detained from his daily avocation a sufficient length of time to properly adjust the strips of adhesive plaster.

In one instance a prominent lawyer of New York City slipped upon the ice and fractured his clavicle on the way down-town. He was brought to his office. Dr. Sayre dressed him in the manner described at 9 A.M., and before 11 he was pleading his case in the open court. A blacksmith was brought to his office with a fracture of the left clavicle. He dressed it and in less than an hour the patient was again working at the forge with his other arm, and continued his labor without any interruption. In both cases the union was perfect and without any deformity. In closing, Dr. Sayre could multiply these cases by many similar ones, and he therefore feels quite confident that if any surgeon will follow the plan suggested, he will have equally good results.—*Ib.*

Cholera. Sir T. WATSON'S Views.

The *British Medical Journal* has published, from advanced sheets, Sir Thomas Watson's "Lecture on Cholera," of which we proceed to give a full account.

The learned lecturer is of opinion that very few of the original doubters remain unconverted to the doctrine which Sir Thomas held from the beginning, that epidemic cholera is *catching*—results from a material poison which is portable, capable of being conveyed from place to place, of being communicated from person to person and from inanimate substances to which it clings, food, furniture, clothing; that the morbid matter floats in the air and is wafted by its currents. He agrees with Dr. Baly that, when it travels over distances, it uses the vehicle of human intercourse, but that it may be diffused over shorter distances—as from either extremity of a town, or from a tainted port to a ship anchored to leeward—by the movements of the atmosphere. Long migrations of the disease are not made rapidly, and its rate of progress seldom exceeds the modern rate of human travelling. Its primary appearance in an island or a kingdom is always at its outer boundary. In the statistical report of the Royal Navy, published in 1858, Dr. Bryson says, "The medical records of the Royal Navy have been searched in vain to discover one instance in which either cholera-morbus or yellow fever made its appearance amongst a ship's company, unless one or more of the men or officers had previously—within at most twenty-one days—been exposed in some house, ship, or locality

where the infectious virus, which emanates from persons ill of the one or the other of these diseases, existed. The spontaneous origin of either malady far away from an infected locality is unknown in the naval service."

That the atmosphere forms one vehicle of infection seems proved by many incidents. At Constantinople it was observed, in 1865, that while the cholera raged there the sea gulls, which used to fit over the waters of the Bosphorus, deserted it, nor did they reappear until the disease had departed and the atmosphere became pure. During the time of the first epidemic (1832) a Westport correspondent of the Dublin *Morning Register* stated that, in the demesne of the Marquis of Sligo, near Westport house, there had been a large rookery. On the first or second day of the appearance of cholera there, all the rooks disappeared, and, during the three weeks that the epidemic raged in the district, did not return to their lofty habitations. Immense numbers of them were found lying dead on the shore near Erris, about ten miles distant; and, upon the decline of the malady, several of the old birds resumed their stations in the rookery, but some of them seemed unable, from exhaustion, to reach their nests. A proof that the air may be the vehicle of infection, and that the poison may enter the lungs with the breath, is furnished by the story of the two pilots who were stricken in consequence of having their open boats towed, by a ten-fathom rope, at a considerable distance astern of the steamship *England*, on board of which cholera raged, neither of these men had been on board the vessel, both took cholera, both transferred the disease to their families and to Halifax, where it had not appeared for many years previous. Still it seems doubtful whether the disorder can become epidemic except in certain conditions of the atmosphere.

Mr. Glaisher states that, in London, "the first three epidemics were attended with a particular state of the atmosphere, characterised by a prevalent mist, thin in high places, dense in low; during the height of the epidemic in all cases the reading of the barometer was remarkably high, and the atmosphere thick; in 1849 and 1854 the temperature was above the average, and a total absence of rain, and a stillness of air accompanied the progress of the disease. In places near the river the night temperature was high with small diurnal range, a deficiency of electricity, a total absence of ozone, probably destroyed by the decomposition of the organic matter with which the air was charged." There is no ground for ascribing cholera to the absence of ozone, except in the sense of there not being a sufficient quantity of it in the atmosphere to counteract all the poisonous miasm which actually produces that disease. The total absence of ozone affords presumptive evidence of the presence of atmospheric impurities, but atmospheric impurities

cannot generate cholera unless the specific exciting poison be present. In the autumn of 1859 the Thames stunk horribly, yet we had no cholera, and there is good reason to believe that this poison can never *create* a spreading pestilence unless it meet with a congenial atmosphere—the foul air lends force and diffusion to the poison, and aids or causes its increase.

The late Dr. Snow was the first to broach the notion that the poison may be *swallowed* with the food we eat, or the liquids we drink, and its multiplication take place within the system, whence by the alimentary canal a new and abundant stock of it is voided. The rice-water excretions, colourless and nearly odourless as they are, may, without notice, adhere to our food during its preparation or its consumption, and the disgusting fact has been revealed to us by the microscope, that the water of some of our public companies habitually contains visible particles of human ordure. Mr. Simon reported to the Board of Health, as the result of the enquiry founded on Dr. Snow's theory, that "the population drinking *dirty water* appeared to have suffered three and a-half times as much mortality as the population drinking other water." The propagation of the disease Mr. Simon considers due to excremental pollution; excrement-soiled earth; excrement-reeking air; excrement-tainted water; and adds, that the local conditions of safety are appropriate structural works, complete removal of faecal impurities, and pure untainted and uncontaminated water. Sir Thomas considers our knowledge of the morbid anatomy of cholera more complete during the last epidemic, drawing his conclusions from the *post-mortem* inspections made by Drs. Parkes, Johnson, and Sutton. In cases of death from collapse, when an early examination is made, the lungs are shrunken, dry, pale, and light, in a word, unnaturally bloodless. The left ventricle of the heart is contracted and nearly empty. The right cavities, the trunk of the pulmonary artery, and the systemic veins, are much distended with blood; the mucous membrane of the intestines are pale, and free from congestion. In some cases the lungs, though light in weight, may be dark in colour, which gives them the appearance of congestion; this colour Dr. Johnson refers to a backward engorgement of the bronchial veins and capillaries, consequent upon the block in the pulmonary artery, and its branches. When death occurs during incipient and imperfect re-action, the morbid conditions disclosed by dissection are the reverse of the foregoing, for the lungs *are* congested, sometimes inflamed, and the mucous membrane of the intestines loaded with blood. These points bear upon the pathology of the disease, and upon its true pathology rests its rational treatment.

There are two conflicting theories as to the pathology of cholera, and there are two conflicting principles which accord with and flow

from these theories, as to its proper treatment. Upon this momentous problem of treatment the final appeal must be made to experience.

It is acknowledged that the primary and special danger in cholera lies in the period of collapse, and it was a natural and plausible theory which attributed collapse to a drain upon the blood by profuse and repeated fluxes from stomach and bowels, whereby the blood being robbed of its more liquid ingredients, and made thick like tar or treacle, became incapable of flowing freely, if at all, through its natural channels, and thus the circulation, coming ultimately to a stop, life stopped also; so the practice put in force was to arrest the destructive flux by astringent drugs and by opium, to urge on the lingering circulation, and to restore the spent strength and the lost animal warmth, by alcoholic and other stimulants. Upon similar grounds was advocated the dilution of the thickened blood by water injected into the veins. On the other hand it is affirmed that collapse is not due to excessive discharges, but that these discharges eliminate the cholera poison, or its products, from the body, and are to be encouraged rather than checked; consequently, that astringents and opiates are partially hurtful. Now, were the first theory the true one, there must exist a relation between the alleged cause and the effect of it; therefore, the greater the intestinal discharge the more decided should be the resulting collapse. But no such proportion has been discovered; nay, the very reverse often obtains, and the most hopeless are those cases where collapse has followed absence of, or very scanty discharges. Again, if collapse were owing to the drain on the blood, it would be prolonged, and become more perilous by the continuance of those discharges; whereas it is a notorious fact that patients emerge from collapse and recover, the evacuations continuing throughout. But in cases where evacuations stop during collapse, a fatal result generally follows. Dr. Parkes states that "exclusive of the mildest form of the disease, a case with little vomiting or purging is more malignant and rapidly fatal than when these prominent symptoms are present."

Tested then by the evidence of acknowledged facts, this theory must be pronounced a failure, and the treatment founded upon it a mistake!

A fallacious analogy has been assumed between the collapse of exhaustion arising from a drain upon the blood, and the collapse in cholera. Only in one point (the smallness and weakness of the pulse) are they analogous, in every other point they differ widely. A person exhausted from loss of blood, or from a continued drain upon that fluid, may be in a state bordering on syncope, if he assumes the erect position he may faint and become unconscious; but in the collapse of cholera, a patient with death stamped upon

his features, with no pulse at the wrist, and a blue and icy-cold skin, may be able to walk his room and perform many of his usual functions,—at the peril of his life, it is true, but the fact of his capability proves there is an essential difference between cholera collapse and ordinary syncope: The exhausted man, if he recovers, does so slowly, and with the repair of his impoverished blood. The cholera patient rallies at once, if at all, from his collapse. Again, the coldness and faintness of exhaustion are relieved by wine and brandy, but in the collapse of cholera alcoholic stimulants do not warm or invigorate, even for a moment, but seem to make matters worse, to draw blood from a person fainting from exhaustion may ensure death. Blood-letting in cases of collapse has sometimes afforded marvellous relief.

To Dr. George Johnson is justly due the great merit of having, by persevering efforts, established the worth and efficacy of the evacuant or cleansing practice in cholera. He holds, like many before his time, that the phenomena of cholera result from the entrance of poison into the blood, where it probably undergoes, like small-pox, a process of self-multiplication, and destroys some of the blood constituents, which are ejected through the mucous membrane of the alimentary canal. The feeling of oppression and *malaise* sometimes experienced before the bowel symptoms are indicative of blood poisoning. The discharges are expressive of the efforts of Nature to throw off noxious material, and consequently a necessary part of the process of recovery, and by checking the excretion, the risk of fatal collapse is increased. If "elimination" be Nature's method and condition of recovery, art may help it by the cleansing, and hinder it by the astringent treatment.

What is the explanation of the contrast between the anæmic condition of the lungs, and the gorged condition of the trunk of the pulmonary artery and systemic veins, as observed after death, during collapse, and the sudden arrest of the stream of blood in the small arteries before it reaches the capillaries? Were the arrest of motion due to gradual thickening of the liquid portion of the blood, it would be found stagnating in the capillaries, as well as in the arteries. Bear in mind the one characteristic symptom of cholera which renders it a disease truly to be dreaded—cramps in the large muscles of the body—produced, we may assume, by the choleraic poison, just as they are produced by the poison of strychnine. Dr. Johnson supposes that a similar spasm, or cramped state of the muscular fibres which embrace the minute pulmonary arteries, is caused by the same choleric poison, and bars these slender channels against the advancing blood. The thickening of the blood is a consequence, and not a cause of arrested circulation and collapse. Precisely the same blood thickening occurs as a result of the impeded circulation through the lungs, which is associated with long-

continued, extreme and fatal apnoea. The true explanation of the fact that diarrhoea does not cause thickening of the blood, is probably—as Dr. Johnson suggests—that water is rapidly absorbed from the soft tissues to take the place of that which escapes from the alimentary canal. Acting on this principle of physiological hydraulics, we remove a dropsical accumulation by the action of hydrogogue cathartics. Dr. Johnson does not propose to excite discharges from the mucous surface of the digestive organs, but to facilitate the removal of matters lodged there, by emetics, by draughts of tepid water, and other diluents, and by castor oil, of which the action is both speedy and gentle.

Sir Thomas continues: “When I last spoke on this subject, I stated that the few recoveries that I had seen took place under large and repeated doses of calomel, but that I could not affirm that the calomel cured them. At present I am much disposed to believe that by this cleansing action, the calomel may have helped recovery, and after all I have since seen, heard, read, and thought on the matter, I must confess that in the event of my having again to deal with the disorder. I should feel bound to adopt in its generality the evacuant theory and practice, and to avoid alcoholic stimulants and opiates.”—*The Doctor.*

MEDICAL INTELLIGENCE.

Papers for Examination of Asst. Surgeons I. M. D., prior to promotion, August 1871.

MEDICINE.

1.—Describe the symptoms, pathology, and treatment of the different forms of sunstroke.

2.—Enumerate all the symptoms indicating the formation of abscess in the liver, the various modes of spontaneous evacuation, and the medicinal and surgical treatment of the disease.

3.—The most frequent causes of acute tubular nephritis, the symptoms and mode of cure.

4.—The differential diagnosis between Pleurodynia, Inter-costal Rheumatism, Pleurisy, and the early stage of Lobar Pneumonia.

5.—Mention the various morbid conditions which may lead to the occurrence of ascites, and describe the treatment according to the cause.

6.—Describe the different forms of Facial Paralysis, and the treatment of those cases which are due to extra-cranial affections.

SURGERY AND SURGICAL ANATOMY.

1. Enumerate the structures you cut through in an amputation at the ankle joint.

2. Give the chief distinguishing marks between fracture of the neck of the femur (external to the capsule) at its neck, dislocation and bruise of the hip joint.

3. Mention the structures of which external and internal piles are composed, and give the appropriate treatment of these two forms of the disease.

4. Give the differential diagnosis between syphilitic and idiopathic non-syphilitic iritis, and their appropriate treatment.

HYGIENE.

1. State the principles on which a diet scale should be constructed, and apply them to the circumstances of European prisoners in India.

2. What positions are to be avoided in the selection of a site for a permanent cantonment ?

3. What are the most important impurities of potable water, and how are their presence and amount ascertained ?

4. What are the means of ventilation, and which of them are most useful in India ?

PATHOLOGY.

1. What are the pathological lesions to be found in a case of acute and chronic dysentery ? and compare these with the ulcerations to be found in enteric fever, and in tubercular infiltration of the intestines.

2. Describe the "amyloid" or "depurative" form of degeneration.

3. Give an account of the changes which occur in the structure of the liver in the condition known as cirrhosis.

4. With what diseased conditions are the various forms of hypertrophy of the heart found, and describe the manner in which these hypertrophies are produced.

By order.

G. BIDIE, M. B.,

Secy. to Inspector General, I. M. D.

(General Orders by the Governor in Council.)

Leave and Allowances.

The 1st August 1871.

No. 2440.

The rules respecting acting allowances at present in force in the Civil Departments are herein arranged and published in the form of a Code.

(2.) All previous notifications and orders respecting acting allowances, except Section XXXI. of the Covenanted Civil Service Leave Code, are hereby abrogated. Future rulings will take the form of additions and corrections to this Code.

DEFINITIONS AND EXPLANATIONS.

Section III. (a)—The “pay” of an officer is as follows:

(1.) In the case of an officer with a substantive appointment: the amount which he would receive monthly under any of the following designations if he were doing the work of his substantive appointment:

Substantive pay.

Consolidated pay.

Military pay and allowances, and Staff salary.

Staff corps pay and staff salary.

(2.) In the case of an officer without a substantive appointment: his subsistence allowance (if a Covenanted Civil Servant,) and his military pay and allowances or staff corps pay (if a military officer.)

(b)—“*Progressive Pay*” is pay which rises from a minimum to maximum.

(c)—“*Salary*” is the sum of “pay” and “acting allowance;” it does not include personal allowances, travelling allowances, or the like.

(d)—“*Consolidated Pay*” includes military pay and allowances or staff corps pay, which cannot be separately drawn.

(e)—“*Staff Salary*” is an allowance to a military officer in addition to the military pay and allowances or the staff corps pay of his rank.

Section IV.—Unless there be something repugnant in the subject or context, “*appointment*” means “appointment in which an officer is officiating for an absentee.”

Section V.—An “*absentee*” is an officer absent, whether on leave or on duty, from an appointment on which he has a lien.

GENERAL RULES.

Section VI. (a)—The maximum salary of an officiating officer shall be the pay of the appointment.

(b.)—The minimum salary of an officiating officer shall be half the pay of the appointment.

Section VII. (a)—If the pay of the appointment is progressive, the maximum salary of the officiating officer shall be the pay which he would from time to time receive, if he held the appointment substantively, non-continuous periods

of tenure being counted towards his increments ; and the minimum salary shall be half the said pay.

(b)—If the officer's pay is not less than the minimum pay of the appointment, he is entitled to the maximum salary stated in clause (a).

(c)—The officer is entitled to count towards the increments any period in excess of one year, immediately preceding his officiating appointment, during which his pay has not been less than the minimum pay thereof: Provided that not more than one year shall be so counted.

NOTE.—This section does not, without a special order of the Director-General, apply to cases arising in the Post Office Department.

Section VIII. (a)—An officer on the maximum pay of his own appointment, officiating in another appointment of which the pay is progressive, and drawing salary not less than the minimum pay thereof, will, if he afterwards obtains it substantively, count the officiating service towards the increments of pay.

(b.)—In departments in which the pay is regulated according to classes, an officer on the maximum pay of his own class officiating in a higher class, and drawing salary not less than the minimum pay of the class immediately superior to his own, will, if he is afterwards promoted to the class last mentioned, count his officiating service towards the increments of pay.

Section IX.—Fractions and percentages of a pay which is progressive are calculated on the mean between the minimum and the maximum.

Section X.—If the pay of an appointment is increased upon an examination being passed, an officiating officer's allowances shall be calculated on the pay which he would from time to time receive if he held the appointment substantively.

Section XI.—If an absentee draws no part of the pay of his appointment, another officer may be appointed thereto substantively, for a time only, on full pay, without disturbing the lien of the absentee.

NOTE.—An absentee who receives leave allowances draws, within the meaning of this section, "part of the pay of his appointment.

MILITARY OFFICERS IN CIVIL EMPLOY.

Section XIV.—The cases which may occur are these—

(A.) An officer officiating in an appointment of which the pay is consolidated may be—

Case 1.—An officer without a substantive appointment.

Case 2.—An officer having a substantive appointment the pay of which is consolidated.

Case 3.—An officer having a substantive appointment the pay of which is a staff salary.

(B.) An officer officiating in an appointment of which the pay is a staff salary may be—

Case 4.—An officer without a substantive appointment.

Case 5.—An officer having a substantive appointment the pay of which is consolidated.

Case 6.—An officer having a substantive appointment the pay of which is a staff salary.

NOTE.—An appointment of which the pay is fixed with reference to its being held by a civil officer, Covenanted or Uncovenanted, is treated, for the purposes of this section, as if the pay of it were “consolidated.”

Section XV.—In case 1 the officer is entitled to his pay and to such acting allowance as will make the total equal to the sum of the assumed subsistence allowance stated below, plus half the pay of the appointment:

Assumed Subsistence Allowance.

	Rs.
For the rank of Captain or Subaltern....	250
For the rank of Major.....	320
For higher rank.....	400

Section XVI.—In cases 2 and 3 the acting allowance is regulated by *Section XII.*

Section XVII. (a)—In cases 4, 5, and 6 the salaries are calculated by military rules: and excess of the consolidated pay of the substantive appointment in case 5 over the military pay and allowances or the staff corps pay of the officer being treated as a staff salary.

(b).—The military rules referred to are as follows:

(1). For officers who have elected the rules of 1868—

An officiating officer will draw half the staff salary of

the appointment, and half the staff salary of his substantive appointment, if he possess one: provided the whole staff salary thus drawn be not less than Rupees 100 per mensem.

(2.) For officers who have elected the rules of 1854—

An officiating officer will draw half the staff salary of the appointment. After acting for six months, whether continuously or not, in the same post or grade, he is entitled to the full staff salary, as soon as the absentee ceases to draw any part of it.

Section XVIII. (a).—A medical appointment, the pay of which was fixed by General Order of the Government of India, Military Department, No. 370, dated 4th April 1867, is to be treated for the purposes of this Chapter as if the pay thereof were a staff salary equal to the excess, if any, of the consolidated pay over the “unemployed pay” of the permanent incumbent.

(b.)—Provided that an officer appointed to the Medical Service before 7th November 1864, officiating in one of these appointments, shall receive an aggregate salary not less than his full batta pay.

PLURAL APPOINTMENTS.

Section XXVII.—The salary of an officer holding substantively, or officiating in, two or more independent appointments at one time, shall be regulated as follows:

(a.)—He shall draw the highest salary to which he would be entitled if he held, or officiated in, any one of the appointments alone

(b.)—For the other appointment or appointments, he shall draw such allowances as the Local Government may fix, not exceeding, for each appointment, half the salary which he would draw if he held or officiated in it alone.

(c.)—Provided that his aggregate salary shall not exceed the pay which he would draw in the most highly paid of the appointments, if he held in substantively and alone.

(d.)—This proviso may be dispensed with, if the Local Government declares that, for special reasons (to be communicated to the Supreme Government), it is necessary, on public grounds, to entrust to the one officer the duties of the several offices at once, and that the salary to which he would be limited by the proviso is insufficient.

[*Illustration.*—A Covenanted Civil Servant holding a substantive appointment, A, of which the pay is Rupees 1,000, is appointed, without being relieved of his own duties, to officiate in two appointments, B, of which the pay is Rupees 1,600, and C, of which the pay is Rupees 2,200.

	Rs.
If he held A only, he would draw	1,000
If he officiated in B only, he would draw pay Rupees 1,000, and acting allowance Rupees 400	1,400
If he officiated in C only, he would draw pay Rupees 1,000, and acting allowance Rupees 800	1,800
He will therefore draw for C (which carries the highest salary)	1,800

And but for proviso (c) he would be entitled for B and A, to such allowances as the Local Government might fix, not exceeding Rupees $\frac{1,600}{2} = 700$ for B, and $\frac{1,200}{2} = 500$ for A.

But in consequence of that proviso, his aggregate salary must be limited to Rupees 2,200 (the pay of appointment C), unless the declaration prescribed in clause (d) be made.]

Section XXXIII. (a)—*Section XXXII.* does not apply to the case of an officer officiating at the same time in two or more appointments which are ordinarily held substantively by one individual. In such case the two appointments shall for the purpose of calculating acting allowances, be treated as one appointment upon the aggregate pay.

(b.)—Nor to the case of an officer discharging the duties of more than one appointment in the same office, or on the same establishment.

EXAMPLES.—One Under Secretary discharging the duties of a fellow Under Secretary in the same office or department as well as his own.

A Joint Magistrate appointed, in addition to his own duties, to officiate as Magistrate of the District. In this case, he gets allowances only as officiating Magistrate of the District.

A District Judge deprived of the help of an Additional or Assistant Judge and therefore doing the Additional or Assistant Judge's work.

A Joint Magistrate doing the work of a second Joint Magistrate in the District, as well as his own.

A Clerk doing the duties of a fellow Clerk in his own office.

(b.)—Nor does that Section affect “local allowances” given for the performance of separate duties.

Section XXXIV. (a.)—An officer appointed, without being relieved of his own duties to be in charge of the current duties of an office, is not ordinarily entitled to acting allowance.

(b.)—But when an officer is appointed to be in charge of the current duties of a judicial office, or of a gazetted office in the Police Department, and the charge, in the opinion of the Local Government, entails a substantial increase of responsibility, besides some additional work, he is entitled to a charge allowance of one-tenth of the pay of the office. If the office is open to and may in practice be held by, a Covenanted Civil Servant or an Officer of the Army, the minimum charge allowance is Rupees 100 per mensem.

(c.)—An officer of the Engineer Establishment of the Public Works Department, appointed without being relieved of his own duties, to be in charge of the current duties of an office of higher class than his own, is entitled to a charge allowance of one-tenth of the civil pay of the class. But the cases must be reported to the Government of India for confirmation.

(General Orders by the Commander-in-Chief.)

Rest House Superintendents, Medicines.

Head Quarters, Madras, 14th December 1871.

No. 142.

The Commander-in-Chief desires it to be notified that, with the consent of the Agent of the Madras Railway, instructions have been issued for the Portable Medicine Boxes, supplied to Rest Houses for the use of the Superintendents and their families, being handed over to the Railway Apothecaries.

MADRAS MEDICAL FUND.

List of Wives

On account of whom Payments have been notified by the receipt of Paymaster's Statements, &c., from 29th November up to this date, for securing the following rates of Pension.

Names of Subscribers.	Date of marriage.	Rate of Pension secured.	Payment how made.
G. Williamson.	31st October 1871.....	Half.....	By Donation.
P. G. Fitzgerald, M.D.	30th October 1871.....	Full.....	By Donation & Subscription.

MEDICAL FUND OFFICE; }
 FORT ST. GEORGE, }
 Dec. 1871. }

CORRESPONDENCE.

To the Editor of the Madras Medical Journal.

SIR,—The *Lancet*, on the 2nd September, contained a letter from Professor Rolleston on the propagation of cholera, in which reference was made to an outbreak of cholera in a marching regiment of this Presidency, notwithstanding that the corps was supplied with pure drinking water, and that it had no communication with infected villages *en route*.

Knowing the facts to have been wholly misrepresented in the letter referred to, I addressed the following communication to the Editor of the *Lancet* on the 4th October.

Up to the date of the last English mail received here (24th November), no notice has been taken of my letter. I venture therefore to hope that in the interests of scientific truth, you will have the goodness to give it publicity.

I have the honor to be,

Sir,

Your obedient servant,

W. R. CORNISH, F. R. C. S.

22nd December 1871.

“To the Editor of the *Lancet*.”

PROPAGATION OF CHOLERA.

SIR,—Dr. George Rolleston, in “*the Lancet*” of September 2nd, page 339, has, very rightly I think, cautioned the profession and the British public against too strict an adherence to the theory that cholera is *invariably* propagated by means of drinking-water. He has adduced a remarkable instance in proof of the view that cholera may be contracted not only when the quality of the water is above all suspicion, but even when there has been no direct communication with infected localities. As I have reason to question the facts of the incident alluded to, I think it is plain, that on closer examination, they will hardly bear the interpretation that has been put upon them. I am, like Professor Rolleston, a firm believer in the view that the cholera miasm may reach the human body either by articles of food, or the air of infected localities, as well as by means of drinking water; although it may be that the latter is the more ordinary channel of diffusion by the special contagium.

In the interests of scientific truth, it is but right that the instance, given on the authority of Sir Patrick Grant and Professor Pettenkofer, should be subjected to the most searching tests available; for if it be true that a marching regiment which scrupulously avoids cholera-stricken villages and halting-places, and drinks water of undoubted purity, has, in consequence of such precautions, no immunity from cholera pestilence, we must assuredly alter some of our views as to the mode of propagation of the disease.

The following is Professor Rolleston’s statement:—

“Before railroads had come into use in India, troops in passing from Bangalore to Madras, were always obliged to halt for some hours in a certain valley, and always with the consequence of an outbreak of cholera amongst them. This route was consequently used as little as possible; but Sir Patrick Grant was compelled by circumstances to send troops by it at the time when Dr. Snow’s theory, and the facts upon which it was based, had exclusive possession of the public mind. Filled with the hope that by acting upon this view of the genesis of cholera, his troops might be enabled to pass through that ‘Valley of the Shadow of Death’ unscathed, Sir Patrick issued orders for the prevention of any and all soldiers from entering any native houses in the valley, and from drinking any of the water of the district; and to make the execution of these orders the easier, the troops took with them an abun-

dant supply of water from healthy districts. In spite of all these precautions, the encampment in this valley cost 80 out of the 400 men who entered it, their lives from cholera. This history speaks for itself."

A few exceptions may be taken to the statement as above given. In the first place, the tract of country described as a "valley," in which troops had to halt for a few hours, should be understood to refer to the descent from the Mysore tableland to the nearest railway station in the plains of the Carnatic, a distance of about 45 miles, occupying by ordinary marches four or five days.

Cholera, moreover, was not "always" a consequence of marching upon this route; the troops referred to, and H. M.'s 1st King's Dragoon Guards, retraversed the same tract a few months later in the same year without any cholera.

Although the name of the corps is not given by Dr. Rolleston, I have reason to believe that the instance referred to was the march of a wing of H. M.'s 43rd Regiment from Bangalore to Madras in the month of March 1857. This, so far as I know, was the only march over that particular tract of country attended by a violent explosion of cholera during the incumbency of General Sir Patrick Grant as Commander-in-Chief of the Madras Army; and as the medical officer's official report of occurrences on that march has been perused by me with the greatest care, I can only state that it does not bear out the view, either that pure water only was used by the troops, or that the men had been isolated from the cholera-stricken villages on the road.

I have no doubt that stringent orders were given on the subject, as mentioned by Dr. Rolleston; but those who have had experience in marching with troops, will understand that it is much easier to issue orders for the preservation of health than to ensure strict obedience to them.

With your permission, I will briefly relate the main facts of the particular cholera outbreak referred to.

The left wing of H. M.'s 43rd Regiment, 537 strong, 68 women and 130 children, attended by the usual complement of camp-followers, left Bangalore for Madras on the 4th March 1857. The service was of an emergent nature, the troops being required to relieve the Madras Fusiliers then under orders for active service in Persia. Cholera was known to be prevalent, at the date of march, both on the Mysore tableland and in the low country towards Madras. The troops

had to move over about 140 miles of country before they met the railway, and of this, ninety miles were in the Mysore country on high table-land, from 2000 to 3000 feet above the sea, and the remaining fifty miles would be taken up by the ghaut to the low country, and a rather level plain not more than 500 or 600 feet above sea level between the Mysore table-land and the railway station near Arcot.

The troops arrived at Palmanair, the last stage on the table-land, on the morning of the 18th March, quite healthy ; but finding the camping-ground at that place covered with filth, and cholera raging in the town, and hearing moreover that a native corps encamping here a few weeks before had been attacked by cholera, the troops pushed on by a double march to the next halting stage of Venketagherry at the foot of the ghaut. Here a halt of one day was ordered. "The encamping ground" writes Dr. Madden, the medical officer, "was one which had evidently been lately used by other regiments (one of which, the 39th Regiment Native Infantry, had suffered from cholera), but was the best that could be got in the neighbourhood ; it was close to, but to windward of, the village, which was reported by the native officials to be healthy, *which we have since heard was not the case, as several natives died of cholera the day we were encamped there.* This circumstance led to the conjecture that the germs of the disease were contracted here, and that the infection was brought on to the next stage, where the disease appeared."

On the 20th March, after the arrival of the regiment at the next stage, cholera began to appear with great virulence ; of the nine cases attacked on the first day, only one survived, and for the first three days of the outbreak the mortality was very great. The march to the railway terminus at Amoor was hurried, and the corps arrived there on the 23rd March, and was taken into Madras by train on the 24th. The outbreak lasted until the 31st March, but was at an end amongst the men on the 27th, up to which time 98 cases had occurred, with 41 deaths. Besides these cases amongst the troops, five women and thirteen children died up to the end of the month.

Dr. Madden notices with regard to the double marches, the first of which was made to avoid cholera, that they appeared to do harm, as it was difficult to keep the troops from drinking during the subsequent halts, and "frequenting the

neighbouring villages, thereby contracting disease." On several occasions, it is stated, "they managed to get to the villages and indulged freely in toddy, arrack and injurious beverages." It is evident from this statement, that although stringent orders were issued for the isolation of the troops from the villages, these orders were wholly nugatory, owing to the difficulty of practically enforcing them.

Not a word is recorded by the medical officer regarding the carriage of pure drinking water for the use of the men. Any one who understands how marching is effected in India, will perceive the enormous practical difficulties in carrying water for five or six days' journey, for a force of between 700 and 800 European troops. The total strength was 735, and allowing only two quarts of water per diem for each European present, and supposing a five days' supply only to have been carried, the carriage of the water would have required 32 barrels of 56 gallons each, and a cart and pair of bullocks for each barrel. Ordinarily, troops marching are supplied with a fixed proportion of bullocks for carrying water in leather skins, but the ordinary establishment would be quite unequal to the task of carrying five or six days' supply of water.

If water was taken from Palmanair at the top of the ghaut, it is only too probable that the supply was already contaminated, cholera having raged in the town for some time before the arrival of the 43rd. If they took water on from Venketagherry, it is still more probable that the supply was poisoned, it being distinctly stated that cholera was in the village during the halt of the corps, although the fact was concealed by the native officials. Although the medical officer does not make the slightest allusion to any precautions being taken for the purity of the drinking water of the regiment, he shows that some orders had been issued regarding bathing.

"I regret" he says, "to state, that the men had but little means of ablution during the march. The orders issued to medical officers prohibit the men from bathing, and although several very favourable opportunities occurred, they could not be taken advantage of for this reason."

Had any unusual orders regarding drinking waters been issued, the medical officer would, I feel assured, have mentioned the subject, considering how minutely he has touched upon every point connected with the sanitation of the men; but what are the facts recorded?

They show that the regiment halted for about thirty hours on ground where a cholera-stricken regiment had been but a short time before, and close to a village where there was cholera (but the existence of which disease was denied by native officials); that the medical officer complains of the halting days as giving occasion for the troops to straggle and have access to native bazaars and native driuks; that intercourse between some of the men of the regiment and the affected village was certain; and, in regard to water-supply, it is not very likely that men who could get arrack or toddy from the native villages, would refuse to quench their thirst with village water. That the men drank no water but what was carried from above the ghauts, is so highly improbable, that it is scarcely worth while to discuss the question; but even admitting that the most scrupulous care had been exercised in carrying water down, it would still require to be shown that the water came from a source where it could not possibly have been contaminated. As cholera was at the time epidemic over a considerable portion of the Mysore table-land, as well as in the villages below the ghaut, it would be quite impossible for any one, without actual examination, to vouch for the purity of a supply obtained from such a tainted country. Professor Rolleston's illustration, therefore, will not, I fear, help us in any way to show that cholera may be propagated in spite of the isolation of travellers, or of their using the purest of water.

I have shown that there was no isolation from affected places, and I think it may be pretty generally conceded that the evidence does not establish the statement that there was an abundant water-supply taken from healthy districts, or that no other water was used during the march.

So many wild statements get abroad doing duty for facts, that I have felt it my duty, bearing in mind the high repute of all concerned in this particular statement, to adduce reasons why no scientific weight can be attached to it.

I have the honor to be,

Sir,

Your obedient servant,

W. R. CORNISH, F. R. C. S.

Sanitary Commissioner, Madras.

FORT ST. GEORGE, }
4th October 1871. }

P. S.—Since writing this letter I have received a reply from Dr. A. Barclay, now Deputy Inspector General of Hospitals of the Mysore Circle, who at the period in question was Surgeon of H. M.'s 43rd Regiment. Dr. Barclay's statement effectually disposes of the alleged "fact" as to the carriage of water from healthy districts. I append such extracts from the letter as are of public interest, and have to thank my esteemed friend for the very valuable testimony he has furnished on the points at issue.

W. R. CORNISH.

Letter from Dr. A. Barclay, Depy. Insp. Genl. Hosp.

(Copy.)

1st October 1871.

MY DEAR CORNISH,—Your note of the 27th has reached me this morning. I had previously seen, and been amazed at, Professor Rolleston's letter in the *Lancet*. Of course he can only allude to the march of the left wing of my late corps, the 43rd L. I., from Bangalore to Madras in 1857, as I do not think any other European corps suffered severely from cholera on that road while Sir Patrick Grant was Commander-in-Chief in Madras.

I have not had an opportunity of seeing an account of the march of the left wing, as related by Pettenkofer, but if the facts had undergone as great a metamorphosis before reaching him as they seem to have done before reaching Dr. Rolleston, any conclusions which he may have drawn from them must be utterly valueless, and it will be difficult to avoid viewing with suspicion any other facts with which they may be associated.

The wing marched from Bangalore about 500 strong, in round numbers, under the medical charge of Asst. Surgeon Charles Madden, an excellent medical officer, now Surgeon-Major of the 4th Regiment. I remained, of course, with the head-quarters and the greater part of the regiment at Bangalore.

No orders were received from Sir Patrick Grant, or from any one else, as to the carriage of drinking water from districts known to be healthy, for use in others believed to be

infected ; nor were any means whatsoever provided for the carriage of water, in addition to those sanctioned by regulation. I was quite aware of Dr. Snow's views, and of the strong evidence by which they were supported ; and had used every endeavour to ensure as pure drinking water as possible for the men on the line of march from the date of my arrival in India. No doubt that matter had been discussed by Madden and myself before the march of the wing, as all others considered likely to affect the health of the men were, but my recollection of such particulars is necessarily now somewhat vague.

The Major under whose command the wing should have marched was unfortunately detained at Bangalore on court-martial duty, and the Captain who succeeded to the command was an officer of little experience, who had been but a short time with the regiment.

The road from Bangalore to Madras was always of bad repute, but troops marching on it were not invariably, or when the march was at the proper season, even generally attacked by cholera.

There is no "valley" like that described by Dr. Rolleston anywhere in its course, but the ghaut is descended by it, some eighty or ninety miles from Bangalore, and there, I fancy I may say, as a matter of course, cholera used to be most prevalent. Many miles from this spot, however, both on the Bangalore and Madras side, there are other halting-places, where the disease was often met with, as you know well.

On the march of the 43rd, it was first heard of above the ghaut, and a double march was made to get away from the infected locality. Unfortunately, I think a halt was made at the foot of the ghaut, and there the disease broke out. The three men first attacked had left camp without leave, and gone to a native village in search of drink, which I believe they obtained.

The disease in them was attended with spasms of unusual violence. I remember hearing at the time that the first man had died resting on his head and heels. As usual, a good deal of panic ensued, and although official documents may not have mentioned anything of the kind, I am satisfied from what I have heard from several officers, that discipline was very ill preserved, and that the men did pretty much what they liked, and got and consumed a quantity of pernicious native liquor. * * *

This outbreak, so far from affording any grounds for disbelieving Snow's hypothesis, appears to me to tell in an opposite direction.

About the same time, an officer of the Madras Army, Capt. S—— with his family, in all five persons, came up from Madras to Bangalore by transit. The weather was hot, and they suffered much from thirst. Some water was got from the roadside, but so bad that the mother-in-law, an old lady, begged of the others not to drink it. Thirst however prevailed, and all except the old lady drank more or less of it mixed with brandy. On their arrival at Bangalore, all except the old lady were attacked by cholera; most of them, including Capt. S—— died. He, at all events, had no doubt as to the water having been the cause of his attack, and while suffering from the disease, kept constantly calling out, what a fool he had been to drink it!

After the outbreak in the 43rd, there was a good deal of discussion as to the best means of preventing similar outbreaks in the future, and with a view to the provision of pure drinking water, I sent the then existing Medical Board some rough sketches of filters or wheels to accompany the column, but though I received a letter of thanks for my "ingenious suggestions," it was heard of no more. * * *

As to the propagation of cholera by contaminated water, I have no doubt at all that it is often so propagated, and that cases so propagated are apt to be very severe. That it may be, and often is propagated by contaminated air, is, I think, equally certain. * * *

(True extract.)

(Signed) W. R. CORNISH, F. R. C. S.

MADURA FOOT.

To the Editor of the Madras Medical Journal.

SIR,—Adverting to your Editorial in No. XXIII of the *Medical Journal*, page 359, on the subject of the "Madura Foot," I have the pleasure to inform you and such of your readers who may feel interested in the subject, that I have forwarded four other specimens of the Madura Foot, as also various preparations of the white roe-like and other sub-

stances found in the morbid foot carefully put up in glycerine, chloroform, olive oil, &c., to Dr. Tilbury Fox, and the receipt of all these specimens except one morbid foot has been acknowledged, and even the last specimen will have reached Dr. Fox before now. To the great kindness of Dr. William Evatt Wright I am indebted for two out of the four specimens, and also for the several preparations very nicely and carefully put up, at my request, and for the other two to Drs. R. Arnold and Iyasawmy. These specimens come from the Districts of Gunttoor, Kurnool and Cuddapah, and I hope now the opportunity will be afforded the *savans* at home of definitely deciding the existence of a fungus as the cause of the disease or not. I should here also state that Dr. Wright tried various methods of growing the fungus at Gunttoor without success.

I am,

Yours faithfully,

JOHN SHORTT.

MADRAS, }
9th Dec. 1871. }

A GRIEVANCE OF THE BRITISH MEDICAL SERVICE.

To the Editor of the Madras Medical Journal.

SIR,—Knowing that the *Madras Medical Journal* has the interest of the members of both the British and Indian Medical Services at heart, I beg that you may permit me to point out, through the medium of your columns, a circumstance regarding the pay of the junior members of the British Service at a certain period of their Indian servitude. I am in hopes that by being “shown-up,” the hardship complained of may be removed, as it certainly cannot be satisfactorily accounted for.

Considering the discrepancy in the pay of the junior members of the two services, and the very responsible duties falling to the lot of the British Medical Officer, it is the greater matter of surprise that the pruning-knife should be applied to his modest remuneration. I allude to the pay of the British Medical Officer *not increasing in this country according to the English rate*. Under five years' service, the British Assistant Surgeon in India receives 317½ Rs. a month, which is at the rate of a rupee for every shilling he

would receive at home, where his pay is 10s. per diem (£15 a month). As no extra allowances, in the shape of quarters, servant, &c., are given in this country, I think it will be admitted, that in the case of the junior ranks, it is as difficult 'to live' at this rate as at home. But *after* five years' service, when the British Medical Officer would receive 12s. 6d. a day if serving at home, or an increase of one-fourth to his pay, what does he receive if unfortunate enough to be serving in India? An advance of eighteen rupees, four annas, two pice! or Rs. 335-12-2 per month. To be paid corresponding to the *English rate* his pay at a *minimum* should be Rs. 375 per mensem. The pay is not assimilated to the English rate till after *six* years' service. I append the two scales.

ENGLISH PAY.		Service.	INDIAN PAY.*
Per day.	Per month.		Per month.
10s.	£15	Under 5 years.	Rs. 317- 8-0.
12s. 6d.	£18 15s.	<i>After</i> 5 years.	Rs. 335-12-2
12s. 6d.	£18 15s.	After 6 years.	Rs. 433-10-2.
15s.	£22 10s.	After 10 years.	Rs. 451-14-5.

The question is, why is the British Medical Officer between five and six years' service underpaid? Why is he paid virtually less here than at home, although his duties are more numerous, more responsible, and more fraught with personal risk?

He has not the relative rank of Captain till after six years' service, but that is no reason he should be paid as a Subaltern. Such does not hold at home. Why here? An Assistant Surgeon may be expected to have acquired greater usefulness from experience gained after five years' service here as at home.

The hardship appears so self-evident that I am confident a little agitation in the proper quarter would set it right. I think that the senior members of both the British and Indian Services will willingly take up a real grievance affecting the juniors of their own profession, although it has been so long patiently borne.

In conclusion, may I ask if the Assistant Surgeon of five years' service, when he finds his allowances less than at home, will be inclined to work hard in a country like this for the public weal, or will be satisfied with the minimum performance of duty, since his services are valued at a discount?

I am,

Sir,

Your most obedient servant,

M. D.,

British Medl. Serv. of 4 years' standing.

TO CORRESPONDENTS.

Inspector General Indian Medical Department—Dr. STEWART, 21st Regiment—Asst. Surgn. WRIGHT—Dr. SHORTT—Dr. KEARNEY—Dr. MCGANN—*Received with thanks.*

NOTE.—*Press of matter has prevented our making use of some of the original communications from correspondents in the present number of the Journal.*

BOOKS, &c. RECEIVED.

Journal des Connaissances Médicales, Oct. Nov. 1871.
 The Doctor, Nov. 1871.
 The Medical Record, Oct. 16th, Nov. 1st, 1871.
 St. Bartholomew's Hospital Reports, 1870.

The Secretaries Madras Branch of ROYAL MEDICAL BENEVOLENT FUND SOCIETY OF IRELAND acknowledge with many thanks receipt of the following Subscriptions for 1871-72.

Dr. A. Porter	...	...	...	...	...	Rs. 10
Dr. P. G. Fitzgerald	...	...	...	...	...	" 20