LONDON JOURNAL OF MEDICINE,

A MONTHLY

Record of the Medical Sciences.

APRIL 1849.—No. IV.

ORIGINAL COMMUNICATIONS.

CONTRIBUTIONS TO THE PATHOLOGY AND TREATMENT OF CHOLERA.

By JAMES BIRD, A.M., M.D., formerly Surgeon of the European General Hospital at Bombay, and late Physician-General, Bombay Army.

INTRODUCTORY REMARKS.

IN my previous contributions to THE LONDON JOURNAL OF MEDICINE, on the Pathology and Treatment of TROPICAL FEVERS, the relation between the algide stage of their intermitting and remitting forms, and that of Cholera, was briefly noticed. The analogy of the phenomena accompanying the reaction and hot stages of these fevers, with the febrile or consecutive stage of Cholera, was also brought under consideration, and stated to be referable to an increased flow of blood through the spinal marrow and its dependent nerves, similar to that which seems to be associated with the symptoms of the hot stage in both diseases. The extraordinary general similarity also of symptoms characterizing the different stages of Cholera, to those attending certain modifications of fever, could scarcely pass unobserved, by any one who had opportunity, within the tropics, of becoming familiar with such affections; nor could the striking fact remain unheeded, that attacks of endemic Cholera happened, like intermittents, most commonly at the changes of the moon, and prevailed, along with these fevers, in the same locality. Such manifest resemblances could not fail in impressing the mind with a belief, that if the relation of these diseases be not constant, it at least arises from the same external atmospheric influences which change the human organism from a state of health to disease. So forcibly had facts brought this conviction to my mind, that in my Cholera reports, on the disease at Kaira, in 1819, addressed to Dr. S. Meek, then superintending surgeon of the Gujerat division, I pointed out the apparently intimate connexion of the two; stating, that several cases had come under my observation, where Cholera and intermittent fever alternated with each other. In 1820, when again reporting to Dr. Jukes, I brought to his notice, that the greater number of Cholera attacks among the prisoners in the jail of Kaira, happened at the lunar periods; and

how, in the middle of April of that year, the *karkoon*, or native revenue writer, of the town of Neriad, in the province of Gujerat, had reported, that for three or four days, about the period of the new moon, thirty or forty people were attacked daily by Cholera, and that, soon after, the number of attacks decreased to six or seven. In subsequent annual reports to medical authorities in India, particularly those of the European General Hospital, for the years 1838-39, I had occasion to repeat the same observations and opinion; and am now only anxious to record my having done so, as Dr. Chambers, in two admirable and luminous lectures on Cholera, delivered to the students at St. George's Hospital, and lately published in the *Lancet*, has proved with great ability the existence of a disease, prevalent in London about 1680, and the following years, identical with the Asiatic malady; and which had a common origin with epidemic febrile diseases, and others of an intermittent type, arising from miasmata, and ordinarily affecting the inhabitants of this city. The delineations of this disease, quoted by Dr. Chambers, are found in Dr. Morton's *Treatise on Fevers*; and both these, and the descriptions of Cholera, by medical authors of antiquity, must satisfy us of the truth, that the so-called Asiatic Cholera, which has of late years prevailed in Europe, was long previously known to practical observers, and cannot be dated as a new disease from the reputed epoch of its birth in 1817. More modern writers in India, as Paisley, Girdlestone, and Curtis, have recorded the prevalence of this disease, which broke out with great severity in 1695, while Aurangzeb's army was besieging Beejapoore. The Persian author, who records the circumstances as an eye-witness, states, "that amidst the calamities of a famine, which afflicted the country the previous year, a pestilential fever and diarrhoea attacked the people in camp; and by little and little spread through the whole with such fatality, that no one calculated on his existence for a single hour, and the bazaar transactions were only carried on for ready money."

But if both diseases appear so closely connected in their origin, they are not less intimately related to one another by their phenomena during life, than by their post-mortem appearances. Cholera, like fever, is not exclusively a disease of either the vascular or nervous system; and if the post-mortem vascular appearances of particular organs be not identical in both, they seem only to differ in degree. Those of Cholera are what we might expect to find in algide intermittent, terminating fatally soon after the accession of the cold stage, had we opportunities of tracing them; but those of fever are more of secondary result, following the reaction of the central vascular organs to remove injuries of the peripheral ones, by abnormal self-excitation of the blood, for the purpose of depuration, and restoration of the circulating fluid to health. It is only by viewing Cholera as allied to fever in its modifications, and progressive like it in its forms, that any well founded arrangement of symptoms can be made, or any rational method of treatment laid down, as applicable to its different stages. Such is the object of this paper; and without speculating on the origin and sources of the disease, I shall endeavour, for the present, to specify its modifications, and the most suitable system of treatment, founded on my own experience, and on that of others.

The following observations may be arranged under five heads, viz.—

I. History of the disease, as observed at various times and places since 1818. II. Modifications; symptoms and stages considered collectively. III. Particular symptoms originating in the perverted functional action of individual organs. IV. Post mortem appearances and pathology. V. Treatment.

I. HISTORY OF THE DISEASE.

On my arrival at Bombay, the 2nd of August 1818, I was directed to do duty in the garrison of Tannah, under the then garrison-surgeon Dr. Jukes, whose excellent letter, descriptive of the Cholera as it appeared at that station, will be found in the well known Bombay Reports. I joined the garrison (then consisting of a wing of H.M. 89th, and of other European and native detachments), immediately after the advent there of the disease, on the 13th of August. It had travelled along the high-road of the Dekhan, from Nagpoor, Jaulnah, Aurungabad, Alunednagar, Seroor, and Poona, to Panwell,—a considerable village on the mainland, separated from Bombay by an arm of the sea. Between the latter and Bombay there is a constant communication, by means of boats, or by the more circuitous overland route of Tannah. On the 6th of August the disease broke out with great violence at Panwell; appeared at Bombay on the 9th or 10th; and at Tannah the 13th of the same month. Here, a naique, who had escorted the state prisoner Trimluckjee Danglia from Seroor, was the first person attacked. By the 16th of the month, the disease at Tannah had become general, and as many as fifty or sixty deaths among the natives of the bazaar were reported daily. The epidemic continued to prevail both among Europeans and natives, and with greater or less violence, till the 19th of September, when it began to decline. From the time of its commencement to its disappearance, I carefully kept notes of the principal cases admitted into the hospital, or occurring among the natives of the bazaar and servants of the civil establishments; the modifications of the disease, the apparent utility or otherwise of remedies, and any peculiarity of symptoms, being in this manner minutely recorded. In the absence of such records, and of the leading characters of Cholera cases, whether of endemic or epidemic origin, we can seldom draw any accurate conclusions as to what may be the contingent, and what the constant conditions of the disease. Certainly, some of the peculiarities of the Cholera attacks then noted have not since come under my observation; and such differences may account for the greater utility of blood-letting at that time, and the greater confidence reposed in it as a remedy, either in India or in this country. These peculiarities and modifications of the epidemic Cholera of 1818, not being mentioned in Dr. Jukes' report, I will endeavour here briefly to detail them.

Most descriptions of the disease, as it appeared at that period, too exclusively appertain to its collapsed stage, when the blood and lungs have ceased to generate animal heat, and the powers of the secretory organs have almost completely failed. But before the occurrence of symptoms characterizing this well-marked period of the disease, there were premonitory ones of diarrhoea, with nervous depression and fits of transient excitement, accompanied by acute burning pain at the scro-

biculus cordis, a frequent irritable pulse, and somewhat augmented heat of skin. This first onset of the disease appeared both among Europeans and natives; and the blood drawn from either at this period, frequently threw up a thin sily film. If nothing was done to arrest the progress of the attack, the burning paroxysmal pain at the stomach increased, and was followed by vomiting of white-coloured fluid; the diarrhoea became more urgent, and the alvine evacuations changed from a dirty yellow colour to that of rice water; the skin was cold, and covered with clammy perspiration; the pulse became more labouring and oppressed, accompanied by much vertigo, distressing languor, and craving thirst: the whole phenomena of this stage bearing a marked resemblance to those of congestive or asthenic remittent. Though the skin of many patients was cold and clammy to the touch, they nevertheless complained of being tormented with burning heat, and were affected by spasms of the extremities.

After these symptoms had existed for some time, without any appearance of reaction in the system, the pain at the scrobiculus cordis for the most part abated, or entirely ceased; the respiration became more oppressed; the arterial action more feeble; the skin corrugated and shrivelled; the eyes sunk in their sockets; the voice more feeble and scarcely audible; till at last, increasing coma and death terminated the patient's suffering. Such was the general mode of attack, and progress of the disease. Sometimes, however, the vomiting and pain at the pit of the stomach were the earliest symptoms, and were present for an hour or two before the purging commenced; at other times both vomiting and purging occurred without vertigo; and occasionally there was no pain of stomach complained of, unless when pressed by the hand, which created an inclination to vomit. The discharges from the stomach and bowels varied in appearance, being sometimes clear and serous; and at others, white and mucaginous, like rice-water. For the most part, the pulse was frequent, feeble, and irregular; but occasionally, it was excited and compressible, as in fever; and whenever this happened, there was less apparent determination to the head than usual. Total deafness was only present in one instance; and in another, the patient complained of a noise in his ears resembling rushing water. There were other symptoms which accompanied the several attacks, and which will be more fully enumerated when I come to consider the modifications and stages of the disease.

Such was its usual progress; but most of the patients were not brought for medical aid, until the stages of congestion and collapse had been fully developed. Generally, these stages ran their course progressively, and were sufficiently well marked; but sometimes, the earlier one of nervous depression was wanting, or so rapid in its transition to congestion and collapse, that its development was scarcely manifest ere it had passed into the final coma of the others. This form of Cholera has been not inappropriately named ganglionic apoplexy, being characterized by the following manner of attack. After some languor, and a little watery purging, having been present for six, eight, or more hours, the person attacked complains of severe burning pain at the pit of the stomach, accompanied by vertigo, and soon after falls down insensible; his respiration being feeble, his pulse oppressed, his

skin more or less cold, and his jaw spasmodically closed, though not so rigidly as to prevent their being opened by gentle force. This will be best illustrated by the following case. On the 26th of August, one of the revenue collector's peons went from his duty to dinner in apparently good health, excepting that in the morning he had been suffering from flatulency and pain at the stomach. While in the act of eating, he was seized with vertigo, and soon after fell down senseless, in which state he was carried to the house of the collector, where some ether and brandy were given to him. Dr. Jukes soon after saw him, and found his skin below the natural warmth, his respiration almost suspended, and his eyes fixed. A vein was opened in the left arm, which bled rather languidly; but as the vital action of the heart became a little renovated, another vein was opened in the right arm, from which the blood began to flow with considerable force. Soon after, the patient made several deep inspirations, his eyes regained their natural motion, and all the other organs seemed to resume their functions. About thirty ounces of blood were abstracted, fifteen grains of calomel were administered, and bottles of hot water applied to the feet and stomach. A copious perspiration speedily followed, and next day the patient was nearly well.

During the cold months, from the end of 1818 to that of February 1819, the Cholera disappeared, and little or no mention of it is made in the hospital reports. By this time, I had been removed from Tannah to Kaira, in Gujerat, and directed to do duty with a native regiment, the 2nd battalion 7th regiment of infantry. In the end of April, some sipahies belonging to a detachment of this regiment, stationed at Dubassa, were sent to the head-quarters at Kaira, where, soon after their arrival, several cases appeared, on the 4th of May, among the men of the regiment. At the same time, the men of the pioneer corps, stationed in the lines at Kuttanpoor, and in the immediate vicinity of the dragoon cantonment, were attacked by the disease, without having had any communication with the affected sipahies from Dubassa. The cases admitted were of a highly congestive character, running rapidly into fatal collapse, which seldom admitted of the abstraction of blood from the veins, even when the patients were in the hottest bath that could be borne; so that if a small quantity of blood were obtainable in this manner, it only hastened the fatal result. Opiates also seemed to increase the desire to sleep, and tendency to collapse. Nearly two-thirds of the cases admitted proved fatal: and many of them within five hours from the period of the attack. In all the severer cases there was a remarkable absence of the paroxysmal pain at the scrobiculus cordis, which distinguished the Cholera attacks of 1818. Most of the deaths happened among the pioneers, who not only occupied an unfavourable locality on the dragoon side of the river, but were greatly predisposed to Cholera affection, by the contingent causes of poor living and mental depression. The supernumeraries of the pioneer corps, to whom the urgency of military service in Cutch had given temporary employment during the cold weather, were brought down to Kaira for discharge, and were those who suffered most. They had no huts to shield them from the weather, and were continually exposed to the heat of the sun by day, and to the land wind by night. They were, with very few exceptions, Hindoos; who, from their abstemious and even penurious habits, are

well known to live on the cheapest food, of inferior nutritious qualities. Such habits, by predisposing the body to the unhealthy influences of other exterior conditions, particularly cold bathing after hard work, and in an excited state of the cuticular capillaries, seem to have borne no inconsiderable share in producing a disease of great malignity. The disease continued to prevail at Kaira, and in many of the neighbouring towns, throughout the hot weather, and disappeared, for a time, after the setting in of the rainy season in the middle of June.

In the succeeding year, 1820, it reappeared about the beginning of March, after having been prevalent for some time in the neighbouring villages of Nereiad, Mahmudabad, and Mandwa. The disease had travelled, as would appear, from Surat to Baroda, and thence to Kaira; having broken out at the former place some time about the end of December 1819, or beginning of January 1820. It made its first appearance there in Chilli Bey's dock-ship, and in the native lines, where the 2nd battalion 3rd regiment of native infantry was then stationed; attacked the men of this battalion, and prevailed also among the prisoners in jail. This regiment, soon after the appearance of the disease in Surat, marched for Baroda, and was severely attacked by it at the second halting-ground. It continued to affect the men of the battalion, but in a milder degree, along the whole line of march, and afflicted them more severely on their arrival at Baroda, where between fifty and sixty died out of a hundred cases. Some account of its prevalence at this station may be found in Dr. Kennedy's work on Cholera. It did not finally cease to prevail in the 3rd native infantry, till the regiment marched from the station and joined Colonel Barclay's force, then employed on the banks of the Run, where not a case occurred during all the hot weather, though the troops were kept constantly marching. On the 3rd native infantry going into Bhooj, in Cutch, about the middle of June, while the Cholera was raging there, it again severely suffered from the disease, which carried off Mr. Colegate, the assistant-surgeon of the regiment.

From this time, Cholera continued prevalent, at short intervals, in different parts of India; but as I had no opportunity of seeing any great number of cases till 1838, I kept no notes on the subject. While employed at this time, as surgeon of the European General Hospital, at Bombay, I admitted twelve cases of the disease in the months of July and November. Three of these proved fatal. All the attacks in July commenced with diarrhœa; which, after continuing several days, was followed by vomiting, coldness of the skin, collapse of countenance, and sinking of the circulation, as marked by a frequent feeble pulse. The gastro-enteritic affections seemed to be only modifications of the same disease; being characterized by pain at the epigastrium, diarrhœa, and sometimes vomiting, accompanied by a feeble pulse and vertigo, which increased as the purging diminished. The Cholera admissions for November happened at the time of the new moon; when the dew was falling, and the weather had become cold. Some cases of intermittent fever occurred at the same time. The sister of one of the Cholera patients who died, had irregular febrile symptoms; and the mother of both these, on being attacked by Cholera, also died in the beginning of the next month.

In 1839, thirty-three cases of Cholera were admitted, fifteen of which proved fatal, being 45.4 per cent. of deaths. The greater number of casualties happened during May; Cholera at this time being prevalent amongst the seamen of the ships in harbour. The men attacked on ship-board were generally sent to hospital in the last stage of the disease, and under most disadvantageous circumstances; having been exposed during the day to the influence of a burning sun, and at night to the land wind. Many of the admissions were of children born in the country, who had lost all pulse, and were in the last stage of collapse. Some of the successful cases were of the bilious kind, or of "hepatic erethism", marked by epigastric tenderness, and cramp of the abdominal muscles. The two diseases, "Bilious Cholera" and "Algide Cholera", are the same morbid states, differing only in degree: the former consisting of ganglionic irritation, and increased hepatic secretion, as the consequence of imperfect decarbonization of the blood; the latter of ganglionic and cerebro-spinal congestion, with endosmotic sero-mucous exhalation from the intestines, the result of impaired vitality of the blood.

I had no further opportunity of observing cases of Cholera, or of ascertaining the progress of the disease, till my removal from Bombay to Belgaum, as superintending-surgeon of the southern division. The troops serving in this division belonged to the Madras presidency; and almost every regiment which, during the years 1841 and 1842, had occasion to change stations, and to march along the extensive plain of deep black alluvial soil, from Kolapoor northwards to Belari southwards, experienced severe loss in its ranks and among its followers, from Cholera, which was extensively prevalent, during these years, among the villages and in the districts included in the collectorates of Kolapoor, Belgaum, and Dharwar.

In the beginning of the former year, it broke out among the pilgrims assembled at Kolapoor, to celebrate the religious festival of "Kadar Ling-deo"; and from them spread, in February and March, into the neighbouring districts of Padshapoor, Uthnee, and Gokauk; having soon after become general in the collectorates already mentioned. In May 1841, the disease appeared with great severity at Kolapoor, among the troopers of the 5th Madras cavalry; the medical officer of the regiment deeming that its outbreak was, in part, connected with the filthiness and ill-ventilated state of the native huts in the cavalry lines. The progress of the disease indeed may have been connected with these causes; but long before its appearance in the lines at Kolapoor, it had been prevalent in the villages of the neighbouring districts, manifesting, in its progress from place to place, that it attaches itself to masses of the people assembled for the purpose of celebrating religious festivals, and can in this way be disseminated from person to person.

Whoever will take the trouble of investigating the information on this point, embodied in Table I (*see next page*), and will, by referring to a map of the country, trace the outbreak of the disease, and its progress from place to place, must, I think, be convinced of this fact, that Cholera of endemic origin, under a community of habits, and of atmospheric conditions, can become transmissible from locality to locality, and from the sick to the healthy, who breathe the same atmosphere in ill-ventilated apartments. Such is the fact, however, and one practically known in

TABLE I.—NUMBER OF PERSONS ATTACKED BY CHOLERA, AND OF THOSE RECOVERED AND DECEASED,
WITH AND WITHOUT RECEIVING THE AID OF MEDICINE.

No.	Names of the Talooks.	Popula- tion.	Period the disease continued.	No. of persons attack'd	Received aid of medicine.		Received no aid of medicine.		Number attacked.			Remarks.		
					Rec.	Died	Totl.	Recov.	Died.	Total.	Recov.		Died.	Total.
1	Sumpgaon	59,329	April to Sept.	1,362	85	26	61	386	915	1,301	421	941	1,362	The disease commenced in Wucknond, E. of Sumpgaon, and amongst travellers from Kulludghree.
2	Beedee	82,164	April to July	702	7	8	16	201	486	687	208	494	702	The disease commenced in Nichundee, E. of Beedee, and amongst the people who returned from the Jatra at Yellama.
3	Padshapoor	46,711	Jan. to Aug.	522	98	94	187	79	256	385	172	350	522	The disease spread into this Talooka, from the people who re- turned from the Jatra at Yellama and Kadar Lingdeo.
4	Chickoree	75,064	April to June	1,282	38	68	101	323	858	1,181	356	926	1,282	The people who went to the Jatra of Kadar Lingdeo, brought the disease into this Talooka.
5	Bagulkote	53,407	April to July	2,715	15	21	36	744	1,986	2,679	759	1,956	2,715	The disease commenced at Hippergee Zillah Kolapoor. At Kolapoor the disease first made its appearance in May 1841.
6	Badamee	56,639	April to July	1,557	48	79	127	386	1,094	1,430	484	1,173	1,557	The villagers of Moolughherree went southward in search of labour; on their return they were attacked by the disease.
7	Uthnee	33,821	Mar. to June	1,816	102	180	282	634	1,050	1,584	636	1,180	1,816	The disease first broke out in Kabundkee, E. of Uthnee, and spread into the whole Talooka. *In Uthnee alone, 681 persons were seized with Cholera during April.
8	Gohak	48,310	April to June	1,306	27	73	100	288	918	1,206	315	991	1,306	Disease broke out amongst the villagers of Chicknundee, from thence it spread into the Talooka. At Kolapoor about 1000 persons died in three weeks in April and May.
9	Pursghur	45,534	April to Sept.	900	46	65	111	204	585	789	250	650	900	The villagers of Bailsoor were first attacked; from thence it spread into the Talooka.
10	Hoongoond	50,649	May to June	827	0	5	5	241	681	822	241	686	827	The villagers of Somlapoor and Koodeehall were first attacked.
	Total	551,628		12,989	406	569	976	3,396	8,678	12,014	3,742	9,247	12,989	

BELGAUM, 31st December, 1842.

India, that, whenever a native regiment, attacked by Cholera on the march, is allowed, immediately after arrival at a new station, to occupy the regimental lines of native huts, its men and followers continue to suffer for a long time from the disease. It is therefore usual to encamp the infected regiment outside the cantonment, in some dry and healthy locality; and not to allow the men to occupy their huts till all traces of the disease have disappeared. Such precautions are, I think, attended with the best possible results in preventing the spread of Cholera: and even where encampments of men have been attacked by it on the deep black alluvial soil, a change of position to the hard, dry, and ferruginous laterite formation, in the immediate neighbourhood, appeared to be followed by equally happy results.

The Cholera was again prevalent in 1842, and raged at the same time in Bombay, as may be seen by reference to Table II. It increased gradually from the beginning of the year till the hot, humid months of May and June, when the disease reached its climax. The influence of a moist and hot atmosphere in diminishing the cutaneous exhalation, and increasing the absorbent function of the skin, seems favourable to the operation of malarious causes; to which, and the negatively electric state of the atmosphere, many of the endemic attacks of Cholera, which annually occur in these months, are clearly traceable. It was in this same year, I think, that the 23rd Madras native infantry, on its march to Dharwar, was severely attacked by the disease on the banks of the Toombhoodra river, and lost several of its European officers. But enough has been already related relative to the history of the disease, and in illustration of the circumstances and conditions of the *endemico-epidemic* causes, which render it prevalent.

TABLE II.—Statement showing the number of persons reported to have died of Cholera, and of those who received Government medicines, with the result, in the island of Bombay (estimated population, 235,000), from 7th February to 31st December 1842.

Months.	Recovered.	Died.	Result unknown.	Total.	Total reported to have died.
February	—	—	—	—	2
March	—	—	—	—	100
April	—	—	—	—	142
May	—	—	—	—	2,391
June	—	—	—	—	851
July	—	—	—	—	292
August	—	—	—	—	283
September	—	—	—	—	265
October	—	—	—	—	128
November	547	161	—	708	740
December	2,144	390	27	2,561	912
Total..	2,691	551	27	3,269	6,106

(To be continued.)