

ACCOUNT  
OF THE  
EPIDEMIC SPASMODIC CHOLERA,  
WHICH HAS  
LATELY PREVAILED IN INDIA,  
AND  
OTHER ADJACENT COUNTRIES AND ISLANDS, AND AT SEA.

COMMUNICATED IN A LETTER FROM  
FREDERICK CORBYN, Esq.  
ASSISTANT SURGEON ON THE BENGAL ESTABLISHMENT, AND  
MEMBER OF THE COLLEGE OF SURGEONS OF LONDON.

WITH  
COMMUNICATIONS ON THE SAME SUBJECT,  
BY FAVOR OF THE  
CHAIRMAN AND DEPUTY CHAIRMAN  
OF THE  
EAST INDIA COMPANY;

AND  
FROM THE ISLANDS OF THE MAURITIUS AND CEYLON,  
BY FAVOR OF THE MEDICAL BOARD OF THE ARMY;

WITH REMARKS.

By SIR GILBERT BLANE, BART. F.R.S.  
PHYSICIAN TO THE KING.

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*Read May 9, 1820.*

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MY DEAR SIR,

*Sauger, September 7, 1819.*

I RECEIVED your communication through the Governor-General, containing enquiries regarding the epidemic which has desolated India for the last two years. In November 1817, I drew up a description, with an account of a treatment which I had adopted, and found remarkably successful. This was contained in a single sheet, and printed

copies of it were distributed by public authority to all the different stations. In August, 1818, I put it into the form of a small tract, which was also printed in this country. But as a considerable time has since elapsed, I shall, in order to satisfy your enquiries, relate the further progress of it since that time, with a detail of the practice as confirmed and improved by further observation and experience.

This singular and calamitous epidemic commenced in August, 1817, at Jessore, about a hundred miles to the N. E. of Calcutta, and spreading from village to village, destroying thousands of the inhabitants, it reached Calcutta early in September. It extended from thence into Behar, depopulating many large cities, till the inhabitants fled to other spots. Benares, Allahabad, Goruckpore, Lucknow, Cawnpore, Delhi, Agra, Muttra, Meerat, and Barcilly, have all suffered in succession; and it is curious and important to remark, that it did not appear in these districts at the same time, but leaving one it soon shewed itself in another.

At length it appeared in the grand army, first at Mundellah, then in the Jubbulpore and Sauger districts. From thence it spread to Nagpore, and continued its course over the Deccan in a violent degree. At Hussingabad its ravages were terrible for several days; and taking its course all along the banks of the Nerbuddah it reached Tannah.

Visiting the famous cities of Aurungabad and Ahmednugger, it spread to Poonah; from thence to Panwell in the direction of the coast, where it extended to the north and south, visiting Salsette, and reached Bombay in the second week of September, 1818, one year after its first appearance at Calcutta.

While this was passing in the west of the Peninsula, the epidemic was making the like progress to the east and south, progressively spreading on the whole Coromandel coast, and we have heard of its passing from thence to Ceylon, to the pure air and temperate climate of Siam, from thence to Malacca, and along the straits of Sunda to China\*. So that in less than two years it had embraced a space from the most northern parts of Indostan to Ceylon, and from the Indus to China. It has also made its appearance on board-vessels, both in harbour and at sea. So alarming indeed has been the extent and rapidity of the progress of this dreadful pestilence, that it becomes a duty to warn Europe of its danger, for we learn from the practice of Sydenham that this disease was twice epidemic in London, in the end of summer and the beginning of autumn.

In my farther account of this disease I shall take the liberty of quoting amply from the Bombay

\* It has since reached the Mauritius.

communications. These authorities pretty generally concur with what I laid down with regard to it, as it appeared in the centre division of the army. The vomiting and purging of watery matter invariably took place. The absence of biliary fluid in the stomach and duodenum was also singularly exemplified, and its return was considered as affording a favourable prognosis. Dr. Burrell, Surgeon of his Majesty's 65th regiment, observed that "the first symptoms of the attack were languor with occasional pains and sense of numbness in the extremities, violent head-ache and thirst: shortly there ensued nausea, vomiting of slimy matter, but *no appearance of bile from the stomach or bowels*; then followed spasms so violent as sometimes to require six men to hold the patient.

Mr. Assistant Surgeon Whyte, from whose accurate and well-defined account I shall take the liberty of quoting largely, agrees, that in the whole of his practice there was the same appearance in this ejected and evacuated matter. "The disease generally begins," says Mr. Whyte, "with a watery purging, unattended with griping or any pain. At an interval, generally from half an hour to five or six hours, but sometimes without any interval, comes on vomiting of a white fluid; and I will here add my testimony to a heap of evidence already accumulated, that in this form of the disease, I have never observed any thing re-

sembling bile discharged upwards or downwards. The vomiting and purging are soon followed by great debility and sinking of the pulse ; the extremities become cold ; the eye sinks into the socket ; the vessels of the *tunica adnata* are injected with blood, from which if the disease advances a film in a few hours is formed ; the features express the deepest anguish, and the eyelids are either wholly or half closed. The patient invariably complains of great heat at the stomach, and calls incessantly for cold drink, although he is warned of the danger attending it. The tenesmus now becomes violent, although nothing is discharged but the fluid above-mentioned, and a substance like the coagulated white of an egg. The uneasiness and jactitation are so great, that it is with the utmost difficulty that we can get an opportunity of feeling the pulse, which by this time is not always perceptible, although it is generally so till the spasms come on. These attack at no fixed or determined period of the disease, but in general not for many hours after the commencement of the vomiting and purging. Medicine given before their appearance will generally be attended with success."

This is one peculiarity differing from the epidemic of the centre division, in which the spasms came on before the vomiting and purging. I witnessed some cases latterly, in which these muscu-

lar spasms attacked the calves of the legs and abdomen, subsequently to the accession of the purging and vomiting; but in these cases there was evident spasm of the stomach and bowels.

“ The spasms are always of the tonic kind, attack first the toes and legs, and extend up to the thighs, chest, and arms. When they reach the chest, the breathing becomes so urgent, the sense of suffocation so great, that the diaphragm must I think be spasmodically affected at the same time.”

“ The most unfavourable and dangerous signs are the coldness of the surface extending to the region of the heart and stomach. The skin under the nails becomes inverted towards the outer skin; the tongue becomes icy cold; an universal colliquitive sweat comes on with shrivelling of the cuticle of the palms of the hands and soles of the feet, the spasms declining while these symptoms continue to increase. In general all pain and spasm leave the patient before death, and although the heart cannot be felt to beat, he expresses himself easy, and says he is better. But sometimes I have seen him in the greatest agony, rolling himself on the ground and groaning, sometimes bellowing, most piteously. This latter circumstance is, I think, confined to patients who linger three or four days before death comes to their relief, in whom the disease appeared at first to have been vanquished, but whose *vis medicatrix naturæ* was

not strong enough to maintain that complete reaction of the system on which the restoration of health depends."

With regard to the appearances on inspection after death, I shall also borrow largely from Mr. Whyte, to whose zeal and exertions, as well as liberal communications, his professional brethren are much indebted.

"Upon opening the abdomen, the most striking appearance was, the enormous distension of the stomach and bowels, not with air, for they were nearly throughout filled with something of a consistence intermediate between that of a fluid and a solid; there was not much of bloody turgescence on their surface, but they wanted the moisture and glossy appearance of health. The liver was much enlarged, apparently from the quantity of blood contained in its vessels, and on one part of its convex surface there was a considerable extravasation of blood. The gall-bladder was filled with bile, and projecting beyond the edge of the liver. The bile was of a very dark color, and the gall-ducts pervious. The stomach was filled with an immense quantity of half-digested rice and meat. The contents of the small intestines were dark-colored, apparently from an admixture of bile. The contents of the large intestines resembled in color what was evacuated *per anum* before death, that is of a whitish colour, and fragments of a

tape-worm were found, parts of which had been discharged while the patient was alive. The bladder was quite empty and wholly shrunk into the pelvis. I thought the kidneys were of a diminished size. The lungs were so much collapsed that they appeared hardly to fill one-half of the cavity of the chest. The left portion of them was marked with several black spots, but whether they were recent I could not determine. There was no fluid in the pericardium. In the Europeans the appearances in the chest were exactly similar to the above, with the exception of the black-colored spots. The stomach and intestines were much distended, but with wind only, as appeared from their collapsing the moment a puncture was made into them ; but the veins on the outside of both, as well as those of the mesentery and mesocolon were turgid with blood, so was the liver, and the gall-bladder was, as in the other case, full of bile. The urinary bladder was completely empty. I shall conclude with remarking, that from the contents of the small intestines in the Sepoy being dark-colored, while those of the large retained the light color which marks all the discharge in this disease, it appears to me that in this case the disorder was proceeding to a favourable termination, which would have been completed had the patient's strength been sufficient."

An important question arises regarding its contagious or non-contagious nature. So many of

those who are exposed to it, escape it, that I am unwilling, as well as unable, to believe it contagious; and were such belief general, it would be productive of great inconvenience and distress, by the dereliction of the sick to which it would give occasion. Among those who have reported on this disease, there is a difference of opinion on this subject. Mr. Surgeon Anderson says, "It is supposed to exist in the atmosphere, from its pervading every where so extensively; but how comes it to spread in opposition to a continual current of air, namely the S. W. Monsoon? Nevertheless the idea of its being contagious is entertained by few."

Mr. Surgeon Jukes, in his report to the Medical Board, states, that he had no reason to believe that the disease had been contagious. "Neither myself nor any of my assistants, who have been constantly among the sick, nor any of the Hospital attendants, have had the disease. It has not gone through families when one has become affected\*. It is very unlike contagion too in many particulars. In general I think it has been remarked, that the greatest number of people are affected the first few days after it has made its appearance in any place; whereas contagion would be quite the reverse. There is undoubtedly considerable obscurity however at present belonging to this very singular

\* It appears from the preface of the Medical Board to their report, that Mr. Jukes afterwards altered his opinion on this subject.

epidemic, and the laws by which it has been moving, from place to place, are very unlike those of common epidemics. If the exciting cause be something in the atmosphere, which has had its influence from Bengal to the Deccan, how did it come directly against the S. W. wind that has been blowing upon this coast since June? How does it happen that the winds from the ocean still spread the disease? And if it be something general in the atmosphere, why has it not hitherto made its appearance in some two distinct parts of the province at the same time? Nothing of this kind has, I believe, been observed. It still seems to be creeping from village to village, rages for a few days, and then begins to decline.”

Nevertheless I have to inform you, that the general opinion is against contagion.

In some situations in India the climate exceeds that of many parts of the world in salubrity and regular temperature, and in which sickness and endemic disease has seldom prevailed. Yet from the Nepaul range of hills running in a line with the snowy mountains which surround the beautiful valley of Catmandoo, to the sandy desert plains extending from the Indus along the Ganges and to Cape Comerin, has this dreadful epidemic spread itself.

I have observed the disease vary by perceptible

degrees with the changes of temperature, and as these changes took place, it seemed capable of operating powerfully upon man and beast ; and although it cannot cease to be marvellous, yet in the grand army a number of cattle died in the most sudden and unaccountable manner. It is a fact, that the indigent and naked part of the lower order of natives seemed to be principally affected by the epidemic influence. I mean those who were confined to particular parts of India, and had never travelled elsewhere ; whilst those who had learned how to evade the severities and vicissitudes of climate escaped the accumulated sufferings and aggravated forms of the disease. In those peculiar local situations in India where the land was fertile and teemed with vegetation of rice to a noxious degree ; in others, where the grass grew man's height ; and in forests of timber and of brushwood where the rays of the sun seldom penetrated, where the waters of grand sacred streams, the Ganges and Hoogly, receded from the land and left a muddy soil and putrid exhalation ; nay, in the very spots where, for years out of remembrance, exhalations rose from marshy bogs, acted upon by intense and suffocating heat, even in these very baneful districts, this disease was never known till now ; the villages which these deleterious lands contained are now, I am informed, entirely depopulated. The pestilence added to *miasmita* had a most terrible effect. But if the history ended here, we might indeed assign these local effluvia as a

cause, but the fairest portion of the Indian Continent, where health was no illusion, where sickness was a stranger, where mountains rose covered with the finest verdure, where rain fell monthly in refreshing showers, where there was no deluging of plains or noxious vapours to contaminate the air, no forest nor grass-jungle to impede its free circulation, where the heat was temperate, equable, and invigorating, where the land was fertilized and the husbandman rewarded, where the luxuriance of nature exhibited a beauteous prospect from the adjacent height; it is too true that in this happy country, the variation of temperature was amazingly great; the disease appeared, and this beautiful country was nearly depopulated.

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It now affords me particular pleasure, as it will be highly gratifying to you, to turn from the melancholy scene I have just described, and inform you that the treatment I have hitherto followed, and which the Marquis of Hastings, whose great anxiety on the subject cannot be enough admired and commended, did me the honor to have published in general orders and circulated in the army throughout India, has proved eminently successful. I shall now quote the authority of others for the excellence of the remedies which I found so decidedly and invariably successful in my own practice, and it is gratifying to me to reflect, that through the promulgation and general

adoption of them, an incalculable number of lives has been saved.

The outline of the treatment alluded to, is, to administer twenty grains of calomel (in powder not in pills) and to wash it down with sixty drops of laudanum and twenty drops of oil of peppermint in two ounces of water, to bleed freely in the early stage, and to support the warmth by external heat, the hot bath and hot friction, and internally by cordials.

The first report is dated Seroor, the 22d of July 1818, by Mr. Assistant Surgeon Wallace. He remarks "The disease is most formidable. We have found the large doses of calomel, oil of peppermint and laudanum, generally succeed in checking the purging and vomiting. But the most formidable symptoms are the sudden debility and coldness, which seem to indicate the use of the most powerful stimulants. The hot bath has been found very useful." This gentleman's third report states as follows: "I believe Mr. Corbyn's practice to be very efficacious when adopted early. The majority of cases did not apply for relief until they had been attacked for some hours, and the medicines were almost invariably rejected in common with every other liquid. I determined to administer the medicine in another form, and rubbed up two grains of soft opium, with fifteen grains of calomel, and about two drachms of

honey. This was gradually swallowed, being dropt into the patient's mouth by the finger. After this he was placed in the hot bath, and small quantities of hot arrack and water mixed with spices and sugar given to drink. The patient commonly fell asleep, and in favourable cases awoke free from danger. In others the coldness and spasms recurred, when recourse was again had to the hot bath, and opium administered in various forms. Twenty-two cases only were admitted yesterday, and all of them except two have recovered."

Dr. G. Burrell, Surgeon of the 65th regiment, dates his report at Seroor, 27th July 1818, and makes the following return. It broke out on the 18th instant.

Admitted 21st	.	.	1
22d	.	.	6
23d	.	.	6
24th	.	.	18
25th	.	.	22
26th	.	.	7
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"On admission I bled in every instance, in general to a good extent. Where universal spasm existed, venesection was carried *ad deliquium*, and the patient was at the same time put into a hot

bath of 110°. The spasms were, by these means, invariably relieved, nausea and vomiting alleviated, so that the stomach bore the exhibition of calomel in scruple doses, combined with laudanum, which doses were frequently repeated; in short, the opium was given under every denomination, with calomel, and I believe the calomel will be found to rest on most stomachs *per se*.

The next report is from Mr. Surgeon Whyte, dated Seroor, the 28th of July, 1818. He states, “The practice I had followed was that first recommended by Johnson\*, and since by Mr. Corbyn, in which the corner stone and sheet anchor is calomel, in a dose of fifteen or twenty grains of the former, to an adult according to his strength.”

We now come to that of Mr. Assistant Surgeon Daws. His letter is directed to Dr. Jukes at Tannah, dated at Aurangabad, 29th of July, 1818. He remarks as follows: “I presume you have seen the letter written by Mr. Corbyn, who had charge of the Native Hospital, centre division of the army, at Eritch, to Captain Franklyn, Assistant Quarter-Master General of the same division. On this subject I could not perhaps do better than recommend you to pursue the plan of treatment therein laid down, as it is the same, with very little variation,

\* In his work on the influence of tropical climates on European constitutions, where he quotes the case of a seaman who had swallowed a scruple of calomel.

that I have adopted, and you will be glad to hear that the success of my own practice tends to corroborate it."

The next report is from Mr. Surgeon Crow, dated Seroor, 30th July, 1818. He observes: "The calomel and laudanum plan, with most diffusible *stimuli*, and the hot bath, have been eminently successful; and if application is made within four or six hours from the first appearance of the disease, the cure is almost certainly effected." In another place he remarks, that a bleeding *quoad vires*, the calomel and opiate, the hot bath, warm clothing, and frictions spirituous or anodyne, form the chain of treatment in the European Hospitals here, and these are repeated again and again as the symptoms may seem to demand. Under this plan, and an early application for relief, I think the disease is not fatal in more than one in a hundred cases.

The following report is from Mr. Assistant Surgeon Campbell of the 22d dragoons, dated from Seroor. "The scruple dose of calomel with Corbyn's anodyne draught was given every two hours, but when the spasms and vomiting had ceased, the laudanum was omitted, the calomel continued, and the stimulants more frequently given."

The next report is from Mr. Assistant Surgeon Tod, dated Camp Chumargoody, August 8, 1818.

“The way I have administered medicine is by giving calomel, one scruple, and washing it down with *tinctura opii*, one drachm, and water, two ounces, and repeating them after an hour, if the first dose is rejected. I have sometimes left the interval of an hour, which generally succeeds ; but I have, in a few instances, been under the necessity of giving it three or four times.” In another place, this gentleman adds, “I have had altogether an hundred cases where the calomel and opium plan has been followed, and though ten or twelve have died, these were either such aged subjects that no rational hope of recovery could be entertained, or were brought in at such an advanced stage of the complaint as to be beyond the power of medicine.

Mr. Assistant Surgeon Milwood writes the next report, which is dated Ahmednugger, 2d August, 1818. “I will now give my treatment with my reason for the addition I have made to Mr. Corbyn’s. There are two great objects to be attained for the recovery of the patient : 1st, to allay the vomiting and purging ; 2ndly, to restore the pulse and heat of the extremities and produce sleep. In order to effect these, I have, in addition to one scruple of calomel, put five grains of antimonial powder, and added to the draught one drachm of *spt. æther. nitros.* In the course of two hours I give ten grains of calomel and five of antimonial powder, with half the draught which I prepare with cam-

phor mixture in place of plain water, and repeat this as it is required. The best laxative I have found to be carbonate of magnesia, four scruples. It remains on the stomach, and generally causes two or three plentiful evacuations.

Mr. Assistant Surgeon Richards reports as follows. Punderpoor, 3d of August, 1818. "Up to this morning the admissions amount to 170; out of which eight casualties have occurred." This gentleman bled, and used the calomel and laudanum doses.

To evince how essentially necessary bleeding is, Dr. Burrell sends the following return :

Bled . . .	88	Died . . .	2
Not bled . .	12	— . . .	8
	—		—
Total admitted	100	— . . .	10
	—		—

I now come to Mr. Surgeon Longdill's report, dated Seroor, 17th of August, 1818. "My general plan of treatment was to give the dose recommended by Mr. Corbyn. If it was rejected, another was given, after waiting an hour, with the warm bath, which generally relieves the patients. After which they required little else but cordials and a gentle laxative."

Mr. Surgeon Robertson, of the European regiment, on the Bombay establishment, dates his report from Keerky, and states that bleeding relieved them, and that calomel and opium brought them quite round.

The report which succeeds is from Mr. Surgeon Gordon, dated Satara, 5th of September, 1818. "I sent you a report in which I stated that I laid considerable stress on free and early blood-letting. Since then I have had eleven cases, bled the whole of them, then opened the bowels, and they are all quite well.

Mr. Surgeon Coats reports to the President of the Medical Board, that "the practice followed in the treatment of this disease at Aurangabad was that recommended by Mr. Corbyn, and had been particularly successful; indeed, if the patient applied in time, it was considered as infallible.

Mr. Surgeon Jukes next reports, that "experience has now taught us that a very large proportion of those attacked by the disease, recover by the calomel and laudanum alone; but I feel satisfied that there are many aggravated cases wherein nothing but the most prompt and decided use of the lancet could possibly save the patient."

The next report comes from Dr. Taylor, a gen-

tleman who had the principal practice in the disease at Bombay. This practice is precisely similar to the foregoing ; he gives the following return :

Medicine administered to . . . . . 7459  
 Of whom died . . . . . 441  
 being a proportion of nearly six to an hundred.

The last report is from George Ogilvy, Esq. Secretary to the Medical Board, confirming the treatment already mentioned, and the reports are concluded with the following abstract of cases which occurred in the island of Bombay.

1817.	Cases.	Deaths.
August	4400	456
September	4804	287
October	2411	146
November	824	44
December	806	64
1819.		
January	889	114
February	517	27
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	14651	1138
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Proportion of deaths in those cases in which medicine was administered, 6.6 per cent. In the same space of time 1294 cases were reported by the police, in none of which medicine was administered, and it is a most important remark by

Mr. Ogilvy, Secretary to the Medical Board, that it was not ascertained *that any case had recovered in which medicine had not been administered.*

The population may amount to between 200,000 and 220,000. The number of ascertained cases was 15,945, which gives the proportion of the attacks of the disease to the population  $7\frac{1}{2}$  per cent.

I believe I have now satisfactorily proved to you the efficacy of the treatment I recommended. I shall add the remarks of the Medical Board of Bombay, made after summing up the whole of the opinions regarding the proper mode of treatment to be adopted.

“ On the subject of the cure of the disease we need say but little. The practice so judiciously and speedily adopted by Dr. Burrell in the 65th regiment clearly proves, that in the commencement of the disease in Europeans, blood-letting is the sheet-anchor of successful practice, and perhaps also with the natives; in this I have entirely concurred in my printed report, but have there said nothing of this practice among the natives. I tried bleeding with the natives, but could get no blood from the arm, and finding every efficacy from the medicine I prescribed, I had no occasion to make a second attempt; but I have no doubt you will perceive from the principles on

which I ground the cure, that the venesection is advisable in all cases where blood can be obtained;” to proceed—“ provided it can be had recourse to sufficiently early in the disease, and as long as the vital powers remain so as to be able to produce a full stream, it ought never to be neglected, it being sufficiently proved that the debility so much complained of is merely apparent. Calomel as a remedy certainly comes next in order, and when employed in proper doses with the assistance of opium, more particularly in the early stage of the disease, seems to be equally effectual among the natives, as venesection among the Europeans, in arresting its progress. In all the cases formerly alluded to, when we met with the disease in its first attack, a single scruple of calomel with 60 minims of laudanum, and an ounce of castor oil seven or eight hours afterwards, was sufficient to complete the cure. The practice of this place, as sufficiently appears from Dr. Taylor’s report, bears ample testimony to the controul which calomel possesses over this disease. All other remedies must in our opinion be considered as mere auxiliaries, no doubt extremely useful as such, and ought never to be neglected, particularly the warm bath and stimulating frictions.”

I trust, Sir, I have now performed my duty in giving you a full and accurate account of the nature and treatment of this alarming epidemic. I am still accumulating information, but in the mean

time as my object is utility and not emolument, I beg you will give publicity to this letter, by procuring the insertion of it in that excellent work, the Transactions of the Medico-Chirurgical Society.

I am, my dear Sir,  
Your very obedient Servant,

FREDERICK CORBYN.

To Sir Gilbert Blane, Bart.

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Such is the account, for which we are much indebted to Mr. Corbyn, of a malady, which, viewed in all its bearings, is without a parallel in the annals of physic. Whether considered in the tragical details of its sufferings and fatality, the obscurity of its origin, the sagacious, energetic and successful practice by which it was opposed, or the singular circumstances of its rapid progress and its diffusion over so large a portion of the habitable globe, it is one of the most interesting and affecting objects that can engage the attention of mankind, particularly of the medical world.

Some conception may be formed of the intensity of the sufferings from what is commonly experienced of the torture from the cramp of a single muscle in the leg ; for what must be the agonies of those in whom the whole muscles of the extremities and trunk are so affected, and what the superadded anguish of those in whom the breathing

is impeded by a like affection of the muscles of respiration, including the diaphragm, not to mention the stomach with other muscular and vital organs, all thrown into the like excruciating contractions! When to these are added the attendant symptoms of despair and prostration of mind, it will be difficult for imagination to conceive a more exquisite picture of human misery.

There is therefore great cause of gratulation to humanity, as well as much matter of triumph to the medical art, in means having been devised for stripping this disease, almost invariably fatal when left to nature, in a great measure of its terrors and danger, by the bold and combined administration of two potent remedies; the one possessing, along with an active evacuating quality, a powerful specific influence on the secretions; the other displaying those anodyne antispasmodic stimulating and exhilarating virtues, which render it one of the most indispensable instruments in the hands of the medical practitioner.

One of the first circumstances which strikes us in the history of this disorder, is the name it has acquired, the term *cholera* seeming to imply that it consists of a redundancy or depravity of the bile; whereas it appears that the secretion and excretion of the bile are entirely suspended, and that the matter evacuated by vomiting and purging is quite of a different character. This is an inaccuracy however, into which the ancients, as well as the

moderns, have fallen, and is best elucidated by Alexander Trallian\*. This ancient author describes three species of cholera. In the most intense, there is no evacuation of bile, and he thinks the name might more properly be derived from *χολαδεις*, an old Greek word used by Homer, to signify the bowels, than from *χολη*, bile. In the species next in degree, however, he says there is a great discharge of bile, and being attended with excruciating spasms like the former, obtains the same name. The third species is a simple bilious diarrhoea without the spasms. In the disease, as it occurs in ordinary practice, in this country, most commonly in the month of August, after the canicular heats, one of the most prominent symptoms is certainly the discharge of a large quantity of bile, and seems to be the middle species of Trallian. Hippocrates says little of the nature of the evacuations, only that green bile forms part of them. Aretæus, in his description, says, that the evacuations are at first pituitous, and then of pure yellow bile. Celsus says, that matter of a white color is evacuated, sometimes black and of various colors; but he does not describe it with his usual precision, for he calls the white matter bile, using the term in the same vague sense as many persons out of the profession in our times, applying it to every morbid humor of the stomach. In the works of Sauvages, Cullen, and most modern authors, there seems to be a want of due precision and care in

\* Lib. VII. Cap. 14, 15, and 16.

specifying bile as the only or chief matter evacuated. The cholera of Sydenham seems to come nearer to the intense species of Trallian and to the Indian epidemic than any other modern before Mr. Curtis\*, and it seemed to prevail, epidemically, in England in 1669, and still more severely in 1676. He says nothing of bile, and characterizes the evacuated matters by the name of *pravi humores*. There seems, however, in all cases to be a propensity to a redundant and vitiated secretion of bile, for sooner or later it makes its appearance, though in the intense species of the disease the secretion of it is suspended in common with the urine and other secreted fluids ; but on the disorder giving way, and the secretions being restored, large quantities of dark colored bile are immediately observable in the discharges from the bowels, the tendency to its redundant and vitiated production having then scope.

Some of the Indian practitioners have been so much struck with the impropriety of calling this disease *cholera*, that they have studiously abstained from giving it this name. As a matter of philology, we certainly, by retaining this name, run the risk of falling into the same absurdity as the scholiast, who so preposterously derived *lucus a non lucendo* ; but, on the other hand, we have the highest cri-

\* See Account of the Diseases of India, as they appeared in the Fleet, in 1782.

tical and classical authority in points like this, for implicitly submitting to established usage as the sole arbiter of speech, without regard to etymology. We will do well then to retain the old name, particularly as no other or better has been proposed by those who have laid aside the old one. Under this explanation it can lead to no mistake, ambiguity, nor error of practice; and as the most prominent character, next to the bowel affection, is the cruel muscular cramps, the epithet spasmodic is here added to it, omitting the word *morbus*, which was first employed to distinguish it from the metaphorical sense of the word as applied to a passion of the mind. If no name had hitherto been affixed to it, it might be denominated the *colica spasmodica maligna*.

Beside what has been extracted from the Bombay communications by Mr. Corbyn, there is little of importance, either in the description or practice. In some of the dissections there is more mention of congested blood in the veins of the intestines, and of the appearance of inflammation on the stomach, even to the effusion of coagulable lymph on its surface, in some subjects. This is what might naturally be expected, from the bloodless state of the extremities, and surface of the body; the circulation there seeming almost suspended, as appeared by the absence or weakness of the pulse, the extreme cold and shrinking, the mass of blood being determined to the bowels; and this seems to

account for the burning pain at the stomach, and the success of blood-letting. Some of the gentlemen in their descriptions seem to labor as if at a loss for language to convey an adequate idea of the shrinking of the limbs and trunk of the body, the shrivelling of the skin, the collapse of the countenance, and the sinking of the eyeballs. It would appear, that the total absorption of the *adeps* had also contributed to this, so great and rapid was the emaciation; and might not the thick white matter, so constantly described as discharged from the bowels, have been the contents of the adipose membrane, thrown on the bowels in the same manner as serous fluids are thrown on them from disease, or the operation of medicine?

We find in these documents also a very interesting and instructive observation regarding the comparative susceptibility of the Europeans and the natives. While thousands of the latter were perishing by the epidemic in a district near Bombay, only six European soldiers died of it. This forms a guide to the *prophylaxis*, namely, good nourishment, good clothing, shelter from the weather, and the avoiding of fatigue; these being the circumstances in which the natives and Europeans differ.

There also occurs an incidental remark, well worth recording, with regard to the dose of calomel and laudanum, which may be safely and even

beneficially administered. “ By mistake twenty grains of the former, and sixty minims of the latter, were given at the interval of less than half an hour. The patient was inclined to sleep ; nothing more was done, and in two hours and a half he was as well as ever he was in his life.”

The farther remarks on the question of contagion are also deserving of notice. The following extract contains the opinion of the Bombay Medical Board on this subject. “ On the 6th of August, 1818, it broke out with great violence at Panwell, a considerable village in the main line of communication between Poona and Bombay, separated from the latter by an arm of the sea, and distant from fifteen to twenty miles ; but between which a pretty constant communication is kept up by means of boats. On the 9th or 10th of the same month, the first case appeared in this island, and, as is mentioned in Dr. Taylor’s report, could be traced to a man who had arrived from Panwell the same day. It is also evident from Dr. Jukes’s report, that it spread north and south along the sea coast from the same place, and that it was imported to a village in the neighbourhood of Tannah in the island of Salsette, distant from this place about twenty miles, by a detachment that escorted a prisoner from that garrison to Panwell. The disease did not break out at Muhim, on the extremity of this island, distant only five or six miles from the principal native town of Bombay,

until it had been established in the latter ; it then gradually spread over the western side of the island to Salsette, through which the road from Bombay to Surat and the northern countries lies ; and by which during the south-west monsoon, is the principal line of communication. By the observation of some individuals\*, who, aware of the danger of the malady, and with the humane view of relieving the sufferings which it inevitably produced, carefully watched its progress, we are enabled to trace the disease as if creeping along from village to village on that island precisely in the same way, that is, by the arrival of people affected with disease from places where it was known to prevail ; and we are assured that there are some villages in that island, which from want of this sort of communication, or from some other cause, have, after a lapse of four months, hitherto entirely escaped.

From the foregoing detail, which, to some, may appear too minute, we are disposed to conclude that this epidemic is not only different in its nature from those that have hitherto been observed ; but that it may be said to stand alone, in regard to

\* Amongst those, we have great pleasure in mentioning the name of ensign W. A. Tate of the corps of engineers, stationed on Salsette ; who, among other arduous duties, paid the most unremitting attention to alleviate the suffering of a large portion of the population, and to whose humane exertions, some thousand of the inhabitants owe their preservation.

some of the more essential characters which usually distinguish those diseases.

In the first place, it has prevailed to a degree equally violent at all seasons of the year ; in regard to temperature, from 40 to 50 degrees of Fahrenheit to 90 or 100 ; in regard to moisture, during the continuance of almost incessant rain for months, to that dry state of the atmosphere which scarcely leaves a vestige of vegetation on the surface of the earth.

Secondly. Although what has been adduced may not appear to some to be sufficient evidence of the fact, it appears to us incontrovertible, that it is capable of being transported from one place to another, as in cases of ordinary contagion or infection, and also to possess the power of propagating itself by the same means that acknowledged contagions do, that is, by the acquisition of fresh materials with which to assimilate, at the same time perhaps, subject to particular laws, with which we may never become acquainted. Aware, however, of the doubtful nature of the ground which we tread, amidst the contrary opinions that have been advanced on this subject, we shall content ourselves with stating a few facts, which have been supplied by gentlemen, whose reports have been already printed, and which might be increased much beyond the limits to which we think it necessary to confine ourselves. In October last, when the

disease had almost disappeared at Tannah, the attention of Mr. Jukes was called to a case that had occurred in one of the apartments of the barracks of that fort appropriated to European troops ; this, owing to too late application for medical aid, soon terminated fatally ; another case occurred a few hours afterwards, the subject of which was saved with much difficulty and after much danger, and in the course of six succeeding days, no less than nine cases occurred in the same apartment. The curiosity of Mr. Jukes was naturally excited to ascertain under what circumstances so much disease was produced, and on examination, the ward appeared to be both badly ventilated and too much crowded with men ; the place was immediately emptied, scoured, and fumigated, after which no other case occurred. Since the middle of December, when we had flattered ourselves that the disease was vanishing as the cold season advanced, the number of cases considerably increased in this island, Salsette and the Conkan, and consequently excited much alarm ; in some instances these cases have been confined to particular spots, and sometimes to particular houses, where the disease has attacked and destroyed, in succession, whole families, consisting of three, four and five persons, while, in others, only a single case, or at most, very few have occurred. We are utterly ignorant of any local circumstances to which such a change can be ascribed ; unless by supposing that a diminution of temperature, together with exposure,

may have called into action some latent remains of an active poison; otherwise it seems difficult to reconcile those facts with what is observed in ordinary epidemics. It will be observed that Mr. Jukes, in his report, remarks that the disease, as it at first appeared at Tannah, did not go through families when one had become affected. He has since seen sufficient reason to alter his opinion in regard to that particular; and we think that we observed in several instances, that the disease has shewn a greater tendency to spread, where the first attacks have proceeded in their course to a fatal termination, which they invariably do when not counteracted by medicine. How far the same thing has been observed to happen in other epidemics we cannot determine.

The next testimony on this side of the question is that of Dr. Burrell, who says, in his report dated Seroor, July 27, 1818: "As every epidemic, by accumulation of subjects, has a tendency to propagate its *virus*, I am cautious in reporting this disease not infectious. Almost every attendant in the Hospital, in the short space of six days, has had the disease. There are about thirty attendants in the Hospital."

In proof of the contrary opinion, the authority of Mr. Assistant Surgeon Whyte may be cited, who, in his report dated Seroor, Sept. 7, 1818, says, "Convinced as I am of the total absence of

contagion in this disease, I have observed the late revival of this opinion with some degree of pain. Surely, if it was at all contagious, the fact of its being so could not remain long doubtful. In the general hospital here, there were three Sepoys, who resided continually from the first appearance of the epidemic, inhaling by day and night at every inspiration, mouthfuls of the infection. If the atmosphere was really loaded with contagious effluvia arising from the bodies of the patients in the hospital, the escape of these men (which has been complete) would be miraculous, indeed; living, as they were, in the very midst of these *effluvia*, and so near their source. Allowing that the constant habit of doing so procured them an exemption from the influence of contagion, the same thing cannot be said of the friends and relations who were attending upon the patients, and of six dooly bearers, changed daily, and who used to assist the sick into and out of the bath, and in every other way; thereby exposed to be infected by the disease, whether it is conveyed through the medium of the atmosphere or by touch; yet I have not known one instance of dooly bearers, friends and attendants of the sick being so infected; nor have any of our hollalchones or hospital assistants suffered."

The next extract shall be from the letter of Captain Sykes to Dr. Milne, dated Punderpoor, 15th of August 1818; and as this is mere matter of

evidence, upon which persons of good sense out of the profession are competent to decide, (perhaps not the less so that they are not biassed by any theory or preconceived opinion) some weight is due to it. " With respect to the origin and nature of the malady, I am incompetent to give an opinion ; but that its progress is independent of the air, I think there are many circumstances to justify the belief. In the first place, we see that it has made its way independent of a permanent S.W. wind from Jaulna down to Punderpoor. Its effects were not instantaneous in the country ; but its progress may be traced, by a slow advance, to from 15 to 29 miles a day, as if it had been communicating gradually by persons travelling from town to town. Its principal ravages about here appear to have been confined to the high roads leading from Punderpoor and the large villages in the neighbourhood, and I dare say it might be proved that it did not break out in any village, until that village had communicated with a neighbouring place in which the disease existed. Corroborative of this, are the observations I made at Natapoota of the 17th of July. That day I descended the Mahadoo ghaut from the town of Singnapoor, in which the disease was unknown, and marched six miles to Natapoota ; where the plague had that very day made its first appearance. It first appeared in Punderpoor on the 14th, so that it had taken three days to travel 40 or 50 miles to Natapoota. There are other circum-

stances also to justify the belief that it is contagious. In my light company there were three or four men taken ill at once; of course there were attendants from the same company upon these men. The disease went on increasing in that company, and there have been more cases of cholera in it than any other. One of my servants was attacked: it gradually extended to five. An officer at Punderpoor had seven servants attacked one after the other; the gentleman in the next tent had not one. I have seen a similar instance in our corps. I should infer therefore, from its running in particular companies of a corps, or sets of servants, that, as they attend on each other, and constantly sit or sleep in the confined space of a small tent, the disease is communicated by absolute contact, or from respiring the same air that a diseased person has done. I am aware that there are very strong arguments against its being infectious, persons escaping who have been in constant habits of handling the sick and breathing the air of the cholera hospitals."

Mr. Surgeon Coates, in a letter to the President of the Medical Board at Bombay, says, "At Tokah we were visited by a gentleman from Aungabad, who brought us accounts of the disease raging in that city; but the idea was, that it had been brought from Jaulnah where it now also raged, and that its progress through the villages in the post road from Nagpore to that station could

be distinctly traced." In another part of his report he says, "From the above facts and others which have been related, I consider the disease infectious; but though this opinion should be well founded, it ought to occasion no alarm, for it is only under some peculiarity of constitution, and that fortunately very limited, that the poison acts. About 1 in 40 in our camp was attacked, and I should think this is above the usual proportion. If the disease were occasioned by a distempered state of the atmosphere, it would have spread over the country with some sort of regularity, but it seems generally to have travelled in lines along the post roads, and always to have required a succession of subjects for its propagation. In Candeish, where there is not sufficient population, and but little intercourse between the villages, its progress was slow. At Punderpoor it made its appearance at the time of the great Jatra, and was spread at once in all directions by the pilgrims returning to their homes; the number of deaths here was 3000 in a few days. The patients are described as being knocked down as if by lightning. We know nothing of the state of the body which predisposes to the disease. "Mr. Coates mentions a circumstance at the conclusion of his letter, which leads to the idea of the infection lying dormant for some time as in the case of small-pox. He says, I might have mentioned that all the subjects predisposed to the disease, seemed to have been attacked at the places where it appeared within ten or twelve days."

The last extract relating to this subject, shall be taken from the report of Dr. Taylor to the Medical Board of Bombay, dated 16th of Nov. 1818. “ Whether the disease be contagious, or a simple epidemic produced by some peculiar state of the atmosphere, is a question which has been a good deal agitated. The course which it has pursued from one extremity of India to the other, unchecked by different states of temperature, and by great variations of seasons ; its proceeding even against the powerful monsoon winds, and its having been traced moving along the high roads from place to place, have been urged as proofs of its contagious nature. The manner in which it was found to have originated and to spread at this place, lends some probability to the same opinion. Its introduction to Bombay has been clearly traced to a person who came from the Deccan, and passed through Panwell when this disorder was raging there ; and it has been observed here, that whenever it appeared in any particular spot or family, a considerable proportion of the family, or of the neighbours, were attacked within a very short period of each other ; on many occasions I have seen three or four of a family lying sick at once. In bringing forward these facts, however, it may be proper at the same time to state, that of the 44 assistants employed under me, only three were seized with the complaint.

The communications from the Mauritius, come next to be considered. It appears by a report made by the principal medical officer there to the President of the Medical Board of the Army, that the disease first shewed itself here on the 20th of November, 1818, and continued to prevail, though with considerable abatement, till the 18th of December, when the last accounts came away. In that time sixty-nine cases had occurred in an army consisting of 1472 men, of whom fourteen had died. It appears by a communication made to the writer of this, by a gentleman high in the Civil Service of the Government, that from the time of its breaking out till the date of his letter, December 18th, the number of burials during the same period was 700. The ordinary average was from 90 to 120 in the same space of time. This is independent of the deaths in the country districts, which have been very numerous. By still more recent accounts it appears that the total mortality in the island amounted to several thousands, and that the number of cases in the army, from the 19th of November, 1818, to the 4th of February, 1819, was 269 ; of whom, 235 were discharged ; 31 died ; and 3 remained. Here, as in India, by far the greatest proportion of seizures took place in the laborious classes of the population. Only twelve of the white inhabitants had died of it ; but this class of the population lost not a moment in removing from the town on the first alarm, and every

precaution was taken as if the disease had been contagious.

With regard to the practice, opium and calomel were administered to the cases in the army, but in smaller doses than in India. Little is said of the civil practice, except that one of the French practitioners stated that he found great benefit from the administration of repeated doses of two drachms of the sulphate of magnesia. It has been already mentioned that the mortality in the civil hospital was 94 in 133 admitted. The deaths in the town by the report of the French practitioners were 194 in 440 admitted. By comparing these statements with those in India, it will be seen that the success was much greater in the latter.

There was here the like difference of opinion regarding the contagious nature as in India. The principal medical officer denies its being contagious, and ascribes the appearance of the disease to the unusual degree of atmospheric heat. Another medical officer is of opinion that it is contagious, and that it fell most heavily on the attendants of the sick. From the great alarm of the inhabitants, it is evident that they were impressed with the same belief, and did not doubt that it had been imported by the *Topaze* frigate, which arrived at Port Louis on the 29th of October from Ceylon, where it prevailed. Of 17 who

were taken ill of this disease on the passage, 3 died, by the report of the surgeon, beside two previously; the whole number of deaths by that disease being stated at 5 on board for the preceding 18 months.

It is of the utmost importance that the question regarding the infectious nature of this malady be decided. The facts and the arguments on both sides of the question have been fully detailed. It has been already observed, that if it is not contagious, and that the general belief should prevail of its being so, the most serious distress and inconvenience would arise, from the dereliction of the sick, to which it would give occasion. But on the other hand, the mischief would be infinitely greater, should it be really infectious, and the contrary opinion prevail. It is evident that the settling of this question must be of the most grave, serious and vital moment to the community, and to the character and feelings of the medical practitioner, to whose opinion the world at large naturally look up, and from whose decision, if erroneous, the most direful calamities must ensue. It is indeed hardly possible to conceive a higher and more sacred responsibility to exist, for upon such decision hangs the fate of thousands, who may, by a mistaken opinion, perish of a disease perhaps the most excruciating in the whole catalogue of human maladies, not to mention that the peace of mind of the individual who pronounces the sen-

tence, as well as the credit of the profession at large, is deeply involved in the opinion he may deliver.

The main argument of those who maintain non-contagion is the exemption of the great numbers who are exposed to breathe the *effluvia*, and to the contact of the affected subjects. To those who employ this mode of reasoning, there are two considerations which seem to have escaped their attention. The one is, that the same principle will apply still more strongly against its being derived from a general atmospheric cause, whether this is made to consist in a higher degree of temperature, or in some contamination from the exhalations of the soil or other cause. For it is evident, that as all must breathe the same air, all ought to be seized; whereas it is possible that many may avoid inhaling the morbid *effluvia* of the sick, which is so much more partially diffused. Those who have remained exempt, must have been equally exposed to the cause as those who are taken ill, if that cause proceeds from the soil or the atmosphere, or any other universally diffused cause, such as must exist if contagion is denied.—The other circumstance not adverted to, is, that in no case of epidemic disease, however distinctly depending on the morbid poison of the sick, is the whole population affected in the same manner. If this were not the case, the plague or small-pox would long ago have extinguished the human species, whereas great

numbers who are taken ill of both, escape with their lives, and others entirely resist the infection. It is clearly stated in some of the testimonies already recited that, except in the hard-living part of the community, only a small proportion of those exposed, were susceptible, from some inscrutable modification in their constitutions, and it appears that after all the susceptible had been affected, the disease abated, and speedily disappeared.

The circumstance which most obviously discriminates an epidemic arising from the morbid poison engendered in the human body, that is contagion, from those which arise from affections of the atmosphere, whether consisting in alterations of temperature or in contaminations from the soil, is that the progress of the former will necessarily be *progressive* and traceable to human intercourse, whereas the influence of the latter will as certainly be *contemporaneous* in situations more or less distant. It will be clearly perceived, by a careful perusal of the preceding history, that the spread of this malady has been strictly progressive, and evidently carried by human beings from one district to another; nor is it conceivable that those requisites of temperature and contamination of the atmosphere, could have occurred by mere accident at those spots and periods in which the disease shewed itself in its progress by sea and land, as historically ascertained in the preceding narrative. This is no where more striking than at the Mauri-

tius. This island is near 3000 miles from the other places at which the epidemic raged ; and can any mind be so constituted as to believe that a new disease of the identical nature with that which had ravaged all India, should have shewn itself by mere accident at the very time when its appearance was in exact conformity with the supposition of its being imported by the frigate ? For let us suppose that the inhabitants of the Mauritius were all, or most of them, susceptible of the small-pox from the long absence of that epidemic, and that a ship should arrive in which several cases had recently occurred, and from which thirty of the sick were landed, and a free intercourse admitted, as stated in the transmitted accounts, it would break out about the same distance of time, that is about three weeks after the arrival of the ship, for no subject might be exposed to the morbid *fomites* for a week or two, and the infection would remain in the system for ten or twelve days, a circumstance common to these two epidemics, and which took place with regard to the cholera after the arrival of the *Topaze*. This subject indeed cannot be better illustrated than by running a parallel between the actual progress of this epidemic and the usual course of small-pox. Let us put the case that small-pox had been introduced into Calcutta in August, 1817, and that the whole of India had been so long a stranger to it that all the inhabitants were in a susceptible state, would it not take exactly the same di-

rection and propagate itself in the same manner as we have seen the cholera to do? It would extend itself to that quarter in preference to any other in which the greatest human intercourse was going on, that is towards the North-West, where the affairs of government and commerce, and above all, at that period, to the quarter where the Grand Army was assembling, on the banks of the Jumna. This was the route which it actually did take, and the like causes carried it into the Deccan, and from thence to each side of the Peninsula of India, where the communication of human beings was going on, and advancing most rapidly where this communication was most frequent, reaching at last the sea-port towns on the Coromandel coast and the island of Ceylon, where having got on board of ships it was transported over seas and oceans to the continents and islands to which these ships were destined.

It farther resembles the small-pox in the subtleness of its communication, the infectious matter of both seeming more volatile than that of the plague; for though we have been able to trace it on the great scale, it has been found occasionally like the small-pox to break out in spots a few miles distance from the known seat of contagion without its being possible to trace it. It is to be regretted that the same circumstance renders it extremely difficult in the case of both diseases, to take measures however

judiciously framed and vigilantly executed, which shall be effectual in preventing their introduction.

The only other hypothesis that has been devised to account for the remote cause of epidemics in general, besides the exhalations of the soil and the infectious effluvia of the living body is that which was suggested by Sydenham, of subterraneous mineral effluvia arising from time to time. This has been actually alluded to by one of the medical officers of India as a probable conjecture; but not to mention the untenable ground of an assumption purely gratuitous, and neither supported by fact nor countenanced by analogy, it may be asked how it is conceivable that these effluvia could exhale from the earth in the progressive manner in which this disease extended itself, and how will it account for its appearing on board of ships at sea, or at remote spots where these ships arrived, the Mauritius for instance, 3000 miles distant from India, while it was unknown at the Isle of Bourbon, a small neighbouring island in the middle of the same ocean, in the same atmospheric stream of air, being situated about thirty leagues to leeward of it? And we may here take occasion to mention that intelligence has just been received in England through the French journals, that a ship arrived at one of the ports of France on the 9th of May, in ninety days from Bourbon, which she must have left therefore on the 10th of February, at which time the disease had not appeared in that island,

and that a strict quarantine had been instituted from the moment it was known to have shewn itself at the Mauritius about three months before\*.

\* Since this sheet was sent to the printer, intelligence has been received from the Mauritius, dated the 21st of March, from which it appears that the epidemic had then entirely ceased there, and that a ship had arrived the day before from Bourbon, with accounts of its having appeared there in spite of the precautions, but had been confined to the town, and had ceased when the ship sailed.