ON THE EARLY SEATS OF CHOLERA IN INDIA AND IN THE EAST,

WITH REFERENCE TO THE PAST AND THE PRESENT.

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[*Read April* 1*st*, 1867.]

I. Early history of cholera in the East.
II. Names of disease.
III. Inferences. 1. Always of various kinds. 2. Long endemic in India. 3. Also epidemic. 4. Causes assigned. 5. Carried by ships.
IV. Its present diffusion in the East; inferences. 1. Tendency of disease to get fixed in adjoining countries. 2. Ships, caravans, pilgrims. 3. Deserts. 4. Imperfect information respecting the past.
V. General results. 1. Importance of Gangetic valley overrated. 2. Quarantine of Red Sea alone quite insufficient. 3. Habits of natives supposed to have an influence on the disease.
VI. Historical summary.
VII. Appendix. Historical table, and table of names.

The disease called cholera morbus, or the choleric passion, has been fully described by most of the Greek and Arab authors. In more recent periods we have accounts of its violent forms, given by Sydenham, and Willis, and Morton, in England, not to mention Zacutus, Riverius, and many other continental authorities. The most comprehensive view of the whole subject was taken by the late Dr. W. F. Chambers, in his lectures in the *Medical Gazette*, 1849. Besides giving a full account of what Greek and Arab authors had said on the subject, he entered in some detail on the disease, as described by Sydenham and others. On this part of the subject Dr. Greenhow has also enlarged in the *British and Foreign Quarterly*.

For accounts of the disease within historical times in India we are indebted mainly to the Madras and Bengal reports of their Medical boards. The information supplied by them has been digested well by Dr. Chambers, by a writer in the *Times* in 1849, by the late Dr. Graves, and has also been given in abstract in Martin's work on *Tropical Diseases*.

But these accounts scarcely go back more than eighty or ninety years. The object of this paper is to give a sketch of the history of the disease within the period of European connection with India; to trace it from the very first appearance of the Portuguese in the East, down to the great renewed outbreak of the disease in 1817. I have to acknowledge my obligations to Hirsch's *Medical Geography* for many valuable references, and to Mr. Gaskoyn for some translations from the Portuguese previous to the date of D'Orta's work; and I have made free use of an article contributed by me to the *Quarterly Review*, January, 1867, containing some new facts, to which I have since been able to add.

I shall not enter in any detail into the history of cholera before the European period. There are full accounts in Sanscrit writings of a disease of various degrees of intensity, one of which was no doubt the true Indian cholera. These have been published repeatedly, and I need not go over the ground again. There is a certain want of precision in the descriptions given by Sanscrit, as by Greek and Arab writers, but the general truth of their accounts is unmistakable. Of late an inscription, said to have been discovered in front of a temple at Vizianuggur, describing the symptoms of the disease, has been resuscitated. But such things are often fabricated. Certain Sanscrit writings have been published in Madras, purporting to show that vaccination is an ancient Hindoo practice, but the scholars to whom I referred them, all doubt their genuineness. In the present instance it appears that the word *murree* is the one used on the inscription; now, *murree* means plague, or pestilence in general. Cholera has been called the sudden *murree*, and, doubtless, occasionally the great *murree*, but the latter phrase has been most frequently applied to an entirely different disease, a form of the Levantine plague. However, if the inscription be not authentic, we know from other sources that the disease prevailed in India before the European period.

I. The Portuguese first reached the coast of India in 1497, and they began to form settlements about 1502. Goa was founded in 1510. Their first proceedings in India soon involved them in war with the Samorin, the ruler at Calicut. and in 1503, during a campaign against him, there is a distinct notice of cholera, as well as of small-pox, having proved fatal to Europeans. In 1543 there was an epidemic of cholera of frightful intensity at Goa: a graphic account has

been left of the distress and consternation which it occasioned. The Governor found it necessary to put a stop to the tolling of the bells on each decease, as their melancholy notes added much to the prevailing alarm. I think it may be presumed that this is the first great epidemic from which Europeans have suffered in India, as it caused such universal consternation. However, such afflictions are soon forgotten; and D'Orta, writing at Goa a few years afterwards, does not mention the epidemic of 1543. In 1563 Garcia D'Orta, a physician, who had been at least a quarter of a century resident at Goa, published there the earliest work on Indian medicine, *Colloquios dos Simples*. Notwithstanding its numberless typographical errata, the work is most creditable to the Portuguese. D'Orta, it may be observed, does not hint at the disease being a new one. His account of cholera occurs in the colloquy on Costas. As it is the first full account of the disease given by a European, I have attempted a condensed translation.

"Let us approach the choleric passion, which the Indians call *morxi*, or disease from eating too much, and which we corrupt into *mordeshi*. The Arabs call it *hachaiza*, which has been corruptly read by Rhazes as *saida*.

"It is a malady which here kills very quickly, and from which few recover. It is more acute than in our lands, for it commonly kills in twenty-four hours. I have seen cases in which it did not last more than ten; persons in whom it lasted four days; and, as there is no rule without an exception, I have seen a man of strong constitution that lived for twenty days, went on vomiting bile incessantly, and after all died. I knew an excellent gentleman who suffered thirty hours from this complaint, and said that he had neither vomiting, nor purging, nor cramp, but was entirely prostrated by inability to breathe freely. The natives call this kind, got by excessive venery, the dry or seco.

"Those who eat much, particularly of cucumbers or shellfish, and those who have too much converse with women, suffer most. The disease is most common in June and July. Symptoms: Pulse is very weak; in a short time there is a feeling of great cold, with cold sweat; the cold is great while the patient complains of great burning; the thirst is clamourous, the eyes are very sunk, there is inability to sleep, much vomiting and purging, until the powers are so exhausted that nothing more can be expelled. Cramps in the legs follow. The patient turns and twists from suffering. After the patient may have been vomiting and purging a

couple of hours, at last he brings up only water, with no bitter or acid taste.

"The malady is not one that can be neglected either by the physician or hospital servants. As to treatment, there is a poisonous humour and infection which ought to be expelled and evacuated. The native treatment was to give a decoction of rice, with pepper and cummin, but, above all, to apply the actual cautery to the feet and ankles, and to tie ligatures round the limbs. He himself gave no water except a little in which gold had been extinguished. He used a variety of astringent vegetable medicines. Thought there was virtue in three grains of bezoar, a remedy with which he cured the Bishop of Malacca. He rubbed the whole body with hot cloths and warm oils, and, when the vomiting ceased, gave a little chicken soup."

Christopher A. Costa, also of Goa, writes in 1580 attributing cholera to the use of the jack fruit: as translated by Clusius, "qui frequentius Jaca vescuntur facile in pestilentem illum et pessimum morbum *mordshi* appellatum incidunt."

Linschott, a Dutchman, who spent many years at Goa, writes in 1789, according to the French translators, "Les maladies que ces changements de temps apportent aux habitants de Goa sont divers, entre lesquelles a la vogue celle qu'ils appellent *mordeshin*, qui survient en un instant et à l'improviste, avec soulevement de l'estomac et vomissement continuel jusques à tomber dans defaillance; cette maladie est commune et mortifere à plusieurs." After talking of the two next most fatal diseases, dysentery and fever, he adds of their fatality,—"Ces maladies font mourir annuellement grand nombre des Portugais." We thus have six distinct accounts in the sixteenth century of the common prevalence of cholera at Goa and the regions about it; or taking this in its most limited sense, the coast of Malabar and Canara. As the word *mordshee* is a Mahratta one, and as the Mahrattas are not the original inhabitants of Goa, their application of the name *mordshi* to the disease at Goa seems to show that the disease was previously known to them.

But in those days the Portuguese were in close connection with Muscat and Ormuz, and with Java and the Eastern seas. Cholera at present is readily conveyed by ships, and we should, therefore, expect to find traces of the disease elsewhere. Accordingly, within forty years of our last notice we hear of the disease both in Java and in Arabia. It seems to me probable that Zacutus' statement of the prevalence of cholera

in Arabia was published in Europe before Bontius' account of it in Java, if not written earlier. However this may be, in 1629 Bontius wrote a full account of the disease, which would have been unmistakable even if he had not identified it by mentioning more than once that the Malays called it *mordeshi.* Now, we know that the Dutch had been preceded by the Portuguese in Java—that the word *mordeshi* is not a Malay word, it must therefore have been imported from India, and applied either to a disease brought by them, or to a disease they found already existing in the island. Bontius has been so often quoted that he need not be reproduced here ; but I would merely remark that he talks of the disease as a common endemic one—mentions four or five native remedies for it, and observes that the disease is dreaded as much as the plague is in Holland ; but Zacutus's notice of the prevalence of the disease in Arabia at this time is particularly interesting—we know, indeed, that the Portuguese troops in various expeditions from Ormuz, suffered from sudden sickness, but the nature of such attacks does not seem to have been specified.

Zacutus was a celebrated Jewish physician, banished along with his countrymen from Lisbon, by Philip IV. He retired to Amsterdam, where he published the great systematic works of the day. He thus had an opportunity of communicating with the Portuguese as well as with the Dutch, who were the two nations in those days in closest connexion with the East. Letters addressed to him from the tropics, and especially from Dr. Pereira, of Goa, show that he was in communication with physicians abroad. His statement in 1632 is very distinct and positive—" Ne ergo contemnas hunc affectum, qui etsi in Lusitania nostra et Amstelodamo paucos jugulet, in Oriente ubi vocatur patrio sermone *mordeshi,* plures quos corripit extemplo jugulat, et in Mauritania et Arabia est lethalis fere, in quem affectum incidunt Arabes frequenter qui continuo jusculum esitant frigidum &c. quod cuscus vocatur." Prax. Histor. lib. ultim. Observat III.

Now this extract shows that Zacutus was perfectly aware of the tropical disease being more violent than the ordinary European one; he wrote forty years before the London epidemics, which by the way Sydenham says, differed " toto cœlo" from ordinary cholera. He knew that the disease was called *Mordshi* in the East, but he expressly adds that it was also common in Arabia—and goes on to specify the mess they eat, to which he attributes the disease.

We have nothing to say to his statement of the disease prevailing in Mauritania; it does not concern us at present, although it is likely enough to be correct—as it was described in that country as Almaida, by Averrhoës, in 1200.

Zacutus makes no mistake, and evidently knows what he is writing about. It will probably never be possible to ascertain what was the source of the disease in Arabia at that time: however, there is nothing surprising in its prevalence, as Rhazes and Avicenna, some centuries, indeed, before, both describe a cholera of very considerable fatality in that part of the world. Avicenna, who lived at Bagdad, attributes its prevalence chiefly to southerly winds, to rain and to heat; and says it is most fatal summer and autumn, and Rhazes calls it *saida*, another form of *haiza*, the word now commonly used in India to designate cholera: and besides this, the Arabs, according to Dr. W. Ainslie, have a tradition that the disease was introduced into Arabia some centuries ago from India—that it travelled over Persia, Syria, and Egypt, and finally disappeared in the African desert.

Mandelsloe, a German who travelled in India in 1638, adds little to our accounts of cholera, but mentions it as a disease that kills without delay at Goa. In 1666, De Thevenot, a French traveller, had a slight attack of cholera when travelling from Boorhampore to Surat, and takes occasion to explain that there are attacks of four various degrees of intensity, all described as *mordshee*. He first mentions this disease, and then gives an account of dysentery. In 1674, we have the first notice of the disease by an Englishman. Dr. Fryer speaks of cholera morbus as occurring in extreme heat at Surat, called *mordesheen* by the Portuguese—a vomiting and purging, treated violently by cautery.

In 1676, Dellon, a French prisoner of the Inquisition at Goa (and it does not matter to us whether his adventures are fictitious or not), attributes to his having been well-fed his escape from the cruel malady, called by the Indians *mordeshin*, which was frequent and dangerous in these climates. Dr. Dellon, about the same time, says that *mordeshin* is common in the Indies, that its symptoms are not always the same, that it causes death in a few hours if neglected. He attributes it to heavy food taken at bed-time, and hints at consecutive fever.

Pursuing the history of the disease, we must now transfer ourselves from the western, to the eastern portion of the great peninsula, from the palm-fringed coast of Malabar with its

luxuriant vegetation and back waters, and its magnificent back-ground of mountains, to the flat, bare, surf-beaten shore of Coromandel, from the haunts of the Portuguese to the Carnatic, where the great struggle for ascendancy was taking place between the English and French.

But it would be a very important link in the history of the disease, first, as showing it in full force above the ghauts, and, secondly, as forming another connecting link between the western and eastern sides of the peninsula, if we had any positive evidence of cholera having broken out in Arungzebe's army in 1689. We have, indeed, accounts of a violent epidemic having spread through his camp in the neighbourhood of Beejapore, and raging with such violence that no one reckoned on his existence for a single hour. To this, according to Grant Duff, the historian, Kafee Khan, has given the usual name for cholera, although the symptoms he mentions rather resemble those of the plague. In favour of the disease having been cholera may be advanced the statement of Linschott, that plague is unknown in India, that Beejapore is only 120 miles from the coast where we have so long seen the disease prevailing, and that when a disease resembling plague appeared in India, they gave it the name of *maha-murree*—great pestilence; a name very seldom applied to cholera.

Our next notice is from a Frenchman, a Jesuit missionary in Southern India, Père Martin, who was familiar with the disease between Madura and Trichinopoly. In his letter dated about 1702, he mentions violent gastric disturbance, with convulsions, and records his cure of the case by the application of the actual cautery to the soles of the feet, followed by violent slippering. An invaluable cure, he says, which was much used along the coast, but little known inland, or at Aour, where this case occurred. D'Orta, and De Thevenot, and Fryer, had already given an account of this remedy, and Dr. Dellon said that, after proving the inefficiency of all other modes of treatment, he had at last adopted it himself.

The history of the disease at this time would rather seem to indicate its having gradually crept north from Madura.

In 1709, another of the brotherhood, Frère Papien, writing from Hooghly, mentions *mordshi* as one of the diseases of the country. This is the first European mention of cholera in Bengal, but as for the present it stands nearly isolated, we must go to the parts of India, where we have fuller notices of the disease.

Madras accounts first mention the disease in 1756 at

Arcot, about fifty miles inland from the presidency town. It seems to have been a district to which the disease adhered for a long time, for in it or in Vellore, or in the adjoining valley of Amburpet, there are frequent notices of the disease from 1769 to 1783 and 1787. There can be little doubt that the disease mentioned by Orme as prevailing epidemically in Southern India, and causing sudden deaths in 1757, was cholera.* Dr. Paisley, of Madras, writing in 1774, says, that in the first campaign made in that country it was horribly fatal to the blacks, and that fifty Europeans of the line were seized with it, that it was the same disease which they had seen at Trincomalee. He says it is often epidemic among the blacks, whom it destroys quickly, and he approves of moving a camp to get rid of the disease. There seems no reason to doubt that cholera reached the Isle of France in 1775. The accounts of this given to our officers at a later period were clear and convincing. Of the ravages of the malady on the Coromandel coast and near the French settlements, we have full accounts from Sonnerat for the period of about 1775 to 1780. This writer has got the credit, but certainly without cause, of having converted *mordeshin* into the similarly sounding *mort de chien.* He gives an account of the ravages of more than one epidemic, and says that upwards of sixty thousand people of the country between Cherigan, in the delta of the Cauvery, and Pondicherry, were carried off by it. In the edition of his *Diseases of Seamen*, in 1780, Lind talks of the *mordeshin* as being very frequent and fatal in the East Indies.

Our next notice of the subject carries us a long way up the coast, to a neighbourhood of which we have scarcely yet heard, to the delta of the Mahanuddy and to Juggernath in the first place, and to Calcutta and the Gangetic valley in the second. Paxman, indeed, in 1736, mentions incident-

* It would be very important to get accounts of cholera epidemics in other parts of India of an earlier date, but no positive ones, except those of the Goa outbreak in 1543, have yet been discovered. Dr. James Johnson, indeed, once made a statement before the Westminster Medical Society, that there had been an epidemic in Surat in 1760, which carried off 60,000 people, but it does not appear on what authority this statement rests. A good deal has been made, especially by French writers, of the fact of 30,000 natives and 800 Europeans having been reported to have died of the disease in Bengal in 1762; but Lind, the authority for this, expressly calls the disease a putrid and remitting fever, to be cured by bark. Lind and Bogue both describe the diseases of seamen in the river Hooghly from a period which may be said to extend from 1757 to 1770, but they make no mention of any disease like cholera, although the disease must have continued to exist as an endemic, and Lind was familiar with the fact of the existence of mordeshin in the south.

ally that the *mordeshin* and *mordshie* occur frequently in India. He says he was nine years in Bengal, and visited Coromandel. He mentions bad fevers in Bengal in August, but says nothing of *mordshi* or of epidemics of it there. In 1781, a detachment of Bengal troops passing down from Cuttack to Ganjam were suddenly seized with cholera on the 22nd of March, the disease being said to have been previously common among the people of the country. It was entirely new to the Bengal officers, who, in the first place, as has happened in many a plague, attributed it to poison. The seizure was as sudden and as violent as its epidemic visitations continue usually to be. Out of a body of about 5,000 men, it is said that 700 died. As the detachment moved on to the south the complaint gradually left it; but the pest was not confined to the country near Ganjam, it travelled up to Calcutta, where, according to Warren Hastings, although recognised as the ailment called *mordeshin*, it created intense alarm and horror, having caused 879 deaths in ten days; in the month of April it gradually abated, and pursued its course to the northward. Unfortunately its course was not traced at the time, but it can scarcely be doubted that it is the malignant distemper of which Mr. Lindsay, of Sylhet, in the north-east corner of Lower Bengal, writes in the month of September, 1781, that, "after having carried off a number of the inhabitants of Calcutta, it is now raging with the greatest fury at Sylhet. Many of the Zemindars and Naibs having fallen victims to it, the others have in a body deserted the town."* The rumour mentioned by the Bengal Medical Board in 1819, that cholera prevailed in Bundelcund about forty years before, may have been well founded if the disease at this time travelled up the Gangetic valley; and perhaps this would in some measure render its sudden outbreak higher up the Ganges at Hurdwar in the early part of 1783 less surprising. The disease when it left the Bengal detachment on its way south, was not exhausted, for it appeared in General Andre's beleaguering army in 1781. We have ample evidence of its presence at Madras in 1782, when it killed fifty Europeans of a regiment within three days of their arrival by sea, and in less than a month a thousand Europeans suffered from attacks of it, in which year it also prevailed in the fleet off Madras, and at Trincomalee; and when Konig, the botanist, who gives an

* Taylor, Topography of Dacca.

excellent account of his attack, was near falling a victim to it at Tranquebar.

Next year, or in 1783, the Madras Report describes the disease as epidemic along the whole coast. We hear from Hay of its being in the south, in the Travancore country; and it showed itself in the army of observation. In this year, too, Curtis talks of *mort de chien* as "this fatal, intractable Indian disease." Early in 1783, or about eighteen months after our last notice of cholera in Lower Bengal, we meet with a furious outbreak of it among the pilgrims assembled at Hurdwar, at the very head of the Gangetic valley. It is said to have carried off 20,000 men in a few days; but, with the apparent capriciousness which distinguishes it, spared a village only a few miles distant. We have no account of the cholera spreading on that occasion.

It appears to have abated somewhat of its violence after this, although we still have notices of its ravages. It is at Vellore and Arcot, which are close to each other, in 1787; in 1790 it again attacked a detachment of Bengal troops moving south near the Chilka lake, in Ganjam; and in 1797 a collector, in one of his reports, alludes to the sickness and mortality in a pergunnah of Backergunge, in the delta of the Ganges, and states, that "in one house, that of a grain-dealer, seventeen lives have been lost in eleven days: and I consider that from four to five hundred lives have been sacrificed to this plague, which has not yet been subdued."* This can only refer to cholera; and tallies in date with the Report mentioned by the Bengal Medical Board, that the disease prevailed epidemically in Lower Bengal in the end of the last century. Yet when it reappeared there, only twenty years after, it was at first taken for a hitherto unheard-of pestilence!

Here we may pause to examine the main features of the disease. We have it attacking soldiers on disembarkation, and sailors on board their ships; troops marching, and troops in camp; we have the holy fair at Hurdwar; we are in Cuttack, on the track of pilgrims to Juggernath; at Vellore, in the route of those going to Conjeveram; at Cherigan, of the frequenters of the southern shrines and Ramisheram. We have the disease freely pervading Ceylon, and, in all probability, carried to the Isle of France. Finally, we have it showing itself along the backwaters of Travancore, up the western coast to Goa, Surat, and the high

* Taylor, *suprâ*.

country above it; in the delta of the Cauvery; in Vellore, surrounded with its rice-fields; in the delta of the Mahanuddy; and in the delta of the Ganges, where it was not destined to take permanent root in its worst form yet awhile. While one is struck with the obvious fact that these accounts refer chiefly to the sea coast, and to districts not very far removed from it, we must also remember that Europeans had very few dealings in those days with the interior.

On looking back to the prevalence of cholera from 1756 to 1797—at least so far as we are enabled to do so by the light of our imperfect accounts—the period of the commencement and termination of the wide-spread of the disease in India during the latter half of the last century, we may assign to about the middle of this period, or from 1775 to 1785, and particularly to the years 1781-82-83, the maximum of intensity of its epidemic diffusion.

Our notices of cholera for the next nineteen or twenty years are scanty in the extreme; there was evidently a period of quiescence. Dr. J. Johnson saw it in the harbour of Trincomalee in 1804. Mr. Barnes, of Jessore, which lies about sixty miles from Calcutta, says that the Court at that place had on two occasions previously to 1817 been broken up, owing to the outbreaks of the disease, and that he remembered having seen cases which resembled cholera; but this is very vague and indefinite. Very recently Mr. C. Macnamara has exhumed a few notices from the records of the Bengal Medical Board, which show that in the years 1808, 9, 11, 12, 13 and 14, also in March, 1817, stray cases of the disease had occurred in various military stations, most in Chunar, near Benares, but some in Fort William. There are very clear accounts from three Madras medical officers of a slight outbreak of cholera in some native troops marching near Jaulnah in 1814; and the next evidence of an absolutely reliable character* that we have, shows cholera in 1817 already widely spread in the delta of the Ganges: in May and June in Kishnagur and Mymunsing; in July at Sonergong, in the Dacca district, and as high up the river as Patna.

Now, it is not common for any pestilence to break out suddenly in country districts where there has not been some unusual collection of people. We do not know of any great

* Corbyn's very extraordinary statement that he saw the disease on board the *Mangles* Indiaman on his way from England to the Cape in 1814, when there were 64 deaths among the Lascars, has never been accepted.

assemblage having taken place in Bengal that year. There is not the faintest reason to suppose that there was cholera in 1817 at Juggernath. Even if there were, the districts where it first showed itself are out of the line of pilgrims, and the disease burst forth before the date of the great religious gathering of the year. According to all analogy—just as we had stray cases of cholera in England in 1865, but our epidemic did not come till 1866—we should expect to be able to discover traces of the disease in Bengal before it became so general. Such traces have been found by Mr. Macnamara, but this does not detract from the extreme interest of the communication of an anonymous writer to a Calcutta newspaper in 1831. He states that a band of bird and fruit sellers—in fact, a sort of gipsies, called Kooroorceas—were seen by him at a village called Saibgunge, in the district of Purneah, north of the Ganges, in 1816, and that in the months of April and May they suffered from a pestilence unknown before as an epidemic, which consequently had no name, but to which they gave the name of *oola*;* that it killed eight or ten of them a day, and that in consequence of it they moved their encampment. We are inclined to attach every credit to this statement, which is put forth quite simply, and unconnected with any theoretical views. The disease is represented as breaking out at the very season which we know to be the commonest one for cholera in that district, and among a class of people, wanderers, among whom we should expect it, and just the people to diffuse it. There is a great probability that they did spread the germs; for it is in districts not far removed from Purneah, that we find the disease first showing itself next year.† How these people got cholera, we cannot pretend to say. We do not know whence they had come, or how long they had been in Purneah; but, granted that they spread the germs of cholera in 1816, the outbreak in 1817 is less surprising. We do see something like a commencement to it, and without the help of these gipsies we have no way of accounting for the disease being widely spread in the earlier half of the year in Northern Bengal. There is no evidence of a spread of cholera from any one central focus in 1817.

As the effect of pilgrimages has of late been brought for-

* Olá-uthá, now the common Bengalic name for cholera, is defined in Forster's vocabulary, 1802," Flux, attended with vomiting."

† There are many villages called Saibgunge in Purneah. It may be said in a rough way that Patna is about 150 miles to the west, Mymunsing the same to the south-east, and Kishnaghur the same to the south of Purneah.

ward so prominently, as pilgrims undoubtedly frequently carry back cholera with them from Juggernath—it may be well to point out that Calcutta and Lower Bengal generally lie out of the main track of pilgrims. Pilgrims passing by Gya, Deoghur, Bancorah, and Midnapore to Juggernath keep quite clear of Calcutta; and in the year 1818, in particular, the Bengal Report says, "Of late the disease has appeared much in the south-west parts of Bengal, visiting severely Midnapore and Cuttack, which it almost spared in the first year of its existence." Lower Bengal, indeed, has scarcely any places of pilgrimage; and Kali Ghat in Calcutta, and Saugor Island at the mouth of the Hooghly, attract a comparatively small number of votaries. So far, then, as we are able to throw any light on the question of how the cholera outbreak of 1817 originated; it is very plain that the disease did not come up, as in 1781, from Cuttack; it is also clear that it first appeared in the upper part of the delta of the Ganges, nay, probably north of it; it possibly may have come down the Gangetic valley to Bengal. But our information as to the presence of cholera in Upper India at that time is too scanty to help us in the solution of the question. Certain it is that cholera in its worst epidemic form was fairly introduced into Bengal in 1781, but, for some reason unknown to us, did not fructify then, as it has done since 1817; and it is probable that if introduced at all in that year, it was entirely from a different quarter from that from which the visitation of 1781 had come. In 1817 both Europeans and natives had almost forgotten the former epidemic. So soon is the memory of such things lost.

Yet in a certain sense the disease cannot be said to have been a new one in 1817 in Bengal, for we have seen that cases of it had been occurring occasionally from the beginning of the century. Dr. Macrae, writing from Chittagong, informed the Medical Board that he had had occasion to observe the disease, as it prevailed in his district more or less every hot season. Indeed, the Board itself in its early communications to Government, assured it that the malady was only an aggravated form of the usual epidemic of the season, though they did not in the first instance apply the name of cholera to it.

No question in medicine is more interesting than that of an endemic disease taking on the character of an epidemic, and of the behaviour of an endemic, when its own epidemic form reaches it.

Returning to our earlier ground in Western India, Dr.

Clarke, in 1772, talks of cholera as a very frequent disease at Bombay. It appears to have been common in Ceylon from 1774 to 1782. In 1776, Fra Bartolomew found the disease on the Malabar coast; and he describes a bad epidemic of it in 1782. In this same year, according to Dr. Clarke, European troops died at Bombay of it, and of coup de soleil. Dr. Clarke, in his edition of 1792, in the new chapter, says, the disease is common in Malabar and Canara. From this time to the first outbreak of the disease in the Bombay presidency, and in India generally, in 1817-18, we have scarcely any information about it in the west. It is astonishing that the Bombay Medical Board had so little to say about the former prevalence of the disease. They only contribute the rumour mentioned by Mr. Jukes, that the disease had prevailed in the Mahratta country about 1790, 1794. They are not even aware that cholera had prevailed in 1814 near Jaulnah, scarcely 200 miles distant.

Still there is sufficient evidence of cholera being endemic at this time. Sir J. Malcolm states that the bad form of it was always endemic in the jungles of Malwa—some distance, no doubt, from the western coast, but still in constant communication with it. Dr. W. Ainslie says that cholera morbus was very common on the Malabar coast. Dr. Macrae writes to the Bengal Medical Board that he had personal knowledge of the prevalence of the disease in that district since 1790. Mr. Craw, writing from Seroor, states that in 1818 common cholera had been prevalent during the rains at Caranja, but that when the epidemic disease arrived next season, the nervous symptoms were so marked, that he considered it resembled tetanus rather than cholera. Mr. Hay's statement from Travancore in the south, also is very interesting. He writes, Nov. 19, 1818, from Quilon: "The spasmodic cholera, I am happy to say, abates the last seven days, having only afforded thirty-six cases, and one casualty, but the Vythians report the death of almost all attacked. I trust to be able to make a noble stand against the epidemic when it arrives: what I have had to encounter recently I hold to be the endemic, if not of the Malabars, certainly of the Travancorians, which is perfectly familiar to us all. Twenty-five years before, it devastated the country, destroying thousands." No new disease, however, did reach him this season, and Mr. Scott, the author of the Madras Report says, that there could be no doubt that the endemic of Travancore was the epidemic of other parts. We have thus traced an endemic cholera prevailing at times with epidemic violence

in the western and southern portions of the Indian peninsula, from the earliest European times down to 1818—and it is not till that period that there is the slightest occasion to allude to Bengal, or the distant delta of the Ganges.

I shall pause here for a short space, and sum up the characteristics of the disease as it manifested itself before 1817—some of those bearing on its ætiology. If we inquire what was the general configuration of the districts in which cholera showed itself, it must be admitted that it has been very various.

It has been found along the back waters, and at the mouths of the tidal rivers, and generally along the sea coast of the west and south of India—a district remarkable for luxuriant vegetation and for periodical heavy rainfalls. It has also visited the deltas of the Mahanuddy and of the Ganges, the conditions of which are tolerably similar;* but then it has also visited the upper Gangetic valley, which is dried up for a great portion of the year, and where the rainfall is scanty, as compared with other parts of India. It has also prevailed with great epidemic violence for a series of years on the plains of the Carnatic, and along the eastern coast of India, which is in all respects the opposite of the west; and it has flourished on high table land, that of Malwa, 2,000 feet above the sea, being probably one of its oldest seats.

It has existed on alluvial soils, on laterite and trap and primary formations, under the most various conditions of sub-soil and of drinking water.

It has always had a tendency to appear at particular seasons of the year.

It has shown a fondness for towns and places of pilgrimage; for soldiers and for camps; for shipping, having been readily carried by ships; and on land showing a power of travelling over long distances in a very short time.

The bearing of these facts on some of the conclusions of the Constantinople Conference will be apparent. That body declared that "Cholera seems to be an original product of the valley of the Ganges. The cholera of the invading character, which we have in our days, is necessarily the result of new conditions, which have been produced in India about the year 1817. Cholera's being only of late years in a state of permanence, must be due to some new and special condition of these localities; some special peculiarities as to houses or food,

* It may be mentioned that old writers generally describe the climate both of Malabar and of Bengala as healthy.

or recently-acquired habits—for instance, the burying of the dead." So little did they know of the history of the disease!

II. We have found the usual native name in those days for cholera, *mordeshi*, a useful guide in our notices. We may inquire into the history of that word, and also of *haiza*.

Rhazes appears, about the year 900, to have used the latter word under the form of *saida*—h and s are letters easily convertible. We again find the word used for cholera by Averhoës about 1200. He terms it *almaida—i.e., alam i Haidsa*, or disease of *haidsa*. In process of time *haiza* has become the common word for cholera all over the East. Its original meaning seems to be vomiting and purging. It need scarcely be said that the word is Arabic.

The other name, now almost forgotten, though it was the one universally applied by Europeans, *mordeshi*, is *morshee*, the word found by the Portuguese in use at Goa, where the Mahratta dialect prevailed. After a good deal of inquiry among Eastern scholars—Col. Chambers, Dr. Hall, and Dr. Rost—I do not think that either of two derivations from the Sanscrit, or Dr. Craigie's derivation from the Persian, making out the word to be "death of the bowels," are at all satisfactory. For the present, the derivation from the word *mödna*, to tear or twist, is about the best. The word still means in Mahratta cholera, but in Guzeratee at the present time it only means pain in the stomach. Dellon, in 1682, writes of the *mordeshin;* Martin, in 1702, says the French had corrupted it into *mort de chien*. This, therefore, is the probable date of the transformation of the name.

In India there seem always to have been various forms of cholera, but the more violent one came to be known as *mordechi* by Mahrattas, as *haiza* by Arabs, as *cholera morbus* by Europeans; in each case the term meaning the disease of cholera par excellence. Just as the Europeans applied the old name of *cholera morbus* and the Arabs the old name of *haiza* to the malignant disease in India, so does no epidemic of it in India appear ever to have originated a new name. On the outbreak of 1817 the Bengalees did indeed coin a new goddess, but they called her by the old name, *Oolabeebee*, from *oola* flux. I believe all the native names of cholera (except one synonymous with epilepsy, and said, rather doubtfully, to have been employed at Bombay) mean vomiting and purging. This survey warrants us, I think, in drawing two conclusions; first, that cholera morbus, or malignant cholera, was considered to differ only in degree, not in kind, from other forms of the disease; second, that vomiting and

purging were always recognised as the two prominent symptoms, just as *brechruhr* is the common name for it in Germany. Some of the synonyms of cholera will be found in a note at the end.

III. I think that several conclusions may be fairly drawn from the foregoing history of the disease and of its names, and the first of them is—

1. That cholera of various degrees of intensity has always prevailed in India, as it does at the present day. If we refer to old Hindoo medicine, we find that under the head of *Ajerna* were described four kinds of cholera, the worst form of which was the *vidhuna visuchi.* [Dr. Hall, of the India Office, assures me that this, like other phrases for cholera, merely means in Sanscrit a disturbance of the stomach and intestines.] This division seems to have passed over to the Portuguese, for, curiously enough, we have De Thevenot saying there were four degrees of *mordeshi.* Different writers make different distinctions among choleraic attacks, but the following are the common forms met with in India, and I may remark that I have had occasion to treat the disease in each of twenty-four consecutive years. You have ordinary bilious attacks of vomiting and purging. You have much more violent choleraic attacks, sometimes fatal ones, often connected with some article of food that has acted as a poison. The earliest Portuguese writers mention such attacks after eating prawns, and I have seen various such cases myself. You have true cholera endemic in districts, occurring sporadically, and generally showing a tendency at particular seasons to become epidemic; and you have the same disease raging with epidemic violence. The symptoms of all these forms of disease run into each other. In their commencement there is no absolute line of demarcation between them, any more than between European and Indian cholera, They only vary in the intensity of the symptoms and the amount of prevalence. Of course no one can mistake a well marked case of the bad form when it is fully developed, but not every one can say where the mild form ends and the bad commences; nor at the outset of a case can you always predicate absolutely, although you generally can, which it is to turn out. These appear to me to be simple facts, whatever conclusions may be drawn from them. I speak of symptoms only. I do not enter into the question of the specific character of malignant cholera.

But a division of cholera of the violent form into two kinds is brought prominently before us by the history of the

past: cases of ordinary Indian cholera in which vomiting and purging were the prominent features, and those in which affections of the nervous system, indicated by spasms and convulsions, were the more marked symptoms.

The latter form was described by Hippocrates as the cholera *sicca*, and led the Greek and Arab physicians to recommend the application of ligatures to the limbs in cholera; a practice derived from their ordinary treatment of epileptic convulsions. So prominent were those features even in the earliest times, that Sanscrit writers disputed whether cholera should be classed among diseases of the nervous or of the digestive system. Bontius in Java, and Girdlestone in Madras confounded cases of spasmodic cholera with the idiopathic tetanus of the country. When the violent epidemic of 1818 broke out in Bombay, we have seen Mr. Craw stating that he thought the disease had more of tetanus than of cholera in it; and at that time one of the names applied by natives to cholera seems to have been *mirgee,* the common phrase for epilepsy. However, as Dr. Clarke sensibly remarked, the identity of the two diseases was best shown by all finding the treatment for cholera to be the best for the tetanic attacks. Attacks in which there appears to be a sudden impression made on the nervous system, seem to occur in epidemics of all diseases, as, for instance, in the Levantine plague, and in the suddenness with which boats' crews were attacked with fever in Bengal in 1762, according to Lind. Cases of cholera, in which the patient is described as struck down at once, always have occurred, and no doubt continue to do so. I have not seen them myself, and the more such cases are examined, the fewer I believe will there be found to be, in which the usual changes in the intestinal canal have not commenced, if they have not been fully developed. I believe the far greatest portion of these cases are merely ones that have been imperfectly observed. Still the occurrence of such cases cannot be doubted.

2. The disease known as Indian cholera has existed as an endemic in the East as long back as we have any certain European accounts. Our early histories do not, indeed, always give full and systematic descriptions. Particular symptoms, such as suppression of urine, rice water evacuations, secondary fever, are often not mentioned at all. But the disease was one which at once arrested the attention of strangers. It is mentioned by Linschott as the first and chief Indian disease, before dysentery and fever. This could not have

been the case if it was only the ordinary European cholera. It is spoken of as a cruel pest; as coming on quite suddenly, and with no warning; as being dreaded as much as the plague in Europe; as killing most of those it attacked; as often killing in a few hours; as prevailing at particular seasons; and as being very fatal both to Europeans and to natives. I think that no more detailed proof (even if we had not examined the history of the word *mordshi*) need be adduced to show the violence of the disease, and of its endemicity we have had ample evidence; that it was always endemic in the west and south of India; and that Europeans have suffered from it from the period of their earliest connection with India.

3. One great characteristic of Indian cholera has been called by the recent Constantinople Conference its invading character, or power of spreading, or of epidemic diffusion. It is, indeed, extremely difficult to draw any positive line between endemicity and epidemicity. Our early notices of the disease represent it as endemic, with a tendency to become epidemic; as not limited to India, but known in Java and Arabia. In India epidemics of all kinds have been mentioned in such vague terms (as *jurree murree*, sudden death) that it is difficult to identify them. It is, therefore, particularly fortunate that we have the Portuguese account of the epidemic at Goa in 1543. Sir T. Roe, about 1616, says the Emperor would not go to Agra on account of a plague there, but says nothing of its nature. Passing over the very probable, but not quite certain, account of cholera breaking out in Arungzebe's army in 1689 before Beejapore, coming to positive proof of its epidemic prevalence on the large scale at a later period, we have supplied ample proof of the disease having been widely epidemic on the Coromandel and Malabar coasts, in the middle and latter half of the eighteenth century, even without pursuing its course up the coast from Madras to Bengal. Any increased power of spreading in the west and south, if admitted, is no new feature of the disease. It is at most an old one intensified, just as the disease has not shown any single symptom since 1817, that had not been often observed before. It is, indeed, a matter of fact that about the year 1817 the disease, after a period of comparative slumber, awoke to a fresh period of prolonged activity, which continues to this day. I confess that after a good deal of study of the subject, I have not been able to arrive at any satisfactory reason for the fresh outbreak of that year.

At the time of the outbreak much importance was attached to food—to bad rice, and to decayed fish; but it was never shown that with respect to them there was any state of things in 1817 that had not often existed before in Lower Bengal. We know that bad food predisposes to many diseases, and that some kinds of it produce in Europe, as in India, attacks, and often fatal ones, most closely resembling cholera; but we have no reason to suppose that they generate more than local epidemics. The state of the weather previously to the outbreak was investigated, and it seems to have been ascertained that the seasons had been very irregular, and that there had been extensive inundations; but although it has been from the first very clear that cholera bears a distinct relation to season, and that its diffusion is aided or impeded by meteorological changes, but few have considered it probable that any such atmospheric irregularities as have been observed, could have produced the great outbreak of 1817.

Then it has been said, and undoubtedly with truth, that increased intercourse helps the spread of cholera, and the greater tendency to spread is the only fresh characteristic of the malady in 1817; and it has been attempted to connect increased communication in India with that particular period. We know of no good grounds for this, except the assembly of the large army of the Marquis of Hastings in that year. But Lower Bengal, and more especially the portion of it where cholera showed itself first in 1817, is entirely out of the course of the usual movements of Indian armies—we have already seen that it was out of the direct course of pilgrims; and as to increased communication and travelling in India, the improvement in them has been a gradual process; and it appears to be a mere arbitrary assumption to assign the period of 1817 in particular as the date of its commencement. The first steamboat did not reach India till 1826, so it is a mistake to suppose, as some have done, that steam helped to convey cholera to the Persian Gulf, which it reached in 1821.

It has been a favourite French notion to throw the onus of the production of cholera in India on English domination, and to attribute it to neglect on the part of the English Government of the great canals and works of the Mahommedan emperors. I need not inquire where those great works were situated, or at what period they fell into decay. It seems sufficient to remark, that cholera is first known to us in districts in which there never were such works, and that its great centre at present is in a part of India where none such ever existed.

It seems on the whole very improbable, especially with reference to the history of other diseases, that we shall ever be able to ascertain why the very invading character of cholera, as the Constantinople Conference terms it, should date from 1817.

4. In those early days the causes assigned were almost always indigested food, and sometimes venereal excess—and a good deal was attributed to the season, and to the air.

Avicenna, at Bagdad, said, "Auster et multitudines pluviarum et regiones meridionales solvunt ventrem." Dorta talks of cholera prevailing in the regions about Goa in June and July. Linshott says it is brought round by the seasons. Bontius, in Java, talks of the influence of heat. Bartolomeo talks of the prevalence of the disease on the Malabar coast in October, November, December, saying that its season was different elsewhere. This character the disease has maintained. Though it may break out, and there may even be partial epidemics at almost every season, each district in India has its season when cholera prevails most frequently.

I have not come across any trace of its being thought contagious or infectious in early notices of the disease.

5. In those days cholera was propagated across the seas, and there can be little question but that this was by ships. At first sight one might be inclined to say—we know that this is the case in these modern days of quickened intercourse—but we should not think it probable in these earlier times; but the more one looks into the question, the greater does the intercourse seem to have been in those days. Every ship, whether Portuguese, Dutch, English, or French, seems in the earliest days to have touched at Zanzibar, at Aden, or Muscat, or at some port on that coast on its voyage from Europe to Surat and Goa. From the western coast of India the voyage was usually extended, especially by the Portuguese and Dutch, to the Moluccas. Then the Portuguese of India were in close intercourse with their settlement at Ormuz. Ships sailed from Surat, conveying merchandise from Agra and Bengal, brought to be shipped for the Persian Gulf, and go on by caravan to Aleppo, the overland route of those days. In the earliest times of the Portuguese the fleet of the Caliph of Egypt even issued from the Red Sea to attack them. European vessels often went up the Red Sea. I need hardly add that from the earliest times pilgrims sailed annually from Surat and other ports, bound for Arabia. The accounts, therefore, of the disease having prevailed both in Java and in Arabia by Bontius and by Zacutus, are only what we might have expected to have.

The introduction of cholera into the Mauritius and Bourbon in 1775 is easily explained, as we know that the malady was common in the English and French ships on the coast of Madras, and in Ceylon; and that the Mauritius settlements of the French were in constant communication with the Indian ones.

IV. We may next turn to another portion of the subject, and inquire how far these districts of India in which we have the earliest notices of cholera, or in which the great outbreak of 1817 first showed itself, continue to be seats of the disease. On this subject my information is not very complete. In the absence of complete statistics, general impressions must often be trusted to. Still, for the present, the case may be thus provisionally stated.

Since 1818, Bombay has been a favourite seat of cholera. It must have spread with the extension of that city. In the years 1862, 63, 64, 65, the deaths by it have averaged more than 3,000, and in one year they nearly reached 5,000. In the last two years the number of deaths has been considerably reduced. Taking the west coast as a whole, the disease does not seem to be very widely spread. It occurs frequently at Surat, and occasionally at Vingorla, Cannanore, and Cochin. It has, according to Inspector-General Pearse, been at least five times more common among our troops on the comparatively high tableland of the ceded provinces, than on the coast of Malabar and Canara. He thus expresses himself: "During a period of fifteen years at Cannanore, where the aggregate strength of the European force was 14,441, only fifteen deaths occurred from cholera, that of native troops 49,389, only sixty-one deaths. This immunity of the troops is not easily explained, for the native population generally suffer severely during epidemics. In the latter part of 1859 the disease prevailed throughout the provinces of Malabar and Canara, destroying large numbers of the population. In the jail at Calicut, a well-ventilated and commodious building, in which 400 prisoners were confined, cholera in a few weeks swept away more than one-fourth of its inmates. A detachment of European infantry, numbering one hundred men, escaped at the same time without losing a man." I observe that there was again in 1863 a fatal outbreak in the jail at Calicut, and only last year in 1865 there was a great epidemic in Malabar, which killed 14,000 people in one month.

The notice given by Thevenot of cholera occurring near Boorhampore is particularly interesting to us, taken in con-

nection with Sir J. Malcolm's belief that cholera was always endemic in the Malwa jungles. If that was really the case, the prevalence of cholera in Bundelcund about 1786, is easily explained, and even the outbreak of the disease in 1783, at the more distant Hurdwar, is less surprising. In 1841 Dr. Irving, in his topography of Ajmere, reported that the neighbouring districts of Kotah Boondee and Merwar are almost annually subject to its severest visitations. It was very prevalent in the south Mahratta country in 1841-42. The recent accounts of the disease breaking out in troops near Mhow, has again painfully directed attention to this particular part of India, which, by the way, has also been remarkable for its sweating sickness. On the whole this district, which offers a complete contrast to the strip of land along the western coast, and to the deltas of rivers, is one of the oldest and most persistent foci of cholera in India, and it is 1500 to 2000 feet above the sea.

But coming back a little nearer the coast of the Concan and Canara, if cholera is not at present very widely spread along it, yet almost all the principal towns above the ghats suffer from it nearly annually, and chiefly in the hot weather. It is enough to enumerate (not forgetting Baroda, which is low), Sattara, Sholapore, Seroor, Dharwar. I think we have thus conclusive evidence that if cholera, in these as in other parts of India, had become less frequent before the outbreak of 1817, yet the disease was only reintroduced into a soil in the west of India, where it had prevailed for centuries, and where it seems as ready to flourish now as in earlier periods.

The portion of India known as the Madras Presidency, and in a general way representing the eastern coast of the Peninsula, was a constant seat of the disease from the middle of the 18th century, and for a period of about thirty years its epidemic ravages in that part of India were frequent. At the present day it does not, however, appear to suffer as much as Bombay or Bengal. The town of Madras, indeed, often suffers from epidemics, and cholera appears periodically at different places along the coast; it also occasionally shows itself on the high plateau of Mysore. But another and less elevated plateau, known as the Ceded Districts, appears of late to have been its favourite seat, at all events it has attracted most observation. Madras regiments, both European and native, have a tendency to pick up cholera on the line of march in a proportion quite unusual in troops in other parts of India. This is usually explained by the immense number of women and children and camp followers

that commonly accompany them. Outbreaks of cholera in this part of India are often connected with religious festivals and gatherings.

In Lower Bengal cholera appears unfortunately to have struck its roots very deeply. It is never absent from Calcutta, and epidemics in the different districts of Lower Bengal are frequent. It is believed to be now endemic in many of the large cities of the north-west provinces, though probably not yet fixed in the Punjaub, and epidemics are not infrequent in the north-west. European soldiers appear of late to have suffered in much larger proportion than the native troops or native population. In Bengal as elsewhere pilgrimages bear their share in the spreading of the disease. And there are frequently epidemics at Gya, Allahabad, and Hurdwar. In most cases, I believe that the travellers bring the disease with them to such gatherings, and that the spread of the disease depends on the season and other influences bearing on the propagation of the disease, among which must be included the prompt application of hygienic measures.

The seasons of cholera have been tolerably well ascertained in Bengal. In the lower provinces the great season is the hot weather, there is almost always a large diffusion of the disease at this period, the shipping in Calcutta suffering especially. In the early part of the cold weather, especially in the eastern districts, the disease appears to have a new period of increase in the commencement of the cold season ; as we pass to the north-west, the period for epidemics appears to be retarded, and it occurs after the setting in of the rains, not that it does not occasionally come in the hot weather. In the Punjaub it is still later in the year. But in the north-western provinces the disease is almost extinct in the cold weather, which is by no means the case in Lower Bengal. I may add that besides the two periods of increase just indicated, Dr. Bryden, who has studied the statistics of the subject with much care, is inclined to believe that there is a third intermediate period of disease, about the commencement of the rains.

The history of cholera in Java is curious. It is spoken of in 1629 as a prevalent endemic greatly dreaded. There can be no doubt of its virulence. A French writer refers to its having been epidemic there in 1689, but I have not been able to verify this. However this may be, it seems to have died away in its worst form, although there was always a slighter form called *mountan* by the Malays, which they

treated with strong coffee, until we hear of the disease reaching the island in 1819 from Bengal. It prevailed there again from 1826-30, and we lose sight of it again till we hear of it at Sumatra in 1853. In Malacca there were epidemics in 1819, 21, 26, and 40, and the disease again prevailed in 1864; but its visits are casual there and at Singapore, and we have no account of the disease having regained its footing and become endemic. Considering the frequent outbreaks of cholera among our troops in China,* and among the French at Saigong, it is only surprising that there is not more cholera at Singapore. The Island of Ceylon may be treated as a part of India in which the disease occurs occasionally sporadically. Epidemics are by no means very uncommon; but it is strange that, notwithstanding this being the case, and its ceaseless intercourse with Calcutta, Bombay, and Madras, the disease is scarcely established at Galle as an endemic. Cholera appears to have been introduced by sea into the Mauritius and Bourbon in 1775-76, but to have died away. After 1817 it was introduced again, and there have since then been various epidemics—of late occurring with more frequency, which looks as if the disease might take up its quarters there permanently.

So far, nothing that has been said admits of the faintest controversy; but if we go to another apparently ancient seat of the disease, Arabia—a great deal is disputed, and especially the introduction of cholera, and the outbreak at Mecca in 1865, a subject on which I shall not enter. There can be no question as to the immense extent to which cholera has prevailed in Persia and Arabia since 1821. It was, no doubt, first introduced by sailing vessels; how far it has found a congenial soil in these countries, or how far it is kept up by fresh importations from India, I shall not inquire; but these are the general facts, that Surat and Bombay are the two nearest points by sea to Muscat, and that the shorter a voyage is, the more readily is cholera conveyed. The intercourse between Bombay and the Persian Gulf, the Arabian coast and Red Sea, has been constant. Cholera was as early as 1821 carried to Muscat, and in that year it extended up both sides of the Persian Gulf to Bussora. In 1823 it was in various places on the Arab coast. In 1831 it was in Muscat again, and, according to Clot bey, it was a caravan that carried it from there to Mecca, whence it spread to Suez. In 1835 it was

* The evidence of the existence of true cholera in China in early times appears to me to be insufficient.

in the Hedjaz. It was at Aden (which by the way enjoys a great immunity from the disease) in 1846. In 1853 I know it was all along both sides of the Persian Gulf; in 1858, at Jedda, Loheia Mocca, Hodeiah, Massowa; in 1859, again at Aden, and it can be shewn to have been in some part of Arabia almost every year since that date up to 1865.

The disease is almost always present in the Persian Gulf. I have met with notices of it in 1821, 22, 23, 29, 30, 41, 42, 43, 46, 51, 52, 53, 55, 56, 57, 58, 60, 61, but it would be tedious to examine in detail the diffusion of the disease in Persia. It is often there, and in this year (1868), the Russians report that it has reached Astrabad.

These facts respecting the diffusion of cholera seem to point out some conclusions, which I can only enumerate:—

a. It would thus appear that Arabia and Persia have been visited by cholera for the last forty-six years. In 1854 Heslop wrote from Bagdad that cholera had lingered in the towns in the south long after the epidemic had passed away, giving rise to the opinion that it may now have taken up its abode there constantly, and it has been already well pointed out by the *British Medical Journal*, that there are many parts of India that have not been nearly so often visited by it. However, the Constantinople Conference, having the latest and, it is to be presumed, the fullest and best information, were of opinion that cholera was not yet naturalised in any country out of India.

b. In these days ships, caravans, and pilgrims have undoubtedly aided materially in the spread of cholera. I shall say a word about caravans. We have been in the habit of looking on caravans as great conveyers of cholera. A Persian caravan was said to have carried it to Aleppo. Damascus pilgrims had the credit of carrying it to Mecca, as also caravans from Muscat. It was also said that caravans carried it from Mecca; but we are told now that there is some mistake in this, at least as to the transport of the disease across deserts, for the Conference lays down that "Deserts form a great barrier to cholera, and caravans never imported it by the desert into Egypt and Syria."

(*c.*) This is an important conclusion, if it is to be generally accepted; I have no experience in such matters, but it goes against much that I have read on the subject, and Professor Griesinger told me, that though he has no detailed notes on the subject, he is confident that on one occasion, while he was in Egypt, the caravan coming through the

western deserts of Africa introduced the disease into that country.

d. Before leaving this portion of the subject, a word may be said on the imperfectness of our information. It may be matter of surprise that there are no accounts of cholera in Arabia or in Java after the time of Zacutus and of Bontius in 1632 till the year 1820. But it is by no means certain that the subject has been fully examined. Careful research may bring out more information respecting the disease in those countries as well as in India. It is surprising how very seldom historians, especially Eastern ones, have thought it necessary to specify the nature of plagues or epidemics. Even travellers like Bernier and Tavernier, writing about the same period as De Thevenot and Dellon, do not mention cholera. In India it would appear that there is only one doubtful notice of the disease by a native historian, Kafee Kahn, in 1689. In that country only one notice of it by Paxman has been as yet found between 1709 and 1756, a period of nearly fifty years. For a long time Dr. Paiseley's letter, written in 1774, was considered to be the first account of the disease in India. For earlier accounts within the European period, Indian writers had to go to Java. If the very intelligent authors of the Bengal and Madras Reports on Cholera were satisfied that the disease was a very old one in India, on the authority only of vague Sanscrit accounts and of a foreigner, Bontius, surely the early notices of the disease in that part of the world by Rhazes, Avicenna, and other Arabian writers, along with the positive statement of Zacutus in 1632, afford sufficient presumption that the disease was not unknown in Arabia, although its history in the intervening period has not yet been traced.

Some of the results of our historical and geographical survey, bearing on questions discussed before the Constantinople Conference, are the following :—

1. Whatever importance we may assign to the great outbreak of cholera in Bengal in 1817, cholera still prevails in its oldest seats, and on the side of India in closest and nearest communication with the Persian Gulf and the Red Sea. The common notion that cholera is the product of the low plains of India appears to be groundless, and the importance attached to the Gangetic valley is quite exaggerated. The French idea of uprooting cholera by draining the delta, and as one gentleman put it, by running about twenty canals through it, can scarcely be entertained by any sane mind.

Supposing the delta of the Ganges to be improved, and cholera lessened, one source of the disease would be diminished; but could we imagine that this would have much influence on the other parts of India where it flourishes independently? The idea expressed in some of the latest French writings, that cholera is the result, not merely of English neglect of public works, but of the mental and physical decay, and of the cerebral degeneracy of the natives of India, consequent on English rule and *exploitation mercantile*, is absolutely too absurd for serious consideration.

2. I have not been able to go far into the question, but as far as I can judge, cholera has shown little tendency to spread through Guzerat, Scinde, or Belochistan, by the interior: it has spread chiefly along the coast. Cholera does not seem much inclined to travel through the Punjab, and by Cabul into Persia. Curiously enough, many believe that by this route it came into India in 1844 from Central Asia. The greatest risk, therefore, of its spreading towards Europe is by the Red Sea and still more by the Persian Gulf. Cholera appears to be almost constantly present in the latter. To have any effective quarantine, it must include the Red Sea, the Persian Gulf, and the coast of Arabia. Even if I attached much value to quarantines at all under ordinary circumstances, still one is not presumptuous in saying that a quarantine of the Red Sea alone is useless, and that so extensive a quarantine as would be required, is utterly impracticable.

3. Although I think it quite vain to search for new conditions to account for the outbreak of the disease in 1817, seeing that it did not then show any one feature that had not been often present before—still the inquiry why India should so long have been the seat of the worst form of cholera is a very interesting one, though scarcely to be taken up at the end of a paper, but I may say a word or two respecting a speciality of the habits of the natives of India, which has been considered to favour the development of the disease. It is certainly worth alluding to in these days, when the doctrine is so prevalent that cholera is propagated mainly by the excreta, and when many most intelligent medical officers attribute the fatal prevalence of the disease of late years among European troops to increased use of common privies; and to the growth of cesspools near barracks.

Orton, the author of an excellent work on cholera, wrote thus in 1832. After noticing the risk from persons labour-

ing under choleraic diarrhœa going about unsuspected, he says, "The rapid diffusion of the cholera over Paris has probably arisen from the practice of using public privies, and, among the lower orders, of obeying the calls of nature in the open air. Cholera has committed most extensive ravages amongst bodies of troops in India in the course of two or three days, but by means of the common privies every man of a corps may be exposed in the common privy to a full dose of infection arising from a single individual in the course of a day or two: and among the civil population it is scarcely less evident, for nearly the whole of them pass their evacuations *sub dio*, assembling in great numbers in particular places, where they sit for a considerable time, luxuriously smoking their hookahs."

Orton, therefore, viewed both the scattering of the excreta over the soil, and their collection in privies, as favouring the propagation of cholera, and in this he is followed by many. But in modern times it is usual to draw a distinction between the excretions in their recent state, and after they have undergone fermentation. In the former state they are said to be innocuous, in the latter, to contain the seeds of cholera. I apprehend that no such distinction can be rigidly made. However, I shall merely remark that, although the natives of different parts of India do not differ from each other in their habits in this respect, yet, undoubtedly, the disease has its favourite districts. The great manifestation of the malady in 1817, since which period no one has ever discovered any change in its character, took place long before the adoption of public privies in our chief Indian cities. But it would be beyond the scope of this paper to discuss this or other more or less theoretical questions at any length. My object has been to present simple facts.

VI. The historical facts which we have been examining, may be conveniently summed up as follows:—

1. Malignant cholera appears to have shown itself in one of the first campaigns of Europeans in India in the year 1503. It is a disease which the Portuguese found in India.

2. The first undoubted great epidemic of cholera within the period of European intercourse with India, took place at Goa, in 1543.

3. From the accounts of Zacutus, Bontius, and others, cholera appears about 1632 to have been widely diffused in Java, in India, in Arabia, and in Morocco.

4. In the present state of our knowledge it would appear, that there was a period of quiescence of the disease in the

early part of the 18th century—then a great outburst after 1756, which lasted about thirty years, and was followed by a period of comparative quiescence till 1817.

5. Since 1817, it can scarcely be said that there has been any true period of quiescence of the disease—nor can it be said, that at the present day is cholera unknown in any one of the districts, in which we have the earliest accounts of it.

6. Without following the disease to China and the east, or to Europe and the west, since 1821, cholera has been found to prevail nearly every year in some part of Persia, or of the Persian Gulf, very constantly in Arabia, and occasionally in the Red Sea.

7. Extravagant importance has been attached to the Gangetic valley as a generator of cholera, whereas from the earliest date up to the present day, cholera has existed in other parts of India—quite independently of Lower Bengal, and it so happens that historically, Bengal is the part of India in which no accounts of the very early prevalence of the disease have been discovered.

It may be convenient to present some of the facts contained in this paper in a tabular form.

VII. APPENDIX.

A.

NOTICES OF MORSHI, MORDESHIN, MORT DE CHIEN OR CHOLERA MORBUS, BEFORE 1817, CHRONOLOGICALLY ARRANGED.

Calicut	1503	Lendes da India, by Gasper Correa
Goa (great epidemic)	1543	
Goa	1563	Garcia D'Orta
Goa	1580	A, Costa
Goa	1589	Linschot
Java	1629	Bontius
India, Arabia, and Morocco ...	1632	Zacutus Lusitanus
Goa	1638	Mandelsloe
Boorhampore to Surat	1666	De Thevenot
Surat	1674	Dr. Fryer
Common in Western India ...	1676	Dellon
Madura and Coromandel coast ...	1703	Père Martin
Mentioned as a disease in Bengal	1709	Père Papien
Mentioned as a disease of India	1736	Paxmann
Tinnevelly	1747	Orme
First campaign in Madras country	1756 ?	Dr. Paiseley
Near Pondicherry	1769-71	Sonnerat
Amberpet and Arcot	„	Madras Report
Bombay	1772	Clarke
Trincomalee ... ... before	1774	Dr. Paiseley
Madras	1774	Dr. Paiseley
Mauritius	1775	Dr. Burke
Malabar Coast	1778	Fra Bartolomeo
Coromandel Coast (bad epidemic)	1776-8 ?	Sonnerat
In East Indies	1780	Lind
Ganjam Calcutta Sylhet (epidemic)	1781	W. Hastings, Lindsay, Dr. C. Wilkins, Jameson
Madras, Trincomalee	1782	Curtis, Girdlestone.
Tranquebar	„	Konig
Malabar Coast (epidemic) ...	„	Fra Bartolomeo
Bombay	„	Clarke
Along the whole Madras Coast ...	1783	Madras Report
In Travancore country	„	Hay, M. R.
Great outbreak at Hurdwar ...	„	Bengal Report
Vellore and Arcot	1787, 8, 9	Madras Report
Ganjam	1790	Bengal Report
Malabar Coast ... ever since	„	Dr. Macrae.
Travancore	1792?	Hay, M. R.
Backergunge	1797	Taylor, Topog. of Dacca
Trincomalee	1804	J. Johnson
At various stations in Bengal ...	1808, 9, 11, 12, 13, 14	Records of Bengal Medical Board
Jaulnah	1814	Madras Report
Purneah	1816	Calcutta newspaper in 1831
Kishnaghur and Mymensing May and June	1817	Bengal Report
Jessore ... ... August	„	„ „

NOTICES OF CHOLERA NOT FULLY VERIFIED.

Aurungzebe's army at Beejapore	1689	Kafee Khan
Nadir Shah's army	1735	Mere native reports

Epidemic, with sudden deaths near Tinnivelly	1747	Orme, vol. ii, p. 201
Arcot	1756-7	French writers
Bengal	1762	French writers, disproved from Lind
Bundlekund	1780	Bengal Report
General André's army	1781	French writers
Mahratta country	1790	Mr. Tuke in Bombay Report

B.

SOME EASTERN NAMES FOR CHOLERA.

Arabic	Almaida, haiza, maradi eswed, saida
Sanscrit	Visuchika,* Chŭrdiê Rogum
Mahratta	Mòdshi, or provincial modavasi; corrupted mordshi, mordeshin, mort de chien, tural
Malabaree	Niritiripa, nicomben, shani
Concan	Vait
Guzeratee ...	Hagok, koganla
Cashmeeree ...	Dakee
Deccanee	Dānk lugnā
Hindostanee ...	Upurwā i tarwā i, said to have been called mirgee at Bombay
Bengalee	Olā ŭtha
Tamul	Ennerum vandi
Teloogoo	Vantee

* This word has been translated by Hay as meaning "bad air," but I am told it means only an affection of the bowels.