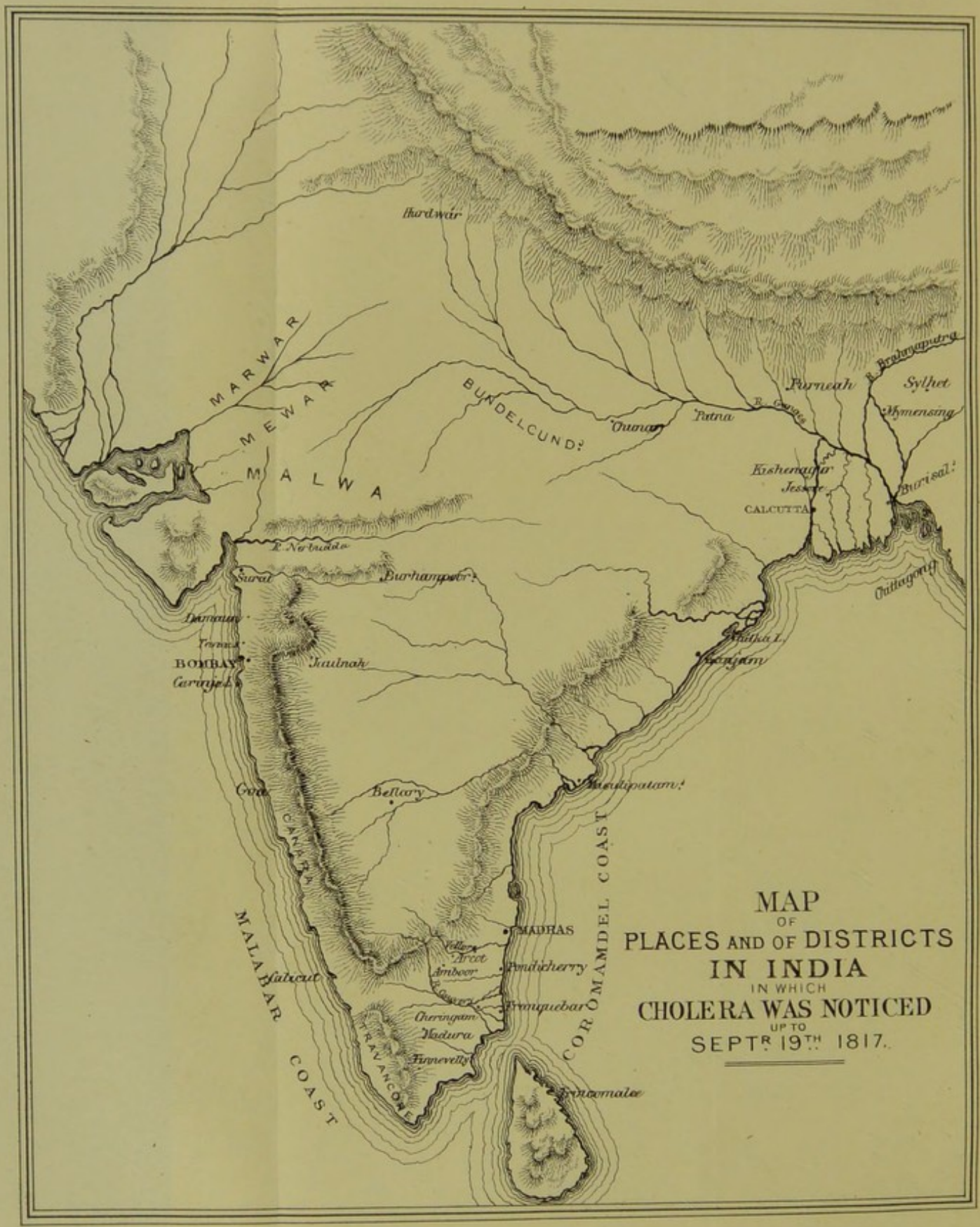
Annals of cholera : from the earliest periods to the year 1817 / by John Macpherson.

ANNALS OF CHOLERA:

FROM THE

EARLIEST PERIODS TO THE YEAR 1817.



MAP
OF
PLACES AND OF DISTRICTS
IN INDIA
IN WHICH
CHOLERA WAS NOTICED
UP TO
SEPTR 19TH 1817.

ANNALS OF CHOLERA

FROM

THE EARLIEST PERIODS TO THE YEAR 1817

BY

JOHN MACPHERSON, M.D.

INSPECTOR-GENERAL OF HOSPITALS H.M. BENGAL ARMY (RETIRED).
AUTHOR OF "CHOLERA IN ITS HOME." ETC.

WITH A MAP.

UNDIQUE DECERPTA.

LONDON
H. K. LEWIS, 136 GOWER STREET, W.C.
1884

Dedicated to

PROFESSOR

DR. MARX von PETTENKOFER, OF MUNICH,

AND TO THE MEMORY OF

THE LATE PROFESSORS

DR. C. A. WUNDERLICH, OF LEIPZIG,

AND

DR. W. GRIESINGER, OF BERLIN,

IN APPRECIATION OF THEIR LABOURS IN PROMOTING THE STUDY OF

THE ÆTIOLOGY OF CHOLERA,

AND IN REMEMBRANCE OF OUR MEETING IN LEIPZIG AT

THE CLOSE OF THE YEAR 1866.

PREFACE.

THE appearance of Cholera in Egypt during the present year, and its continued prevalence there, have excited fresh interest in that disease. A re-issue of this work, which appeared originally in 1872, may therefore perhaps prove acceptable now, especially while so many problems respecting the ætiology and the treatment of Cholera remain unsolved.

The book treats of only one portion of the subject of cholera: it is merely a collection of facts gathered from all available sources, and is not written in support of any particular theoretical views or opinions. Yet, as the study of its past history ought to throw some light on the present of the disease, it may possibly, from the large amount of ground which it goes over, help to give a breadth of view in considering the questions connected with the subject, which is at present rather wanting in our discussions.

We have abundance of opinions respecting Cholera

and the modes of its diffusion, but certain views may appear to explain the phenomena of particular outbreaks, yet may not be found to bear the test of general application. These annals of Cholera appear to show, that its malignant form may prevail almost anywhere, and under any circumstances, although the disease has its favorite *habitats* and its favorable accompanying circumstances.

The mere facts of this book have not been called in question; but all of them have not been very heartily received, even by some weighty authorities. Some of these have remarked, that after all, the disease since 1817 must be considered a different one from what it was before that period, because authors before 1817 did not seem to think that the disease was transmissible from man to man. It is true, that the first author who alludes to the question, in his account of Cholera at Goa more than 300 years ago, remarks that "the poison does not seem to be catching," an opinion in which most writers before 1817 seem to have been agreed. But was not this the common opinion of medical men in India for at least two decades, after the outbreak of 1817 had made

most of them familiar with the disease? The epidemics of that and of subsequent years, do not seem to have produced any change of opinion respecting the transmissibility of the disease. The same authorities, although accepting the account by Bontius of malignant Cholera in Java in 1629, are inclined to ignore the equally clear Portuguese accounts of the disease in India, a century earlier.

As this book treats solely of Cholera before 1817, the only change that might be expected in a new edition of it, would be the incorporation of any new facts which had come to light respecting the history of Cholera before that date. Such new facts would, almost of necessity, be merely confirmations of what was already abundantly evident; but, in truth, I have not been searching for more evidence, and I owe to the kindness of Professor Dowson the only addition I have to make. He says, that Jehan Gir, in his authentic biography, mentions "that one of his nobles died of the cholera *(Haiza)* in the Deccan in 1616." He goes on to say, "that in that year a dreadful plague (*waba* or *ouba*) broke out in many parts of Hindostan. It

first appeared in districts of the Punjab, and gradually came to Lahore. It spread through Sirhind and the Doab to Delhi and its dependent districts, and reduced them and their villages to a miserable condition. It had now wholly subsided. The disease was considered a new one, and its most probable cause was, that for two years in succession, the country had suffered from famine, and there had been a deficiency of rain."

Haiza undoubtedly means Cholera, and it is well to have thus a distinct notice of it in the interior of the Continent of India at this time, as there is rather a want of notices of the disease in India proper between 1577 and 1639. As to the nature of the epidemic, any form of fever would certainly not have been considered as something new. Still I do not like to pronounce that this plague was Cholera, because the word *waba,* although used by Arabs at this day for Cholera, is not so specific a word as *haiza.* It certainly would have been interesting, to have found a positive record of Cholera pursuing its course down, instead, as is usual, up country in India.

I shall now make a remark or two on some of the

subjects alluded to in the Appendix. It contains a note, which points out what seem to be rather far-fetched conclusions of Dr. Bryden, respecting the connexion of European and of Indian epidemics before 1817. Dr. Bryden has since died, to the great regret of all interested in Indian medical subjects. No one has ever contributed so much to a knowledge of the vital statistics of India, or has studied the laws of the diffusion of Cholera more deeply. It is unfortunate, that there has always been a certain want of clearness in his language. But there are few authors who can enter on the complicated subject of epidemics, without involving themselves in obscurity. Nevertheless, as long as we continue to see diseases such as Cholera, or even Small-pox, (which differs from it so much in transmissibility and in all respects), or their germs, if it is preferred to use that expression, spread at one time with immense rapidity, and at another shew no tendency to spread, it may be fairly assumed that there is some cause for this, although we can at present offer no adequate explanation of its nature. Cholera has been thought to spread by direct contact or communica-

tion; or by means of a poison believed to reside in cholera dejections, and conveyed through drinking water, or by soiled clothing, or as an emanation from the soil after the excreta have lain in it for some time, or as an impalpable substance borne by winds. These modes of transmission in their fullest operation, (and aided by individual or by local predispositions, which are much less simple and definite influences than they are usually assumed to be), are insufficient to explain the sudden spread of an epidemic. Some undiscovered additional agency is required.

In the Appendix there is a short paper on the analogies of Cholera nostras and of malignant Cholera. It may be of some use now, at a time when the question has been raised again, as to what clinically distinguishes the two diseases; and when some physicians even doubt whether the recent epidemic in Egypt was the malignant disease; when it is mooted, whether Cholera ever originates *de novo* in other countries, besides in India; and whether it may not originate in India, in other parts of the country, besides in those which are considered to be its especial homes.

Curiously enough, viewing the matter historically, there appear to be few early notices of Choleraic disease in Egypt, although the delta of the Nile is well suited to be its cradle, but this is also the case with regard to Lower Bengal, which is now regarded as the chief seat of malignant Cholera.

I would add, that I regret that I did not notice more fully in the body of the work, the subject of Cholera Infantum, as that disease in its most acute forms very closely resembles malignant Cholera, and as it resembles it in this other respect, that it has particular seasons for making its appearance in different parts of America, and probably in other countries, just as Cholera has in India. It seems to me, further, a remarkable fact, that while Cholera Infantum is not infrequent, and when it does occur, is very fatal in India, yet deaths of infants from malignant epidemic Cholera are comparatively speaking rare, both in India and in Europe.

This brings me to remark, that a Berlin observer has recently discovered low forms of life in the intestines of children who have died of Cholera nostras, just as Dr. Koch has made somewhat similar obser-

vations in some Cholera cases in Egypt. One must welcome the discovery and the establishment of any fact connected with the pathology of Cholera, such as that of the constant presence of a form of bacillus in it. But it does not seem at all likely that the ascertained presence of such low organisms in cases of the disease, will in any way affect the general or the special treatment of malignant Cholera.

Some friends have asked me, why I have not continued these annals down to the present period. In reality, I have no new facts to contribute to the recent history of the disease. Besides it is to be found in many works, and it has been treated of with conconsiderable fulness by my friend Mr. Charles Macnamara in his "*Treatise on Asiatic Cholera.*"

JOHN MACPHERSON.

Curzon Street, W.

December, 1883.

TABLE OF CONTENTS.

APPENDIX.

ANNALS OF CHOLERA.

CHAPTER I.

LITERATURE OF THE SUBJECT.

Cholera is one of the most ancient diseases of which distinct descriptions exist. It is a disease that varies a good deal in its manifestations, and it has been variously defined in consequence. Its general characteristics are so well known, that it is unnecessary to offer a fresh definition of it, especially as I am not going to write a treatise on its theory or treatment.

When we consider the enormous bulk of the literature to which cholera has given rise, particularly within the last forty years, it is surprising to find how little has been written concerning its early history. Yet it so happens, that there are few diseases respecting which such an uninterrupted chain of evidence exists; and it is, on the whole, not creditable to the English, who are so directly interested in India, that they have added little to the accounts of the early history of the disease in that country to be found in the admirable reports of Messrs. Jameson and Scott, of the Bengal and of the Madras Medical Boards, now fifty years old.

It is the object of these pages to supply such additional information,* and if these records do not aspire to completeness or to the dignity of history, I have at least striven to write them in the impartial spirit of an historian. This is the more necessary, as it is very unusual to find any writings on the subject of cholera, even official reports, in which the author does not show a very distinct bias for some one theory as to its ætiology, pathology, or treatment; and unfortunately no theory that has been hitherto brought forward on any one of these points, can be considered to have advanced further than the stage of being under probation. I shall therefore give, as far as possible, the accounts of authors in their own words, so that every one may have it in his power to draw inferences for himself. My commentary on them shall be very brief, and my observations, as far as possible, only such as seem in a manner to force themselves on us. Some further consequences, which appear to me to flow naturally from the history of cholera, I have placed in an appendix, as all may not assent to them.

I had intended, in the first instance, to limit myself to notices of the disease in the East; but I soon found that the subject must be handled very imperfectly, especially with reference to dogma and treatment, if the history of the disease in other

* I had already done so partially in the "Quarterly Review," January, 1867, in the translation of "Cholera in its Home," by Dr. R. Velten, Erlangen, 1867, and in the Epidemiological Society's Journal, 1869.

parts of the world were overlooked. I therefore resolved to attempt to draw, what has not hitherto been done, a sketch of the history of cholera in all times. The sketch is imperfect; still it fills up in a measure a blank in the history of cholera. In this part of the subject I have derived much assistance from Dr. Short's* useful but now forgotten work.

For the early history of the disease, and for accounts of it by the Greek and Arab authors, I have found Dr. Adams, in his translation of Paulus Ægineta, a learned and useful guide.

Dr. W. F. Chambers† furnished a masterly review of the whole subject, especially noticing Greek and Roman authors, and some of the earlier European ones, but like Dr. Graves and Sir R. Martin, in their standard works, had nothing to add to what was already known respecting the older history of cholera in the East. Hirsch,‡ in his very important work, has supplied a number of useful references to old travellers, and has taken a broader view of the outbreak of 1817, than is usual with most writers.

Mr. Gaskoin§ has produced some most valuable translations from the Portuguese.

Mr. Macnamara, of Calcutta, has furnished me with a very interesting account of the cholera temple

* On Air, Weather, Storms, &c. London, 1749.
† Medical Gazette, 1849. ‡ Medicinische Geographie.
§ B. and F. Med. Chir. Review, July, 1867.

in Calcutta, and he* and Dr. Baird Smith † have collected a good deal of curious matter connected with the outbreak of 1817.

Dr. James Wise, of Dacca, has supplied me with some useful references to books of travel.

Several German and Dutch physicians have expressed an interest in the subject, but have been unable to furnish me with fresh materials. Various kind friends have, I hope, prevented me, in spite of my non-acquaintance with Eastern languages, from falling into any very grave philological blunders in the chapter on the nomenclature of cholera.

The work, however, to which I am particularly indebted, is that of Dr. Scoutetten,‡ of Metz, a veteran in the field of cholera literature, who, after undergoing the siege of that city, died soon after its occupation by the Germans.

He has produced a work which, in spite of a few inaccuracies, leaves little or nothing to be desired on the subject of early Greek and Latin, and of early Hindoo literature. Had he been equally full about later European and Indian periods, there would have been no occasion for the present work. Though following him in many things, I hope to be warned by his example, and avoid the mistake which he committed, of combining an excellent historical sketch with one of the recent theories of the disease, which is already abandoned by many of its followers.

* On Asiatic Cholera, 1870. † Indian Annals, 1870.
‡ Histoire Chronologique du Cholera. Paris, 1870.

I thought at one time of adding a list of early writings on cholera. But really the separate works on the subject referring to the period of which I treat, are not very numerous, nor very important, nor very accessible. I have chiefly had to consult the systematic writers on medicine and the works of travellers; and the references to them in the body of the work, seem to be all that is required in the way of bibliography. I have, in most practicable instances, verified references by consulting the original authorities.

CHAPTER II.

NOMENCLATURE.

Cholera has been described under such a variety of names, that a knowledge of them is absolutely necessary to anyone who wishes to investigate its history. They may be classed thus:—

1. Names common to it and to other pestilences; and such names are naturally commonest in the East, where epidemics of the disease have been so frequent.

(*a.*) The Hindostanee name is *murree*, or deadly disease, a word evidently from the same root as the Latin *mori*, *mors*, or our own *murrain*. Cholera in many parts of India is called *murree*, or *jurree murree*, that is, the sudden pestilence, or *maha murree*, that is, the great pestilence. The latter term has of late years been applied also to a disease in certain parts of India, resembling the Levantine plague, which has occurred occasionally during the last forty years, although all early authors comment on the fact that India is free from the plague proper.

(*b.*) The Arabic names for pestilence are *taoun*, and still more *wuba*, or *El ouba*, and by such names is epidemic cholera occasionally described in India at the present day. *Ouba* is a common name in Arabia

for cholera, as well as for the plague. An illustration of this is afforded by Scoutetten,* who found that the Arabs in Algiers had no specific name for cholera, but applied to it that of *El ouba*, the name usually employed by them for the plague.

Hindostanee or Arabic names, such as *murree*, or *taoun*, or *ouba*,† cannot, therefore, be accepted, without collateral evidence, as necessarily meaning cholera.

(*c.*) The Chinese name for cholera, *Ho louan*, is probably a name of this class, as it is said by Chinese scholars‡ to consist of two characters, the first denoting a sudden start, as of a bird taking flight, the second meaning confusion or disorder. It, therefore, seems to indicate a sudden and violent attack, and nothing more.

(*d.*) The French name of *trousse galant*, or *tuck-up spark*, must be considered to come under the same head, and merely indicates the sudden death of the robust.

(*e.*) It is scarcely worth while to allude to a far-fetched derivation of cholera from the Hebrew. However, it appears that in Ecclesiasticus, chap. xxi., v. 22, and in some texts of the Bible, the words *cholaim raim*, literally bad disease, in the plural *choli ra*, occur. This was erroneously trans-

* Op. cit. p. 45, Note.

† It has been said that the Arabs in the East have called cholera the air, *el ouwa*. This is an error that has arisen from confounding *el ouba* with *el hawa* : the latter word means air.

‡ Transact. Med. and Phy. Soc., Calcutta, Vol. I., p. 204.

lated in the Septuagint version, χολερα και στροφος, which was rendered *cholera et tortura* by St. Jerome. I rather think this version passed into the Vulgate. However, Luther translated it rightly, and in Coverdale's Bible, in 1535, it is merely rendered "aike and pain of the body." This derivation is now generally given up.

2. The great majority of the names that are specific for cholera, are derived from its first and most prominent symptom, derangement of the alimentary canal. As much doubt exists respecting the actual date of Sanscrit and of Chinese writings which describe cholera, the name which occurs first in the writings of the father of medicine, and which to this day continues to be the popular name for the disease in all except Eastern countries, namely cholera, must be considered the most ancient.

(*a.*) There has been considerable difference of opinion regarding the exact etymology of the word χολερα. It has been supposed to be a contraction of χολη, and ρον or ροια, flux, thus meaning flow of bile. It has been derived from χολας, χολαδος, intestine. Others have imagined that it was the same word as χολερα, the gutter of a roof, because the discharges in cholera flow as from a spout. I shall not enter into any criticism on those derivations,* none of which will stand the test of much examination. On the whole, the most satisfactory derivation is from χολος, the old form of χολη bile, and χολερη is

* For further criticism on these, *vide* Scoutetten, p. 41-43.

ἡ χολερη νοσος, the bilious disease, or disease of bile, the word χολος not being exclusively confined to bile in the technical sense of the word. But even from an early date the word cholera must have had an extended meaning. Had cholera meant only flow of bile, Hippocrates could not have contradicted himself by describing a dry form of the disease.

Besides cholera, Hippocrates talks of Παθεα χολερικα, or bilious affections, and says that pork is χολωδης, which Galen understands as meaning productive of cholera. There was also the word χολερωδης, of the nature of cholera. Two Greek phrases for cholera seizures may be added, as they are characteristic of the suddenness of the disease—χολερα ἑλαβε, cholera seized a patient, and χολερικως ληφθηναι, to be seized with cholera. Patients labouring under the disease were called χολερικοι, or χολεριῶντες.

(*b.*) The Sanscrit name usually believed to denote cholera, is *visuchika*. I understand that originally it means a disturbance of the stomach and intestines generally. Dr. Hessler* says it is certainly Ileus, or spasm of the intestines, with retention of fæces, while Dr. H. H. Wilson† translates it spasmodic cholera. Dr. Martin Haug,‡ probably with over refinement, thinks that there were in Sanscrit different names distinctly descriptive of different stages of the disease:—1. *visuchika*, vomiting and purging;

* Commentar. in Ayurvedam Fascic II. p. 101.

† Sanscrit Dictionary.

‡ Pettenkofer Verbreitung's Art., &c., 1871.

2. *alasika*, cramps; 3. *vilambika*, collapse; besides still another name, 4. *dandasalika*, applied to rigidity. In Southern India the spasmodic form of *visuchika* has been named *sitanga soniput*. But it does not appear to me that such terms are really defined in Sanscrit with any approach to accuracy. Practically, this is of little importance, as Sanscrit names are only known to the learned, have not been in general use for centuries, and, therefore, help us little in tracing the history of cholera.

(*c.*) The next oldest specific name of cholera, *haidsa*,* is the term by which it is generally recognised at the present day in India, and by which it has always been known to Mahommedans. It has been known to the Arabs at least since the time of Rhazes, who, about A.D. 900, described the malady as *el haida*. It does not appear to be certainly ascertained what the origin of the name is. It seems to mean relapse or lethargy, but this is uncertain.

(*d.*) Far our most important guide in tracing the course of cholera within the period of European connection with India, is *mordeshee*, or *morshee*, the word found by the Portuguese in use at Goa, where the Mahratta dialect prevailed. The word in the Mahratta language still means cholera, but in

* Sometimes corruptly read *saida* and *almeida*, or *haisa*. Its various forms, I am told, can be easily explained by the placing or omitting the dot over the Arabic letters, and by the mode of writing the first letter, which may easily be mistaken for an *m*.

Guzerattee it only means pain of the stomach. The word is, I believe, never used now by Europeans. As early as the year 1702, Père Martin observes that the French had corrupted the word *mordeshin* into *mort de chien*. Cholera was in early times always termed *mordeshi* by Europeans, and affections analagous to cholera were also described under that name.

The following are some of the forms under which the name occurs in works of European travellers :— *Mordshi*, *morshi*, *morexi*, *morexin*, *mordexin*, *mordeshin*, *mort de chien*. Scholars consider the derivation from the Mahratta word *mŏdna*, to tear or twist, the most satisfactory.

(*e*.) The names locally employed in the East to designate cholera, are most of them more or less descriptive of vomiting and purging, or, put in its simplest form, of motion up and down :—

Hindostanee	Upurwai turwai. Sweta Rasa, white fluid.
Mahratta	Morshi, Modsi, Modavasi. Tural.
Guzerattee	Hagok. Koganla.
Deccanee	Dank lugna.
Cashmeree	Dakee.
Bengalee	Ooola, oota.
Chittagong	Mou-pet, mouth and belly.
Tamul	Enerum Vandee, vomiting and purging.
Teloogoo	Vantee.
Malabaree	Niritiripa. Nicumber, gush of water. Shani. Visuchika.
Malay	Moontaan.

Similarly in Europe:—

German	Brech-ruhr, vomiting and purging.
Dutch	Brak-loup.
English	Unbloody dysentery.
	Plague in the guts.
	Cramps.
	Spasms.

Turkish and Russian names, calling cholera the black disease, are, I suspect, more recent than the period now treated of.

3. Another set of names expressed more or less theoretical views respecting the nature of the disease, or described some of its leading features. I give only such as have been used before 1817; most of them had indeed been employed before 1770.

(*a.*) Such symptoms as referred to the nervous system attracted attention. Cholera has been at times classed in Indian as well as in European medicine among spasmodic or nervous affections, and has, in consequence, been sometimes termed in India *sitanga soniput*. It has been called a tetanus; it has been even named *mirgee*, the common Hindostanee word for giddiness or epilepsy. It has been called *cramps*, *spasms*, *syncope*.

(*b.*) It has often been confounded with diseases of the digestive organs, such as *diarrhœa*, *colic*, *ileus*, *dysentery*, and with *fever*. Hence we have such names as *dysenteria incruenta*, *colica miseraica*, *cholera intermittens*, and *febris cacatoria*.

Cholera has also been confounded at times with *ileus Indicus*, and with *diarrhœa choleroides*.

(*c.*) As long ago as 1763, Sauvages established no

fewer than eleven varieties, and he explains that the disease is called cholera *morbus*, to distinguish it from cholera *ira*, that bile, and choler or anger, may not be confounded:—

1. Spontanea.
2. Sicca, or ξηρη.
3. Æruginosa, e fungis.
4. ,, { *a*. venenis fossil. / *b*. ,, animal.
5. Dysenterica Æruginosa.
6. Intermittens.
7. Indica.
8 Verminosa.
9. Arthritica.
10. Crapulosa.
11. Serosa, αχολος.

Other names given to it, most of them also long before 1817, were—

Passio cholerica.
Cholera legitima.
illegitima, or notha.
humida, ὑγρη.
flatulenta.
spasmodica.
maligna.
infantum.

To enter into any minute criticism on all those names would occupy no small space, and I trust that, without doing so, the reason for bringing so many of them together, will be apparent in the sequel. Dry though this enumeration of terms must be to most readers, a knowledge of them is of much importance, both as affording a clue to many notices of cholera in the writings of professional and of unprofessional men, which have hitherto escaped notice, and also as affording many curious indications of the diffusion of the disease, and of the theoretical views that have been entertained

from time to time respecting the nature of the malady.

As comparative grammar throws much light on the history of races, so does comparative nomenclature on the history of a disease.

I shall at present only remark, that one or two conclusions flow irresistibly from the preceding list, such as, that the diagnosis of cholera from colic and ileus and dysentery, must have been in former times most inaccurate; and, indeed, this is not surprising, while to this day colic and ileus continue to be very vague and uncertain terms: that, having such a variety of names, cholera must have been a disease presenting much variety of symptoms: and, further, that cholera must have been a disease very familiarly known, for in Europe almost every country had a popular name for it, and in India there was not a district or a language, that had not its local name for the complaint.

In one shape or another cholera may, therefore, be said to have been in all ages a world-wide malady.

CHAPTER III.

CHOLERA FROM THE AGE OF HIPPOCRATES TO THE COMMENCEMENT OF THE SIXTEENTH CENTURY.

CHOLERA is made mention of in the earliest medical writings that are in existence. It is in the works of Hippocrates that we first find the word χολέρη. It is repeated frequently by him, as well as the phrase, choleric affections. No systematic description is given of the ordinary form of the disease, though several cases of it are recounted.* For instance:—

"At Athens a man was seized with cholera. He vomited, and was purged and was in pain, and neither the vomiting nor the purging could be stopped; and his voice failed him, and he could not be moved from his bed, and his eyes were dark and hollow, and spasms from the stomach held him, and hiccup from the bowels. But the purging was much more than the vomiting. This man drank hellebore with juice of lentils; and he again drank juice of lentils, as much as he could, and after that he vomited. He was forced again to drink, and the two (vomiting and purging) were stopped; but he became cold. He was washed with plenty of (hot) water down to the genital organs, until the upper

* Epidem., book v., 4, 29, 27.

parts also grew warm, and he lived; and next day he took some gruel (meal with water)."

Here is another case:—

"Eutychides had a choleric affection, which ended in a tetanic seizure of his legs, along with purging. He vomited for three days and nights a quantity of coloured and very red bile, and he became powerless and oppressed with nausea, and he could retain nothing—neither drink nor food; and there was complete retention of urine (του οὐρου πολλη σχεσις), and there was no passage downwards. By vomiting soft dregs were evacuated, and they also passed downwards." Again:—

"It happened to Bias, the pugilist, who was a great feeder, to have a choleric attack from eating flesh. . . . In summer reign choleric affections and intermittents."

The two first of these cases are descriptions of sporadic cholera of some intensity; the last is only a case of indigestion.

We have seen something of the treatment of the first of these cases, but Hippocrates says more on the subject of treatment.*

"In cholera, for the pain, it is proper to give what is ordered among the remedies for relieving pain, and to take care of the belly, moistening it with drinks (internally), and relaxing the whole body except the head, with warm baths. In this way, some fluid being introduced, the vomiting is

* On Affections.

easier, and any adhering matters are expelled upwards, while the alvine evacuation is facilitated; but if the patient is empty, he vomits and purges with greater difficulty. In the evening he should get what is prescribed for persons over purged by an evacuant."

Hippocrates mainly assigned disordered bile (probably using that word in an extended sense) as the cause of cholera and kindred affections, and the disorder was induced by indigestible articles of diet and by excesses at table. He thought men of middle age most subject to these attacks, and the summer season most favourable to their occurrence. In his Aphorisms* he places chronic diarrhœa, cholera, and dysentery next each other.

It would thus seem that sporadic cholera was common enough in the days of Hippocrates; but there is no hint of the disease being epidemic, although it was more frequent at a particular season. Hippocrates gives most of the symptoms of cholera, including suppression of urine, but expresses no opinion as to the gravity of the disease. His treatment was mainly diluent, with the external use of warm water. Though in one case he mentions giving hellebore, he gave very little active medicine; and it was only in later stages that he ordered medicines to suppress purging.

But Hippocrates described another kind of cholera.† "In χολιρα ξηρα, the stomach is distended with air, borborygmi are heard, there is pain in the sides and

* 3 Sect., 30. † De Victu.

in the loins. The patient, unable to pass anything downwards, is constipated. In order to quiet vomiting, we must produce action of the bowels. The patient must have immediately a clyster, hot and as oily as possible. He must be anointed freely with oil; he must be extended in a bath, and cold affusions must be used slowly. If, when he is revived, alvine evacuations follow, he is cured. . . . If the pain does not abate, give him asses' milk to drink until he is purged. If the stomach is relaxed and he has bilious motions—if he has griping, vomiting, oppression, or gnawing feeling, it is best to keep him quiet and give him oxymel to drink, &c." He attributed this affection to indigestible substances, especially to eating assafœtida with a quantity of cheese.

I think that all must frankly admit that the above account does not describe any known form of cholera. There are, indeed, rare cases of cholera with a very small amount of evacuation, but never characterised at the onset by flatulence and constipation. This division of Hippocrates has been followed by many of the early authors, but by no means by most of them. The disease was evidently a flatulent colic, such as is not very unfrequent in any country, and some forms of which, occurring in the East, have been described by such terms as *Ileus Indicus* or *Colica Japonica*.

We have evidence that the successors of Hippocrates were acquainted with cholera, as we know something of their mode of treatment. For in-

stance, Erasistratus ordered wine, but in very small quantity; and Asclepiades (who thought the definition of flow of bile too narrow, and called it a flow of humour) gave his patients the first day wine and polenta. They add, however, but little to our knowledge of cholera.

At the commencement of the present æra Celsus* wrote the following account of the disease :—

"Cholera simul et dejectio et vomitus est: præterque hæc inflatio est; intestina torquentur, bilis supra infraque erumpit, primum aquæ similis, deinde ut in ea recens caro lota esse videatur, interdum alba, nonnunquam nigra vel varia. Ergo eo nomine morbum hunc χολέραν Græci nominârunt. Præter ea vero, quæ supra comprehensa sunt, sæpe etiam crura manusque contrahuntur: urget sitis, anima deficit: quibus concurrentibus non mirum est si subito quis moritur. Neque tamen ulli morbo minori momento succurritur.

"Protinus ergo ubi ista cœperunt, aquæ tepidæ quam plurimum bibere oportet et vomere. Vix unquam ea sine vomitu sumitur; sed etiamsi non incidit, tamen corruptæ miscuisse novam materiam prodest, parsque sanitatis est vomitum esse suppressum. Si id incidit, protinus ab omni potione abstinendum est. Si vero tormina sunt, oportet frigidis et humidis fomentis stomachum fovere, vel, si venter dolet, iisdem egelidis, simul venter ipse mediocriter calentibus juvetur. Quod si vehementer et vomitus et dejectio et sitis vexant, et adhuc subruda sunt

* De Medicinâ, lib. iv., cap. 11.

quæ vomuntur, nondum vino maturum tempus est: aqua, neque ea ipsa frigida sed potius egelida, danda est. Admovendumque naribus est pulegium ex aceto, vel polenta vino aspersa, vel mentha, vel quod secundum naturam est.

"At cum discussa cruditas est, tum magis verendum est ne anima deficiat. Ergo tum confugiendum est ad vinum. Id esse oportet tenue odoratum, et cum aqua frigida mixtum, vel polenta adjecta, vel infracto pane: quem ipsum quoque assumere expedit: quotiesque aliquid aut stomachus aut venter effudit, toties per hæc vires restituere. . . . At si inanis est homo, et crura ejus contrahuntur, interponenda potio absinthii est. Si extremæ partes corporis frigent, ungendæ sunt calido oleo, cui ceræ paulum sit adjectum: calidisque fomentis nutriendæ. Si ne sub his quidem quies facta est, extrinsecus contra ventriculum ipsum cucurbitula admovenda est, aut sinapi superimponendum. Ubi id constitit dormire oportet: postero die utique a potione abstinere: die tertio in balneum ire: paulatim se cibo reficere somnoque quisquis facile acquiescit: vitetque lassitudinem et frigora. Si post suppressam choleram febricula manet, alvum duci necessarium est: tum cibis vinoque utendum est. Sed hic quidem morbus et acutus est, et inter intestina stomachumque versatur sic ut cujus potissimum partis sit, non facile dici possit."

In the foregoing sentences, Celsus gives a clear account of a very decided cholera, a disease in which he is not sure whether the stomach or the intestines are most involved. He says little or nothing

of the causation of the malady, but he gives a good idea of the practice of the period. He began with ordering water as an emetic, with the object of stopping the vomiting by clearing the stomach, and considering, that the water would be useful by dilution, even if it did not produce vomiting. He recommends externally frictions with oil, sinapisms, and dry cupping. He also recommended wine pretty early. Every practical man will recognise the soundness of his advice in being cautious not to induce relapses by giving too much drink or food.

The description of the disease given by Cœlius Aurelianus,* about eighty years after Celsus, was admirable. He considers cholera to be closely allied to diarrhœa. He mentions many symptoms of much importance. For instance, he enumerates as precursors of cholera, heaviness and tension of the stomach, feeling of discomfort, restlessness, flatulence, nausea. He notices blackness of the countenance and sharpening of the features, egestion of thin, watery fluid, the eyes growing red towards the close, recovery by gradual relaxation of the symptoms, especially the discharges taking place at longer intervals. He uses the very phrase of consecutive fever, now so much employed. His allusion to it is more distinct than that of Celsus, and he discusses how it can be best kept off, recommending abstinence.

He says little of the pathology of the disease. It is usually caused by some variety of indigestible food, and he alludes to the analogy of sea-sickness.

* Acut. Morb., lib. III., cap. 19, 20, 21.

In his chapter on treatment he criticises severely the practice of others, especially that of giving emetics—a measure, he says, like bleeding a man suffering from hæmorrhage or from profuse perspiration. He also mentions that Heraclitus Tarentinus used opium and henbane, and other remedies to restrain the discharges; but his own practice is essentially the same as that of Celsus. He recommends ligatures to the limbs, but that they should be frequently changed, lest the pressure should be too continued. This practice is of interest, as being so common in Eastern countries. He gave wine, and in the decline of the disease he gave drinks made of the juice of quinces, pomegranates, and autumn fruits, a practice in which he was followed by all the later authors. He was cautious to prevent relapses, and was quite aware of the gravity and of the antiquity of the disease, for he says that the ancients described it as acute and very swift, being rarely protracted to the second day.

I have not quoted Aurelianus at length, as I subjoin a very similar account of the disease by one who was nearly his contemporary, and one of the most valuable early writers on medicine, Aretæus of Cappadocia* :—

"Cholera is an inverted movement of everything in the whole body to the stomach, to the belly, and to the intestines—a very sharp malady. For the matters collected in the stomach escape by vomiting, and the fluid matters in the belly and intestines run

* Morb. acut., lib. II., c. 5; Morb. acut. curat., lib. II., c. 4.

through by the lower passage. What is first vomited is like water, but what passes by stool is stercoraceous fluid and of ill odour. For continued bad digestion has been the cause of this. But what is washed away is first like phlegm, afterwards like bile. At the beginning the disease is free from pain, but after that, there are tension of the stomach and tormina of the belly; but if the disease increases, the tormina are augmented, there is syncope, the limbs are unknit, there is helplessness, loathing of food; and if they swallow anything, yellow bile rushes out unceasingly by vomiting with sickness, and the dejections are like. There are spasms, and drawing together of the muscles of the calves of the legs and of the arms. The fingers are twisted; there is vertigo and hiccup; the nails are livid; there is cold refrigeration of the extremities, and the whole body becomes rigid; but if the malady runs on to its end, then the man is covered with perspiration; black bile bursts out upwards and downwards. There is retention of urine from spasm of the bladder; but, indeed, much water is not collected in it, owing to the pouring out of the fluids into the intestines. There is loss of voice; the pulse becomes very small and frequent, as in syncope; there are constant fruitless attempts at vomiting, desire to evacuate with tenesmus, but dry and without fluid; death, full of pains and miserable, with spasms and suffocation, and fruitless vomiting. . . . But if he rejects everything by vomiting, and a perpetual perspiration flows, and the patient becomes cold and

ash-coloured, and the pulse approaches extinction, and the patient becomes speechless, it is well, under such circumstances, (for the physician) to make a graceful (becoming) retreat." We shall have occasion to notice this singular remark afterwards.

Aretæus devotes a very full chapter to the internal treatment of the disease, and to the application of local remedies. These, however, need not be detailed here. The principle of his treatment was that it was bad to suppress excretions which ought to be removed. He used, therefore, diluents chiefly, and water in small quantities. He remarks, what is very characteristic of the disease, that patients always preferred cold drinks, but sometimes he gave them hot ones. If there were signs of the patient's strength failing, he gave wine and the juice of fruits.

Aretæus, while he describes the symptoms of the disease so well, does not enter into its pathology; but as to its ætiology, he observes that the disease prevails most in summer, next most in autumn, less in spring, and least in winter: and as to age, that young men and men at their prime are attacked most, old men least, boys more than old men, but not very fatally.

We must now turn to accounts of cholera by another class of authors.

There is much variety of opinion as to the comparative antiquity of Hindoo and Chinese and of Greek medicine. As some claim a far greater antiquity for the two first than for the last, I might have commenced this sketch of the history of cholera with

extracts from the Shastras and from the earliest Chinese books; but I have thought it most convenient to introduce the Sanscrit accounts of cholera here, as they are probably not earlier than the latter half of the second century; not that I presume to settle a question on which scholars are much divided.

"*Visuchika* chiefly attacks those who are timid or immoderate in their living. . . . Along with convulsions, the patient has intellectual torpor, diarrhœa, vomiting, thirst, giddiness, restlessness, tenesmus, yawning, feeling of heat, lividity, shivering, pain in the head and at the præcordia. The belly is retracted: the patient, whose voice is lost, is in a state of extreme agitation. The gases contained in the belly rise. When the fæces and the air remain shut up in the belly, the patient grows weak, loses power of moving, then come hiccup and eructations. . . . When the patient's gums are livid, his nails and lips pale, when he vomits abundantly, and loses consciousness of his acts, when his eyes become hollow, when his voice is lost, when his joints are all relaxed, one ought to have recourse to the instructions of the sacred books,"* or, as Dr. Wise translates it, "such a person may be taken out to be burnt, he will not recover."

With respect to treatment, Dr. Wise tells us† that besides commencing with an emetic, and the appli-

* Ayurveda of Suçruta. Calcutta, 1835, Vol. II. p. 518. The chapter is in verse. I follow a translation by Dr. Lietard, given by Scoutetten.

† On Hindoo Medicine, 1845, p. 330.

cation of the actual cautery to the ancles, Suçruta recommended a compound of myrobalan, orris root, assafœtida, the seeds of the Wrightia anti-dysenterica, red garlic, rock-salt, and *atees*, of each equal parts. These were reduced to powder, and mixed with warm water for use.

Charaka, a later writer, added opium and black pepper to the mixture. This receipt is said to cure cholera when the eyes are sunk, the pulse is imperceptible, and the extremities are cold.

In addition to these prescriptions,* Dr. Wise also mentions a potion, the chief ingredients of which were Sinda salt and *butch* infused in water. The *butch* is a warm stomachic like ginger.

In the preceding description of cholera, which is, I believe, treated under the head of indigestions, we have a very fair account of cholera, but by no means so complete as some of those already quoted. It gives us no idea of what was the degree of frequency of cholera in India, but it shows that there was a very acute form of it to be met with, of so severe a nature, that in the end it was usual to abandon all attempts to save the patient.

I think the reader cannot fail to be struck with the very close resemblance between the concluding sentences in Aretæus and Suçruta. Their structure is similar; they occur in both at some interval

* It is curious to find in these prescriptions the prototype of all the opium and assafœtida and black pepper cholera pills, which always have been employed in Bengal, and are at the present day popular with the natives of India, and much used in European practice.

from the description of the disease. They both consider what should be done when the case becomes hopeless, and both agree that the patient may be abandoned by the physician. I cannot but think that the Sanscrit author, having Aretæus before him, was shocked at the suggestion of the physician's simply beating a retreat, and therefore recommends recourse to the last rites of religion. Others may think Aretæus borrowed from the Sanscrit. But, for the history of cholera, this chronological question is of no very great importance.

We are able to see these Sanscrit accounts, as they appeared in a somewhat altered form, in Southern India, in the books of the Tamul physicians. Their present form is of uncertain date.*

"The *Vidhuman Visuchi* (the third species of *ajerna*, or indigestion) is most rapid in its effects: its symptoms are dimness of the sight, perspiration, sudden swooning, loss of consciousness, derangement of external and internal senses, pains in knees and calves of legs, griping pains in belly, extreme thirst, lowness of the windy and bilious pulses, coldness in the hands, feet, and whole body."

The more spasmodic form, *sitanga soniput*, was thus described:—"Chilliness, like coldness of the moon, over the whole body, cough, and difficulty of breathing, hiccup, pains all over the body, vomiting, thirst, fainting, great looseness of the bowels, trembling of all the limbs."

Sitanga soniput was said to be simply spasmodic,

* *Madras Courier*, January, 1819. Quoted by Scott.

and though usually yet not suddenly fatal. The *visuchi* is most rapid in its progress, and at times epidemic.

In the preceding extracts from the Tamul there appears to be a mixture of what is of extreme antiquity with what is comparatively modern.

On the whole, the ancient writers on Indian medicine do not give nearly so clear and distinct an account of cholera as the Greek and Roman ones, and they afford no indication of any particularly virulent or epidemic form of the disease being known to them.

There are accounts of cholera that profess to be of very early date in another Eastern country. It is unnecessary to discuss the question of the antiquity of Chinese medicine. There seems to be no reason to doubt that it is at least as old as Hippocrates, but the age of such notices of cholera as we have, is very uncertain.

Cleyer* gives some account of ordinary and not very severe forms of cholera, on which much need not be remarked, but it is of interest, as being written in 1669, long anterior to questions arising about the prevalence of cholera in China. The disease *Ho louan* is described as "perturbatio supra et infra, ut cum fluxu alvi et vomitu æger laboret."

In the Chinese book, Ching-che-chin-shing, printed about 1790, there is an account of *Ho louan*.† Most of the usual symptoms are mentioned, and

* Specimen Medicinæ Sinicæ, 1682, p. 80.

† Transact. Med. and Phy. Socy. Calcutta., Vol. I., p. 208.

some very characteristic ones:—"Sometimes the patient is hot and restless, and desires to throw off every covering. When there are spasms, vomiting and purging, cold perspiration, giddiness in the head, and confused vision, the disease becomes incurable."* The disease was attributed to neglect of diet, to exposure to changes of temperature, to extreme heat—although it might also occur in winter. These points in the sequence of symptoms may be noticed. "When the pain attacks the head first, vomiting comes first; when the pain commences in the abdomen, purging comes first. If the pain in the head and in the abdomen come on together, so do the vomiting and purging."

These notices seem scarcely to afford proof that in very early times cholera was known in China as an epidemic. However, such full and positive accounts, professing to describe a cholera of great antiquity, have been published, that I give their substance.†

"This malady is due to a miasmatic poisoning. Bad nourishment, too cold food, watery and green fruit, develop the germs of this plague, which is often epidemic."

"Cholera *Sicca*. The prodromi are malaise, lassitude, loss of appetite, pain in the abdomen, diarrhœa. The duration of these symptoms is very various, they sometimes occur ten days before the attack. They require to be watched, especially the diarrhœa." Then there is the usual description of

* This sentence reminds one of Aretæus and Suçruta.

† La Médecine chez les Chinois. Paris, 1863.

symptoms, in which I may observe the mention of vomiting matters white and like rice-water, and of suppression of urine. The mortality of this disease is great, about 20 per cent.; its duration from two to ten days.

The description of the *humid* form differs from that of the dry mainly in saying that "the prodromi are less marked. Sometimes the attack is sudden, without any notice whatever. Retraction of the testicles is also mentioned as a symptom. The same treatment as for the other kind. The mortality is 50 per cent. if the patient is not early seen to; if he is attended to, you scarcely lose 10 in a 100. The disease lasts four or five days."

The important point in treatment was to practice acupuncture in eight or ten points of the body, including the tongue, applying heated salt to the stomach, and giving warm drinks, especially an infusion of ginger.

The symptoms here recounted do not in themselves require much remark, but some of them seem to apply to nephritic colic, and there is to me evidently an appearance of their having been gathered from many sources. They have a half modern cast—for instance, the phrases miasmatic poisoning and ricelike evacuations—as if they were meant to bear on questions agitated at the present day. If really old, the Hippocratic division into humid and dry would be very curious, but the symptoms assigned to *humida* apply just as well to *sicca;* in fact, a disease cannot be called *sicca*, when it is said that

there are evacuations both upwards and downwards. I cannot regard the statements of the comparative mortality of either disease as of much importance, except as showing that the disease meant to be described must have been a severe one.

It is extremely interesting to find that acupuncture was the main feature of the treatment—a practice widely adopted in Java, China, and Japan, in all spasmodic diseases, and especially in *Colica Japonica*.

Returning to Europe, it is a matter of surprise, that the great monarch of medicine for so many centuries after the close of the second one, says little of cholera. Scoutetten finds, indeed, that Galen has used the word thirty-three times; but he does not say much more of the disease than that he had seen cholera caused by eating raw mushrooms. He had a remedy, the Theriacum, which had restored new life to patients in the collapse of cholera; and he observed that cholera *humida* was caused by indigestible acrid articles of food, and cholera *sicca* by acrid flatulencies. He also mentions spasms of the gastrocnemius muscle, and the state of the pulse in the disease.

The later Greek writers are chiefly of importance to us as carrying on the thread of the history of the disease: they describe nothing fresh. Aëtius,* about A.D. 360, gives a poor description of cholera. He however puts the theory of the evacuation of morbid matter (in modern phrase, the eliminating treatment

* Lib. III., Sect. prim., cap xii.

of the disease) in so strong a point of view, that his remarks must not be omitted :—

"Adjuvare etiam oportet per sedem excretionem. Alvum enim velut venenum insidens et ventrem et intestina rodit, et humores ex universo corpore adtrahit. Per vomitus itaque opportunam provocationem vomitus ipse solvitur et cessat. Quum vero humorum excretio quieverit," etc.

No one can condemn more strongly than he does the use of astringents :—"Si quis igitur mox in principio ea quæ efferuntur cohibere aggreditur, is majoris mali auctor est."

Aëtius had, therefore, very distinct notions about the presence of a poison, which irritated the intestines and drew all the fluids of the body to them, and which ought to be eliminated. He thought the vomiting might be cured by the use of emetics, and did not hesitate to accuse those who used astringents of injuring their patients.

Alexander of Tralles,* a century later, dissatisfied with the ordinary derivation of the word cholera, because the evacuations were often serous and not bilious, suggested a new derivation of the word from κολαδες or χολαδες intestines; he also adopted the division of Hippocrates into ὑγρη and ξηρα, and insists with great earnestness on the patient being seen at the commencement of the attack.

Paulus Ægineta, about A.D. 700, the last Greek writer I shall quote, gives pretty full accounts of the disease, and fuller of its treatment, but adds nothing

* Medicina Practica, Francft. 1622, p. 345.

to what was known. He recommends the use of mixtures of juices of fruit, and of various wines. He however alludes to a frightful epidemic and contagious colic in his day,* which had ran all over Europe, and which suggests the idea of cholera, but for the prominence given to some of its sequelæ, that is, to epilepsy, paralysis, and other affections of the nervous system. Nevertheless, although in modern days such sequelæ are not very common, undoubtedly epilepsy, partial paralysis, loss of power in fingers, anæsthesias, paraplegias, neuralgias, insanity, have been recorded as the consequences of malignant and sometimes of ordinary cholera; and in India cholera has actually been described by the names of epilepsy and of tetanus.

I have looked through a great many Arab writers, the successors of the Greek ones, in Latin translations, as others have done; but they add nothing to the Greek accounts, from which they are mainly borrowed, and to which they are inferior in accuracy. Their notices, however, are so far important, that they show how cholera continued to be a well-marked and recognised affection. Rhazes, who flourished at Bagdad about A.D. 900, gives† in a

* Mercurialis (book vii., cap. iv.) was much puzzled at the account by Paulus of this colic being contagious, and he cannot understand a colic being epidemic. Still he thinks it may sometimes arise from pestilential air; and he remarks that the word colic was used for almost any pain of the bowels. As to ileus, most of us have had occasion to observe the facies cholerica in cases of obstinate obstruction, or in perforation of the small intestines, and can understand ileus being taken for cholera.

† Continens, lib. v., cap. 2. A most laborious compilation

chapter, the heading of which is "*De fluxu ventris s. el Heyda*," the following description:—"It begins with nausea and diarrhœa, or one of the two, and when it reaches the stomach it goes on multiplying itself. The pulse fails, and the breathing is attenuated; the face and the nose become thin; the colour of the skin of the face is changed, and the countenance of the dead succeeds. The extremities become cold, and there is cold perspiration, and there are spasms in the hands and feet and legs. There is urgent thirst, which cannot be satisfied, as the patient immediately rejects what he drinks." His notions of causation are these:—Cholera is produced by some external cause, as too great a quantity of food, or by some internal cause, such as bad humours in the body. As to influence of weather, he says that hot weather produces it, and that it is worst in summer; that it often occurs in autumn, and sometimes in winter. As to mortality, he observes that the young and men in the vigour of life usually recover, but that there are few of the old and decrepid who get over an attack—few of them that do not perish. With respect to analogies with other diseases, he seems to regard it as resembling spasms from excessive evacuation, or the effects of poisoning, and observes its association with tertian fever, and its occurrence in the course of fevers.

The treatment was essentially that of the Greeks, and the same as that recommended for syncope from

of the opinions of others, each opinion prefixed in the Latin translation with the monotonous word "Dixit."

excessive evacuation. He used the word syncope as synonymous with collapse. He repeats the usual caution, that the physician must not be negligent, but be constant in his attentions and his endeavours to get something to stay on the stomach. For vomiting, ligatures of the legs were preferable; for purging, those of the hands. This had been said by Alexander of Tralles before him. If there was great debility, the more styptic wines, and ones of good odour, were given. The use of wine was to be limited, or as ordered in the chapter on syncope; for excessive burning of the stomach, cold water, or even snow or ice, were recommended.

In the first place, if debility was not great, the patient should be vomited and purged, not nourished, and warm water was often given. To procure sleep was a great object, and opiates in moderate quantities were employed.

These slight notes of his practice are sufficient to show, that many of the questions on which there is such variety of opinion in modern days, continued to be frequently discussed—the use of wine and of opium, and how far the evacuations were to be repressed or encouraged. Apparently the only allusion to what was called cholera *sicca*, is to be found in the recommendation to use clysters, if constipation be present.

Avicenna,* about a century afterwards, mainly repeats Rhazes, and also employs the word *haida* for cholera, which evidently continued to be a common

* Avicennæ opera. Venet, 1608.

disease. There is, however, no trace of its being epidemic beyond the statement of his predecessors, which he repeats, about heat and summer and autumn producing the affection. It is said that he remarks on the greater prevalence of the disease during the Ramzan, the fasting period of the Mahommedans, but I have not been able to verify this. He observes that the disease is particularly fatal in children; and, like many writers before and after him, says that the disease is least fatal in those who have had previous attacks of it. There was therefore no question that this form of cholera might recur in the same person.

He is also of interest to us because he has been more particular than other Arab authors in specifying the nature of the evacuations. He says:— "Cholera incipit cum fluxu ventris cholerico, deinde aquoso puro et fœtido, deinde perducit ad fluxum ventris, qui est sicut lotura carnis recentis, habentem odorem pinguedinis, et ad *curathium*."* This last is an Arabic term, having a close relation to milky or rice-water evacuations.

Again, he is very judicious in directing the treatment, *i.e.*, the favouring or suppression of discharges, according to the character of the evacuations. Thus

* My friend, Dr. Sprenger, author of "The Life of Mahomet," called my attention to this word, which he believes to be an altered form of an Arabic word applied to a disease of camel and sheep, in which the milk coagulates in the udder. *Curathium*, therefore, may mean a milky or flocculent substance. Dr. Greenhill tells me he thinks this doubtful.

he says:—"Amplius oportet ut consideres illud quod egreditur. Dum enim perseverat exeundo chylus et aliquid homogeneum ei et cibus, non concedatis ejus retentionem omnino. Sed quum illud quod egreditur est res *curathia* viscosa aut cholerica, aut alia ex his quæ debilitant corpus, oportet ut adjuvetur in ejus retentione cum stypticis."* Probably the Latin translation is very imperfect, but the important point is that Avicenna recommended the treatment to vary according to the evacuations. Every practical man in treating the disease knows what important indications the evacuations afford in the worst forms of cholera, and therefore this looks as if Avicenna was well acquainted with them.

Though Avicenna says nothing of cholera being epidemic, he takes occasion, under the head of colic, and when mentioning the epidemic colic spoken of by Paulus Ægineta,† to say:—"Et quandoque accidunt colica et ileos secundum semitam accidentis ægritudinum pestilentialium advenientium, et perveniunt de regione ad regionem, et de homine ad hominem."‡

Avicenna thus appears to believe in epidemic colics and ileus sometimes prevailing in the East. Notwithstanding the very full chapter he gives on colic, he must have used the above expressions hastily, for ileus can never be epidemic, and it is questionable whether true colic can be so, as I shall have occasion afterwards to show.

* Avicennæ, edit. cit., p. 812. Ibid. p. 828.

† Supra p. 33. ‡ Lib. III., Ten. 16, tr. 3.

Without pressing the matter too far, I think it may be fairly inferred that epidemics akin to cholera were not entirely unknown in the days of Avicenna.

Averrhöes, in the twelfth century, is of value, as he wrote in Spain and knew something of Morocco, where indeed he died after a short residence. He continues the use of the word *haida* or *el haida*—written corruptly by his translators *almaida*. In his chapter on syncope coming from excessive evacuation, occurs this passage* :—"Sicut fit in illa passione, quæ cholerica nominatur, et in Arabico dicitur *almeida*, in qua vomitus et secessus simul fiunt, quæ curatur stringendo et ligando crura et brachia." Such patients were to be placed in a hot bath.

I do not suppose that a further examination of Arabian writers would elicit much of value. It is said that some account of cholera is to be found in the works of Ali Ben Hossein, of Bokhara, in 1364; in the writings of Mohammed Ishah, and of Abdoul Curvy Ben Shahad, about the same period. This is only so far interesting as bearing testimony to the existence of a form of cholera in the East.

To show that cholera continued to be a well-known disease in Europe, it may be sufficient to refer to Bernard Gordon, John of Gadesden, and Gilbertus Anglicus. They all give some account of it, yet they are little better than copyists of Rhazes and Avicenna. It may, however, be worth while to

* De Medicina, lib. VII., c. 19.

say that Bernard Gordon of Montpellier's theory of the disease, was shortly this*:—"The choleric passion is a combination of anastrophe and of catastrophe, an expulsion of food upwards and downwards. The cause is a corrupt humour in the stomach, which passes to the members and then again returns to the stomach; and being now fully formed, expels with immense impetus both up and down. Spasms and similar accidents occur, therefore you must be careful to watch them." Bernard Gordon seems to have lived in the thirteenth century. There appears to be nothing of interest on this subject in John of Gadesden, who was nearly a contemporary of Gilbertus Anglicus,† who lived about the commencement of the fourteenth century. Of the latter it is sufficient to say, that he treats of Colerica or Colerides; that he used the word syncope as synonymous with collapse; that he says that excessive evacuation and spasms accelerate death by inducing syncope. He considers it a most acute disease. Bad cases terminate in the course of a day, and he thinks that unless the patient is strong, evacuants must not be used.

These extracts may be taken as representing the views entertained in the thirteenth and fourteenth centuries. I have not consulted any medical authors of the fifteenth century, but nothing is likely to be discovered among them, the period immediately preceding the revival of letters, and, indeed, the three centuries from the thirteenth to the sixteenth being

* Lilium Medicinæ Lugdun., 1573, p. 481.
† Compend. Medicinæ Lugdun., 1510.

perhaps the most barren and uninteresting in the whole history of medicine.

The general notions of the fifteenth century may, however, be considered to be fairly enough represented by Raphael of Volterra,* in a sort of encyclopædia of human knowledge published by him in 1507. He enumerates colic, ileus, cholera, dysentery, in succession, setting down the two first as diseases of the intestines, the two last of the stomach. Of cholera, he says:—"Cholera, numero plurali, ventris turbatio facta et per inferna et per vomitum ob cruditatem et pravos humores aggestos. Cholera vero numero singulari pro bile ponitur," &c., &c. This strange but erroneous notion, of there being a singular and a plural word, cholera, I have not met with before this period, but it has been repeated by some authors.

With this extract these tracings of cholera from the earliest ages to the year 1500 may close.

If we review the history of cholera up to this date, we find that almost every writer on medicine in Europe or in Asia has described a disease, the prominent symptoms of which were violent vomiting and purging. Different writers have dwelt on different symptoms of the disease more particularly. But serous evacuations, suppression of urine, loss of fluid to the system, lividity of countenance, collapse, rapid recovery, protracted recovery with secondary fever, relapses, have all been described from the earliest periods. The disease was counted a very grave one.

* Commentaria Urbana, Basil., 1543.

The prevailing idea of the pathology of the disease was that some foreign matter, such as indigestible food or some morbid secretion of the system, acting as a poison, irritated the stomach, and stimulated it and the intestines to evacuation, and that the system suffered in sympathy.

The ordinary treatment was in the first instance to aid in clearing the stomach of irritating matter by gentle emetics or aperients, or frequently to be satisfied with diluting the contents of the stomach with water. There was a great dread of debility, and wine was used as early as it was considered safe. Opium, from a very early date, was employed by some. A great variety of measures were used externally to restore heat and relieve cramps.

There is no reliable account of epidemics, but the disease prevailed most in warm weather.

We have indeed seen that Paulus Ægineta described an epidemic bearing much resemblance to cholera, and that Avicenna mentioned epidemics of colic and ileus. Some of the sudden pestilences recorded in the Bible have been conjectured, on no sufficient grounds, to have been cholera; and Josephus, the Jewish historian,* recorded a pestilence in which the patients died with pains in the intestines and vomiting, but he adds that they evacuated the bowels corroded in every way, a description that could not apply to cholera.

Although we have a great aid in its identification

* Lib. I., cap. v., v. 6.

from the fact that it has been wonderfully constant in its symptoms for 2000 years, it would have been very surprising indeed, if it had been possible to identify with certainty any epidemics of cholera at so early a period.

The names applied to it by the earliest Greek and Arabic authors, cholera and *haidsa*, are at this day its popular designations in Europe and in the East.

From the history that has just been traced, we are warranted in drawing the conclusion, that up to this time no Eastern writers have described a form of cholera more acute than that of which the Greek and Roman authors have given full accounts.

But after this period, we find that European travellers on reaching India were at once struck with the existence in that country of a more acute form of the disease than was common in Europe; and, therefore, from this date we can conveniently treat of cholera in the East and of cholera in Europe separately, always recollecting that in all parts of the world it was a disease of varying intensity, and that varied in its symptoms within certain limits.

CHAPTER IV.

CHOLERA IN THE WEST FROM A.D. 1500 TO A.D. 1817.

THE chief difference which strikes us between the period we have just surveyed, and that on which we are now entering, is this, that from the commencement of the sixteenth century we begin to have notices of epidemics of bowel affections of considerable magnitude. They have rarely been described with sufficient accuracy to make it possible to determine actually what they were. They have been usually called colics or dysenteries. But in modern times almost all epidemic colics are referred to lead poisoning, and attributed to the consumption of unwholesome wine. Many of these colics appear to have been too widely spread to be so accounted for. Again, dysenteries are usually confined to comparatively limited areas, but Fernelius tells us* that in 1538, "violent dysenteries ravaged the whole of Europe with such ferocity, that scarcely any state escaped unscathed." For these and other reasons it seems probable that such epidemics may have been somewhat of a choleraic nature.

In the history of cholera† in Europe in the

* De abditis rerum causis, lib. II., cap 13.

† Where I do not give authorities, I have found the statement in Short, op. cit. supra p. 3.

sixteenth century, a great deal turns on the interpretation of the French term *trousse galant*,* now the popular name for the disease in France. A century later, or by the year 1643, it is used by Van der Heyden as synonymous with cholera; but P. Forestus, writing indeed only what he had heard, in giving an account of *trousse galant*, which ravaged all France and England in 1545, describes it as a malignant fever with putridity and vomiting of worms; and though he writes at some length about cholera, he in no way hints that it resembles *trousse galant* in any respect.

Mezeray, the French historian, after saying that a famine had desolated Italy and France for five years, and was followed, in 1529, by the disease of which he gives this description†:—

"De cette mauvaise nourriture s'engendra une nouvelle maladie qui étoit si contagieuse qu'elle saisissit incontinent quiconque approchoit de ceux qui en étoient frappés. Elle portoit avec soi une grosse fièvre continue qui faisit mourir un homme en peu d'heures, d'où elle fut dit *trousse galant*. Que si

* We find the earliest notice of this disease with its name slightly altered in the remote kingdom of Scotland, which was, however, closely connected with France. Holinshed says: "In the month of September, 1510, an universal sickness ruled through all Scotland, whereof many died. It was very contagious, and they called it *stowpe galant*." Unfortunately, he says no more. September has always been a cholera month in these islands. The name indicates a disease sudden and severe.—History of Scotland, p. 194.

† Mezeray, Histoire de France, tom. ii., p. 966, quoted by Anglada, Etude, &c., 1869.

quelqu'un en échappoit, elle lui arrachoit tous les poils et les ongles, et lui faisoit une langoureuse foiblesse six semaines durant avec un si grand dégoût de toutes sortes de viandes, qu'il ne pouvoit en avaler que par force."

I quite agree with Anglada that no one can pretend to recognise here a description of cholera. The most characteristic symptoms of all, vomiting and purging, are not once mentioned. Great continued fever, excessive contagiousness, and loss of hair and nails, are no signs of cholera. I think, therefore, it must be admitted that the *trousse galant* of that period in France was not cholera, for neither the non-medical description of the disease in 1529, nor the medical one of it in 1545, point to that affection.

But leaving these uncertain descriptions, we come very soon to something very closely resembling autumnal cholera, although it is termed a colic or ileus. Moyses Alatius* writes thus:—"Colicam iliacamque memini me vidisse in civitate Mantuæ anno 1560 mensibus nimirum Augusti et Septembris, qui pubilce tum temporis ejusmodi passionis contagione per universam civitatem grassabantur, cum sævis symptomatibus, assiduo nempe ac urgente vomitu bilis porraceæ in magna copia, necnon etiam æruginosæ, lipothymia, assidua febre malignitatis non experte, ac siti immensa, ac in eadem familia plurimi eo morbo oppressi inveniebantur." With the violent vomiting, immense thirst, and collapse,

* Marciæ Prælect., p. 276, 26.

doubtless many other symptoms were associated, though they are not enumerated; undoubtedly, this looks very much like a local epidemic of cholera.

In 1564, however, we have the disease described by name in an appendix to the works of Riverius. The unknown author writes thus in substance:— "In the year preceding the plague at Nismes, if I recollect rightly, the disease called cholera was prevalent, killing many within four days; but nearly all recovered who sought aid on the first onset of the disease. The treatment was of this sort. The smallest possible quantity of liquid was given, although the patients were tortured with inexhaustible thirst, because vomiting and purging were increased whenever they drank, and death followed inevitably from them. Warm oil was used against the torpor and the convulsions of the legs. The vomiting and alvine flux were combated by all sorts of warm powders and cordial epithems applied to the abdomen. They also got opiates, and sometimes, if the strength had not yet failed at the commencement of the disease, rhubarb was given. Strengthening clysters were also used, especially in boys reduced by the disease. Under such measures nearly all the patients recovered."

I think it is worth while to quote here the description of cholera given about this time by Lommius,* as it is concise, and his writings remained classical in medicine for nearly two centuries:—

"Omnium id penc atrocissimum est quod χολέραν

* Medicinal. Observation, lib. III. Antwerp, 1560.

Græci dicunt. Bilis supra infraque magno impetu prorumpit, acuti in intestinum superum dolores et torsiones et inflationes incidunt: ingens afficit bibendi cupiditas; pulsus celer, frequens, parvus atque concisus est: sæpe sudores toto corpore moventur; ubi gravius malum est, pulsus prope totus concidit, crura manusque contrahuntur, frigidæ sudationes fiunt, anima deficit, et quum ad extremum ventum est, syncope accidit, quibus concurrentibus omnibus, mirum non est aliquem subito extingui."

With all this good description, Lommius hints only at ardor urinæ instead of suppression, and at stercoraceus vomiting, a thing unknown in cholera. He says, "The disease is commonest in summer and autumn: common among the young, rarer and more fatal in old men."

About the same time, or near the year 1575, the celebrated Paduan Professor Mercurialis gave a full account of cholera; and although it is mainly based on the histories of previous writers, some of his observations are well worthy of being remembered. As to the Protean nature of the malady, and its varying mortality, he says*:—"Illud notandum, non ita varium esse Proteum a poetis descriptum, uti morbus ille varius videtur: quondam interdum ita mitis esse videtur ut tutus censeatur, et tamen jugulat; interdum gravissimus incidit, ut statim videatur jugulare velle, et tamen in bonum vertitur." As to the diseases with which it is associated, and as to

* Lib. III., cap. 25.

its fatality* :—"Videntur enim in cholera convenire singultus, nausea, inappetentia, (diarrhœa) dysenteria, vomitus, morsus, cardialgia, tremor (convulsiones), et tandem omnes morbi qui infestant ventriculum, ut non sit mirum si ab omnibus et lethalis et acutissimus sit existimatus." And then he comments on the retreat of the doctor recommended by Aretæus, and says, that under such circumstances the priest is of more avail.

About treatment he lays down some golden precepts, the neglect of which has contributed not a little to our knowledge of the relative value of different modes of treatment being so imperfect† :—"Est tamen in perficiendis his scopis aliqua differentia, quoniam alia conveniunt in principio, alia in augmento, alia in declinatione morbi." The treatment of the different stages of the disease is seldom with us sufficiently varied.

Towards the end of this century, Prosper Alpinus,‡ though he did not see any cholera in Egypt, the diseases of which country he described, remarks that he had frequently witnessed deaths from cholera, usually connected with double tertian.

Piso§ has less freshness than Mercurialis. He is very much of a compiler from former authors, but he bears testimony to the violence of the disease, which was such "ut ea perculsi toxicum se bibisse putent," a forcible expression of the old belief that its effects

* Loc. cit. † Loc. cit.

‡ De Medicinâ Methodicâ.

§ N. Piso, de cognoscendis et curandis morbis, lib. III.

were akin to those of poison. He insists on cholera being sometimes the result of the abuse of purgative medicines; in fact, the three causes for the disease which he assigns, are depraved humours, food, and medicines, and he says that the most recent theory of the disease in his day was that bile having accumulated becomes irritating, and is expelled hither and thither.

He was inclined to use both gentle emetics and mild purgatives. The vomiting is cured by an emetic, but after a time, if the powers were failing, he gave wine.

We come next on a notice of a contagious epidemic colic, which prevailed with great violence, and spread all over Europe. An account of it was given some thirty years afterwards by Zacutus Lusitanus, but he treats the disease quite apart from the description of cholera which he gave at that time, while making the statement, that the Indian form was much more acute than the European one, to which we shall afterwards have to refer. He makes a remark, which many other writers do, that those who have had previous attacks of cholera are most likely to recover. This indicates a mild form of the disease.

We have every reason to believe that fluxes (no doubt mainly true dysentery) were common in Europe in the beginning of the seventeenth century, if we are to judge by the literature of the period. In 1607, two treatises were published at Strasburg and at Freiberg, on the *Pestis et Dysenteria*, then commonly epidemic.

In 1610, Gardiner* tells us that in England summer brought tertian ague, yellow cholera, and choleric fluxes. In 1617, Gramann published at Halberstadt an account of the white and the red flux,† a distinction somewhat resembling that which was at a later period taken up in England by Claremont,‡ who divided fluxes into Jecoraciæ and Rheumaticæ, and by Willis. In 1623 and 1626, there were epidemics of flux at Pont-à-Mousson, and at Lyons; and what shows that some of those fluxes were probably of a choleraic character, Pietre, in 1624, published a treatise in Paris on the expediency of blood-letting in cholera. Unless some form of the disease was prevalent, a monograph on a single point of treatment would surely not have appeared.

It is worthy of remark that about the year 1636, "rising of the stomach" or vomiting became a new heading in the London bills of mortality; also that the deaths from convulsions increased very rapidly

* Trial of Tobacco. London, 1610.

† As early as 1583, Schönheid gave an account of the red flux. This term is enough to show that a flux not red was then recognised. I am aware that up to the present day the uneducated in Germany sometimes make a distinction between white and red dysentery. There is no doubt occasionally a good deal of white mucus in dysentery, and the dejections are sometimes nearly colourless, though free from mucus, in cases which have been described as dysentery; but I know of no form of true dysentery in which a white discharge is characteristic of the whole course of the disease. Still, it does not follow that white dysentery was cholera.

‡ De aëre et locis Angliæ, 1672.

after that period up to the end of the century. So did the deaths from cholera morbus (so specified) considerably, and proportionate to the increase of deaths by cholera morbus was that of deaths by colic and ileus. This statement does not refer to the epidemics of cholera. Thus, according to the London bills of mortality, the deaths were in these proportions:—

	1629-36	1695-1712	1754-67
Cholera Morbus	23	78	79
Colic and Ileus	192	640	546

A very lively description of the "*trousse-galant*, called cholera morbus," was given in 1643 by a Belgian physician, Van der Heyden,* a great advocate of the water cure in gout and in some other diseases:—"The furious onset of *trousse-galant* in a short time takes away from the body so much of its substance and of its force, and occasions in it so much mischief and change, that in seven hours their domestics would not recognise in such a sufferer a master or a relative, unless they knew it could be none else, for they encounter the true Hippocratic expression, which indicates the extreme of debility and the image of death. Once when I was called to see a patient, only five hours after his attack, I found him in a condition giving the most unfavourable prognosis, to wit, without pulse or speech, passing in his evacuations only a fluid resembling

* Discours et advis sur les flux de ventre, &c. Ghent, 1643-45.

clear milk. Along with this, his eyes were so sunk that one could scarcely see them, and his legs and arms so drawn back by convulsions, that one saw no movement in them, and so cold from the moisture of a cold and clammy perspiration adhering to them, that the patient seemed more dead than alive."

The chief treatment of this malady was by the laudanum of Theophrastus. It is well to remark in this admirable picture of cholera the precise statement about the nature of the evacuations.

At this time it was believed that excesses and imprudences contributed to the development of cholera, and doctors laid down hygienic rules for avoiding attacks of it. The popular rhyme which will be found in the note,* while it embodies some such advice, recommending abstinence from excess, and keeping the feet warm, shows at the same time that the malady which gave rise to it must have been a widely-spread one. The precise date of the rhyme is not ascertained.

About the same period, or in 1649, Rivierus, of Montpellier, gives a full account of a cholera, chiefly sporadic, but of very considerable intensity. It was sometimes followed by secondary fever, and he gives also some cases of intermittent terminating in cholera. As there is more of freshness and originality in his remarks than in those of many other

* Tiens tes pattes (feet) en chaud,
Tiens vides tes boyaux (bowels),
Ne voyez pas Marguerite,
Du cholera tu seras quitte.

systematic writers, I do not scruple to make a few extracts*:—

"It is worth while to consider whence the enormous quantity of fluid expelled in this disease by vomiting and purging can be derived. It is usually said that this fluid comes both from the mesentery and the parts near it, and also flows into the intestine from the whole body. This is probably occasioned by the malignant matter in the intestines poisoning the whole fluids of the body, as the irritating medicines, antimony and elaterium, by poisoning the healthy humours, cause hypercatharsis.

"As to its prognosis, this disease must be considered a very acute one, usually bringing sudden death with it, but if there be any palpable cause for it in what has been eaten, recovery is probable. The more acute the symptoms in cholera are, as syncope, convulsions, coldness of the extremities, the shorter history we have, and death is the nearer.

"If the vomiting begins to abate, if the cadaverous hue of the face begins to disappear, there is good hope; but patients are often carried off by a relapse after not only bystanders, but the physicians themselves have thought the danger over."

As to treatment, he would allow a little evacuation in the commencement of the disease, until the depraved humours were gone. But his main remedy evidently was opium, and when the discharges were somewhat checked, the use of cordials.

Some practitioners bled at the commencement of

* Prax. Medic., lib. ix., cap. ix.

the attack, when they said the vital powers were oppressed, not exhausted. This he did not approve of, but recommended bleeding once or more in the secondary stage, when it was necessary.

He considered cholera *sicca* a very rare disease, and his treatment is not meant to apply to it. Rivierus believed in the existence of contagious and pestilent epidemics of colic, which were most deadly.

There is much in Rivierus that applies to the disputed questions in the theory and treatment of the disease at the present day.

After this we do not for a time find much mention of cholera in Europe. But Piso,* in his account of South America, observes in the year 1658 that cholera was a severe disease among the natives of Brazil, often killing in twenty-four hours.

There was an epidemic of cholera again in Ghent, in 1665.

We now come to the famous English epidemics, which have been illustrated by Sydenham, by Willis, and by Morton. Short tells us that in England, owing to the heat in 1669, came cholera morbus, which reigned till 1672. In 1676, the convulsions were more violent and more continued than Sydenham had ever seen before, and required stronger anodynes. Notwithstanding that they are well known, Sydenham's accounts of the cholera of those days are so valuable that I shall extract their principal portions:—

Cholera morbus occurring in autumn is very

* Historia, &c., Indiæ utriusque. Amstelodam.

different from the ordinary cholera induced by indigestible food. The disease is easily recognised. "Adsunt enim vomitus enormis, ac pravorum humorum cum maxima difficultate et angustia per alvum dejectio: cardialgia, sitis, pulsus celer ac frequens, cum æstu et anxietate, non raro etiam parvus et inæqualis: insuper et nausea molestissima: sudor interdum diaphoreticus: crurum et brachiorum contractura, animi deliquium, partium extremarum frigiditas, cum aliis consimilis notæ symptomatibus, quæ astantes magnopere perterrefaciunt, atque angusto viginti quatuor horarum spatio ægrum interimunt."* The disease varied in its symptoms. Cholera occurring at any other season of the year differed "toto cœlo" from that in August.† Sometimes the cramps were particularly violent. "Exeunte æstate cholera morbus epidemice jam sæviebat, et insueto tempestatis calore evectus atrociora convulsionum symptomata, eaque diuturniora, secum trahebat, quam mihi prius usquam videre contigerat. Neque enim solum abdomen, uti alias in hoc malo, sed universi jam corporis musculi, brachiorum crurumque præ reliquis, spasmis tentabantur dirissimis, ita ut æger ex lecto subinde exiliret."‡ Respecting the causation of the disease, Sydenham's opinions are chiefly remarkable for the weight he attached to the epidemic constitution of the year and to season, as if there was "something hidden and peculiar to the air of the particular month that

* Observat. Medic., sect. iv., cap. 2. † Loc. cit.
‡ Epistol. R., I., 7.

impressed a specific alteration on the blood or on the ferment of the ventricle." As to his practice, he considered that "to attempt to remove the acrid humours, the cause of the disease, by cathartics, was as throwing oil into the fire, or to retain the secretions by astringents, was to subject the patient to an intestinal war." He hit on a middle plan, and, preferring dilution to evacuation in the first instance, gave chicken soup, but after three or four hours, if the patient had not improved, "Hoc, inquam, casu, omissis aliis quibuscumque auxiliis, recto cursu ad sacram hujus morbi anchoram, laudanum intelligo, confugiendum est; quod non tantum exhibendum est urgentibus symptomatibus, sed etiam cessantibus vomitu ac diarrhœa, mane et sero quotidie repetendum, donec pristinas vires æger ac sanitatem tandem receperit."* He therefore gave laudanum very freely, and continued its use much longer than has been usual in more modern practice. Sydenham had only seen one case of cholera *sicca*.

It is, perhaps, not too much to say that the account of the same disease given by his contemporary Willis, is, in many respects, as interesting as that of Sydenham. He has not omitted the leading symptom of white or watery evacuations. Willis, like many other writers, considered cholera to be a kind of dysentery, or, as it was vulgarly called in England, "griping of the guts." The

* Observat. Medic., sec. iv., cap. 2.

following is Willis's description of the unbloody flux—dysenteria incruenta*: —

"In the year 1670, about the autumnal equinox, a great many were sick of an unbloody but very sharp and dangerous dysentery. The disease invading suddenly and frequently without any manifest occasion, did reduce those labouring with it by great vomiting, frequent and watery stools (excretory convulsions, with tormenting perturbation of the whole body), quickly to a very great debility, to horrid failure of the spirits, and loss of all strength. I knew some, the day before well enough, and very strong, in twelve hours' space so miserably cast down by the tyranny of this disease, that with a weak and small pulse, cold sweat, short and quick breath, they seemed just ready to die; and truly not a few to whom fit remedies or opportunity of cure were wanting, were suddenly killed by it. This sickness, raging for a whole month, began to decrease about the middle of October, and before the beginning of November was almost wholly vanished. Very few in that time had bloody stools, and not many bilious, but very many had vomits, and watery, almost clear, and plentiful stools. Whilst that popular dysentery raged in the city so cruelly, in the country, or at least three miles beyond the city, almost none was sick of it. Besides here, although very many were sick, the disease did not seem to be propagated by contagion, but to affect those only that were predisposed. For it did not take those who were

* Pharmaceutica Rationalis, sect. iii., c. 3.

conversant in the same family with the sick any sooner than those who shunned their houses."

Next come his views of treatment. "For the cure of this disease no evacuation did help; yea, phlebotomie vomiting and purging sometimes did hurt; but for the most part the remedies were only cordials, in so much that spirits of wine, with sugar a little burnt, became a popular remedy and for the most part profitable, though in the bloody flux it was often found hurtful." If the pulse and breathing were strong enough in the evening, he gave some laudanum.

As to the ætiology of the disease, he did not think its symptoms proceeded merely from the acrid contents of the intestines. To account for the sudden prostration of strength, he thought that a degeneration of the nervous liquor and nervous juice overflowed into the mass of the blood, which, as the nervous liquor is incongruous with it, rejects it by the stomach and intestines.

Willis's views were tinctured by his opinions on the nervous system, but here we have the germ of the well-known theory which attributes the phenomena of cholera to a sudden impression on the nervous system. The main cause of the disease was the evil influence of the air, which was naturally increased by errors of living, but he could not connect the disease with over-eating of fruit. Willis did not describe secondary fever.

Another great physician of those times, Morton, speaks of epidemic diarrhœas and dysenteries, accom-

panied by awful twitching cramps, as prevailing annually from 1666 to 1672 to such an extent as to occasion a weekly mortality of from three to five hundred. The diarrhœa consisted of a copious purging of colliquative and virulent serum. Dr. Morton's account is particularly valuable as showing the connection between cholera and the fevers of those days. He also gives one of the best marked descriptions of the livor produced by the disease :— "Totum corpus instar glebæ frigidum et madore perfusum, cutem, præ sanguinis congelatione, nigridine tinctam."*

These statements respecting the prevalence of an annual form of abdominal flux at this time by professional writers, are confirmed by Mr. Chapman, of Bath, in 1673, who, in a pamphlet written in praise of the waters of his own city, propounds the question, whether it may not be owing to the fashion of drinking purgative mineral waters in the neighbourhood, that "a not only painfully torturing but mortal malady, as the bills of mortality show, that doleful disease, griping of the guts, had caused more deaths in London about that period than ever in former ages."

With respect to this *griping of the guts*, as we have already seen, Willis appears to include under the term both bloody and unbloody fluxes. Nevertheless the great majority of those who have considered the question, are of opinion, that the griping of the guts usually referred to the cholera described

* Pyretologia, &c., histor. prim.

by Sydenham, doubtless including cholera infantum, a very fatal form of the disease. Dr. Greenhow writes* that "an examination of the bills of mortality shows a great increase of diseases of the flux family after the great plague of 1655. This mortality is chiefly assigned to the disease styled *griping in the guts*, sometimes also called *plague in the guts*, between which, bloody flux, flux and colic, a distinction is uniformly maintained. In the year immediately preceding that of the great fire, the number of deaths from this one form of flux exceeded two thousand. Below that it never fell until near the close of the century, although in some years it exceeded three thousand; and in one or two, four thousand. Making allowance for the increase of population, the mortality for this single disease in ordinary seasons equalled that occasioned by the cholera epidemic in London in 1854."†

Ettmüller,‡ the standard author of his day, does not say anything of much importance on cholera itself, but his remarks on diarrhœa and dysentery

* B. and F. Med. Chir. Review, April, 1856.

† Dr. Black (*a*) reckoned that during the last thirty years of the seventeenth century, the deaths from gripes and colic in London amounted to the large number of 69,979. With respect to the diffusion of disease of the nature of flux in Europe at this time, I find that there were diarrhœa and dysentery in Denmark in 1660, great dysentery over all Europe in 1666, dysentery at Breslaw in 1680, dysentery in most parts of Europe in 1684, dysentery in Augsburg in 1688.

(*a*) Comparative View, &c., London, 1788.

‡ Opera Theoret. et Pract. Lugdun., 1685.

are instructive in their bearing on cholera. He considered cholera to be only an excessive and unusually malignant form of diarrhœa, and he is loud in the praise of opiates for its cure. Diarrhœa, he said, was at times more or less epidemic, and was at such periods contagious. He believed it to arise from a ferment either inspired with the air or taken in with the food, or arising from the excreta of the sick, which multiplied itself after being introduced into the body. Of dysentery, he said that it might be sporadic or common, endemic or epidemic, mild or malignant, with fever or without it. Every epidemic of it was contagious. The disease was caused by the air, by bad water, and by bad fruit. The contagion was propagated by the latrines, and sometimes even by injection syringes. Rivierus before him had pointed out how in contagious dysentery all the members of a family got it from the use of common latrines.

Pechlin deserves mention as having described a cholera about this time, which he expressly describes as serosa and ἀχολα, or without bile, and says that the cause of cholera had been erroneously assigned to the bile.

In 1689 there were cholera and dysentery in Nuremberg. In 1691, in London, the third fit of intermittent was sometimes accompanied with convulsions or a cholera. In 1695, in Ulm, there was an epidemic convulsive colic, with fearful cramps, and often with vomiting. I mention this epidemic, not as necessarily having been cholera, but certainly

having close analogies with that disease. I might enumerate more epidemics, such as one in Switzerland in 1696, commonly attributed to wine. Such epidemics are usually set down to lead colic, and no doubt often so with justice; but they appear to have spread from district to district in a way that it is difficult to account for by the lead theory alone, and the symptoms were much more acute than it is usual to witness in ordinary lead poisoning.

The celebrated Hoffmann's* account of cholera is chiefly interesting from the close parallel which he draws between that disease and the effects of poison, especially of arsenic.†

We now enter on a new century, and the notices of cholera become less frequent. This coincides with what happened in the East. There is no question whatever of the decay of the disease in the East, as I have examined most of the available authorities. I cannot say that I have examined the question as regards Europe as thoroughly.

In 1701 there was an epidemic of cholera at Breslaw, which was described by Helwig. He observes that the disease occurs annually, and is worst in the hottest years. In 1711, according to Lentilius,‡ cholera was almost epidemic in Tübingen

* Opera, Vol. III., p. 174.

† It is curious to find another Hoffmann only last year describing the post-mortems of some cases of arsenical poisoning, in which, like Virchow, he found the shedding of epithelium, and the very sporules said to be distinctive of Indian cholera.

‡ Eteodromus, p. 568.

in June and July. In 1712 Augsburg had a cholera, in the month of August. About the same date Torti remarked on the supervention of choleraic attacks in intermittents. In England, from the beginning of the century, the mortality from the various forms of alvine flux began to fall. Dr. W. Heberden states that the mortality from flux, which for many years in the end of the last century annually exceeded two thousand, amounted to one thousand and upwards in the early part of the eighteenth century, (others have calculated the deaths from colics and gripes of the guts in the first fifteen years of this century at 13,668), decreased to one hundred and fifty by the middle of it.

As a specimen of the physico-mechanical medicine that prevailed at that period, Dr. Pitcairn's* views on cholera may be given in abstract. He was a great authority in his day, not only in Holland, but throughout Europe. He cannot admit that there is any foreign ferment mingled with the blood. Cholera was caused simply by the putrefaction of some article of food in the stomach. This cause exercised its force before it could get into the blood, by exciting convulsive movements in the fibres of the stomach.

All the phenomena of cholera were merely symptomatic of the stomach affection, not of any ferment in the mass of blood. As the corrupt substance irritates the stomach and intestines to excretion, there is no need of artificial purging upwards or

* Philosoph. Mechan. Elements of Medicine, 1717.

downwards; and as there is a necessity for excretion, no astringents will be wanted, so long as any portion of the morbid matter remains. As when a person has taken a strong emetic, no one in his senses will give another emetic or purge, or anything to stop vomiting, so in this distemper we must proceed on the same considerations.

His treatment was therefore mainly by dilution. In the later stages he gave opiates, but warily and in divided doses, and in a liquid form. He was thus quite aware, as practical men commonly are, that the system is usually sufficiently active of itself in its efforts at evacuation.

Cholera was not unusual at this time in towns in the north of Germany, for returns show that in the years 1722-3-4 there were 113 deaths from cholera morbus in Berlin, and 208 in Breslaw.

In 1726, according to Dr. Short, there came in England in July looseness and cholera morbus, in August mild choleras. This seems to have gone on more or less every year till 1737, the disease never being very violent or epidemic. About 1736, Dr. Douglas, of Fife,* described cholera in that part of the world as occurring occasionally, and frequently killing in twenty-four hours if it were neglected. His treatment is perhaps worth quoting. In the first place, he gave copious draughts of warm water, to make the patient empty the contents of his stomach: then he gave them toast-and-water made with oat cake ad libitum. This was his grand remedy. But if

* Edinburgh Medical Essays, v. iv., p. 140.

the patient was convulsed or exhausted, or near the jaws of death, then he gave laudanum freely and wine.

In 1736, there was a contagious dysentery at Nimuegen, of which Degner has given a very careful history.* From his description of the disease it would seem undoubtedly that a certain number of the cases were true cholera. He did not at first think the disease contagious, but became convinced that it was so, when a fair took place, and when the country people evidently carried back with them the contagion to their homes. He thought cholera to be allied to dysentery, but to differ from it in not being contagious.

Van Swieten, who produced his commentaries on Boerhave† from 1742 to 1747, speaks very shortly of cholera, and nowhere gives a complete history of the disease; yet the impressions of so great an authority in medicine must always be of value. He says:—"In cholera morbus, of a sudden and in a few hours' time, there is so great a discharge of the humors both by vomiting and by stool, that the whole body is exhausted, the face is pale and collapsed. All the strength is destroyed, and even convulsions are observed from so profuse and sudden an inanition, even though not so much as a drop of blood is discharged either upwards or downwards. This I have often observed with great astonishment, and especially in the case of a strong girl, who in the

* De Dysenter. Bil. Contag., 1738.

† Commentaries, Edinburgh, 1776, Vol. vi., p. 299.

space of three hours had her face so altered and collapsed, that her most intimate acquaintances could not know her, all the humors being dissolved as it were by a poisonous force, and violently expelled by vomiting and purging."

Our next accounts of the disease take us to the South. In the period from 1742 to 1750, Dr. Cleghorn* describes cholera morbus in the island of Minorca, and especially as occurring in the cold stage of intermittents.

About the same period another army surgeon, Sir John Pringle,† tells us of cholera, dysentery, and fever prevailing in the Low Countries and about Ghent, associated very much as we find them in such localities in the tropics. He believes fever, dysentery, and cholera to be produced by the same cause—a view often held by those who have had experience of tropical disease. He propounds the view, nearly as old as anything in medicine, that noxious vapours may exhale from the porous surface of the earth; and what is more interesting with reference to recent theories, although the remark is made when he is speaking merely of intermittents, and he does not indeed seem to have seen very much cholera, he writes:—"By looking into their wells, it is easy to determine the healthiness of their villages. These wells being fed by the underground water, and being observed to sink proportionally to the drought in summer, are at once a proof and a measure of the

* Observations on Diseases of Minorca.

† On Diseases of the Army.

constant exhalation of this concealed water through the pores of the earth, occasioned by the heat of the sun."

In 1751* there was an epidemic of cholera in Paris, witnessed by Malouin in the month of July, and treated successfully with opium.

About this date Cocchi,† an Italian physician, mentions that acute and dangerous disease with the ancient name of cholera. I merely make this reference to show, that the disease continued to be known in that part of Europe in which it has always been most prevalent.

In 1753 a certain Dr. Tralles‡ published a work of very considerable importance in the history of cholera—not for anything new in the way of facts that it contains, nor for the very elaborate detail of his own symptoms, but as an excellent digest of what had been written on the disease up to that time. He has very good remarks on the analogies of the phenomena of cholera with those of poisoning. Perhaps he is the first writer who expressly refers the oppression of the circulation to the blood being drained of its serum. "Ita emunctum esse liquidum ut circulatio desinere incipiat." Aretæus had given a similar reason for suppression of the urine. He has a special chapter on secondary fever, which most previous authors—I mean of those who mentioned it at all—did not discuss at length. As to the causation

* Quoted in Anglada, Etudes, &c., 1869, p. 620.

† Bagni di Pisa, 1750.

‡ Historia, &c., Vratislaviæ, 1753.

of the disease, he did not believe with Sydenham and Willis in an occult atmospheric influence, but attributed more to sudden refrigeration of the body during great heat. As to the gravity of the disease, he gives a long list of authors who have pronounced it deadly, and he says for himself:—"Inter eas autem et choleram morbum quandoquam se efferre, tyrannicamque stragem longe lateque edere solere, nimis eheu! rerum usu compertum est." But he is most valuable in his comments and criticisms on the various means applied to the cure of cholera, namely, bleeding, emetics, purgatives, clysters, especially on turpentine, acids, absorbents, demulcents, salts, volatile aromatics, tonic astringents, anodynes, opiates, wine, drinks, cold water, topical applications, baths. It is impossible to follow him in all his details, but I may say shortly, that he uses the phrase "eliminative," even then not a new one; that he is very severe on the use of emetics; is averse to the use of purgatives; rather likes demulcents and diluents, on the analogy of the presence of an irritating poison in the intestines. He thinks absorbents useless, but many have faith in them, as in many remedies, because if they do no good they at least do no harm. He approved of venesection in the plethoric at the commencement. But his chief faith was in opium, though he admitted that it should be used with some caution. He approved of wine, but gave some hints as to the risk of its causing congestion of the head.

He winds up with the practical reflection that

there is no universal method of cure, and that he really cannot recommend much more than the simple remedies which were useful in his own case—venesection, diluents, demulcent tepid drinks and clysters, fomentations and emollient ointments, and opium. He hopes that some one article of the huge apparatus of medicines he has enumerated, may detract from the savage cruelty of cholera morbus, which suddenly cuts off so many lives. So much for the treatment of cholera and for its fatality in Europe in the middle of the last century.

Bissett,* in 1762, writes:—"The true malignant cholera morbus seldom appears in Great Britain, at least in the northern parts of the island. I have not met with more than four cases of it in seven years' practice, yet several cases of an unmalignant cholera have fallen under my observation, particularly in August, 1759." This is merely interesting as recognising the existence of a virulent form of the disease. Sauvages, as we have already seen,† describes, in 1763, a great variety of forms of the disease, including the Indian one. In 1765 there was a choleraic form of intermittent at Montpellier.‡

In 1766 Sims§ described a bilious colic in London. We are carried by Rouppe‖ to quite another area, to

* Essay on the Medical Constitution of the Air, &c.

† Supra p. 13.

‡ Anglada, Etudes, &c., p. 397.

§ Observations on Epidemic Disorders in London, 1773.

‖ De morbis navigantium, 1762.

naval life and to sailors, among whom, owing to their diet, colicky attacks are in all ages frequent. Of specific facts he does not give many. One is a remarkable one of a whole ship's crew being stricken down with cholera, off the Mediterranean shores of Spain. Seventy men were attacked in one day, and the epidemic lasted two or three days. This is what we might now read of in cholera times—but mark the difference, all the cases recovered!

Rouppe was quite aware of the prevalence of choleraic attacks in tropical regions (he did not visit the East), yielding in no degree in violence to the effects of the most keen poisons, and says that those attacks are sometimes sporadic, sometimes epidemic. He describes a fever complicated with a choleraic access, and treated such an access in yellow fever with warm drinks, poultices, and opium.

In 1767 Dr. Short mentions cholera morbus as one of the diseases that made havoc among men. Holmes, the President of the London Medical Society, in his address to it in 1777, remarked that cholera morbus came round every year as regularly as autumn.

In 1782, Dr. Currie,* of Philadelphia, described a fever that frequently terminated in cholera. There was immense mortality of children from cholera infantum, as there always has been in America. In July, 1791, attacks of cholera were common in Philadelphia.

* Account of Climate and Diseases of America.

The ordinary views prevailing respecting cholera morbus are fairly represented by Dr. Black* in 1788:—

"Cholera morbus is much more frequent in tropical and warm climates, and in northern regions in the summer and autumnal seasons, especially in unusually hot seasons. The disease is not infrequent in this island and metropolis; nor is it confined to the warm season only. The symptoms are sickness and nausea, succeeded by violent vomiting and purging of a bilious nature, with gripes, tenesmus, tension of the abdomen, anxiety, great prostration of strength, intense thirst, cardialgy, and sometimes muscular spasms of the lower extremities. In cases of ordinary violence it may continue a day, and then cease. In more tremendous assaults it sometimes proves fatal in twenty-four hours, portentous omens of which are violent vomiting and purging, sudden prostration of strength, quick, weak pulse, hiccup, fainting, cold sweats, and cramps of the extremities."

Among its causes he enumerates hot climate and seasons, and in the tropics extreme heat and dry weather, succeeded by fall of rain and coolness of temperature, sudden changes of weather, corrupt bile, excesses, &c.; adding that "the disease is symptomatic in intermittent and remittent fevers."

Dr. Tallman described an epidemic of cholera at

* "View of Mortality," London, 1788.

Püllna in 1790.* Dr. Chambers gives the following abstract of his more important observations:—

"He is, perhaps, the earliest author who has recorded as a premonitory symptom uneasiness of the throat, accompanied by eructation. This is followed by heat alternating with rigors, by universal languor, lassitude, gripings, constriction of the præcordia, nausea, on which supervene suddenly vomiting and the most violent purging. In a short time the pain in the abdomen becomes more intense; an incredible anxiety and painful thirst come on, while the nausea and tenesmus, even in the intervals of vomiting and purging, is most distressing. The patient is sleepless; the pulse grows very frequent, small, and unequal; the urine is often suppressed, the mind unsteady." There is not much more to be gathered from him, that has not been often repeated in these pages; but the description of the more advanced stage is good:—"The body has a shrunken, corpse-like look (cadaverosum, macilentum); there is constant inquietude and restlessness; the eyes become sunken and hollow; the spasms of the various parts are most excruciating; the nails become blue; the extremities cold; cold sweats break out, especially on the forehead."

Towards the close of this century Fodéré† saw cholera epidemic in the neighbourhood of Nice, and in the canton of Martignes. He disliked the delays

* Tallman in Stoll, Dissert. Medic., v. ii., p. 247.

† Sur les Epidémies, vol. ii.

of laxatives and clysters, and found opium the only remedy.

Drs. Chisholm* and Clark,† in 1795 and 1797, mention cholera morbus in the West Indies. It was, however, a mild disease, although the latter observes that instances have occurred of its being quickly fatal when neglected. Cholera continued to show its old liking for ships. A cholera morbus appeared in 1800 among troops on board ship in Port Mahon in an alarming form, though with no fatal consequences.‡

A notice by Dr. Willan§ may conveniently wind up the century.

"In 1800 the cholera was a frequent disease in London in September, but particularly so after the rains on the 19th and the 20th of August. To a profuse discharge of green bile from the stomach and intestines, cold sweats, fainting, and hiccough, were superadded most painful cramps of the muscles of the lower extremities. The trunk of the body was similarly affected, being jerked from side to side by sudden and violent convulsions."

I shall be very brief in what I say of the commencement of the nineteenth century.

I observe that Mr. White, of Bath, published a book on cholera in 1808. Mr. Curtis, in his book published in 1808, says that he has observed many

* On Yellow Fever.

† On ditto.

‡ Currie Medical Reports, vol. ii., p. 548.

§ Miscellaneous Works, p. 375.

cases of cholera near Edinburgh, nearly identical with the *mort de chien* he had seen in the East Indies; but there was this difference, that only one of these cases was fatal.

Saunders, in his treatise on Liver, in the edition of 1809, continued his statement that cholera morbus was extremely frequent in England in the months of August and September, so as to be considered the autumn epidemic.

According to the bills of mortality, diarrhœa, summer cholera, and other diseases of the nature of flux, were unusually fatal in most of the early years of the century, for instance, in 1802 and 1803, and again in 1811, 1814, and 1815.

Dr. Armstrong* described cases resembling cholera, which occurred at Shields and in the neighbouring districts in 1817, under the head of congestive typhus; and Mr. Hennen† recorded the prevalence of a most fatal cholera at Cephalonia, in the years 1816 and 1817. It does not seem to have spread widely, but it destroyed three out of the four attacked by it, and was therefore proportionately more fatal than ordinary Indian severe epidemics.‡

Looking back now at those three centuries, we find

* Armstrong on Typhus Fever, 1819.

† Medical Topography of the Mediterranean, 1830.

‡ Many of the medical officers insist, in their letters in the Bombay Report on Cholera, on the close resemblance between what they saw and what was described by Armstrong. For myself the fièvre pernicieuse, or algide, has always appeared to me to resemble cholera much more closely than any other phase of fever does.

that varieties of the disease were recognised at a very early period, and that by the middle of the eighteenth century it had been subdivided into more than a dozen species.

Perhaps the most remarkable point in those subdivisions* is, that they indicate the close connection of cholera with dysentery, and with intermittent fever; that the worst Indian form of the disease was even then recognised. Further, a spontaneous, a dry, a verminous form, the rheumatic form (which merely meant flux), were admitted, besides cases the result of poisoning, whether vegetable or metallic. In this long list of allied affections various forms of colic, and possibly of ileus, were in all probability included, as well as acute colliquative diarrhœa.

This multiplication of species can be considered no advance in medicine, and is in strong contrast with the late classification of the London College of Physicians,† which lays down only two varieties, cholera simplex and cholera pestifera.

Nor is the advance of this period to be found in any more complete description of the symptoms of the disease, unless perhaps in so far that secondary fever was more distinctly recognised. Suppression of urine, and rice-water evacuations, usually considered the characteristics of Indian cholera, had been already described, but were noticed again in Europe. Various questions were raised as to

* See Chapter I. supra.

† Diarrhœa, cholera, paralysis, and colic succeed each other in their general list.

the pathology of the malady. The condition of the circulation was more fully considered, and how far it was dependent solely on the mere drain of fluid from the intestines. Although much was still ascribed to articles of food as exciting causes, there were questions of its not being simply a disease of the stomach and small intestines, of its being a more general affection of the system, of spontaneous blood poisoning, and of a primary impression on the nervous system. The connection of cholera with dysentery, with fever, and especially with intermittent fever, was studied.

The difficulties attending the discrimination of two forms of dysentery, which were early observed, can not now be entirely cleared up; but there seems to me to be a strong presumption that in many instances, and a hundred years before Willis, white dysentery meant cholera.

As to treatment during this period, emetics and purgatives seem to have been going out of fashion, and the old diluent treatment was frequently adopted in the beginning, although a few practitioners would not allow any liquid at all to be given. Opium and cordials became latterly the favourite medicines. General blood-letting was recommended and practised in the first half of the seventeenth century; but I doubt whether it was ever very popular, especially in the commencement of the attack. As to other treatment, hot baths were used; blisters and sinapisms were applied to the stomach and to the extremities.

As to the ætiology of the disease, a great deal was attributed to a certain epidemic constitution of the air, to season, to miasms generated in the soil, and depending on its moisture and the heat of the sun. As regards contagion, cholera was undoubtedly reckoned non-contagious. The contagion of the cognate diseases, epidemic diarrhœa and dysentery, was acknowledged, and the idea at least of cholera being contagious had been suggested, though settled in the negative by such authorities as Willis and Degner. Although the contagious nature of the cholera excretions does not seem to have been hinted at, the contagious nature of the excreta in what were considered diseases of a kindred nature, diarrhœa and dysentery, was freely admitted, as also the influence of bad water in their production.

But what marks this period most distinctly is the repeated occurrence of epidemics of the disease, among which the comparatively limited ones of London hold a prominent place, owing to their having been so fully described. Imperfect though our information is, there are strong indications that there were epidemics of the disease of considerable magnitude in France and other parts of Europe.

But the disease, at least in the eighteenth century, seems never to have produced a very startling mortality, nor were its epidemics so appalling as those we shall find described in India during the same period. All the physicians, indeed, seem to have spoken very confidently of being able

to cure cholera, if they were only called in early enough. As we shall find that this confidence was often entertained in India in the presence of the worst forms of the disease, I should not trust to this mere tone of assurance as a proof that they could cure the disease, did not the narratives of the period of particular cases show, along with many sudden deaths, a very great proportion of recoveries.

CHAPTER V.

CHOLERA IN THE EAST FROM A.D. 1500 TO A.D. 1750.

As the Portuguese found cholera in India on their first arrival, it is only reasonable to suppose that it existed there before that period. The words by which pestilences have been described by Mussulman historians are, unfortunately for our purpose, applicable to other diseases besides cholera. However, Mr. Dowson, in his learned edition of Sir Henry Elliot's "History of India,"* gives an instance of what very possibly was cholera in the neighbourhood of Delhi, as early as the year 1325. At that time the Sultan Mahomed Ben Tuglúk Shah arrived at Arangal, where cholera (*waba*) was prevalent. Several of the nobility and many other persons died of it. The sultan himself had an attack, and his recovery was tedious. There appears to have been in that season a scanty fall of rain: there was famine and great distress, and the people perished in great numbers. This is doubtless no solitary instance of what happened before the year 1500, and sometimes such pestilences were fevers, sometimes cholera; but it is pleasanter

* Vol. III.

to deal with indisputable facts, as we are able to do henceforth.

We now reach the period of direct intercourse with India and the Islands of the Indian Ocean, by the voyage round the Cape, and of the settlements of Europeans in the East which naturally followed. From this date we have an almost unbroken chain of evidence, usually direct, in some few cases circumstantial, of the prevalence of cholera in India, not only in its milder, but also in its most malignant forms—evidence quite sufficient to satisfy anyone having a practical knowledge of the disease in India. Although the description given of the symptoms is often incomplete, as was to be expected in the accounts of ordinary travellers, and as is the case when they mention other maladies, yet, taken in connection with what we know of the native names for cholera and of the habits of the disease, a few points which are always noted are quite sufficient to identify cholera. For instance, sudden attacks of vomiting and purging, followed by cramps and collapse, and causing death within twelve or twenty-four hours—attacks so sudden that they were often attributed to poisoning, and for which Europeans had no remedy—a disease occurring sporadically at one time, as an epidemic at another. No other Indian malady, whether epidemic or sporadic, was so sudden in its onset and in its progress, or excited the suspicion of poisoning. The native treatment by cautery, recommended in old days in Sanscrit writings, although it was used in other complaints, also

affords a valuable clue in tracing out cholera.* I am satisfied that evidence of this kind—many little facts, not in themselves sufficient, but when taken together irresistible — will make most impression on those who are most familiar with the disease. They are φωνεντα συνετοισι—that is, they speak to such. Such experts cannot, of course, pretend to define with certainty what form of cholera each mention made of it was, whether sporadic, endemic, or epidemic; but the existence of a bad form of cholera is always recognisable. Indeed, considering how small the total number of Europeans in India was, how few parts of the country they had visited, except as passing travellers, bearing in mind that even at the present day it is only in exceptional years that cholera is one of the principal, that is, most destructive maladies; that fever, and dysentery and diarrhœa, whether original or as sequelæ of fever, are the

* I think it may be said that, as a rule, the cautery to the ankles was chiefly employed in the East in violent spasmodic diseases and affections of a general nature, as in *mordshi*, in the last stage of fever, and in calentures. In more local affections it was applied topically, as over the spleen in diseases of that organ, for instance, in the Maldives in 1604, according to Pyard, or at this day in Bengal, or over the colon in an affection of it called *null* in Bombay, which seems to be the colic alluded to by Carreri in 1696. I believe that applications of the cautery to the abdomen or to the ankles were not often used in diarrhœa or dysentery. The moxa was also a favourite application in the East, especially characteristic of Chinese and Japanese medicine. Apparently the acupuncture of China and Japan did not reach India. The Greeks applied the cautery lightly in colic, but not in cholera.

diseases which always have destroyed the greatest number of lives in India—it is surprising that we have so many notices of cholera, and it is certain that it must have been very widely spread to have attracted so much observation. Undoubtedly far the greater number of cases that have been formerly described as *mordshi* or cholera, or cholera morbus, would in these days be considered cases of true malignant cholera.

Vasco de Gamez first reached the south-western coast of India in the year 1497. The Portuguese began to form settlements about the year 1502, and they took Goa, which continues to this day to be their seat of government, in 1510.

Their first proceedings in India soon involved them in a war with the Samorin, the ruler at Calicut, and in 1503, during a campaign against him, there is an unmistakable notice of cholera, as well as of small-pox, having proved fatal.* "The loss of the Samorin could not have been less than 20,000 men, to which, besides the wounded, greatly contributed the current spring disorders, and also smallpox; besides which there was another disease, sudden like, which struck with pain in the belly, so that a man did not last out eight hours' time."

Some years afterwards, or in 1543, an epidemic of frightful intensity at Goa, and a graphic account of it and of the distress and consternation it

* Lendes da India, vol. I., book iv., p. 489. *et seq.* This and the next extract are translated by Mr. Gaskoin in the British and Foreign for July, 1867.

occasioned, has been left us. "In the spring of this year there appeared a mortal throe, which those of the country call *moryxy*, common in all classes of people, no less to the child at the breast than to the octogenarian—to the stalled beast and the domestic fowls also, for it was common to all things living; nor could any reason be assigned for this agonising infliction. The sound as well as the sick fell victims to it, and nothing did it respect. This dolour struck on the stomach: so grievous was the throe, and of so bad a sort, that the very worst kind of poison seemed to be taking effect, as proved by vomiting, with excessive thirst for water accompanying it, as if the stomach were parched up, and by cramps that were fixed in the sinews of the joints and in the soles of the feet, with pain so extreme that the sufferer seemed at the point of death. The eyes were dimmed to the sense, and the nails of the hands and of the feet black and curved. For this disease none of our physicians found a cure. The patient barely lived the day, or at most the night through, in such sort that of one hundred attacked scarcely ten escaped, and they used native remedies. So great was the mortality, that the bells tolled all day long. There were twelve, fifteen, or twenty burials daily. At last the Governor ordered that the bells should be tolled no more, as their tolling increased the alarm. The Governor ordered the physicians to examine a dead body; but they found nothing in the body, but the stomach shrivelled up like a piece of leather."

As this is the first notice of an epidemic of cholera in India, so also is it of a post-mortem examination of a case of the disease, with the usual negative result of a superficial examination. It proves beyond question that the Portuguese applied the word *moryxy* to malignant cholera from the very commencement.

The points of most interest in the preceding account are the occurrence at that early date of so violent an epidemic, and the statement that domestic animals suffered at the same time from the disease. Similar statements have frequently been made, but it is very difficult to admit their accuracy without more complete evidence.

This pestilence came after a time, like other epidemic invasions, to be forgotten; for D'Orta, writing at Goa a few years afterwards, does not mention the epidemic of 1543.

Garçia D'Orta, who had resided at least a quarter of a century at Goa, published in that place, in 1563,* the earliest European work on Indian medi-

* While giving the Portuguese all praise for the printing of this book at Goa, I may go a little out of the way to give them credit for their great hospital, a royal foundation at that place. All travellers are loud in its praises. The building is described as being more like a palace than a hospital, and it had beautiful gardens attached to it. It had accommodation for from 1000 to 1500 patients. The cleanness of the beds and bedding, and the excellence of the diet, were the theme of admiration with all, and no doubt the change to it from on board ship must have been most grateful. Patients on admission had the hair shaved from every portion of the person, and were well washed. The gentlemen of Goa used to go into the hospital for

cine, and the first book printed in India. Notwithstanding its numberless typographical errors, the production of the work is very creditable to the Portuguese. The book is in the form of colloquies, and his account of cholera occurs in the colloquy on the drug *Costas*. As it is the first full account of the disease given by a European physician, I have attempted a condensed translation of it:—

"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 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

treatment for all serious illnesses. The establishment was under the management of the Jesuits. There were other hospitals for women and for natives. The hospital at Diu was only second to the great one at Goa. But Goa began to decay early. Tavernier (*a*) tells us, in 1648, that the management of the hospital was changed, and its credit gone. The patients complained of the want of all nourishing food. Tavernier says that the credit of the hospital was somewhat revived by the successful use of profuse blood-letting, sometimes repeated from twenty to thirty times! The patients were often made to drink a glass three times daily of the urine of the cow, a practice borrowed from the natives!

(*a*) Suite des Voyages, 1713, vol. iii., p. 163.

of strong constitution that lived for twenty days, and went on vomiting bile incessantly, and in the end died. I knew an excellent gentleman who suffered thirty hours from this complaint, and who 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 *secco*.

"Those who eat much, particularly of cucumbers or shell-fish, and those who have too much converse with women, suffer most. The disease is most common in June and July. Symptoms: the pulse is very weak; in a short time there is a feeling of great cold, along with cold perspiration; the surface cold is very great, while the patient complains that he is burning; the thirst is clamorous; the eyes are very weak; 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, and cannot remain quiet. 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." He further adds that "the poison, bad though it be, does not seem to be of a catching kind."

"The malady was not one that could be neglected either by the physician or by the hospital attendants. 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 cinnamon, but above all to apply

the actual cautery to the feet and ankles, and to tie ligatures round the limbs. They also pushed long pepper into the eyes in collapse, as they did in *lethargy*. He himself gave no water to drink, except a little in which gold had been extinguished. He used a variety of astringent vegetable medicines. He thought there was much 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 stopped gave a little chicken soup."

Thus D'Orta points distinctly at the varied forms of the disease—the ordinary one with violent vomiting and purging, the other with nearly an absence of those symptoms. He does not mention the usual crucial tests for malignant cholera: watery dejections and suppression of urine. He mentions a case of partial convalescence, yet which ended fatally, after many days of bilious vomiting. One case is described as being mainly one of asphyxia. He says the disease is one of season, prevailing chiefly in June and July, and does not allude to any former epidemics. He does not for a moment believe the affection to be a new one, although he knew it was more severe than the ordinary disease in Europe.

In D'Orta's account the influence of ancient authors, and especially of Rhazes, is very plain. He pursued his mode of treatment mainly. He follows the Greek and Arab practice of applying ligatures to the limbs, and also the Indian treatment by cautery.

The next author who mentions cholera is Christopher A'Costa, who surnames himself Africanus. He made much use of D'Orta in his treatise on "Drugs and Simples," * and thus expresses himself (I have used the Italian translation) :—"The Brahmins and the Canarese doctors use the Canarese pepper for the passio cholerica, a malady called *morxi*, which malady is so acute that it kills in twenty-four hours, or less. It is called by the Arabs *hachaiza*, and is to be regarded as a particular pestilence. Of which poisonous malady God has cured many by my hands in these Eastern parts. And I have in hand a treatise on this and on many other common Indian maladies, to be published if God will."

We also learn from his translator "Clusius" † that the Malabar doctors consider the jack-fruit to be injurious : "Qui frequentius Jacca vescuntur, facile in pestilentem illum et pessimum morbum *mordshi* appellatum incidunt."

We thus learn that cholera morbus and *mordshi* were considered the same by A'Costa as well as by D'Orta, and that it was one of the common diseases of that part of India, namely, Canara—that is, according to the usual acceptation of the term, that cholera was endemic there.

We may set down to about this period, or from 1570 to 1580, a notice of cholera in Goa by the Sieur Vincent le Blanc.‡ Apparently his account

* Burgos, 1578. † Antwerp, 1582.

‡ Le Blanc is one of the early describers of Bengal, and, like most writers, he praises its wealth and salubriousness, and

of travels in the East (part of which, I suspect, is a compilation) was not put together till 1631, when he was of the age of seventy-four. But by his own account he started from Europe in 1567, and must in two or three years have reached India. He says of Goa :—"Tout ce peuple est fort sujet à la verole, et a une autre maladie qu'ils appellent *mordesin*, qui commence par des vomissements et des maux de tête, et est pestilentielle, dont plusieurs meurent." He then goes on to talk of scurvy.*

Linschott, a Dutchman, who spent many years in Goa, and who published a book of travels, writes in 1589, according to his French translators :—"Les maladies que ces changements de temps apportent aux habitants de Goa sont divers, entre les quelles á 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 défaillance : cette maladie est commune et mortifere à plusieurs." After talking of the two next most fatal diseases, dysentery and fever, he

says its inhabitants enjoy great longevity. Like others, he declares the Ganges water to be excellent. Tavernier, sixty years afterwards, is an exception to the general rule. He tells us that, notwithstanding that the water is salubrious to the natives of the country, and that it is sent to the Great Mogul for his personal use, the Dutch in their settlements are obliged to boil it before drinking. He and his companions, somewhere near Allahabad, tasted a little mixed with wine, and only did themselves a little harm ; but their servants suffered severely from the incautious use of it.

* Les Voyages, &c., Troyes, 1658.

adds of them all:—"Ces maladies font mourir annuellement grand nombre de Portugais"; just as one might write at the present date of the three diseases.

We thus have six distinct, entirely unmistakable accounts of the common prevalence of cholera at Goa, and in the regions near it, in the sixteenth century—one of them a graphic account of a bad epidemic, of a type as fatal as has ever been known. Taking, therefore, the most limited view of the case, the disease must have been common on the coast of Malabar and of Canara. As the word *mordshee* is a Mahratta one, and as the Mahrattas had come from the interior to Goa, it seems probable that they had brought with them to that place a knowledge of the disease to which they attached that name. The Arabs, too, described the malady by the old name in their language for it; and I can find no hint in any direction of the affection being regarded as a new one.

In the sixteenth century we have thus found cholera to have been present in Western India only, but, be it remarked, in the only places where Europeans had any opportunity of observing the diseases of the country. If we have no notice of cholera before the arrival of Europeans, and then only of its prevalence in the parts visited by them, it is surely probable, not only that the disease was to be found in India before their arrival, but also that it was not limited merely to the districts with which they communicated.

With the next century we find abundant traces of the disease, not only in India, but in the adjoining countries and islands; and this gives me occasion to say, that when one looks into the question, there appears to have been a wonderful amount of intercourse throughout the East in those days. Every ship, whether Portuguese, Dutch, French, or English, 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, Goa, or Calicut. From the western coast of India the voyage was usually extended, especially by the Portuguese and Dutch, to the Moluccas; some ships, too, found their way up the bay to the kingdom of Bengala. Then the Portuguese on the west coast of India were in close communication with Ormuz. Ships sailed from Surat, conveying merchandise, brought from upper India and from Bengal, to be shipped for the Persian Gulf, and to 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 and besiege Diu. European vessels often went up the Red Sea. I need hardly add that from the earliest periods, long before the Portuguese reached India, Mahommedan pilgrims sailed annually from Surat and other ports, bound for Arabia. November was the month in which the ships usually started. There was, therefore, an immense deal of communication among the different parts of Asia with India, mainly by ships and also by caravans.

General Beaulieu* who commanded an expedition of a few ships sent out by the French, on arriving at Sumatra, in 1620, heard that there had been a very fatal epidemic among the natives, which had also destroyed a good many Europeans, especially Frenchmen, and that it was of so sudden a nature, that the Dutch and English were accused of poisoning their rivals, and Beaulieu was cautioned on the subject. Nevertheless, Beaulieu himself had an attack of the most violent vomiting and purging, for which he was treated with Bezoar, a remedy known to be used in cholera. He afterwards lost forty of his men of "dysenterie et des grandes vomissements, auquel on n'a pu trouver remède." He talks of "les dysenteries" and of "comme je crois les vomissements" separately. He attributed the disease to the sailors drinking a great deal of water, and then sleeping in the open air with their bellies exposed. He said that living moderately, if it would not ward off an attack, at least increased the chance of recovery. Here, as elsewhere, we find cholera and dysentery associated.

A very clear light is thrown on these imperfect notices by Bontius, who in 1629 gives 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

* Recueil de Thevenot, vol. ii.

Malay word: it must therefore have been imported from India, and it must have been applied by the Portuguese to a form of cholera which they either brought with them or found already existing in the island.* Bontius has been oftener quoted than any other authority for the early existence of cholera in the East; still, he is so important, that his account of the disease must be reproduced here. Before giving it, I shall merely remark that he talks of the disease as a common endemic one, says it is as much dreaded as is the plague in Holland, and that he mentions it over and over again, under the heads of several native remedies for it. We learn that Bontius had the misfortune of losing his wife in Batavia, in 1631, from an attack of cholera, and he had this loss probably before his mind when he says how much cholera is dreaded, and how it is only too familiar in those regions. "Proh dolor!" Bontius was well acquainted with the works of D'Orta, and therefore with that writer's account of the disease, as they both were with the writings of Greek and Arab authors, some of whose phrases and treatment they repeat.

"Cap. VI.—*De Cholera.* Præter jam dicta alvi profluvia, etiam cholerica hic familiariter ægros infestat, cujus causam signa ac symptomata, curam denique hoc capite absolvere animus est. Fit itaque cholera, cum materia biliosa ac prætorrida ventriculum ac intestina infestans per gulam simul ac per anum

* Besides this there was much intercourse between Java and India before the European period.

continuo ferme ac cum magna copia rejicitur. Morbus est acutissimus, ideoque præsenti eget remedio. Causa præcipua hujus mali, præter aëris calidam et humidam temperaturam, est nimia fructus hic edendi licentia, qui quod plerumque sint horarii ac putredini obnoxii, tum humiditate sua superflua ventriculo infesti sunt ac insueti etiam, ac bilem æruginosam hanc gignunt: hæc excretio et non sine causa alicui videretur salubris, quod talia purgentur qualia oportet: tamen quia cum tanta quantitate simul effunduntur spiritus vitales ac naturales, debilitato quoque per fœdos halitus corde, caloris omnis ac vitæ fonte, ut plurimum commoriuntur ægri, idque celerrime, utpote qui intra viginti quatuor horas, vel etiam pauciores, expirent, ut accidit inter plurimos Cornelio van Royen ægrorum in nosocomio œconomo, qui hora sexta vespertina adhuc valens subito cholera corripitur, et ante duodecimam noctis horam vomendo simul ac per alvum dejiciendo, cum diris cruciatibus ac convulsionibus miserrime expiravit, vincente morbi violentia ac celeritate omne remediorum genus: si tamen ultra prædictum spatium, pernicies ista protrahitur, magna curæ spes est: pulsus hic admodum debilis est, respiratio molesta, membra externe frigent. Calor vehemens ac sitis interne urgent, vigiliæ adsunt perpetuæ. Jactatio corporis inquietissima, quæ si comitatur frigidus ac fœtidus sudor, mortem in propinquo esse certissimum est.

"Danda in hoc affectu primum opera, ut acerrimus iste humor, qui tanto furore ac orgasmo fertur,

mitigetur. Quod fieri potest maxime per adstringentia medicamenta, ac ventriculum et intestina corroborantia, et simul modico frigore furorem materiæ morbificæ refrænantia. In his præstantissimus est sirupus ex Billingbing, tum fructus ejus saccharo conditi, adjecto croco: sirupus præterea e succo limonum recentium. In Java nascitur præterea ad hunc affectum pseudo-Myrobalanus qui forma Bellericos refert. Et magna copia a nigris in urbem venalis adfertur. Et sola astrictoria vi præstat, cum ceteræ Myrobalanorum species etiam laxativi aliquid habeant: hinc conditus hic fructus utilissimus, ad choleram non solum, sed ad cæteros omnes alvi fluores nimios: cum cornu cervi usto, lapide Bezoar, rasura cornu rhinocerosis, vel margaritis præparatis.

"Sed his non adferentibus juvamen, confestim ad extractum croci deveniendum est, tum ut vigiliæ arceantur, ac somnus concilietur: qui propter summam virium dejectionem hic necessarius est: tum ut, tantisper mitigato atroci isto humore, natura fortior denuo ad vincendum hostem insurgat: cholerici (ut fere semper) convulsi moriuntur."

Bontius thus says that the disease is a common one; that it is caused by hot and humid air, and by eating too much fruit; that although vomiting and purging are efforts of nature to get rid of what is noxious, yet they produce such a degree of alarming weakness and such sudden death, that they must be checked. He does not mention the nature of the evacuations, nor suppression of urine, but he paints

the disease unmistakably. He says, what there is much truth in, that if life can be protracted beyond twenty-four hours, there is considerable chance of living, and he saw how much recovery depended on the powers of reaction of the constitution.

As to his treatment much need not be noticed; he proceeded at once to vegetable astringents. Myrobalanus, I believe, continues to be used in Java for dysenteries, for which one would be more inclined to use it than for cholera. The mention of the use of lime-juice is interesting.* Like D'Orta, Bontius has faith in Bezoar.

But his great remedy was extract of crocus, and, like the Arab writers, he had a strong sense of the necessity of inducing sleep, if possible. Saffron was in those days used as a hypnotic, but in his preparation of it there was a very large proportion of opium.

We come next to a very important notice of cholera, which very probably was published before Bontius' account of the disease in Java, if not written earlier. Zacutus Lusitanus was a celebrated Jewish physician, banished along with the rest of his countrymen from Lisbon by Philip IV. He retired to Amsterdam, where he published what was perhaps the great systematic work on medicine of the day. He had opportunities of communicating with the Dutch, as well as with the Portuguese, the two nations in those days most closely connected with the East. Letters

* This remedy for diarrhœa, now popular in many parts of Europe, was about that time a favourite remedy of the negroes on the west coast of Africa for colic.

addressed to him from the tropics, and especially from Dr. Pereira, of Goa, show that he was in close communication with physicians abroad. The story about the cake from which the Arabs suffered is quite new, and was not borrowed from preceding authors. The statement therefore which he makes in 1632 is entitled to much consideration; it is very distinct and positive:—"Ne ergo contemnas hunc affectum, qui etsi in Lusitania nostra et Amstelodami 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 . . quod *Cuscus* vocatur."*

The notice by Zacutus of the prevalence of the disease in Arabia is very important. We know, indeed, that the Portuguese troops in various expeditions from Ormuz suffered from sudden sickness, which compelled them to retire; but the nature of such attacks does not seem to have been specified. A Russian physician, Dr. Rehman, learnt in 1832, that there was a tradition that cholera had been introduced into Arabia some centuries before, that it travelled over Persia, Syria, and Egypt, and finally disappeared in the African desert.† We also know that all Arab writers described cholera (of one kind at

* Prax. Histor. lib. ultim., observat. iii.

† Diseases are often mentioned as occurring in ships in the Mozambique Channel, but they were chiefly fevers, dysenteries, calentures, and scurvy. Rowles tells us of seven seamen dying almost instantaneously in Madagascar in 1607; but this was set down to poisoning by the natives.

least) as an ordinary disease; and a little later we shall find Then Rhyne stating that choleraic colic prevailed universally through the East. But though none of these statements are in themselves sufficient to prove the existence of malignant cholera in Arabia, they tend greatly to confirm what Zacutus has said. He was perfectly aware that the tropical disease was more violent than the ordinary European one; he knew that *mordeshi* was the name given to the disease in the East; and when he expressly names the cake they eat, to which he attributes the attacks of cholera to which the Arabs are subject, he must have been using the information given him by some local informant.

With reference to the prevalence of the disease in Mauritania, its mention as a violent illness by Averrhoës, who practised in Spain about the year 1200, shows that at one time, at all events, it was not unknown; and Zacutus, being a native of Lisbon, was likely enough to have good information respecting a country but little removed from Portugal, and with which there was probably as much communication in those as in modern days.

We now return to India proper, and find an intelligent German traveller, Mandelsloe, who travelled all over the world, giving the following account of the maladies of Goa in 1639 :—

"Ce dérèglement des saisons et ce changement subite d'une extrémité à l'autre sont causes de plusieurs grandes maladies parmi les Portugais. Mais celles qui y règnent le plus sont celles qu'ils appellent

Mordexin qui tuent subitement, les fièvres chaudes et la dysenterie, contre lesquelles ils ont presque point d'autre remède que la saignée."

He then goes on to say that true plague is entirely unknown in India. Although Mandelsloe may appear to a certain extent to be repeating what Linschott had already said about the diseases of Goa, he knew that place and Surat well, and could scarcely make a mistake. He is quite precise, and there is no possibility of confounding the *mordexin* with dysentery or with any other disease. He also talks of the *mordexin* in the plural, as if there were varieties of it, and as if it were a commonly prevalent disease. It is the first, he tells us, of the fatal maladies which reign there.

Although there is abundant evidence of the prevalence of cholera in India about this time, a slight notice by Baldæus, a Dutch clergyman, who gave very full accounts of Ceylon and of the Malabar coast, need not be overlooked. He enters very little into the diseases of the country, but the following casual observation was made by him in his account of the coasts of India in 1641:—"Care must be taken to cover well your belly, hips, and legs, for fear of the *cramp*, especially if you lie exposed to the air in moonshiny nights, the neglect of which precaution often proves fatal to soldiers and sailors, after they have treated themselves with arrack or with other strong liquors."*

* Collect. of Voyages, vol. iii., p. 661.

Now, what cramps could these have been? The tetanic attacks described about that period seldom proved fatal, still less the facial paralysis which to this day is commonly ascribed to sleeping in moonlight. We know of no cramps that were often fatal, save those of cholera.

We now begin to hear again of cholera in its epidemic form. Some very extensive epidemics are alluded to by native writers, who are quoted by Colonel Tod.* The name applied by them to the disease is *murree*, the generic term, as we have already seen, for any deadly pestilence, and, Colonel Tod tells us, the name commonly applied in Rajpootana to the choleraic pestilence. Unfortunately, very incomplete accounts are given of those, as of all other epidemics, which were seldom described in detail by native historians. But when we know how common cholera was in India at this time, and that it had prevailed epidemically in a former century, the presumption is very much stronger that epidemics of the disease did occur, than that they did not. I have also observed some confirmation in entirely opposite quarters of at least two of the epidemics mentioned by Colonel Tod, as will appear in the sequel.

According to him, native historians give accounts of epidemics of cholera in Mewar in 1661, in Marwar in 1681, and in camp before Goa in 1684, when as many as 500 men a day are said to have perished.

* Annals of Rajpootana, vol. ii.

Colonel Tod, who was an officer of great intelligence, remarks very sensibly (and it is often useful to hear the opinion of independent non-medical observers, who have no theory to support) :—"Thus, in the space of twenty years, we have cholera described in the Peninsula, in the deserts of India, and in the plains of Central India. I have no doubt that other traces of the disorder may appear in the chronicles of the bards, or in Mahommedan writers, judging from those incidental notices which might never have attracted attention, had not *murree* come to our own doors."

Unfortunately, those further traces have not yet been discovered, but I am glad to be able to support Colonel Tod's opinion respecting the former prevalence of cholera in the part of India of which he treats, by that of another eminent man, Sir John Malcolm, who seems to have believed that cholera has always been endemic in some portions of Malwah.* His words are:—"It has been ascertained that cholera morbus, which has so lately spread over India as an epidemic, always exists as a disease in this province."

De Thevenot, a French traveller, in his account of his wanderings in the East, mentions that in 1666 he had a slight attack of cholera in travelling from Boorhampore to Surat, and gives the following account of the disease:—

"Les Portugais appellent *Mordechin* les quatre

* Report on Malwah 1821, p. 5, note.

sortes de coliques qu'on souffre dans le Indes, où elles sont fréquentes. La première est une simple colique, mais qui cause de grandes douleurs : la seconde est celle qui outre la douleur cause le cours de ventre. Ceux qui sont affligés de la troisième ont de grands vomissements avec les douleurs ; et ceux qui ont la quatrième souffrent les trois maux ensemble : à savoir, le vomissement, le flux de ventre et les extrêmes douleurs ; et je crois que cette dernière est le Cholera Morbus. Ces maladies viennent le plus souvent d'indigestion, et se font sentir quelquefois avec des douleurs si pressantes, qu'elles tuent un homme en vingt-quatre heures. Le remède que l'on a aux Indes pour s'en délivrer est de faire rougir une brochette de fer grosse comme la moitié des doigts, l'appliquer sur la plante du talon du malade, et l'y tenir jusqu'à ce qu'il ne la puisse plus souffrir. Il faut faire la même chose à l'autre talon ; et ce remède est pour l'ordinaire si efficace que les douleurs cessent en même temps. Si l'on saigne le malade avant cette ustion, il serait en péril évident de la vie. . . . . Mais la saignée n'est pas dangereuse deux jours après l'opération. Il y en a qui se servent de ligatures pour ce mal, à la tête, au dos, aux reins, aux cuisses et aux jambes ; et quand le malade ne sent pas la force de cette ligature, on juge qu'il ne peut guérir.

" Le cours de ventre seul est aussi fort ordinaire, et très dangereux."*

* Thevenot, Relation des Voyages, vol. ii., chap. 10. Paris, 1673.

This account is of much interest, especially as showing that different degrees of *mordshi* were observed. They continued to be recognised by the Portuguese, as they had been pointed out in early Hindoo medicine. Thevenot records the use both of the cautery and of ligatures, and is remarkable as recommending blood-letting, in convalescence, as Rivierus did.

Cleyer* noticed ordinary cholera in China in 1669.

Our next notice, a brief one, contains, I believe, the first specific statement about cholera by an Englishman. Dr. Fryer† made more than one voyage to the East, and in his account of Surat and of the Western Coast, about 1674, he speaks of cholera morbus as occurring in extreme heat; also of there being a vomiting and purging, called by the Portuguese *mordesheen*, and treated most unmercifully by them with the actual cautery. He does not seem to regard cholera morbus and *mordesheen* as identical.

A certain Dutch Professor, Then Rhyne,‡ writing in 1679, affords very important information respecting cholera in the East. It is all the more valuable, as he had resided some years in Java, and had also made a voyage to Japan. He, therefore, must have been familiar with the condition of Oriental countries.

Although Then Rhyne only makes one precise statement about cholera—that it was common on

* Supra p. 28.

† A new account of East India, &c., 1698.

‡ Then Rhyne de Arthritide, &c., 1683.

the coasts of India, and treated with the cautery—I have thought it best to give the whole passage at full length, both because others may wish to be able to judge of it for themselves, and because colic is intimately connected with cholera, at least historically. It seems quite possible that he may have confounded colic with cholera.

"In vehementissimo dolore colico (qualis per Asiam passim horrendum in modum sævit, ægrosque nefandis cruciatibus sæpe necat, vel saltem paralysin in manibus pedibusque post se multotiens relinquit) hoc remedii genus adhibent Lusitani :—

"Candente ferro pedibus insistunt nudis, donec sibilum edat adusta pars persentiatque dolorem, unde ilico levamen solet sequi, sin minus incurabilis habetur. Inde arguit flatus esse hujus efficientem causam mali. Qui contra sensuum fidem de flatuum præsentia dubitat, hoc Bengalensium facile convincetur experimento, qui in hoc atrocissimo morbo abdomen ita fricare ac premere norunt, ut flatus per ipsum umbilicum sensibiliter exeat cum sibilo : quod si non succedat, umbilico magnam ollam (*Cojang* vocant) aqua repletam imponunt,* quæ tum flatuum impulsu ac impetu movetur et evidenter subsilit. In eodem porro affectu milites nostri Cælonenses cremati

* Fryer mentions that in bloody flux an earthen pot filled with earth was made fast over the navel by a string. Then Rhyne was so carried away by his belief in flatus being the cause of spasm, that he believed that the Bengalees actually squeezed flatus through the umbilicus, and that the sound of the skin when the cautery was applied violently, was caused by the escape of flatus !

ligni cineres de foco tollere, et aqua mixtos bibere solent, unde subitum solamen persentiunt.

"Multi præterea Indicæ oræ incolæ pedum inustionem in Cholera Morbo optato cum eventu instituunt."

Then Rhyne, therefore, thus describes a very fatal colic as prevailing everywhere through Asia, and specially among the Dutch soldiers in Ceylon, and in the natives of Bengal, which often left paralysis behind it. It would seem to me that various forms of endemic colic, and possibly of cholera, have been mixed up in one general description, and it is scarcely probable that any true colic would have been either so widely diffused or so fatal.

Without, however, pretending to determine what this colic was, I think Then Rhyne might have added that cholera prevailed in Java as well as on the shores of India, for elsewhere in his account of acupuncture he mentions that it is sometimes employed in Japan in cholera.

This period is undoubtedly referred to in a statement made some years afterwards by the celebrated chemist Homberg, a native of Java.*

"M. Homberg† nè dans l'isle de Java, souvient que quand les Javanais ont une certain colique, ou un cours du ventre doloureux, qui est ordinairement mortel, ils s'en guérissent en se brûlant les plantes

* Histoire d'Académie, &c., 1708, p. 47.

† Homberg's father was Dutch. He himself makes the extraordinary statement that his sister was married at the age of eight, and was a mother at nine!

des pieds avec un fer chaud." A real colic is not a "cours du ventre," nor is any alvine flux but cholera usually mortal. This confirms a French statement, given without assigning any authority for it, that cholera continued to prevail in Java in 1689.

All this history of choleraic affections is strongly confirmatory of the statement by Zacutus respecting the extended prevalence of cholera in the East.

Returning to India and the country about Goa, we are next met by a certain Dr. Dellon, who seems to have left France in 1667, and to have returned home in 1677. He is apparently author of a real or fictitious history of a prisoner in the hands of the Inquisition at Goa,* and he makes the prisoner attribute his escape from the cruel Indian malady called *mordshin* to his having been well fed. In an appendix to his book of travels,† there is, with his initials attached, an account of the diseases of India, and the subjoined one of cholera. It is a poor one to be given by a medical man, still it cannot be mistaken, as he elsewhere speaks of its great mortality, and says that, after trying all European remedies, he had finally to fall back on the treatment by cautery. It will be observed how writers repeat each others words :—

"La maladie que les Orientaux appellent *mordechi* n'est proprement qu'une indigestion ; elle est fréquente dans les Indes, où les chaleurs et les sueurs

* Relation de l'Inquisition.

† Relation d'un Voyage, Paris, 1685.

continuelles rendent les estomacs débiles ; elle n'est pas pour cela moins dangereuse, et l'on voit très souvent mourir des personnes en peu d'heures, si elles ne sont pas promptement secourues. Les excès du boire et du manger, et les aliments de difficile digestion pris particulièrement le soir, sont les causes ordinaires de ce mal. Ses signes sont : grande altération, douleur de tête, inquiétudes, fièvres, délire, flux de ventre et vomissents ; le pouls est fort et inégal, les urines rouges ou blanches mais toujours claires : tous ces signes ne se rencontrent pas toujours dans un même sujet ; mais comme le mal est dangereux, il ne faut pas rien négliger aussitôt qu'on a lieu de le soupçonner."

Here, if we were merely to go by the mention of some symptoms and the non-mention of others, we might easily doubt whether this was cholera. Pain in the head, delirum, pulse strong and unequal, urine red or white—these are not symptoms of cholera. Neither rice-coloured evacuations nor suppression of urine are mentioned. Yet no one, even without the help of the name *mordeshi*, could fail to suspect the real nature of the malady. Dellon further confirms this impression by the treatment, of which he gives an account :—

" Le premier et le principal remède que l'on fait à ceux que l'on croit ou que l'on craint être attaquez du *Mordechi*, est de leur brûler les pieds, en appliquant un fer rouge et delié comme une broche, en travers sous le talon à l'endroit le plus calleux, l'y laissant seulement jusques à ce que le malade ait témoigné par

ses cris qu'il l'a senti, on l'ôte d'abord, frappant quelques coups sur le lieu brûlé, avec une pantoufle pour empêcher qu'il ne s'élève des vessies, sans y rien mettre davantage.

"L'application de ce fer ne fait pas un grand mal, et pourveu qu'on ne soit pas empesché par d'autres raisons, l'on peut marcher après, aussi librement qu'auparavant; neantmoins elle arreste la violence du *Mordechi*, en dissipe souvent tous les accidens sur le champ, et s'il arrive que la fièvre continue encore, elle peut estre traiter sans danger avec les remèdes ordinaires.

" C'est encore dans ces sortes de fièvres que les Indiens mettent beaucoup de poivre dans la Cangez (ou Congé) des malades aussi bien que sur leurs testes, et ceci est ordinairement que par ce régime et par la brûleur qu'ils la guérissent sans y employer la saignée, qui seroit infailliblement mortelle dans les commencemens, et la purgation n'est mise en usage, s'il arrive qu'elle soit nécessaire, qu'apprès que la violence du mal est dissipée et qu'il n'y a plus du tout de fièvre."

If Dellon is not very distinct or very accurate in his descriptions, we are at all events obliged to him for this account of the association of the disease with fever. He follows Rivierus in considering blood-letting in the commencement of the disease bad practice, though it may be required at a later stage.

About this period Kaempfer* tells us that cholera

* Amœnitat. Exotic., fascic. iii., observat. 11.

was frequent and fatal in Japan :—" Cholerâ admodum in hac regione frequenti et funestâ "—expressions which would not apply to occasional cases of sporadic cholera. He further tells us that a family had grown rich on the sale of a Nostrum for cholera. It was as bitter as gall, but when brought to Europe did not seem to have the same effect on German as on Japanese stomachs.

We have already seen that Colonel Tod believed from native sources, that cholera was epidemic in Marwar in 1681-2, and before Goa in 1684.

That there was much epidemic disease diffused in India about this time is very certain, and I think I am scarcely wandering from the subject of these annals, in entering into a short investigation of the subject.

In 1687, after a prosperous voyage in the S.W. monsoon, from Pondichery, Commander Forbin* put into the port of Masulipatam. They had been astonished at passing through thick clouds of insects†

* Histoire Générale des Voyages, vol. xii., p. 150-51.

† This is one of the many instances in which there has appeared to be a connection between epidemics and unusual swarms of insects. The idea that lower organisms were the causes of epidemics is very old. It is nearly 2000 years since Varro wrote, " If there are any marshy places, and they dry up, certain minute animalcules are hatched, so small as to escape the sight, which enter the body with the air through the mouth and nostrils, and cause serious distempers." Varro has had many followers down to the present day. In these days of microscopic research, however, the discovery of various kinds of microphytes in different diseases has led to the theory of lower forms of animal life, being very generally supplanted by

just before arriving there, and when approaching the land, the air was so obscured by them, that they had to make their way by sounding. When by the aid of a pilot a boat of theirs reached the shore, they were surprised on landing, to find most of the factories shut, and the town nearly deserted. The cause of this was a pestilence, or rather the plague, *la peste*. Unfortunately, Forbin says nothing of its nature. One may guess, from his account of a disease on board his ship after leaving Masulipatam, that he supposed it to be a pestilential fever. But fevers seldom cause either so much alarm or so much mortality. True plague, all travellers say, was unknown in India. It would have been very satisfactory to have been able to identify this epidemic as one of cholera, as hitherto we have no notice of it so far north along the Madras coast. But the proof of its being cholera, is insufficient.

Another epidemic of uncertain nature has been sometimes assumed to have been cholera, that before Beejapore, in the year 1689, described by Kafee Khan.* His history of it does certainly not accord with the usual accounts of that disease. He uses the very general appellations of *taoun* and *ouba*, and

that of lower forms of vegetable life, being the active agents in the production of disease. Apparently, the latter theory has not been found very happy in its application to cholera either in Europe or in India. However, these minute fungi or sporules are very convenient supports for the zymotic or ferment theory of disease, which, too, is one of great antiquity.

* Grant Duff's History of the Mahrattas, vol. i.

friends who have examined Kafee Khan for me, have not been able to show that the disease was really cholera. However, now that we have such abundant evidence of the general diffusion of cholera at that period, the question whether there was cholera at Beejapore is of less importance than it once was.

Ovington also tells us of a pestilence which had raged at Surat, off and on, from 1684 to 1690* :— "It had some time of interval in the season that cooled the air. The greatest paroxysms were always before the rains and after them. As many as 300 have died in a day. The Europeans escaped, but their servants sometimes were dead within a few hours of leaving their presence. In 1691 a sweeping pestilence prevailed at Balsora."

On this it may be remarked, that we know of no disease in India, except cholera, that produces such sudden deaths; that its being more or less under the influence of seasons is characteristic of that disease; and that the period assigned exactly agrees with Tod's account of cholera at Goa in 1684.

As for the apparent immunity of Europeans where natives suffer, that and the reverse are facts of no rare occurrence in epidemics of cholera. Nor, after what we have seen, and shall see, is Ovington's not being able to identify the pestilence and *mordechin* of much importance.

However, the only reliable guide we have to the nature of the disease which showed itself at Goa

* A Voyage to Surat, by I. Ovington, M.A. London, 1696.

and Surat, and at Masulipatam and Beejapore, is what Grant Duff reports of the illness at Beejapore, on the authority of Kafee Khan:—"A fever had prevailed for some years both in the Deccan and in Guzerat. It consisted of a slight swelling under the ears, or in the armpit or groin, attended with inflamed eyes and severe fever. It generally proved fatal in a few hours, and those who did recover became wholly, or in part, blind or deaf."

The rapidity with which death ensued would be characteristic of cholera, and sloughing of the cornea is not infrequent in that disease; but both symptoms occur also in Pali plague, or *maha murree*.

Its extending from coast to coast looks, therefore, as if this plague might have been cholera.

Maha murree has, in modern times, been limited to districts in the west and north-west of India; it has never been known in Southern India or in Bengal. The greatest difference in their extent has always prevailed between epidemics of fever and of cholera. The bad fevers of Bengal in 1757 and 1762, and the one prevailing now for some years in Bengal, have never quitted the limits of that province. The bad fever of 1809-10-11, in Southern India, remained limited to that district. Epidemics of dysentery do not run from one end of India to another. Cholera is the only epidemic that has shown itself in every corner of India before 1817.

On the whole, nevertheless, after balancing all considerations, I am inclined to believe that the

malady which prevailed so extensively at this time over India was a fever approaching in character to the Levantine plague, probably resembling the Pali plague of 1837, and the *maha murree* of more recent times.

The second Englishman who mentions cholera in India is Ovington, Chaplain to the King. In his account of Surat, in 1690, he tells us that the three chief diseases are fever, *mordechin*, and barbiers:—"The *mordechin* is another disease of which some die, which is violent vomiting and looseness, caused most frequently by excess in eating, especially a mixing of flesh and fish, and which is cured by a hot iron clapt to the heel of him that is sick," and which often made him lame for some time after he was cured.

With one other notice, we conclude the history of cholera during this century. Dr. Gemelli Carreri, in his voyage round the world, mentions *mordazin* as prevailing at Damaun, near Bombay, in 1695, and its treatment by cautery.

His account of it is worth quoting on several accounts:—"The disease they call *mordazin* is a complication of fever, vomiting, weakness of the limbs, and headache. It always proceeds from too much eating, and is cured by burning into the heels with a red hot spit, till the patient cries out. That which they call *bombaraki* and *naricut* swells and causes a violent pain in the belly, and to cure it fire also is applied to the swelling, so that those who have the good fortune to recover, carry

the signs of the fire after on their belly. For this reason the physicians that go out of Portugal into these parts, must at first keep company with the Indian surgeons, to be fit for practice. Otherwise they go about to cure these maladies, so different from ours, after the European fashion, and may chance to kill more than they cure. For fear of these diseases, on flesh days they only eat flesh at dinner, and generally fish at night."*

Here, again, we have cholera and a form of colic associated. We have already had ample evidence that the Portuguese adopted the native treatment by cautery for cholera — a sufficient proof of the gravity of the disease, and of their sense of their inability to cure it. Some may wonder how such a remedy ever enjoyed so great a repute. But we must remember that Bezoar, dissolved pearls, and a host of similar remedies, were in those days in vogue in the treatment of the disease. Besides, the cautery is not talked of as infallible. It did not cure, if the patient did not feel it—that is, if the case was very far advanced.

In pursuing the history of *mordeshin*, we now hear of it in a quarter in which we have as yet had no notice of its presence, unless Then Rhyne's account of flatulent colic be accepted as such, in its great modern seat, Lower Bengal.

We have already had occasion to believe that cholera is mentioned in ancient Sanscrit writings.

* Collection of Voyages, vol. iv., book i., chap. 2, p. 199.

From a very early period the Deity was propitiated in various forms to avert certain maladies. One of the best known forms was that of Sheetola, or of the goddess of small-pox. Some years ago it was stated that there existed an inscription in front of a temple at Vizianuggur, which described the symptoms of cholera. I have never been able to ascertain on what authority this statement was made; but it is not very important, as Sir W. Jones is said to have pronounced, that the inscription did not date from a period anterior to the Mahrattas. We know that at the date of the outbreak of 1817 the cholera goddess was worshipped in various parts of India, as *Maree*, or "the destructive;" and in Lower Bengal as *Oola Beebee*, or goddess of cholera; but it is also certain, that she was worshipped in various parts of India long before the year 1817.

Mr. C. Macnamara has recently made out the history of the temple of the goddess at Calcutta, which is shortly this:—At an early period, the date of which cannot be ascertained, an old woman went into the jungle, and discovered, by what process is unknown, a stone which was believed to be the idol of the cholera goddess. She assured her friends that whoever worshipped the stone with due reverence would, with his whole family, enjoy an immunity from cholera. The fame of the goddess gradually spread, and people flocked from a distance and worshipped her with great devotion.

As is usual in such cases, the idol became the property of a priestly family, and a source of income.

Originally the idol was kept merely under a bamboo shed; but early in the eighteenth century, probably about the year 1720, an English merchant, to please his Hindoo friends, built a temple to the goddess, which still exists in a ruinous state.*

Of the rites performed at the shrine we know that, besides presenting offerings, the votaries of the goddess fasted in the morning, and at two o'clock in the afternoon dined upon crushed rice and *dhahee*, a preparation of milk, taking nothing after that until next day. Every Tuesday and Saturday some three or four hundred females used to worship after this fashion, and return to their respective homes in the evening. The pilgrimage was especially common from April to June, or during the cholera season.

In process of time the temple became inconvenient, from its situation, and Mr. Duncan, the merchant who built the first temple, supplied 6000 rupees for the erection of the building which is now in use. It was built probably about the year 1750.

The old rude stone was transferred to the new abode, and a somewhat elaborate idol constructed. It represents in the centre a carcass, with a vulture preying on it, and on the back of the latter the goddess is represented with four hands, and in a sitting posture. On her right is Munsha, the

* I have seen a photograph of the ruin. It has a tower or minaret copied from the tower of Pandoah, some thirty miles distant. Its pillared verandah is in the usual debased style of Italian architecture introduced into India by the first Europeans.

goddess of serpents; next to her is Shiva, the destroying principle; next comes a female in a suppliant posture, and a male afflicted with the disease. The female is supposed to be praying to Shiva for the recovery of her husband. On the left of the goddess are the idols of Sheetola, the goddess of small-pox, and of Shusthee, the goddess presiding over infants and children.

This piece of sculpture for some time attracted many votaries, and the revenue of the temple amounted to about 4000 rupees a-year; even the rice collected from the offerings amounted annually to 200 or 250 maunds (nearly nine tons).

The temple continues to be the property of the family that originally possessed it, but it is by no means so lucrative now, producing hardly an income of 300 or 400 rupees a-year.

From this curious history we are entitled to infer that, although cholera was not so prevalent in India in the commencement of the eighteenth as it was in the seventeenth century, yet it was a common disease at that period in Bengal. It seems also certain that the disease must have raged at times with violence, or it would not have been found necessary to propitiate the Deity specially for it.

Accounts of cholera in Southern India about this time are supplied by the Jesuit missionaries.* Père Martin met with the disease between Madura and

* Travels of several learned Missionaries of the S. Jesus. From the French, 1713.

Trichinopoly. In a letter dated 1702 he mentions an attack of violent gastric disturbance with convulsions, and records its cure by the application of the actual cautery to the soles of the feet, followed by violent slippering—an invaluable remedy, he says, much used along the coasts, but little known inland, or at Aour, where this case occurred. Martin is the first author, I believe, who uses the name of *mort de chien*. He describes that extraordinary indigestion which they call in India *mordeshi*, and to which some of the French have given the name of *mort de chien*, as it causes a cruel and violent death; it was an "espèce de colique de miserere," and a distemper far commoner in India than in Europe, and it was rare for a patient not to succumb to it. This was his theory of the disease:—"La continuelle dissipation des esprits affoiblit si fort la chaleur naturelle, que l'estomac est souvent hors d'état de faire la coction des alimens." Another French missionary mentions at this time a marvellous case, but not more marvellous than many a cure of cholera reported at the present day:—"Les jours passés un païen était attaqué d'une maladie qu'on appelle *mordechin*. Son frére qui est Chrétien, lui donna un peu d'eau bénite et se mit a réciter avec foi quelques prières: le malade guérit subitement."

The Sieur Luillier* made a voyage to India, and arrived in Malabar in June, 1702. He visited

* Nouveau Voyage aux Grandes Indes, &c. Rotterdam, 1726.

Bengal in 1703, and on his return published an account of his voyage, to which he appended the account of the diseases special to India, which had been already published by Dellon. Luillier visited Hooghly in 1703, and gives the following account of *mordeshin* :—

" Comme la chaleur excessive empêche la circulation du sang, les Européens et les Mistis se font frotter, tirer et masser les bras, les jambes et toutes les parties du corps, afin d'aider à la circulation, et c'est ce qu'ils appellent se faire masser, autrement ils tomberoient dans des assoupissemens létargiques, dont ou meurt souvent, si l'on n'est pas promptement secouru ; ce mal s'appelle *mort-de-chien*, l'expérience a fait trouver un remède qui est unique et tres-assuré : c'est appliquer un fer chaud sous la plante des pieds, et ensuite les battre avec un bâton ou autres choses plates " (p. 83).

There is no novelty in this account, but the reason assigned for the practice of mulling and shampooing the limbs which Luillier found in use, is a curious one. It is the first time I have heard of it as a prophylactic against cholera ; but its being regarded by anyone as such, shows how common the disease must have been. For the present, Luillier's notice is the earliest one we have by any European of *mordeshin* being a disease known in Bengal.

In the end of the year 1709 another of the Jesuit brotherhood, Frère Papin,* who had sailed up to

* Lettres Curieuses, &c., Paris, 1781, vol. xi., p. 258.

Bengal, writes from Chandernagore an account of the diseases of the country. Among them he enumerates *mordshi*, or cholera morbus, but gives no hint whatever as to its degree of prevalence, beyond placing it as first of the principal distempers. The native treatment, he tells us, is to withhold fluids from the patient and to cauterise his feet.

A Dutchman, Valentyn, compiled an elaborate description of Eastern settlements, which appeared in several folio volumes about the year 1726. He makes little or no mention of cholera, but incidentally observes that it is a common disease in Goa.

The existence of a bad form of cholera in the East was at this time generally recognised in Europe. The well-known Dr. Arbuthnott, in his book on Air, published in 1733, although he gives no authority for the statement, tells us that the cholera morbus, and beriberi, and fevers are the prevailing diseases at Fort St. George, or Madras, from April to the end of July. In the year 1736, Paxman published a short sketch of the diseases of India.* He observes that the *mordeshin* and *mordshie* occur frequently in India, and says that *mordshi* denotes a disturbance of the stomach; *mordeshin* nausea and vomiting, a distinction of no value, except as showing that there were various forms of cholera. He says that he was nine years in Bengal, and that he also visited the coast of Coromandel. He mentions very bad fevers as occurring in Bengal in

* Specilegium de Indorum Morbis, 1735.

August, but says nothing special of *mordshi*, or of epidemics of it, in that part of India.

For the next fourteen years our accounts of cholera in India continue to be very scanty, and we learn, chiefly from systematic works and from Theses, which seldom give any original information, that the Indian form of cholera was still recognised in Europe, although little was heard of it in India.

Perhaps the main points in the long history of 250 years which we have just gone through, are the following :—We are told that there were several kinds of *mordeshi*, but the descriptions of them are imperfect. The earliest notices are much the fullest. The Portuguese in the sixteenth century, and Bontius in the early part of the seventeenth, give the only tolerably complete accounts ; yet, notwithstanding the constant mention of *mordeshi* in India in those days, quite as lively pictures of cholera were drawn in Europe.

In the causation of the disease a great deal was attributed to moist heat and to season, to repressed perspiration and to exposure of the abdomen to chills; a great deal also to indigestible articles of food, chiefly to vegetable ones, though occasionally to flesh and fish.

With respect to its pathology, there was not a novel idea. The prevailing one was, that it was an affection of the stomach and of the intestines, while there are sometimes indications that it was occasionally considered to be a fever, or an ileus, or an indigestion. There was little speculation on the

nature of the disease, the old notion that there were morbid secretions to be removed being the ordinary one, and little which, as the discussions in Europe at the same time have, has much bearing on the questions agitated in modern times respecting the essence of the disease. It is, however, to be remembered that for the last fifty years of the period, European physicians had not the constant opportunities of studying the disease in India, which they had before that time. The disease does not seem to have been considered contagious; still it is probable that some considered it so, when we find A'Costa calling it a *peste particulare*, and Bontius declaring that it was dreaded as much as the plague was in Holland.

With regard to treatment, the Portuguese, in the first instance, followed the practice of the Arabians, but after a time were content to follow the lead of the natives, especially in the universal adoption of cautery as a strong revulsive. Bontius treated the disease with vegetable astringents, and with saffron and opium. He had the faith of the day in Bezoar, in solutions of Hog Stone, and in prepared pearls. In the way of diffusible stimulants he does not appear to have employed anything more than shavings of rhinoceros or hart's horn, if they may be regarded as such. In some of the later stages blood-letting was practised.

We have distinct and positive accounts of epidemics of the greatest malignity.

We have traces of the disease attacking European and native soldiers, and of its occurring on board

ship. But the most striking feature of the period is the wide extent to which cholera prevailed throughout the East during the seventeenth century—a diffusion of it, which was followed by a period of decline of about fifty years.

We shall in the next period have more complete descriptions of the disease, and accounts of epidemics of it, in India. Whether these epidemics were more extensive may be a matter of question; but we shall hear somewhat less of the prevalence of cholera in other parts of the East.

CHAPTER VI.

CHOLERA IN THE EAST FROM A.D. 1750 TO A.D. 1817.

About 1750 we begin again to have fuller accounts of the malady. Mr. John Henry Grose, in 1766,* in his observations on the East Indies, says:— "There is likewise known, on the Malabar coast chiefly, a most violent disorder, being called *mordeshin*, which seizes the patient with such fury of purging and vomiting, and tormina of the intestines, that it will often carry him off in thirty hours. For this the physicians among the natives know no more effectual remedy than the actual cautery to the soles of the feet, the powerful revulsion of which seldom fails to have a wholesome efficacy." But, what is much more important than this repetition of the old story, Mr. Grose tells us, in his account of the island of Bombay, which immediately follows his account of his arrival in 1750, that *mordeshin* was hardly now known there, thus showing that the disease had been formerly well known, and that it had its periods of increase and of decrease in the island then as now.

* A Voyage to the East Indies, &c., by John Henry Grose. London, 1766.

The healthiness of the island must have been improved since the time of Ovington, when a man's life in Bombay was supposed to be worth two monsoons! A suggestion of those days for diminishing the unhealthiness of the place was, that the houses should be better raised.

Cholera is next found on board ship. Mr. Johnson, of Chester,* mentions that the English fleet in India suffered much from cholera in the year 1756. Mr. Johnson had the care of a hospital ship, and gave the Calumba root to a great many patients—often to twenty in a day—attacked with the cholera morbus. He seldom employed any other means previous to its exhibition; and he generally found that it soon stopped the vomiting, which was the most fatal symptom, and that the purging and remaining complaints quickly yielded to the same remedy. The mortality on board his ship, after he used this medicine, was remarkably less than in the other ships of the same fleet, in this fatal disorder.

In this year the Madras Report on Cholera says, that the malady prevailed at Arcot, about fifty miles inland from the Presidency town. That neighbourhood 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 notices of it for a series of years.

There can be little doubt that the affection mentioned by the historian Orme† as prevailing

* Percival's Essays, 1783, vol. iii. † Vol. ii., p. 203.

epidemically in Southern India, and causing great and sudden mortality, in 1757, was cholera, especially as its date would agree with what Dr. Paisley writes, that the disease was horribly fatal in our first campaign in the country to the blacks, and that fifty Europeans of the line were seized with it, and that the disease was seen at Trincomalee.

We have so few notices of cholera at this period in other countries of the East besides India, that we are glad to find that the existence of a tolerably acute form of cholera in Arabia did not escape the observation of Karsten Niebuhr in 1761-63,* although it was overlooked by the Constantinople Conference. He remarks that cassia fistula, or black cassia, mixed with a little rhubarb, is the best remedy known to the Arabian physicians for the cure of the cholera morbus and of diarrhœa, which are in hot countries particularly dangerous.†

* Travels in Arabia.

† A good deal has been made, especially by French authors (anxious to localise the origin of the disease in the Delta of the Ganges, and to ascribe its outbreaks to English neglect), of the fact reported, that 30,000 natives and 800 Europeans died of the disease in Bengal, in 1762. But Lind, a relative of the better known author of that name, the authority quoted for this, expressly calls the disease a putrid and remitting fever, which was cured by bark. Ives, Lind, and Bogue describe the diseases of seamen on the river Hooghly for a period which may be said to extend from 1756 to 1773; but they make no mention of any disease like cholera (the nearest to it is Ives' account of twenty-seven cases, in 1756, of convulsions of the intestines from a scorbutic state and muddy river water), though we know that it remained in Bengal as an endemic, and

M. de Gentil,* in his travels to India on the occasion of the transit of Venus on the 6th June, 1761, and 3rd June, 1769, informs us that the *mort de chien* is considered to be more dangerous than the flux of blood, and that the Indians are less subject to it than Europeans. As Grose mentions the disease as common on the Malabar coast, so Gentil found it on the Coromandel shore. His letter is dated at Pondichery, 1769, and it evidently refers to the important epidemics, to the full account of which, by Sonnerat, we shall presently have to turn; first, however, quoting Gentil's letter in the original, and a notice of cholera in India and China, usually attributed to Linnæus:—

"Le *mort de chien*, ou *mordeschin*, comme l'appelle Henri Grose, est une maladie terrible et plus dangereuse que le flux du sang. Elle fait mourir

though most writers were familiar with the existence of the acute *mordeshin* in other parts of India. There is no doubt that the disease of 1762 was a fever, yet it is worthy of notice, how suddenly a boat's crew would be knocked down by it, also, that "what they vomited and voided by stool was most commonly a whitish matter resembling chalk and water, or curdled milk which is vomited by sucking children, when the curd is much broken down,"(*a*) as happens in *fièvre pernicieuse algide*. Stavorinus, a Dutchman who visited Bengal in 1768-71, describes a very fatal disorder peculiar to the country, called *Jounibaad*, which swept away multitudes in three days, or, if there was recovery, left blindness, deafness, or paralysis. I can find no other account of this disease. It was somewhat like the disease of Beejapore mentioned above.

* Voyage dans les mers de l'Inde, 1779.

(*a*) Lind on a Putrid and Remittent Fever, p. 25.

souvent en moins de trente heures: je la regarde comme une sorte d'indigestion, qui occasionne la plus violente révolution dans tout le corps. Les Indiens sont encore beaucoup moins sujets à cette maladie que ne le sont les Européens.

"Le malade est pris de vomissements terribles, de douleurs considérables dans le sintestins, et d'évacuations inconcevables; il perd peu à peu ses forces, et tombe dans des défaillances continuelles. A la côte de Coromandel, on emploie des lavages et des cordiaux: Grose dit qu'à la côte du Malabar on applique des cautères sous la plante des pieds et que leur révulsion puissante opère presque toujours un effet salutaire."* The phrase "évacuations inconcevables" is a strikingly characteristic one.

Shortly after this we have another notice of cholera in the East, and of its occurrence in China, as well as in India. Dr. Wänmann,† in his inaugural thesis, which appeared under the auspices of Linnæus, mentions that he had made at least one voyage to the East. He observes that cholera Indica is a most frequent disease of sailors, especially on their first arrival in India. He attributes this to change of diet, eating turtle and fruits, especially acid ones, and the fruit *lemties*, sold to them in such quantity in China. The disease was to be cured by opium, and by drinking decoction of rice or of mallows.

* Vol. i., p. 676. In a letter dated "Pondichéry le 1er Mars, 1769."

† Linnæus de Morbis Nautarum, 1768.

Whatever form of cholera this may have been, there is no doubt that sailors and passengers are especially subject to the worst forms of the malady on arrival in Eastern ports; the change of diet, no doubt, predisposing them to its attacks, as well as to those of the milder alvine fluxes.

Sonnerat's travels were not published till 1782, and in a general way extend over the period from 1774 to 1781, but his allusions to cholera appear to include the epidemics about Pondichery in 1769, just alluded to by Gentil. Sonnerat has got the credit of having converted the native name of *mordeshin* into the similarly sounding French term *mort de chien*, but we have already seen that this transmutation had taken place by the commencement of the century. His statements about cholera are so full and important, that I introduce them at length. He says that an epidemic malady prevails, which sometimes kills those attacked by it in twenty-four hours, or less. It prevails only during the cold season :—

"Les débauchés et ceux qui ont des indigestions sont attaqués d'un dévoiement ou plutôt d'une écoulement involontaire de la matière fécale devenue liquide, mais sans aucun mélange de sang. Ils n'ont point de remède pour ce cours de ventre, qu'ils appellent *flux aigu*, et dont ils laissent la guérison aux soins de la nature.

"Le flux de cette espèce qui régna il y a quelques années se répandit dans tout le pays, fit de grands ravages, et depuis Chéringam jusqu'à Pondichéry

emporta soixante mille personnes. Diverses causes l'occasionnèrent. Les uns en furent affligés pour avoir passé les nuits et dormi en plein air ; d'autres pour avoir mangé du riz froid avec du *tair* (lait caillé) ; mais la plupart le furent pour avoir mangé aprés s'être baignés ou lavés avec de l'eau froide, ce qui leur causait une indigestion, un spasme universel du genre nerveux, suivi de l'atonie et de la mort, si les malades n'étaient promptement secourus. Cette épidémie arriva pendant que les vents soufflaient du nord en Décembre, Janvier, Février : quand ils cessèrent, la maladie disparut.

" Elle était caractérisée par un cours de ventre aqueux accompagné de vomissements, d'une faiblesse extrême, d'une soif ardente, d'une oppression de poitrine, et d'une suppression d'urine. Quelquefois le malade sentait de vives douleurs de coliques. Il perdait souvent connaissance et la parole, ou il devenait sourd : le pouls était petit et concentré, et le seul spécifique que trouva le frère du Choisel, de la mission étrangère, fut la thériaque et la drogue amère. Les médecins Indiens ne purent sauver un seul malade. Il y a lieu de penser que la transpiration arrêtée refluant dans la masse du sang et se portant à l'estomac et aux intestins, occasionnait des vomissements, qui se terminaient par ce cours de ventre.

" Celui qui le suivit deux ans après fut des plus terribles. Il ne provenait point de la même cause que le premier, puisqu'il commença en Juillet et Août, s'annonçait d'abord par un cours de ventre

aqueux, qui survenait tout à coup, et quelquefois enlevait le malade en moins de vingt-quatre heures. Ceux qui en étaient attaqués évacuaient jusqu'à trente fois en cinq ou six heures, ce qui les réduisait à un tel état de faiblesse qu'ils ne pouvaient ni parler ni se remuer : souvent ils n'avaient point de pouls. Les mains étaient froides ainsi que les oreilles : le visage était allongé, l'enfoncement de la cavité de l'orbite était le signe de mort : ils ne sentaient ni mal de ventre, ni coliques, ni tranchées. Ce qui les faisait le plus souffrir, était une soif ardente. Quelques uns rendirent des vers par les selles, d'autres par les vomissements. Ce cruel fléau frappa généralement toutes les castes mais surtout celles qui mangent de la viande, comme les parias. Les médecins nationaux ne réussirent pas mieux à traiter cette maladie, qui se renouvela dans le temps des vents du nord.

" Les Indiens sont encore sujets à des cours de ventre séreux et à des vomissements occasiònnés par la transpiration interceptée et par leur excessive misère, qui est telle que le plus souvent ils n'ont pas assez à manger pour entretenir l'équilibre de la circulation. A ces deux causes se joint le défaut de linge pour se couvrir dans les temps froids. Ils couchent sur une terre humide, dans des cabanes où ils ne sont pas à l'abri de la pluie et du vent. Le manque de toutes les choses nécessaires à la vie de l'homme attire à ces malheureux des maladies qui les font périr en grand nombre.

" Les indigestions, appelées dans l'Inde *mort de*

chien, sont fréquentes. Les castes qui mangent de la viande, nourriture trop pesante pour un climat si chaud, en sont attaquées. Les Brames, quoiqu'ils ne mangent ni viande ni poisson, ont souvent de ces indigestions, produites par la grande quantité de beurre qu'ils mangent avec leur riz : plusieurs en sont morts subitement.

" Ces indigestions fréquentes n'ont pas toujours pour cause une nourriture trop abondante. L'air frais auquel on s'expose avec tant de plaisir cause une indigestion, s'il a trop réfraîchi le ventre, la tête, ou quelqu'autre partie du corps, en supprimant la transpiration : plusieurs personnes sont mortes pour avoir couché imprudemment en plein air."

Lengthy though this account is, it is, in very many respects, worth studying.

Sonnerat appears to describe sporadic cholera as *mort de chien*, endemic as the serous flux, and epidemic as the acute flux. He seems indeed to have been but half aware, that they were merely different forms of the same disease.

In his description cramps were not a very prominent symptom ; the epidemic disease which he paints appears to have had little spasmodic reaction. Oppression of the chest and suppression of urine are recorded, and occasional deafness and vomiting of worms.

The epidemics lasted a long time, for one succeeded another in two years, and the latter one broke out a second time within the year, before its whole force was spent.

December, January, and February seem to have

been the chief cholera months, and although one epidemic commenced in July and August, it broke out afresh in the cold season.

His theory of the disease is, that suppressed perspiration enters the blood, and then acts on the stomach and intestines. He accuses rice, but not fruit, also eating meat, of causing the disease. He attributes attacks of cholera to catching cold after bathing, to imperfect clothing, deficiency of food, and to general misery, humid soil, and want of protection from the weather.

But the disease *mort de chien*, a dangerous indigestion, was caused by eating too much either of animal meat, or too much butter with rice. It was also caused by exposure of the body to the air.

He says little of the treatment of the disease; for neither form of it did the natives appear to have efficient remedies. The great loss of life, called 60,000 men, in the small space between Cheringam and Pondichery, shows the virulence of the epidemic.

On the whole, no author before the time of Sonnerat gives us so distinct an account of the epidemic prevalence of cholera, so full a description of its varieties, or has attributed it so positively to the physical misery of the natives of the country.

During the period which may be said to be covered by Sonnerat's histories, we learn from the Madras Report that cholera prevailed at Amburpet and Arcot in 1769-71.

Dr. Clark* tells us that cholera was a very frequent disease at Bombay in 1772.†

The prevalence of cholera at Madras in 1774 led to Dr. Paisley's communication respecting his knowledge of the occurrence of the disease at an earlier period, which communication, strange to say, did not see light till some thirty years afterwards.‡ Dr. Paisley approved of the troops changing ground, in hopes of getting rid of the disease.

There seems to be no reason to doubt that cholera reached the Isle of France in 1775. The accounts of this event, collected afterwards by Dr. Burke, appear to be quite convincing, and Tholozan§ tells us that he is informed that old people who saw the disease in 1819 recognised it as the old malady of 1775.

The chief epidemic described by Sonnerat on the Coromandel coast must probably have occurred from the year 1776 to 1778.

Fontana,‖ writing in 1776 an account of the

* On Diseases of Voyages to Hot Countries, 1773.

† Dr. Clark, speaking of Calcutta at this period, says:—"There have been several melancholy instances of persons who have returned home in a state of perfect health from performing the last duties to a deceased friend, and have next day been numbered with the dead." Dr. Clark is writing of fever and fluxes. Such cases have occurred within my own knowledge; but they have always been cases of cholera. Fevers of such rapid malignity are scarcely known in Calcutta.

‡ Curtis' Account of the Diseases of India, 1807.

§ "Gazette Medicale," 1868.

‖ Osservazioni, &c., Livorno, 1781.

diseases of sailors in India, mentions that during his voyage he had no opportunity of seeing a case of that terrible and fatal malady, cholera morbus or *mordeshi*, because the disease, he believed, was more common on land than in ships. He was, however, perfectly aware of the existence of the affection.

The Medical Board of Calcutta had reason to believe that the disease was epidemic in Bundlecund about the year 1779.*

In that year Sir Elijah Impey† writes thus of the malady, as it prevailed in a mild form in Calcutta :— "I am subject once or twice a year to violent attacks of the cholera morbus, here called the *mort de chien*."

Folly‡ saw cholera at Tranquebar in 1780.

Lind, in the second edition of his book in 1780, remarks generally, that the *mordeschin* is very frequent and very fatal in the East Indies. Opium was the great remedy.

From this period onwards there is not much to be said of the march of cholera in India, which is not to be gathered from the Indian Reports, especially those of the Medical Boards of Bengal and of Madras. My task will henceforth be chiefly confined to a chronological re-arrangement of facts, with the addition of a few new ones which illustrate what was already known ; and which show very clearly that, however it might slumber, cholera,

* Bengal Report.

† Life by his Son.

‡ Tode. Med. Ching. Biblioth. x., p. 409, quoted by Hirsch.

even in its malignant form, never ceased to exist in India.

After the history which we have just gone through, and more especially after the constant notice for the previous ten years of the prevalence of cholera along the Madras Coast and in Southern India, it appears to us almost inconceivable, how the outbreak now to be recorded, should have been the cause of so much astonishment. It shows, at least, how very little was known in those days of what was going on in different parts of India, and that cholera, in its malignant form, could have been little known in Bengal at that time, although the cholera goddess had not been installed in her new temple more than ten or twenty years. The nature of the ordinary cholera of the period may be guessed from the letter of Sir Elijah Impey, just quoted, in which he speaks of the frequency of his attacks.

This is Jameson's account of the Ganjam outbreak:—"A division of Bengal troops, of about 5000 men, was proceeding down the coast towards Madras in the spring of 1781. A disease resembling cholera had been prevalent in that part of the country for some time before the arrival of the column. On the 22nd of March, at Ganjam, it assailed the troops with almost inconceivable fury. Men in perfect health dropt down by dozens, and others, less severely affected, were dead, or past recovery, within an hour. The spasms of the extremities and trunk were dreadful, and distressing vomiting and purging were present in all. About

500 were admitted into hospital that day, and for the two following days the disease continued unabated—more than one-half of the army was sick, and it was found impossible to proceed further. It was, therefore, resolved to halt at Itchapore. The good results of this measure were immediately apparent. By the 29th of the month the sick were diminished to 908, and on the 1st of April the army was able to recommence its march, leaving the convalescents behind. The deaths, probably, did not fall short of 700. The camp-followers were first attacked, then the Sepoys, and then the Europeans. Few officers were affected, and only one died. The disease was at first attributed to poison, and especially to the drinking water, but afterwards to vicissitudes of weather, and to exposure of the troops." Mr. Jameson adds, that in the treatment no opium was employed, and that there is reason to believe that tartar emetic was too freely used.

"The disease found its way up to Calcutta," writes Warren Hastings, 27th April, 1781, "and after chiefly affecting the native inhabitants, so as to cause a great mortality during the period of a fortnight, it is now greatly abated, and is pursuing its course to the northward." Unfortunately the course of the disease to the north was not traced; but Mr. Lindsay, of Sylhet, writing in September of the same year, affords some slight clue to it:—"The malignant distemper, after having carried off a number of the inhabitants of Calcutta, is now raging with the greatest fury at Sylhet. Many of the Zemindars

and Naibs having fallen victims to it, the others in a body have deserted the town." * Another letter of Mr. Hastings', of the 28th, to Major Scott, gives his further impressions regarding the disease :—" A contagious distemper seized the detachment at Ganjam, and threatened to annihilate it. It partly resembled the disease called *mordeshi*, or *mordeshin*, in Europe cholera morbus, but seems to be a species of the plague, and to have been caused by exhalations from the rains, which have fallen almost incessantly and with great violence during two months. It has travelled since to Calcutta, where it made an alarming havoc for about ten days. By a report which I ordered to be made me, of the number and names of the inhabitants who perished by the distemper between the 11th and 21st of the month, there appear to have died in all 879, multiplied by reports into many thousands. The weather has cleared, and the mortality abated. I do not recollect whether Colonel Pearse's letters mentioned the number that he has lost, but I fear that of Sepoys alone it has not fallen much short of a thousand. By the last advices, he was near Vizagapatam, and his men fast recovering." † The mortality here mentioned was far greater, for the time the plague lasted, than what took place in Calcutta in 1817.

This visitation of Bengal cannot have lasted long, for Balfour, in 1784,‡ in talking of the diseases of

* Taylor's Medical Topography of Dacca.

† Gleig's Life of Warren Hastings, vol. ii.

‡ Influence of the Moon on Fevers. Calcutta, 1789.

the district, only mentions incidentally "fluxes and spasms."

According to the accounts of French writers, which I have not been able to verify, cholera in this year attacked the army of the French commander Anderne in the south. In the year 1782 cholera was largely diffused in Southern India. The *mort de chien* or *cramp* prevailed in Sir Edward Hughes' fleet, both off Madras and Trincomalee, at the latter place in May and April.

Curtis* tells us of that fatal and intractable Indian disease, which from July to September of this year occurred in the Madras hospital and in the fleet. He thought he could make out two sets of cases: one, when the disease was of a more bilious nature, the other, with sudden depression which was not proportionate to the spasms or to the amount of fluid lost. This last observation may be noted. This sudden depression he considered to be the great characteristic of the disease. He could not satisfy himself, as others did, that the orderly and well-clothed man suffered less from the disease than the disorderly and ill-clothed. He at first for treatment made use of small doses of glauber salts

* Op. cit. Curtis's satisfactory account of cholera is remarkable as not having been published till twenty-five years after the events it relates. He does not once allude to Girdlestone, who described the same occurrences twenty years before him. It is strange, that although they must have been in Madras at the same time, and though Curtis must have seen the book of Girdlestone, who described the same occurrences twenty years before him, he does not once allude to his name.

with one-eighth of a grain of antimony, and also used other purgatives and castor-oil. When there was bilious colluvies in the primæ viæ, he found them admissible, at least gentle purgatives; but in cases of depression he found the evacuants only increased the weakness. His treatment in the main became the use of strong ammonia and stimulants, with some opium.

Mr. Girdlestone,* at the same time, October, 1782, on landing at Madras, found spasms the first disease. Though there can be no doubt as to the nature of the affection, he does not mention purging or suppression of urine. More than fifty of the newly-arrived troops were carried off within three days of their landing, and 300 men of the 101st regiment were attacked within the month. All the worst cases were brought in about four o'clock in the morning. The faculty at Madras prescribed chiefly hot Madeira wine. Girdlestone, who never calls the disease cholera, indeed, says, "in spasmodic affections, and in cholera morbus," thought giving forty drops of laudanum with a cordial, repeating the cordial without the laudanum if it was retained, most successful treatment. He also used injections of warm broth, and friction to the surface. He was much pleased with the result of his own practice, while he did not judge as favourably of the effect of the treatment of the disease by the faculty.

Curtis and Girdlestone are pretty well in accord as to the morbid appearances to be found after

* Essay on Hepatitis and Spasmodic Affections of India, 1787.

death. Both were agreed that there was no injury sustained by the brain, liver, gall, bladder, stomach, or heart; but Curtis observed in two of his cases that there was more water then natural in the pericardium, and the vessels of the lungs, liver, and pericardium appeared to be very turgid and full of blood.

In the same year König, the botanist, gave the following admirable account of the disease :—

"Nuper iterum morti proximus fui, morbo enim diro, quem Dysenteria apoplectica appellare fas est tenebar. Sanitatem reddidit clementissimus Deus. Integer tamen mensis ante perfectam restitutionem transiit. Morbi cursus hic est: Diarrhœa corripitur æger cum elastica quasi excrementorum ejectione; dein sequuntur ejusmodi dejectiones, quæ nihil nisi humorem lymphaticum clarum continent. Manus mox frigent cum pedibus. Manuum musculi contrahuntur, et hæ æque ac facies flavidum glutinosum mucum transsudant. Pulmones angustantur, vox rauca vix adstantibus percipienda. Alii timore percutiuntur, alii indolentes videntur. Pulsus in omnibus extremitatibus deficit, et tantum ad carotidem arteriam observatur, quamvis irregularis. Nonnulli jam vomunt. Ungues lividi sunt; et diri spasmi brachia et suras corripiunt, cum clamore ægroti. Hæc mors sequitur sine insigni convulsivo motu. Cursum hunc sequitur morbus, qui sæpe intra semihorium terminatur: nonnunquam sex ad octo horarum spatio absolvitur. Qui remediis sublevantur idoneis, ad nycthemer spatium illum

protrahere possunt. Pauci sibi relicti convalescunt. Hunc ego morbum periculosissimum vici, et sospes hodie descripsi."*

König had thus a narrow escape of his life, and was able to give us this lively picture of what I suppose may be called the endemic of the country, which he experienced at Tranquebar. There is nothing overlooked in this description, except the suppression of urine. His tardy convalescence makes it probable that he may have had consecutive fever. The case is as it were an average one, the diarrhœa being as usual the most prominent symptom. The sudden failure of his powers must have suggested the phrase of apoplectic dysentery. The disease must have been acute enough, as it was said to kill perhaps in half an hour, or in six or eight hours. He believed that none recovered who did not receive treatment.

In the same year, according to Dr. Clark,† troops fresh from England, although coming off an unfortunate voyage, died in Bombay harbour on landing of cholera and of *coup de soleil.* He adds that cholera there is a disease of the dry months.

Fra Paolino Bartolomeo, a Capuchin brother, who spent thirteen years in Southern India, and who published, in 1796, his travels, which contain much useful matter, describes an epidemic of the disease in Malabar in this year. His account of

* Retzius, Observat. Botan., 1786, Fascic. iii., Preface.

† Op. cit. 2nd edit., 1792.

cholera may therefore be conveniently introduced here: —

"Far more dreadful are the consequences of the intestinal colic, called by the Indians *Shani*, *Mordexin*, and also *Nicomber* and *Nirtiripa*. It is occasioned by the winds blowing from the mountains, which carry with them a great many nitrous particles, and which commonly commence immediately after the rainy season, when the wet weather is succeeded by a great heat or a continued drought. On the coast of Malabar this is the case from the beginning of October till the 20th of December, and on the coast of Coromandel in April and May. People are then liable to catch colds, and the consequence is that malignant and bilious slimy matter adheres to the bowels, and occasions violent pains, vomiting, fever, and stupefaction, so that persons attacked with the disease die very often in a few hours. It sometimes happens that thirty or forty persons die in this manner in one place in the course of a day, unless speedy relief be administered. The bitter essence—the *drogue amere*—is the best remedy for this colic. In the year 1782 this disease raged with so much fury, that a great many persons died of it. The above essence is very dear, and it was not possible to procure it in such quantities as to supply all the patients. In its stead, therefore, we employed *togora*—cocoanut brandy, distilled over horse dung. All those recovered to whom this beverage was given, but the rest died in three or four hours. The fame of our medicine was spread as far as Cochin.

When the Dutch physicians at that place were informed of this circumstance, they not only gave our medicine their approbation, but even employed it in their practice." *

In the preceding account the chief noteworthy points are, the immense importance in the causation of the disease which Bartolomeo attributes to season; also his finding the use of spirits exceedingly valuable, as I imagine those who have had much practice among the natives of India, have usually done.

Next year, or in 1783, the Madras Report describes the malady as epidemic along the whole coast. We hear from Hay of its having been at Travancore in the South, and it showed itself in the army of observation.

An outbreak which took place this year† has always excited much interest, and especially since the influence of pilgrimages in diffusing the disease has come to be studied. It also seemed to stand alone as an isolated example of cholera occurring in the north-west of India. But now that we know of previous outbreaks in Rajpootana and Bundlecund, and when we find that the opinion has been entertained that cholera has always been endemic in Malwah, the epidemic is less surprising.

Hurdwar, where the waters of the Ganges first issue into the plains, is held very sacred by the Hindoos, and every year, at the full moon of April,

* Travels, &c., p. 409, English edit., 1800.

† Vide Bengal Report, &c.

and more especially every twelfth year, an immense concourse of people assembles near it to hold a fair, and for the purpose of bathing in the holy stream. The year 1783 was one of the propitious years, and the concourse of pilgrims was very great (it has been stated at one or two millions!). It is the custom of the pilgrims to repair to the bed of the river, where they pass the night with little, if any, shelter—many persons being crowded under the cover of a single blanket, thrown out as an awning. The temperature is very variable, the days being hot and the nights cold. Whatever influence this may have had, or an easterly wind springing up during a hot night, it is certain that cholera broke out soon after the commencement of the ceremonies, and raged with such fury that in less than eight days it is said to have cut off more than 20,000 victims. But so confined was its influence, that it did not reach the village of Juwalapore, only seven miles distant, and ceased immediately upon the concourse breaking up, on the last day of the ceremony.

After this year the epidemic diffusion of cholera diminished, although the disease every now and then cropped up. It was at Vellore and Arcot, which are close to each other, in the years 1787-88, and 1789. At Vellore it was a disease so rapid in its progress, that many of the men were carried off in twelve hours' illness. Mr. Davis's account of it at Arcot in November, 1787,* is singularly interesting, as he

* Madras Report.

describes three varieties of the disease in hospital, namely, cholera morbus, an inflammatory fever with cramps, and a spasmodic affection of the nervous system distinct from cholera; he adds, that the last disease was more fatal than the other two, destroying all that were attacked by it.

This disease, which was the true malignant cholera, Mr. Duffin treated with castor-oil successfully; indeed, he was happy to say, he scarcely lost a man.

Mr. Thompson* has given us an account of the post-mortem appearances, which, such as it is, is far more satisfactory than those usually furnished.

The gall bladder was exceedingly distended with bile, extending an inch or more beyond the edge of the liver. There were no marks of putrescence in any of the abdominal viscera; the kidneys and the intestines were healthy; the urinary bladder quite empty, and contracted to the size of a walnut. The stomach and duodenum both empty of bile, and no appearance of inflammation in any part of the intestinal canal or peritoneum.

Here we have the gorged gall bladder, and contracted urinary bladder, so characteristic of cholera. The minuter changes occurring in the surface of the intestines and in the kidneys were not matter of observation until a much later period.

In one of these years, about 1788, according to native report, we learn, through Superintending-Surgeon Duncan, that cholera prevailed epidemically at

* Madras Report.

Bellary. This is of interest as affording an instance of a place at a considerable distance from the sea being attacked.

The opinion expressed at this time by the Madras Medical Board, in November, 1787, is an important contribution to the history of the disease :—

"A disease had in October last prevailed at Arcot similar to an endemic that raged among the natives at Paliconda, in Amboor Valley, in 1769-70, in the Bengal detachment at Ganjam, in 1781, in the army of observation in 1783, and in several other places at different times, and as epidemic over the whole coast in 1783, under the appearance of dysentery, cholera morbus, or *mordezin*, but attended with spasms at the præcordia, and sudden prostration of strength, as characteristic marks."

Here we see that the Board recognised an old disease, merely intensified by its being epidemic; the old resemblance to dysentery comes out again.

If we hear less of cholera in India proper at this time, yet it seems to have been in Batavia in 1789, where it was treated mainly with large doses of opium.*

Singularly enough, another Bengal column was attacked in 1790† in much the same way as that of Colonel Pearse, and in the same country, at the same season. The cholera commenced late in March, but was not general till the 15th of April, when its activity was heightened by a heavy squall of wind

* Journal de Marine, La Haye, 1868. † Bengal Report.

and rain, which overtook the detachment on the north side of the Chilka Lake. From this time till the middle of June, when the detachment reached Ellore, and the weather had become more moderate owing to frequent falls of rain, the disease proved very fatal. But although the disease accompanied the column much longer than it did that of Colonel Pearse, it did less mischief. Luckily, says Mr. Jameson, laudanum and cordials were resorted to for its cure.

Clark, in the new chapter of the edition of his work in 1792, says that cholera is common in Malabar and in Canara, and, according to Mr. Hay, writing from Quillon in 1818,* "The endemic, if not of the Malabars, certainly of the Travancorians, devastated the country twenty-five years ago," which would be about 1793, "destroying thousands." At this time, be it observed, according to Hay, the native doctors abandoned their charges and fled, thinking the disease contagious.

The rumour mentioned by Mr. Jukes, in the Bombay Medical Report, that the disease had prevailed in the Mahratta country about this time, and had reached Tannah, is confirmed by the more precise statement of Colonel Tod, that it was epidemic in Marwar in the year 1794.†

* Madras Report.

† The disease which occurred this year at Ellore, and which is described in the Madras Report, was a variety of heat apoplexy, or coup de soleil. Some of its nervous symptoms approximated to those of cholera.

I am able to conclude this century with a confirmation of the report mentioned by the Bengal Medical Board, that the disease prevailed epidemically in Lower Bengal in the end of the century, although when it re-appeared there only twenty years afterwards, it was regarded by the great majority of observers as an unheard-of pestilence. In 1797 a collector, in one of his reports,* alluding to the sickness and mortality in a pergunnah of Backergunge (and Backergunge and Burisal may be taken as synonymous), says:—"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 plague can only have been cholera. There is no other Indian complaint to which the description would apply.

As we get nearer the great outbreak of 1817, or for the next nineteen or twenty years, our notices become scanty in the extreme. There was evidently a period of comparative quiescence of the disease, although every now and then it gave evidence of its existence. Dr. Jameson, of Cheltenham, in a note to his work on that place, observes, in 1802, that hepatitis and cholera morbus were the chief diseases of India in the hot season, according to the statement of officers to him. Dr. J. Johnson† saw some cases of the disease in the harbour of Trincomalee in 1804.

* Taylor's Topography of Dacca.

† Influence of Tropical Climates, 1813.

He insists—it does not appear on what authority—that cholera, or *mort de chien*, existed in its most concentrated state on the east coast of Ceylon, where it was more prevalent than in other parts of India. He recommended the use of blood-letting and of Calomel. Mr. Barnes, of Jessore, tells us that on two occasions previously to 1817, the Court at that place had been broken up owing to outbreaks of the disease, and that he remembered having seen cases of cholera. Recently, Mr. C. Macnamara* has exhumed from the records of the Bengal Medical Board a few notices which show that some stray cases of the disease, so named in the returns, occurred in the years 1808-9-11-12-13 and 14, most of them in Chunar, near Benares, and some of them in Fort William, Calcutta—in this last place, in 1814, in a crowded barrack, among newly-arrived troops.

In this year, too, we have clear and distinct accounts from two medical officers of an outbreak of the disease among native troops near Jaulnah.† That in the 9th Regiment, recorded by Mr. Cruikshank, was of considerable severity. Mr. Cruikshank, on referring to his notes some years afterwards, found that, in consideration of the great amount of vascular collapse, he had denominated the disease, asphyxia. Mr. Cruikshank's account is also interesting, as giving an example of two corps of the same brigade being apparently situated alike, yet one suffering from the

* Treatise on Cholera. † Madras Report.

disease, and the other escaping it, for no assignable cause.

Further, says Mr. Scott, in the Madras Report, this paper of Mr. Cruikshank's is important, inasmuch as it evinces that cholera did exist at that time to an extent not hitherto suspected, and yet that no trace of it is found in the public records.*

We are indebted to a Calcutta newspaper in 1831 for an account of a small outbreak of cholera in Lower Bengal in 1816. It appears that a band of bird and fruit sellers called Kooroorcheas (from whence they had come is not known) were at a village called Saifgunge, 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 for which they then had no name, but to which they gave the name of *oola* next season; that it killed eight or ten of them daily, and that in consequence they broke up their encampment, and scattered themselves in the neighbouring villages. There is no improbability about this story, and if it be accepted, it shows that, if we had fuller evidence, it might probably turn out that cholera of the malignant kind was present in more than one locality in Bengal the year before the outbreak of the great

* Corbyn's very extraordinary statement that he saw the disease on board the *Mangles* East Indiaman, in 1814, among the Lascars, on the voyage from England to the Cape, has never been accepted. The men's legs were œdematous; it was evidently some acute form of choleraic diarrhœa, supervening on scurvy.

epidemic. That what was called cholera morbus was not unusual in Calcutta itself, is shown by the police reports,* if they are to be at all credited. For, counting Mahommedans, they assign a mortality of about 200 by this disease, in each of the years 1815 and 1816, to the population of Calcutta.

The great epidemic of 1817 is usually described as having commenced at Jessore; but in that year there was a fatal case of cholera in Fort William in the month of March, which attracted no attention. In May and June the disease was raging epidemically in Kishnaghur and Mymensing. In July it was at Sonergong in the Dacca district, and as high up the river as the large city of Patna, and it did not reach Jessore till August, and not till after the middle of the month. It broke out in Calcutta at much the same date, or a few days earlier. In both places it caused great consternation, but the greatest in Jessore.

As the old temple of *Oola beebee* (Lady of the Flux) was in an out-of-the-way suburb of Calcutta, a new temple to her was opened at Kidderpore, and at Sulkea a young woman sat for some days in a temple as an incarnation of her, till removed by order of the magistrate. The priests of the old-established deity of Kali Ghat issued a proclamation, and sent cowries round in a mysterious way, threatening those who did not resort to her shrine, and the road to her temple was crowded with pilgrims.†

* Bengal Report. † Asiatic Journal, 1818.

This shows at once the intensity of the alarm, and that in reviving the worship of *Oola beebee*, the antiquity of the disease was recognised.

In Jessore, which is sometimes mentioned by the old name of Morley, although there was great mortality in the district, and cholera undoubtedly showed itself with much malignancy, the disease broke out on the 19th of August in the part of it called Veramdah; it was gone from the Jail by September 2nd, and the mortality in the station was almost over by the 20th of September. So much was this the case, that the civil surgeon, Dr. Tytler,* reported that it was unnecessary to carry out the hygienic measures recommended by the Medical Board of Calcutta, such as clearing away trees and overgrown jungle, and collections of filth, and filling up pools of stagnant water. The treatment recommended by the Board, as carried out by him with no instance of failure, if adopted at once, had been sufficient to overcome the disease! That treatment was mainly, the use of large doses of calomel in the first instance, and of opium in small doses, if the vomiting was protracted.

The practice officially recommended by the Medical Board, and carried out by the aid of native doctors in Calcutta and its suburbs, was founded on the principle, that the administration of diluents only led to waste of time; that nothing could be more dangerous than any delay in supporting the

* Dr. Baird Smith, in Indian Annals, 1870.

patient; that by giving aperients or emetics in the commencement, you increase the virulence of the disease, which it should be your object to quiet. The treatment, therefore, was in the first place to give about a Madeira glassful of brandy, plain, or with water, according to the degree of depression of the patient. When the patient was a little revived, and his stomach was quieted for a time, you were to give fifteen drops of laudanum in water; if that was not kept down, or until a dose was retained, you were to go on repeating the laudanum, increasing the dose to about forty drops. Opium dissolved in water was to be applied to the pit of the stomach, and hot brick-bats applied to restore warmth.

When the stomach was quieted, and brought into a fit state to retain purgative medicines (given with a view of expelling the morbid secretions of the intestines), calomel, owing to its action on the liver, was thought an appropriate medicine, and was given in pills of 3 grs. each every half hour or forty minutes. But care must be taken not to give a large dose at once, which would infallibly bring back the vomiting. During the exhibition and operation of calomel or other purgatives, the patient's strength should be constantly attended to, and be supported by small quantities of brandy-and-water, given from time to time. After a space tonics were administered to restore vigour to the stomach.*

* We have no distinct account of the treatment adopted by the native doctors. The Medical Board borrowed the use of decoctions of black pepper, of ginger, and other stimulant

This treatment was considered to be very efficacious. "In a very eminent degree successful." "It is fortunately," writes the Medical Board,* "a disease which in most instances admits of a speedy remedy." This of the great choleraic pestilence!

Nothing is at the present day more surprising to us—at least to such as are really familiar with the disease in Europe or in India—than the confidence with which medical men talked of the result, if they were only called in in time. Yet nothing could be more acute than the malignant forms of the disease described at the time. There are, indeed, some tables of the cases treated in Calcutta, and of the number of deaths.† If we could have the slightest confidence in them (and they would show that only about ten per cent. of those who were treated died), we must believe that the disease could be handled far more successfully then, than in modern times. But we know that such results could not have been really obtained during a virulent epidemic.

The following extract‡ from a memorandum circulated at the time by Government, gives a sufficient idea of the intensity of the epidemic:—"The most alarming symptom of the disease is the sudden prostration of strength at the very commencement. The patient while walking or engaged

medicines in common use among them. Had the natives forgotten the use of the cautery, the universal remedy in former cholera times?

* Indian Annals. † Bengal Report.

‡ Indian Annals, 1870.

in his usual occupation, without any previous warning symptom, falls down, and is immediately seized with vomiting, at the same time that a cold and clammy sweat breaks out over his body. His pulse can scarcely be felt, and his debility is such, that he is unable to move from the spot without support. In some cases the patient has died within half an hour of his first attack; but in general, where no remedies are used, it proves fatal in ten or twelve hours. . . . In recovery a relapse is frequently produced by loading the stomach with food, and this is generally very speedily fatal."

The intensity of disease described above, is no greater than what we have read of at Goa, in Malabar, in the Delta of the Cauvery, in Ganjam, and at Hurdwar. Similar malignity prevails at the commencement of all bad epidemics, although the accounts of it are sometimes exaggerated by such panic, as manifested itself at Jessore on this occasion.

I think it unnecessary to load my pages with a full account of the symptoms of the disease as it showed itself at this time, for they differ in no respect from other accounts of Indian epidemics of cholera, of which so many specimens have been already given.

It is not my intention to pursue the history of cholera beyond the point now reached—the commencement of the outbreak of 1817—and I shall conclude by giving the ideas of the Medical Board, expressed within a fortnight after Jessore was

attacked.* They refer to the extent of the disease, to the local circumstances which favoured its spread, and to the condition of the people, which predisposed them to its ravages. They are in spirit much the same as the reflections of Sonnerat† :—

"It is probable that there is no considerable town in the low and humid climate of Bengal that is at present entirely exempted from the operation of the disease. The obstruction to ventilation in native towns from rank and luxuriant vegetation powerfully aids the influence of the season; and, according to the degree of the operation of this cause, will the prevalence and fatality of the epidemic be probably increased or diminished.

"The sudden alternations of heat and cold, acting on the constitution of natives, which are extremely susceptible of those impressions, no doubt influence the prevalence of the present epidemic; and the same observation is perhaps applicable to unwholesome or insufficient diet, and to the miserable accommodation afforded by the low and damp huts of the lower and more indigent natives."

Such were the impressions created in Lower Bengal, when the existence of the epidemic was first recognised.

It should not be forgotten that Mr. Craw‡ treated 200 or 300 cases of common cholera during the rains at Caranja, near Bombay. We learn this merely

* Indian Annals, 1870. † Supra p. 131.
‡ Bombay Reports.

incidentally, but it is sufficient to show, that choleraic affections were common in at least one other part of India, at the date of the Bengal outbreak, although having no connection with it. The presumption arises naturally, that Caranja was not the only place where such affections were occurring.

CHAPTER VII.

REMARKS ON THE OUTBREAK OF 1817.

When cholera reached Jessore and Calcutta, and caused such alarm, the medical authorities reported, in the first instance, that it was the usual epidemic of the season in an aggravated form. It was some little time before the term cholera was applied to it.

(1.) Not raising just yet the question, what was the usual season for such an epidemic, I shall first inquire what collateral evidence there is of there being a sort of annual cholera in Bengal, otherwise an endemic cholera. The fact of there being a temple at Calcutta dedicated to the goddess of the disease, limited even though her worshippers may have been in numbers of late years, is a tolerably satisfactory proof that the disease was always recognised in Bengal; but we have further notices of its existence from English witnesses.

Dr. Young, of Allipore,* for a long series of years used to have a few cases of cholera, but not of much virulence, among the prisoners in his jail every season. Dr. Barnes, of Jessore,† said, that he had

* On Cholera, 1831.

† Rouppell, Lumleian Lectures, 1832.

been accustomed to cases of the identical disease, although he had not called them by the name of cholera; that he thought the disease was a new one, superseding the periodical remittent of the season; and that it had repeatedly been the subject of correspondence between him and the Medical Board. Dr. Tytler, again, who was the officer present at Jessore at the time of the outbreak of 1817, considered the disease to be the usual epidemic. This was before he had stumbled by haphazard on his rice theory, which, indeed, had been previously indicated by Sonnerat. Dr. Tytler* afterwards wrote, that he had proof from official records, that cholera had formerly occurred at Jessore.

Dr. Macrae, of Chittagong,† who furnished the report of the outbreak of the disease in the Bengal column in 1791, which has already been quoted, and whose evidence is very valuable, as he had undoubtedly witnessed a sharp epidemic of the disease among soldiers, said that he was familiar with the disease every hot season since 1794, the date of his settling at Chittagong.

Mr. Jameson tells us that such epidemics occurred in Calcutta in the sultry season, of which, indeed, the death of a soldier in the Fort, in March of the year 1817, was an illustration; and in the appendix to his report, the return already quoted‡ shows, that about

* On Cholera, p. 41.

† Macnamara's Treatise on Cholera, Appendix.

‡ Supra p. 152.

200 deaths annually were occasioned by cholera morbus in the whole population of Calcutta.

Dr. Clark, too, had long before this said, that cholera occurred in Bengal in the hot season, though less common there than on the Malabar and Coromandel coasts.

The Medical Board was, therefore, not without grounds for the view which it at first entertained. But whatever its first opinion was, it soon came to acknowledge that the disease was a wide-spreading pestilence, of far greater severity than any annual epidemic that they had been accustomed to.

(2.) With respect to the season considered to be the normal one for the endemic cholera in Calcutta, Mr. Jameson's statements are a little conflicting, and I think I can trace very plain signs that, fair though he generally is, like other writers on the subject, he has his views somewhat tinged by the conclusion at which he had arrived; this was, in fact, the ancient doctrine about pestilences, that not merely hot, but hot moist air, as well as vicissitudes of temperature, were necessary for the production of cholera.

His first observation is, that the disease rarely occurred in the equable months of the dry and hot weather, but acquired vigour towards the autumnal equinox. Further on in his Report he makes the statement, that the disease is endemic in sultry periods of the year, which I suppose would bring us back to the hot season.

If we come to facts bearing on Calcutta and its neighbourhood, we learn from his Report that there

was a death from cholera in Fort William in March, 1817, and that cholera prevailed in Nuddea in May. Reverting to older evidence, we find that the chief season of pilgrimage to the cholera goddess was from April to June, and that the epidemic of 1781 raged in Calcutta in April. Clark, in the edition of his work published in 1792, says that the hot months are the season for cholera in Bengal, and Dr. Macrae used to observe it annually in Chittagong in the hot season.

Still, the fact remains, that the first great outbreak of 1817 in Calcutta was in the month of August (and I have myself seen, during the rains in Calcutta, in September, 1859, the worst epidemic I have ever witnessed among Europeans); but the disease very soon resumed its old habits—may be said to have righted itself. After having almost died out by the end of the year 1817, it suddenly broke out again in the end of February, 1818, and raged during the hot-weather months. The two worst months of the rains in 1817 produced only 727 deaths, while the two worst ones of the hot weather of 1818 produced 2454 deaths, or considerably more than three times as many. Cholera was thus very much worse in Calcutta in the second than in the first year of the outbreak. Its course was similar in other places near Calcutta. It recurred at Nuddea in the end of February, 1818. In Burdwan it was particularly violent in the hot weather of 1818. It probably followed a similar course in Jessore, says Mr. Jameson, although

reports are wanting. In all those places the disease showed itself again in the hot weather of 1819.

Reviewing thus what evidence we have of the season for cholera in Calcutta before and immediately after 1817, I think there is a very decided presumption that the hot weather has always been the chief cholera season in Calcutta, although its period was deranged for a time in 1817.

(3.) The outbreak of 1817 was of such magnitude, and has had such lasting effects, there has also been, in my opinion, so much misapprehension about its source, that I hope a few words on its origin will not be thrown away, even if they do not profess to solve the cause of the outburst.

In inquiring into the origin of the outbreak of 1817, it may be well to determine some of the dates when, and the localities in which it showed itself first, a part of the question which seems to have been somewhat overlooked; and a few facts are of more value, than much speculation on the subject.

The disease is represented as prevailing in May and June in Kishnaghur (of which another name is Nuddea), sixty miles north of Calcutta; and in Mymensing, 250 miles north-east. On July the 11th it broke out in the large city of Patna, 300 miles north-west of Calcutta. It was at Sonergong, in the Dacca district, in July, about 150 miles east of it. Early in August cases of the disease occurred in Calcutta and Jessore, but did not cause much alarm till about the 15th and 19th of the month respectively.

On the 13th of August cholera was at Sylhet, nearly 300 miles north-east. Nay, by the 18th it had reached Ghazeepore, almost 400 miles north-west of Calcutta. We know that the disease was raging in Chittagong, 250 miles south-east of Calcutta, by the 23rd of August.

It is, therefore, very surprising, how Jessore ever came to be considered the centre from which the disease spread in 1817,* and still more how the Sunderbunds, a district south of it, equivalent to the mouths of the Ganges, have been specially fixed on. Notwithstanding the declaration of the Constantinople Cholera Conference, that Jessore could not be considered to be a particular centre of diffusion, the statement that cholera dates its origin from Jessore, or from the Sunderbunds, is repeated in almost every work—has, in fact, become stereotyped.

We have already seen that cholera was spread over a large area in almost every direction from Jessore except the direct south, before its outbreak in that place.

The districts south of Calcutta and of Jessore were not attacked until after those places. Diamond Harbour, for instance, forty miles south of Calcutta, was attacked on the 20th of September, or a month

* Until they were better informed, the Bengal Medical Board seem to have shared the popular belief about the local origin of cholera at Jessore, and that it spread from that centre. This belief they entertained up to the latter half of the year 1818. See their letter in the Bombay Reports on Cholera of 1819.

later. The Sunderbunds are not once mentioned by name by Mr. Jameson, but he does remark that the mouths of the Ganges did not suffer till a month after Calcutta. Indeed, it may be doubted whether they suffered at all in 1817. Mr. Jameson's only positive fact is, that cholera reached Burisal, which is situated at the eastern border of the Sunderbunds, on September 14th; but further on in his Report he says, that in Bullooah, and tracts near the mouth of the Ganges, the disease began in February, and ended in June, 1818. In any case the mouths of the Ganges were attacked after Calcutta and Jessore. As to other places situated south-west of Calcutta, Balasore, on the coast, 180 miles distant, was attacked on September 15th; Midnapore and Cuttack are said to have been almost spared during the first year of the epidemic.

On the whole, therefore, all our evidence goes to show that in 1817 cholera was, in the first instance, diffused to the north of Calcutta and Jessore; that it was first in the upper, or rather the outside part of the Gangetic Delta, and certainly not in its lower portion. The disease had no special connection with Jessore, and still less with the Sunderbunds.

The disease, however, when it did reach Jessore, was of a high degree of intensity. But, neither did it begin there, nor can it be said that it showed itself there first in a small way.

I have been unable to discover the source even of the report that cholera originated in the Sunderbunds.

(4.) Did the disease spread from any centre? Jameson, when the facts were all before him, was able to say it did not spread from a centre, and he is probably quite right. I am far from meaning to assert that there is sufficient proof that there was any centre. Yet I cannot but remark that, if there was one, the district in which the gipsies had cholera the year before, was as probable a centre as any—Saifgunge, in the Purneah district, lying about 150 miles west of Mymensing, north of Kishnaghur, and east of Patna, the places where cholera was first observed in 1817.

(5.) Is there any ground to believe that the disease in that year came to Bengal from any other quarter? We know that in 1781 epidemic cholera was believed to have reached Calcutta from Ganjam, and then passed off to the north; but in this year there is not the slightest indication of there having been cholera in Ganjam, or among the pilgrims at Juggernath, or, indeed, of the malignant kind in any part of India. The last we have heard of it in the Gangetic Valley was at Chunar, where there were seventy-nine cases in 1811-12-13, and the local epidemic in Purneah in 1816, already alluded to.

In more distant parts of India we only know of the small outbreak near Jaulnah, in 1814. On the whole, there is no other quarter of India from which we can conjecture that cholera came to Bengal in 1817; there is no trace of its importation in that year.

(6.) When we undertake the investigation of

questions concerning the propagation of disease, except when it passes direct from man to man, we enter on very perplexed paths. When we engage in inquiries as to the origin of a new disease, a wider sea of difficulties opens before us. A good deal is known, although more is assumed, of the causes that have led to local outbreaks of disease, and that favour the spread of a malady that is once in existence; but of the causes which produce world-wide pestilences we virtually know nothing. Nevertheless, we may pass in review some of the causes that have been assigned for pestilences in general, and for the outbreak of 1817 in particular.*

* There is so much that is assumed and so much that is vague in ætiology, that I may be excused for endeavouring to state a few elementary considerations. Many, I believe, have positive opinions on points considered doubtful by others.

A distinction must be drawn between the origination and the propagation of an epidemic disease.

As to its commencement, we may conjecture it to be some morbid process originating within the system, or excited in it by bodies organic or inorganic, solid or gaseous, however generated, coming from without.

The morbid process, when once set up, has periods of activity and of rest. (The cause of this has been conjectured to be the periodical birth and death of animal or vegetable germs.) Whether such process ever arises afresh, either from within or from without, in a disease like cholera, or it is only revivified —in short, whether there is spontaneous generation of cholera —remains undetermined.

The morbid process once having been set in action, it is ascertained that in some diseases, and it is probable that in others, the system gives off particles capable of propagating it. These particles may be transferred from man to man in various ways:—

Quintilian,* in his chapter De Conjectura, says that pestilences may arise from "irâ deûm, aut intemperie cœli, aut corruptis aquis, aut noxio terræ halitu." There could not be a more concise expression than this, of the views of the ancients on the subject, and one might almost suspect that there

1. *By contagion, direct or indirect.*—To many minds the explanation of the propagation of cholera by contagion alone is quite satisfactory.

2. *By air.*—The theory of cholera being an air-born pestilence has always been the popular one in India, and has, if I may use the expression, been revitalised of late years by Dr. Bryden with much ingenuity and ability.

3. *By water.*—The school that believes in the propagation of cholera mainly by water polluted with its germs, is essentially English.

4. *By soil.*—Under this head come all the old popular notions of emanations from the soil, malaria, drain, and privy emanations, gases, such as sulphuretted hydrogen or carbonic acid. Pettenkofer must be considered the great modern investigator of these terrene miasms. I would venture to say, that in his views, as he now expresses them, it appears to me that the presence of the dejections of cholera occupies a less prominent place than formerly. His great factors are, soil and subsoil in various conditions of heat, porosity, and moisture (including *grund wasser*, to which he seems now to attach a wider meaning), and the extrication of gases. In his most recent researches he has obtained some very remarkable results as to the great and sudden increase of the amount of carbonic acid given off by the soil in the months of August and September. It remains to be seen whether this phenomenon will prove a constant one, and to discover a satisfactory explanation of it, if it be so.

5. *Seasons and weather.*—These undoubtedly influence the

* Lib. vii.

was a little quiet irony, in its being introduced in the chapter on Conjecture.

Further agencies, such as earthquakes, sidereal influences, electrical currents, newly-developed animalculæ, or fungi, are things of which we practically know nothing as generators of disease, and very little that is positive of any of them as propagators of it; but men groping in the dark have attributed pestilences to their influence, and cholera among others. Such theories allow so wide a scope to the imagination, that they will always be popular with many; for, as man is constituted, he is better pleased to have any explanation of a phenomenon than none. They are in their nature extremely attractive, but until some mode is discovered of submitting them to the rigid test of observation, they must not be allowed to usurp the place of facts.

Still more imaginary or fanciful causes, such as cerebral degeneracy of the Hindoos under the rule of foreign masters, influenced solely by a mercantile spirit, or combinations of moral and cosmical causes, have been sometimes advanced by the French,

propagation of cholera. In one sense they may be considered as the aggregate results produced by the last three agents—air, water, and soil—as influenced by light, heat, and electricity.

It appears to me that all writers on ætiology insist too much on some one of the foregoing modes of propagation.

There is a further side of the question, and one with which hygiene has much to do—how far individuals or localities are predisposed to receive the disease, when it is brought to them, through whatever channel.

and by others, who have doubtless supposed that they have been explaining something by the use of this vain and mystic phraseology; but I pass on to causes of which somewhat more is known—sequence in time seeming to point to cause and effect, even though it may not explain the mode of operation.

(*a*) Pestilences have been attributed, at times, to the crowding together of large congregations of human beings, and local outbreaks of disease have been traced to such causes. But no cause of such a nature existed in Bengal in 1817. We know of no great pilgrimages or assemblages there in that year. Besides, the pilgrims to Juggernath only skirt the Delta of the Ganges; and the pilgrimage to Saugor Island, at the mouth of the Hooghly, is comparatively a small one. Cholera did not become epidemic till some months after the season of pilgrimage; and there is no evidence to show, that in the early part of the year there was cholera at either of these places. In fact, those places which lay to their south, were not attacked till after Jessore and Calcutta. Lord Hastings's large army was also in an entirely different part of India, from that which was the scene of the first outbreak.

(*b*) We know that bad food predisposes to many diseases, and that some kinds of it are the exciting causes in India, as in Europe, of attacks, often fatal ones, that closely resemble cholera. We have seen how often, in all ages, cholera has been attributed to irregularity of diet. At the time of the outbreak, much was attributed to the consumption of bad rice

and of decayed fish. New rice is always unwholesome, and bad fish has often acted like a violent poison; but there is not the slightest evidence that there was anything unusual as regards the quality of the supply of food in Bengal in 1817.

(*c*) Famine is another cause that has been assigned for pestilences, but though there have often been famines in India, and there was scarcity of grain in some parts of India in the preceding year, there was no scarcity of food in Bengal, or in any other part of India, in 1817.

(*d*) Experience shows us that various conditions of poverty, with its close attendant, filth, along with bad drainage, and bad water, and rank vegetation, are inimical to health, and favour local outbreaks of disease. Such sources of disease were pointed out by Sonnerat as accounting for the cholera on the Coromandel coast, and such conditions of unhealthiness existed in Bengal abundantly at all times. It can scarcely be said that there was anything peculiar in this respect, in the state of Bengal at the time we allude to.

Even if it were certain, as some believe, that large tracts of land, in Lower Bengal and in the Sunderbunds, which were formerly under cultivation, are now waste, owing to the silting up of rivers, and other changes, such causes had been in progress for long periods before the year 1817, and there is no evidence that they were intensified about that time.

(*e*) It has been a favourite notion of the French, to throw the onus of the production of cholera on

English domination, and on the neglect by Government of the great public works of the Mussulman Emperors.* I need not inquire where those great works were situated—certainly not in Lower Bengal—or at what period they fell into decay. It seems sufficient to observe, that cholera was first known to us in districts where no such works ever existed, that is, along the shores of India.

(*f*) Seasons may be regarded as the aggregate result of the temperature, moisture, and movement of the air, and of its action on soil and vegetation; and their operation on disease, both in the production and in the propagation of it, is one of the best established facts of ætiology, although the theory of this is very imperfectly known.

A great deal of influence in the production of the cholera of 1817 has been attributed to the irregularity of the season in Lower Bengal. There seems to be no question that the season was an unusual one,† that in 1817 there was an extensive inundation

* See Dr. E. Goodeve's Reply in Proceedings of Constantinople Conference.

† On this, as on many other points, the Bengal Medical Board had, in the first instance, very imperfect information. It wrote to Bombay in the latter half of 1818(*a*):—"The preceding cold and hot months were in no way different from those of former years, and the rainy season was progressing with its wonted regularity, when cholera appeared." Yet the same Board, on 23rd September, 1817, had thought the disease "chiefly referable to the long-continued and incessant rains of this present season."(*b*)

(*a*) Vide Bombay Reports.
(*b*) Baird Smith's Indian Annals, 1870.

in Lower Bengal. In the preceding year the scantiness of the rains, and the short supply of grain, were believed to have generated in the Upper Provinces a bad epidemic of a bilious remittent fever.

In 1817 there were singular deviations in Lower Bengal from the ordinary course of the seasons. In the lower and western portion of the Gangetic Valley there was a long protraction of heavy rain (120 inches, or nearly double the usual amount of rain, are reported to have fallen during the year), while in the eastern part of Bengal things wore a different appearance. In that quarter, there was a deficiency of rain, and the rise of the river was four feet short of its usual height. There was, therefore, undoubtedly the influence of unusual weather at work. We have already said, that it is known to induce attacks of illness in individuals, and also to influence the course of epidemic diseases. What further power over disease it has, no one can pretend to lay down positively. Incapable though it may be of producing a new disease, yet it may possibly be able to intensify an old one, and cholera was an old malady in Bengal, though latterly quiescent.

It seems at least certain, that the influence of weather was sufficiently powerful to alter the period of the old endemic disease, for the first epidemic of its aggravated form in Calcutta took place in September; although even in the very next year the old epidemic season of the dry weather resumed its sway. The old season for the disease returned; but,

unfortunately, not the comparative mildness which had characterised the affection of late years.

As to the origin of the disease in 1817, it seems, therefore, pretty certain that it was the old endemic complaint which became intensified in that year, and the most reasonable conjecture is, that the disease was intensified by the unusual weather.

"Intempestivis pluviisque et solibus icta."

Whatever may be the value of this conclusion, which has no pretension to novelty, a careful examination of all the circumstances connected with the origin of the disease makes it certain, that no great change of any kind, no new palpable cause or class of causes, came into operation about the year 1817, as has been inferred to have been the case by the Constantinople Cholera Conference. Such new causes of any tangible nature never have been, and never are likely to be, detected, as far as I am enabled to form an opinion.

If I cannot pretend to have thrown much new light on the causation of the outbreak of 1817, still it is to be remembered that the origin of all great pestilences is buried in obscurity; and that, if it has been ascertained that the cholera of 1817 was only the old cholera intensified, more has been learnt of its origin, than of that of most of the great epidemics or world-wide pestilences.

It would be beyond the scope of these historical notices to inquire, why the last outbreak of cholera has remained so long in force—why, unlike former

ones, it has not yet reached a period of quiescence—and further, why this last outbreak has been so extensively diffused.

I shall content myself with merely remarking on the latter question, that it has been often attempted to explain the spread of the disease, by saying that the year 1817 is a period from which increased communication throughout India commences. There is, however, no ground for this assumption, as far as I have been able to ascertain. I cannot attach the importance that some do to the attack of the large army under Lord Hastings by the epidemic. Increased facilities of communication sprang up very gradually in India, and their commencement can be referred to no particular date, and certainly not to so early a period as the year 1817.

CHAPTER VIII.

GENERAL REVIEW OF CHOLERA IN THE EAST.

1. The word *mordeshi* and its modifications have been used, like the word cholera, somewhat loosely, and applied to various forms of the disease in the East. This has been already apparent, but will come out more clearly by a summary of its use by authors.

D'Orta talked mainly of only one *morxi* — the Arab *Haida*—but also mentioned a dry form. Bontius mentions only one cholera, or *morxi;* he almost always associates it with dysentery, but on one occasion with spasms. De Thevenot, again, described generally four varieties of *morxi*, one of which he thought was the true cholera morbus. Dellon, although he alludes to its fatality and to its connection with fever, says *morxi* is an indigestion. Fryer seems to speak of cholera morbus and of *mordeshin* separately. Mandelsloe talked of the *mordexins* in the plural. Martin called *morxi* a sort of *ileus miserere.* Sonnerat seems to describe three diseases—first, epidemic cholera, which he calls a *flux aigu;* next, serous fluxes with vomitings, to which the natives of India are subject; and lastly, an indigestion which is called *mort de chien.*

Lind treats of dysentery and cholera morbus in the same chapter, and knows that *mordeshin* is the Indian name for the latter. Sir R. Chambers tells us that he used to have several attacks of *mordeshi* during the year.

Curtis mentions that cholera may be bilious or spasmodic; and Girdlestone seems mainly to have regarded the spasms. Curtis and Clark were aware that they were called *morxi*, or rather *mort de chien*. Fra Bartolomeo calls *mordeshin* an intestinal colic, though describing the true features of cholera. König thought cholera an apoplectic dysentery.

This analysis might easily be carried further, but enough has been said to show that the diagnosis and nomenclature of cholera were scarcely a shade more accurate in the East than in Europe. Nor is this surprising. Many of the authors just quoted were unprofessional men, from whom technical exactness could not have been expected. Still, the existence of a violent form of cholera called *morxi* comes out everywhere very distinctly. Doubtless the disease itself varied in its character then as it does now, and authors naturally described differently a disease of varying intensity.

I suppose there are few who will not admit that cholera varies, but I shall, nevertheless, give my own general experience of cholera attacks in India.

You meet with an ordinary bilious attack, often colicky, but of unusual severity.

You have an attack closely simulating cholera in all its symptoms (and which an experienced physician

may in the first instance take for and treat as cholera), sometimes ending fatally, which may be traced to the use of a positively poisonous article of diet. A familiar example of this is offered by copper poisoning, sometimes erroneously called copper colic—erroneously, for I have never seen constipation in it.

Then you have occasional sporadic cases of cholera, or you have the disease bursting out with epidemic violence, and spreading on every side.

If this or any similar classification at all approaches the truth, it is not surprising that various forms of disease were described by the term *mordeshin*.

But a further source of confusion is, that cholera, even in its epidemic form, although retaining its characteristic features, varies in its symptoms, not only in different seasons, but during different periods of the same outbreak. The variety is shown in the presence or absence of premonitory diarrhœa, the amount of vomiting and purging, the violence of the spasms, the lividity of the countenance, the period of the supervention of collapse, the frequency of the occurrence of secondary fever. It was the predominance of particular symptoms that led to many of its names — as bilious, spasmodic, asphyxia, syncope, black cholera, dry cholera. Three varieties in different epidemics were well observed by Sonnerat, and we have seen that the violence of the spasms led occasionally to the disease being confounded with tetanus. True tetanus has undoubtedly occurred in cholera, in Europe as well as in Asia, though it is not frequent.

The general result at which we arrive, from a consideration of the use of the word *mordeshi*, is, that there was always cholera of varying intensity in India, from the date of European connection with it, and that *mordeshin* was a general name for the disease, although often loosely applied. It would be a vain attempt to endeavour to determine, in every instance where the word *mordshi* has been used, whether true cholera was meant to be indicated by it, as the writers who used the two phrases had often no very definite ideas on the subject; but it is absolutely certain that a disease identical with modern malignant cholera, both in its sporadic and its epidemic form, was usually meant by *mordeshin*.

2. It is unnecessary, I think, to enter into questions as to what constitutes the endemicity of a disease. I shall use the word in the sense of a disease prevailing in a district for a series of years.

With respect, then, to the endemicity of cholera in various parts of India, especially from Surat to Cape Comorin, and along portions of the Coromandel coast, our early travellers had no doubts on the subject. Even Bontius regarded cholera as a disease of Java—he expressly calls dysentery, cholera, and spasms endemic; and Then Rhyne described it as prevailing on all the coasts of India. It is unnecessary to recapitulate all that authors have said on the subject of its prevalence in the north and west of India; but some of the more valuable information is, what Sonnerat gives about the coast near Pondichery, in 1770; Bartolomeo, in 1782, about

the coasts of Malabar and Coromandel; and their accounts are in a general way confirmed by Clark, in 1792.

But was cholera an endemic in India at the time of the outbreak?* We have already seen that Drs. Barnes and Tytler, and Dr. Young, also Dr. Macrae, of Chittagong, say they were acquainted with the disease, though usually in a milder form. Dr. W. Ainslie† informs us, that he had long known sporadic cholera to be common on the Malabar coast.

For further evidence we must travel a little beyond the year 1817, although I am anxious not to exceed that limit. The Madras newspapers, in 1818, said that the disease was occasionally known as an endemic in that Presidency; but we have nothing more important or interesting in the whole history of the disease, than what Mr. Hay wrote from Quillon, Nov. 19th, 1818:—

"The spasmodic cholera, which caused great mortality in Trevandrum, in last May, I am happy to say, abates, the last seven days having only afforded thirty-six cases and one death. But the Pythians (native doctors) report the death of almost all attacked. I hold this to be the endemic of the

* Orton, one of our most intelligent writers on cholera, said:—"Sporadic cholera is rarely met with, except in certain tracts of country, as the lower provinces of Bengal, Chittagong, the east coast of Ceylon, the province of Travancore, and, according to Sir J. Malcolm, certain woods and highly malarious tracts of Malwah."—On Cholera, 2nd edit., 1832, p. 351.

† Observations on Cholera, 1825.

Malabars, which is perfectly familiar to us all. I trust to be able to make a noble stand, when the epidemic does arrive." No new disease, however, was reported to have reached him that season, and Mr. Scott, the author of the Madras Report, remarks that there can be no doubt, that the endemic of Malabar was the epidemic of other parts of India. It is strongly in favour of its having been really the epidemic, that it occurred exactly at the usual season for its prevalence, according to Fra Bartolomeo. Whether this conclusion be accepted or not, I think it is impossible for anyone, after making all allowances for native exaggeration, to doubt that at this time a severe form of cholera prevailed near Quillon. If Mr. Hay and the Pythians mistook the new cholera for the old endemic one, with which they were so familiar, it only shows, how very closely the diseases must have been allied. It is extremely to be regretted that Mr. Scott did not push the inquiry further at the time. Of no subject is less known, than of the meeting of an endemic and an epidemic of the same disease.

But perhaps as striking a case as that of Mr. Hay, is afforded us by Mr. Craw. He writes from Seroor,* 30th July, 1818 :—" You have seen that I think the disease, as it has exhibited itself in the European corps, is allied to tetanus. But I must tell you that we have, too, cases of common cholera; and should we not have had them, though free from this wide-

* Reports on the Epidemic Cholera, Bombay, 1819.

spreading disease? I had two or three hundred cases last rains at Caranja." Mr. Craw further observes that the disease is of a most multiform character. Both common and tetanic cholera were occurring at the same time.

Are we not fairly entitled to conclude that cholera morbus was endemic in that district, in Mr. Craw's opinion, and that the chief difference he perceived between it and the epidemic disease, was the comparative violence of tetanic spasms, which symptom, too, he observed mainly in Europeans? In short, we find that Mr. Hay took what was considered to be the new disease for the old one, with which he was perfectly familiar; and that Mr. Craw considered a portion of the cases occurring during the epidemic, which reached him in 1818, to be of the same nature as cases of the disease he had treated in the previous year.

We are strongly reminded, by this mixture of different forms of cholera, of the cases with tetanic spasms which Girdlestone gave an account of, without any mention of purging, and of Dr. Clark's very sensible remarks on the subject* :—"The spasmodic affections which appear on the Coromandel coast seem to have a close analogy to cholera. With respect to their cure, according to the united consent of all the gentlemen with whom I have conversed, they are to be treated exactly like cholera."

On the whole, then, without endeavouring to push

* On Diseases in Hot Countries, &c. London, 1792.

any conclusion too far, I think we have sufficient evidence, that about the time of the outbreak of 1817, a certain form of cholera prevailed in various parts of India, and in some extremely remote from Bengal—a form so closely resembling epidemic cholera, that it was difficult to distinguish the one from the other.

3. But cholera at times prevailed epidemically as well as endemically. The Goa epidemic of 1543 seems to have been one of great intensity. It would be interesting to learn whether cholera prevailed in other parts of India at that time; but on this, and on other early epidemics, no complete information is to be obtained. There is strong reason to believe that there were several epidemics of cholera in the seventeenth century, especially in its latter half, in Marwar and Mewar, and possibly at Goa, Surat, and Balsora. If we come to later ones, we find that there were many epidemics in the south, near Madras, from 1757 to 1780; but we have no traces at that time of cholera on an extensive scale in any other part of India.

Dr. Clark expressly tells us that cholera was more prevalent on the Malabar and Coromandel coasts than elsewhere.

We know the medical history of Lower Bengal for that period tolerably well, and that during the last half of the eighteenth century there was little cholera in Bengal, and therefore it is highly improbable that the epidemics of cholera of that period on the Madras or Malabar coast, had come from Bengal or any other part of India.

In those days they knew that cholera travelled

considerable distances, but do not seem to have entertained the idea of its source being in an entirely different part of India, from that in which it occurred. And there is no evidence to show that it was—not even enough to excite the suspicion of it.

Within the period of his stay in India, or from 1774 to 1781, Sonnerat records one epidemic followed by another in two years.

In 1781, what was called the Ganjam epidemic reached Calcutta, where the disease seems to have been quite unknown.

Again, in 1790, the Bengal column, marching south, was astonished at the outbreak of the disease, which they thought they picked up on the Ganjam coast. This was the last considerable epidemic before 1817.

It appears to me perfectly marvellous that, for more than two years after the outbreak of 1817, the Medical Board of Calcutta remained in ignorance of the invasion of Bengal in April, 1781. Yet in ten days of that month it killed more of the inhabitants of Calcutta, than were carried off by the epidemic of 1817 during the three first months of its prevalence. Of officers who made reports to the Bengal Board, Dr. Macrae appears to be the only one who had seen anything like a real epidemic.

In like manner, as already observed, D'Orta, writing in Goa, makes no allusion to the great epidemic of the disease, which had occurred in that city twenty years before. Apparently, the memory of such things is soon lost.

4. Intimately connected with endemicity and epidemicity is the tendency of cholera to prevail in particular districts at particular seasons. The disease, though it is capable of appearing at any period of the year, yet seems to have a preference for one* or even more periods of it.

Thus we have seen that on the Malabar coast the last months of the year were its favourite period; in Ganjam and Calcutta, again, the hot season; while from Surat to Bombay and Goa the season was earlier than farther down the coast.

It would be unwise to pretend to push this subject further, or to be more precise, as it is only now by the results of a whole series of statistical returns that we are making out the seasons of the present prevalence of cholera; and undoubtedly, so far as we can see, the old and the new seasons coincide. I merely insist on the fact of seasonal prevalence; its theoretical or ætiological explanation may vary according to the theories held by different observers.

* This was indicated in some tabular statements by Sir R. Martin and Dr. D. Stewart, but was first pointed out on a large scale by Mr. H. M. Macpherson, Inspector-General (retired), in his valuable statistics of Calcutta (*a*). The question was gone further into in "Cholera in its Home," and the remarkable influence of Indian season on small-pox, as well as on cholera, was pointed out. These subjects have been since illustrated on a vastly wider scale by Dr. Bryden, in his exhaustive report, and by Dr. Cornish, in his recent lucid examination of the diffusion of cholera

(*a*) Indian Annals, 1863.

5. If we consider our knowledge of the diffusion of cholera in India chronologically and geographically, we shall find that in early times it was mainly proportionate to our knowledge of the country.

During the sixteenth century Europeans had little intercourse with any part of India except its western coast. In this period, accordingly, we find cholera at Calicut, at Goa, and the country round, and we have an account of a frightful epidemic of it at Goa. In the next century we hear of cholera over a wider area. It was, in the first half of the seventeenth century, in Sumatra and Java; it is said that it was also in Arabia, and we have further accounts of it at Goa. In the last half of the century we have accounts of its continued prevalence in Java, also in Ceylon, and on all the coasts of India; indeed, if we take Then Rhyne's statement in its widest sense, in Bengal also, and throughout the whole of Asia. We have special notices of the disease at Goa, Damaun, Surat; and a very probable account of epidemics in Marwar and Mewar, and at Goa.

For the first half of the eighteenth century we

in the Madras Presidency. Professor Von Pettenkofer has done much to spread in Europe the knowledge of the latest observations in India, and of the fact of the periodicity of cholera in that country. But it must be remembered, with reference to most of our Indian Reports, that they chiefly illustrate cholera as it occurs under peculiar conditions, that is, among men massed together, as soldiers or prisoners, and that as yet we have little information respecting the diffusion of the disease throughout the general population.

have few accounts of cholera; yet we have traces of it at Madura, at Calcutta, at Madras, at Goa, and generally as an Indian disease. In the latter half of the eighteenth century it was constantly prevailing, often with epidemic violence, especially from the year 1768 to 1783, almost uninterruptedly, especially along the Madras coast. It was at Bombay and on the Malabar coast, in the English fleet in those seas, at Trincomalee, Tinnevelly, Pondichery, Cheringam, Arcot, Vellore, on the Coromandel coast generally, and at Ganjam, whence it travelled to Calcutta and Sylhet; at Bombay, on the Malabar coast, at Tranquebar, high up in the north-west at Hurdwar; again at Vellore and Arcot, again near Ganjam and at Travancore, besides being very probably epidemic in Mewar and Bundlecund. It seems to have been last heard of in this century at Burisal, near one of the mouths of the Ganges. It had by this time visited almost every corner of India.

In the first years of the nineteenth century we hear of a few cases of the disease in very opposite parts of India; none of them, except the outbreak near Jaulnah, approaching to the nature of a violent epidemic. Some of those places were Trincomalee, Chunar, Jaulnah, Fort William, Purneah. Besides this, there was a comparatively mild form of the disease, but varying in intensity and the degree of its prevalence, known in many parts of India as an endemic. This was the state of things before the great outbreak of 1817.

6. If we next consider the configuration of the

districts through which cholera was diffused,* we are struck by its prevalence along sea-coasts; but this may be in a great measure attributed to European intercourse, and to our knowledge, consequently, having been limited in the first instance to the coasts, and to mouths of rivers. We have it along the two shores of India—the western, remarkable for its luxuriant vegetation, and for its periodical heavy rains; and the eastern, which may be almost characterised as being its opposite in these respects. In modern times cholera has been observed to follow the course of rivers. In how far are there any traces of its doing so in olden times? We have none on any of the large rivers, such as the Ganges, the Godavery, or the Nerbudda; but we have cholera prevailing at Arcot, Vellore, and Amburpet, up the Paliar river from Madras. We find cholera frequent at the embouchures of rivers, as at Surat, Goa, and Cochin.

It seems to have flourished in the dense verdure of Goa, and in the back waters further down the coast. On the other side it visited the deltas of the Cauvery and the Ganges, and perhaps that of the Mahanuddy, for troops appear to have twice suffered from the disease, just after passing through it. But it also visited the plains of the Carnatic, the high land of Malwah, 2000 feet above the sea, the central district

* This subject is, I hope, sufficiently illustrated by the map prefixed to the work, although its scale is small. The object has been more to indicate districts, than to insert every spot where cholera had been noted.

of Bundlecund, and occurred as high up the Gangetic valley as Hurdwar—districts in their climate and physical characteristics as remote as possible from the deltas of rivers.

It also reached islands: Ceylon (which may be counted part of India), Java, Sumatra, and the Mauritius. It seems to have visited Arabia, and possibly Africa; but respecting this, and its prevalence in China or Japan, at least in an epidemic form, we must speak with reserve. It has existed on coasts and islands, on deltas of rivers, on plains a thousand miles distant from the nearest sea-coast; in districts of as different configuration, as the delta of an Indian river, and the volcanic formations of the Mauritius. Nevertheless, the disease has, on the whole, shown a preference for low, damp districts with abundant vegetation; in early times, as was indeed to be expected, there are no accounts of its invading hills approaching in height to mountains.

Cholera has manifested itself on soils and rocks of the most opposite nature—on alluvium, on laterite, on sandstone, on trap, and on primary formations.

7. Our knowledge of the chronological and geographical distribution of cholera is summarised in the following table of notices of *mordeshi*, or *mort de chien*, of cholera, or of cholera morbus, in the East, chronologically arranged. Epidemics are marked with an asterisk:—

Author.	Year.	Locality.
Correa	1503 .	Near Calicut.
Do.	1543 .	Goa.
D'Orta	1563 .	Goa.

Author.	Year.	Locality.
A'Costa	1577	Canara.
Le Blanc	1580	Goa.
Linschott	1589	Goa.
Beaulieu	1621	Sumatra.
Bontius	1629	Java.
Do.	1631	Batavia.
Zacutus	1632	India, Arabia, and Mauritania.
Mandelsloe	1639	Goa.
Baldæus	1641	At sea in the East.
*Colonel Tod	1661	Mewar.
De Thevenot	1666	Between Surat and Boorhampore.
Fryer	1674	Surat.
Dellon	1676	Goa and Western India.
Then Rhyne	1679	Coasts of India.
Cleyer	1680	China.
*Colonel Tod	1681-2	Marwar.
* Do.	1683-4	Goa, Surat.
Kaempfer	1684	Japan.
Homberg	1689	Java.
Ovington	1690	Surat.
Carreri	1695	Damaun.
Père Martin	1703	Madura, Coasts of India.
Luillier	1703	Bengal.
Père Papin	1709	Bengal.
Valentyn	1726	Goa.
Arbuthnott	1733	Madras.
Paxman	1736	India.
Grose	1750-64	Bombay and Malabar Coast.
Johnson	1756	English Fleet in India.
Madras Report	1756	Arcot.
*Orme	1757	Tinnevelly.
Paisley	1757	First campaign.
Niebuhr	1761-3	Arabia.
Wänmann	1766	India and China.
Gentil	1769	Pondichery.

Author.	Year.	Locality.
*Sonnerat	1768-9 .	Do., and whole coast.
Madras Report . . .	1769-71	Amburpet and Arcot.
Clark	1772 .	Bombay.
Paisley	1774 .	Madras.
Burke	1775 .	Mauritius.
Fontana	1776 .	Malabar Coast.
Fra Bartolomeo . . .	1778 .	Malabar Coast.
Sonnerat	1778-79	Coromandel Coast.
Bengal Report	1779 .	Bundlecund.
Sir Elijah Impey . . .	1779 .	Calcutta.
Lind	1780 .	Common in India.
Folly	1780 .	Tranquebar.
*W. Hastings	1781 .	Ganjam and Calcutta.
Hirsch	1781 .	Anderne's Army in South
Curtis and Girdlestone .	1782 .	Madras, Fleet, Trincomalee.
König	1782 .	Tranquebar.
*Bartolomeo	1782 .	Malabar Coast.
Do.	1782 .	Cochin.
Clark	1782 .	Bombay.
*Madras Report . . .	1783 .	Whole Madras Coast.
Do.	1783 .	Army of Observation.
Hay	1783 .	Travancore Country.
*Bengal Report	1783 .	Hurdwar.
Madras Report . .	1787-8-9	Vellore and Arcot.
Do.	1789 .	Bellary.
Dutch Accounts . . .	1789 .	Batavia.
Bengal Report	1790 .	Near Chilka Lake.
*Hay	1792 .	Travancore.
*Jukes, Tod	1794 .	Mewar and Mahratta Country.
Jukes	1794 .	Thanah.
Taylor	1797 .	Backergunge, or Burisal.
Jameson, T.	1802 .	India.
Johnson, J.	1804 .	Trincomalee.
Macnamara . . .	1808-9-11-12-13	Various places in Bengal, Chunar.

Author.	Year.	Locality.
Madras Report . . .	1814 .	Jaulnah.
Bengal Report . .	1815-16	Calcutta.
Calcutta Newspaper . .	1816 .	Purneah.
Bengal Report . . .	March, 1817	Fort William.
Do. . . .	May and June	Kishnaghur, Mymensing.
Do.	July .	Patna.
Do.	July .	Sonergong in Dacca.
Craw	1817 .	Caranja, in rains.
Bengal Report . .	August 13	Calcutta.
Do. . . .	August 19	Jessore.

8. As to what may be called the habits of the disease, when it became epidemic, it attacked the natives over large areas; it showed little respect for persons, although the poor and feeble were supposed to suffer most. It sometimes attacked them in their religious pilgrimages, of which we have a striking instance at Hurdwar. Europeans were as liable to its attacks as natives.

The disease attacked camps. It was picked up, so to say, by troops passing through districts where the malady prevailed. The disease would either reach its maximum in a few days, and then leave the column, or it might adhere to it for weeks in the shape of sporadic cases. Of two bodies of soldiers, apparently under exactly the same conditions, it would attack the one, and spare the other. It is difficult to say whether European troops suffered more than natives; the men certainly suffered much more than the officers. The robust and the weak seem to have suffered nearly alike. The great majority of attacks were just before daybreak.

There are indications of travellers having suffered particularly, and positive proof of European soldiers suffering at the time of their disembarkation, from the ships that had brought them to India.

The disease often attacked ships, and, indeed, was particularly common among sailors, although often confounded with colicky affections.* Dr. H. H. Goodeve† observed long ago that cholera, though not perhaps existing to so great an extent throughout India generally, was, in 1782, as destructive on board our ships, as it has been at any later period.

There is the strongest presumption, that cholera was conveyed from place to place by ships as much in those, as in later periods.

With reference to the history of the disease after 1817, a knowledge of the travelling habits of the malady before that time is a desideratum. But it is not safe to affirm much positively. It seems to have been believed, that the disease readily travelled up or down either coast of India, when it was epidemic. In 1781 it travelled from Ganjam to

* Mr. Jameson, p. 92, makes the very important statement, that the epidemic has again and again visited the sailors of European ships just entering the river, and previously to their having any communication with the shore. Surely it might be easily ascertained whether this is really ever the case in the river Hooghly. I have had cases reported to me of sailors dying without having touched the shores of India, but not before their ships had communicated with the land.

† Transact. Med. and Phy. Society, Calcutta, vol. viii., part 2nd, 1842, in an excellent sketch, I believe the only one extant, of the history of European practice in India.

Sylhet, which was north-east, and in 1794 nearly south, from Mewar to Thanah; in the one case, going from the coast to the interior—in the other, from the interior to the coast.

With respect to the supposed rate of travelling of the disease we know very little, but it is worth observing, that it attacked Colonel Pearse's force near Ganjam, on the 22nd of March. On the 27th of April, Warren Hastings remarks that it had visited Calcutta about the 13th of March, and after a fortnight's prevalence was passing off to the north.

9. We have not many data to throw light on the period of incubation of the disease; but two cases show as well as any instances have done so since, how short the period of incubation commonly is. Dr. Clark tells of soldiers getting cholera on landing at Bombay the day after their coming into harbour; and in like manner Girdlestone tells us of troops being attacked at Madras within three days of their arrival. The period of incubation was therefore just as short in those days, as it is usually now.

10. Respecting the causation of the disease, we find no ideas that were not familiar to the ancients. The prime factor was always heat, next vicissitudes of temperature, sometimes rain and damp heat, and generally locality and climate, as the disease was believed to be an endemic in particular places, and common on board ship, and most prevalent at particular seasons. Filthy and

ill-aired places were acknowledged to present a field very favourable for cholera. On the part of the patient, (as has been already observed in the summary of an earlier period in Chapter V.) much was generally attributed to some imprudence on his part; for instance, to exposing himself when overheated to cold air, especially to sleeping with the abdomen uncovered. A great deal was also ascribed to the use of unwholesome articles of diet, especially of some kinds of fish, and fruit, and rice, and of bad drinking water. Fatigue and excess of any nature, imperfect clothing and poor diet, and general low condition, were also assigned as causes, but in the middle of epidemics were less observed, as then there was little distinction of persons.

Although contagion was commonly admitted in the case of dysentery, and mainly through the medium of the evacuations, it seems only to have been just thought of in cholera, and the first expression of a suspicion that the evacuations might propagate the disease, occurs in Jameson's mention in the supplement to his Report of the state of the privies at Meerut. The non-mention of contagion, however, does not in itself prove anything, for in former times smallpox and scarlatina have often been treated of, without any allusion to their contagiousness being made.

11. There is nothing very new to be gathered concerning the pathology of the disease during this period. The disease was supposed by some to be excited by putrescent food or corrupted bile acting on

the stomach and intestines. Sonnerat suggested suppressed perspiration getting into the blood and poisoning it. Then the violence of the spasms led to the disease being considered a form of tetanus. Others regarded the disease as a sort of dysentery or colic, or ileus. Its connection with fever was less insisted on in India than in Europe. On the whole, perhaps, it may be said that a distinction between bilious and spasmodic cholera was pretty generally accepted, and that, although blood-poisoning and a sudden impression on the nervous system found advocates, yet the general feeling was, that the disease was caused by irritating matter applied to the stomach and the intestines. Towards the end of this period the suggestion was thrown out that the disease was an asphyxia. I need not pursue this subject further, as it is not my object to enter on any discussion on the theory of the disease.

Little advance was made in the study of morbid changes observable after death. The facts of the distension of the gall-bladder with bile, and of the contraction of the bladder, were noticed, while the stomach and intestines, and the viscera generally, were usually, according to the superficial examinations of those days, declared to be healthy, or at most to contain flatulence, have their mucous surfaces in a state of irritation, or some of the mucous glands enlarged.

12. As to treatment, there was not much novelty. The old question whether to commence the treatment with the removal of morbid secretions by

means of emetics, purgatives, diluents (or, in modern phrase, eliminants, if you will), or not, continued to engage atttention, as in the days of Hippocrates. Many used them in the first instance in the treatment of the beginning of an epidemic; but then, after a time, they were struck with the prostration of the nervous system and the sudden depression of the powers. They felt that a patient might die, while they were occupied with their preliminary measures, and as a rule, whether rightly or wrongly, they usually became advocates for the early use of stimulants and opiates. It was mainly with those remedies that the outbreak of 1817 was in the first instance combated.

The chief thing to be remarked as to local treatment, is the universal adoption by the Portuguese of the native treatment by the actual cautery, which we found referred to in Sanscrit medicine. This usage appears to have died out, at least in European practice, after the middle of the eighteenth century. The analogous one by the moxa was made use of by Mr. Moorcroft,* in 1817. The native treatment by ligature does not seem to have found much favour with Europeans—indeed, is scarcely mentioned.

13. There are a few indications of the hygiene of the day. People were cautioned against indigestible articles of food, and against bad water (it was believed that some families had remained well

* Asiat. Journal, 1818.

owing to having their drinking water boiled), against exposure to the air, and to change of temperature. Warm clothing, and especially protection to the abdomen on board ship, were recommended. There were no precautions used against a contagion which was not believed to exist.

Not a word seems to have been said on the use of disinfectants, although before that period they had been applied to the excreta of dysentery.

Changing ground was recommended for camps, and occasionally also a halt, when troops on the march were attacked.

On the outbreak of the disease in Jessore, the Medical Board sent orders to have jungle cleared away, stagnant pools filled up, and everything done to procure free ventilation. These very measures are the ones recently adopted in Bengal, against the epidemic fever. Their Report recommended widening the streets, improving the drainage, and making various other changes, such as closing the European and Mohammedan burial-grounds, with a view to improving the sanitary condition of Calcutta.* When writing of the new epidemic, Mr. Moorcroft,† of Chuprah, suggested, in 1817, at all events in principle, the system of drainage in Calcutta, one section of which has just been successfully accomplished. He wrote that perhaps two steam-engines on the river, with a system of open

* In 1753, before the era of the Black Hole, a committee was assembled to report on the drainage of the place.

† Op. cit.

and gun drains beginning at the engines, leading through streets, and disemboguing into the Salt Water Lake, might suffice to drain the city, and that the expense, however large, would be abundantly repaid by the increased salubrity of the place.

I must not leave the subject of treatment and of hygiene, without remarking on the mistake which has so commonly been made in all ages. Because an epidemic in the natural course of things becomes milder towards its termination, and at last ceases, the lessened mortality, and final disappearance of the disease, are ascribed to our improved practice, or to our better arrangements.

CHAPTER IX.

GENERAL SUMMARY.

I SHALL conclude these annals with an enumeration of some of the results, which have been obtained by this survey of the history of cholera.

(1.) Cholera of various degrees of intensity has existed in all parts of the world, in varying extent, as long as there have been any records of the healing art.

The general laws and habits of cholera have remained wonderfully constant.

The great characteristics of cholera have from the earliest ages been sudden attacks of excessive vomiting and purging, with rapid failure of the powers of the system.

From an equally early period physicians have always had the problem before them, how far it is better to encourage or endeavour to restrain the evacuations, and how early it is necessary to support the strength of the patient.

The Greek and Roman authors describe a disease of quite as great intensity as the early Indian or Chinese ones do.

Although it was always remarked that cholera was influenced by season, there is no positive evidence

of there having been epidemics of the disease either in Europe or in Asia before the sixteenth century, unless some of the epidemics of colic and of ileus be accepted as outbreaks of cholera.

In Europe we have had a good many epidemics of cholera, the earliest of which, that has been described by name, occurred at Nismes, in 1564.

Cholera was first observed by Europeans in India, in 1503, and the first epidemic of it that has been described, took place in Goa in 1543.

The disease in India was at once recognised to be more violent than the cholera of Europe.

Cholera was first observed in India, on the coasts of Malabar and Canara, in the sixteenth century, and continued to prevail there almost uninterruptedly up to 1817.

In the seventeenth century cholera was known at Sumatra, in Java, in Japan and China, in Arabia and Mauritania, at Goa and Surat, and on the shores of India generally, and it is tolerably certain that there were several epidemics in the interior of India.

In the seventeenth century cholera was a common sporadic disease in Europe, and there were bad epidemics of it in the first half of the century, known as *trousse galant* in France and Belgium, and also bad outbreaks of it in the latter half of the century, particularly in London.

None of the European epidemics of cholera, so far at least as we have reliable accounts of them, nearly equalled the Indian ones in malignity or in extent.

In the first half of the eighteenth century there was comparatively little cholera in India, and no epidemic of importance in Europe.

In the last half of the eighteenth century cholera continued to prevail on the Malabar, and was especially common on the Coromandel coast. It was constantly at Vellore and Arcot, visited Bellary, Ganjam, and Calcutta as an epidemic. There was also probably more than one outbreak in Upper India. The disease appeared in Java and China, and visited the Mauritius.

There was no cholera in the last half of the eighteenth century in Europe, in America, or in the West Indies, at all comparable in virulence with what occurred during the same period in India.

Cholera died away in the end of the eighteenth century, and remained quiescent in the first few years of the nineteenth. It occurred sporadically in Europe, was endemic in India, but scarcely manifested itself as an epidemic.

Cholera in India was an endemic disease, every now and then breaking out as an epidemic. Our information about epidemics is very incomplete; still there is enough to show, that sometimes an epidemic passed over after one visitation, sometimes it repeated itself during the same year, sometimes one succeeded another at an interval of two or three years. Occasionally an epidemic was more fatal in its second, than in its first year, (*i.e.*, in what has been termed the second year of invasion).

Having obtained these more general results, we may next consider the periods of increase and of decrease of cholera in more limited areas.

(2.) In India, it is certain that there was little cholera in the Delta of the Cauvery in the beginning of the eighteenth century; that after the middle of the century there were very extended epidemics; and that towards the end of the century the disease had died out very much.

Again, it is certain that there was little cholera in Lower Bengal during the last half of the eighteenth, and very little in the commencement of the nineteenth, although it broke out with such virulence in the year 1817.

Or out of India, whether it was introduced into Java or not, it was for a long period in the seventeenth century regarded as an endemic of that island, but ceased to be so in the eighteenth century.

Again, as an epidemic, the disease visited the Mauritius in 1775, and died out. It visited Bengal in 1781, but was extinguished. It visited or broke out in Bengal again in 1817, and has never ceased to exist there.

We thus learn that a district nearly free from cholera may become its favourite seat, and then, after a longer or shorter period, cease to be so.

We learn that out of India, as in Java, the disease, after appearing to be endemic, may cease to be so.

Thus, generally, it is clear that an epidemic may pass off, or may take root in a district.

Of the causes of such phenomena we practically know very little; we cannot pronounce why a country should at one time seem to nourish the disease, at another time not. It is not a case of drainage, as with malarious fevers. These changes have taken place without any alteration in the condition of the people or of the country—at least, alterations that anyone has been able to indicate.

The same applies very much to the London epidemics, and to European ones generally. We can only say, that as the general health of districts has improved, sporadic cholera has been less frequent. European epidemics bore a more distinct relation to the prevalence of dysenteric affections, and of aguish fevers, than has been recorded of Indian ones.

I come next to some propositions more immediately connected with the outbreak of 1817.

(3.) As far as can be ascertained, while cholera was so prevalent on the Malabar, and still more on the Coromandel coast, in the latter half of the eighteenth century, it was little known in any other parts of India.

Although there are a few occasional notices of cholera in Bengal, and the existence of the cholera temple shows that the disease must have been at times very well known, Lower Bengal is the portion of India, in which we hear least of cholera in early times, and it could not have been a common disease in its worst form in the last half of the eighteenth century, or its appearance in Calcutta in 1781 could

not have occasioned such panic and astonishment. The same remark applies to the outbreak of 1817.

With reference to the place of origin of the epidemic of 1817, there is not the slightest reason for connecting it with Jessore in particular, and still less with the Sunderbunds.

No disease appeared in India in 1817, that had not often appeared there before—no symptom manifested itself, that had not often been witnessed before —no new habits of the disease were developed.

The natives of India invented no new name, and worshipped no new goddess, for the disease of 1817. A pretty sure sign, that they did not think the malady a new one.

Two new attributes, however, have been sometimes ascribed to the disease of 1817, contagiousness, and power of spreading. As regards the first, there is no reason to believe, that the disease in that year was either more or less contagious, than in similar outbreaks in former years. As regards the second, the disease had often spread widely before, and it can at most be said, that this power of spreading was intensified.

APPENDIX.

ON THE ANALOGIES OF CHOLERA NOSTRAS AND CHOLERA INDICA.*

The survey of the history of cholera in its various forms which has been taken in the preceding pages, suggests an inquiry into the points of accordance and points of difference, which exist between what is called cholera nostras, and cholera Indica. I do not mean between the slight attacks of summer cholera, with which term many attacks of bilious derangement are dignified, but between the graver forms of cholera, which were known in Europe for 2000 years, and that which was recognised in Europe in 1831 as the Indian disease. I do not take either disease at any one particular date, but as they have both shown themselves during the course of the three last centuries.

An ordinary case of cholera nostras, by common consent, differs widely enough from one of cholera Indica. Many will say they cannot be possibly mistaken for each other.

* Read before the Medical Society of London in 1870; its substance appeared in *Medical Times*, December, 1870.

But when an attempt is made to show in detail in what the difference consists, many difficulties spring up in our way, as will appear from the following comparative view of some of the phenomena of the two diseases.

1. It is unnecessary to enter on an enumeration of the symptoms of either disease. For our purpose, it is sufficient to look at the late nomenclature of the College of Physicians. Cholera has wisely received a wide definition. It is set down among general diseases. Two forms are mentioned, simple and malignant, which may be considered equivalent to cholera nostras and Indica. The first is not described, but the latter is termed an epidemic disease, characterised by vomiting and purging, with evacuations like rice-water, accompanied by cramps, and resulting in suppression of urine and collapse. I have no occasion to find fault with this enumeration of symptoms. But there is no one symptom laid down here, or that ever has been attributed to cholera Indica, that has not occurred in cholera nostras. Suppression of urine and rice-water evacuations have been ordinarily considered to be the distinctive characteristics of cholera Indica; but the first of these was mentioned by Hippocrates, and has been noticed over and over again, by those who described with care cholera nostras of any intensity. An enormous serous discharge has always been characteristic of cholera nostras. Celsus described this as often being white, or like water. Without going over the long list of authors already quoted, I may

mention that Morgagni, in 1738, and Tralles, in 1753, described it in their own persons, and, like many of their predecessors, said that it was clear and in ineffable quantity; and Short, in 1749, in describing fluxes, besides talking of a milky and chylous one, mentions "a clear watery serous, or lymphatic looseness, which is either clear as water, yellowish, or ash-coloured." The cramps are often just as marked in cholera nostras as in Indica; and the same is true of collapse. How many pictures of it have been quoted above! Another symptom is secondary fever. Celsus hinted at it, and C. Aurelianus calls it consecutive. Rivierus and others of his time mention it, and there are full accounts of it in the middle of the eighteenth century.

Among the sequelæ, affections of the nervous system seem to have been just as common after nostras as after Indica.*

Temporary albuminuria has been observed in both. Even the not very common sequela of a rash is to be found in cholera infantum, a very severe form of cholera nostras. The out-of-the-way symptom of vomiting worms has been described occasionally in both diseases. It might have been imagined that certain changes in the temperature of the body were characteristic of cholera Indica. They have not been sought for much in nostras; yet they have been detected in it by Dr. Sutton, of the

* Dr. Aquilla Smith has communicated to me a case of paralysis occurring after cholera nostras, which was cured by electricity.

London Hospital. It is more than doubtful whether there are any chemical or other tests by which the evacuations of the one disease can be positively distinguished from those of the other. In both diseases the intelligence is not obscured until unconsciousness supervenes, although it has sometimes been described in both as being disturbed.

2. The appearances after death have not been investigated in a disease of less fatality like cholera nostras, as carefully and as frequently as in Indica. Yet no distinctive difference has hitherto been pointed out. Staff-surgeon Hunter, who had experience of cholera in the East, gives the results of a post-mortem at Chatham in a case of cholera nostras, which, he observes, would do for the banks of the Ganges. That excellent observer, Griesinger,* made some careful examinations, but could discover no difference. Scoutetten, who had seen cholera in every part of Europe and in Africa, had occasion to examine the bodies of some patients who died at Metz, in 1869, of cholera nostras. He could find no difference except in the absence under the microscope of the so-called cholera sporules, a matter now becoming one of very little importance. Since then Quinquaud,† in Paris, has examined the bodies of two cases of cholera nostras with the same result. Masses of detached epithelium have been found in the intestines in nostras as well as in Indica. Griesinger observed

* Infections Krankheiten.

† Archives Générales de Medicine. March, 1869.

that one of the bodies in his fatal cases of cholera nostras was very distinctly warmer than natural twenty-four hours after death. Muscular movements do not appear to have been witnessed after death by cholera nostras, but the opportunity for observing it is not often offered in a disease of so small mortality.

3. The same general views have been entertained during a long series of years as to the nature of the two complaints :—

(*a*) That they were the manifestations of the action of a poison, whether depraved humours of the body, or articles introduced from outside ; in short, in one shape or other, manifestations of blood poisoning.

(*b*) That they were affections of the nervous system, of a more or less spasmodic character.

(*c*) That they were forms of fever, or diarrhœa, or dysentery, or colic.

(*d*) That they were attacks of acute or subacute inflammation of the bowels and intestines.

Theoretic explanations of the mode of operation of the poison apply equally well to either form.

4. If we turn to treatment, we find that for 2000 years physicians have been considering which indication it is best to follow—to encourage the discharges, or to restrain them. The earliest indication

usually followed in nostras was to remove, besides crudities of food, altered phlegm or bile, or an unknown poison, just as with many of the present day it is the object in treating cholera Indica, to eliminate or evacuate a specific poison. Others have thought it best in both diseases to endeavour to check the evacuations, and to support the strength of the patient. We find that the treatment of cholera nostras was a mixture of the diluent, the evacuant, the astringent, the cordial, or stimulant, just as that of cholera Indica. Opium has frequently been considered the sheet anchor in both, although some have thought that its less efficacy in Indica, affords a ground of distinction between it and nostras.

The spasms of the extremities have been treated alike—ligatures, and even the actual cautery have been used in both; friction, with aromatic substances and oils, and the application of heat and of baths, have been practised in both forms.

5. It is admitted that the prognosis in the two diseases is very different. Nevertheless, for a long time after the outbreak of cholera Indica in 1817, practitioners were as confident that they could cure the disease, if they were only called in in time, as they had been in the case of cholera nostras. When cholera nostras was fatal, it was so nearly as rapidly as cholera Indica.

6. As to their ætiology, both diseases have been attributed to the air, to a certain epidemic influence acting on the system; they have been attributed to irregularity of the seasons, to heat, especially moist

heat,* to exhalations from the soil, and to marsh poison. The influence of falls of rain in producing both diseases has been observed. Both have been attributed to emanations from sewers and privies—the case of the school at Clapham, in 1829,† is a good example of this in cholera nostras. They have both been ascribed to bad drinking water.

On the part of the patients, they have in both diseases been considered to have been predisposed by some irregularity of diet, by indigestible vegetables, fruit, or fish, by alcoholic excess, by the exhaustion of great fatigue, or of sexual indulgence, by depression and poverty, by sudden frights, by exposure to rapid changes of temperature, and especially to night chills, with the abdomen imperfectly protected.

7. Both diseases have, on the whole, been supposed to attack adults most; but neither age, nor sex, nor race, has afforded any real immunity. Travellers, and those who are moving from place to place, have suffered most from both affections. Sailors come under this category. Whether there has been warning in the way of malaise, or of diarrhœa or not, the absolute invasion of the disease is always sudden, and has constantly suggested the idea of poisoning. In both diseases the attack is often ascribed to the violent action of purgative

* Moist heat has, from the days of Hippocrates downwards, been considered by the vast majority of writers as the great propagator of epidemic diseases.

† Medical Gazette, 1829.

medicines. The commonest hour for an attack of either disease is in the early morning.

8. Both diseases occur sporadically, endemically, and epidemically. Both diseases are migratory. There have been some very considerable epidemics of cholera nostras. A disease must have been tolerably widely spread to have many familiar names for it in Europe, and popular rhymes would not have been made about a disease that was not common.

9. Both diseases appear to attach themselves to certain places and parts of places, and both, on the whole, prefer low flat ones. We read of repeated outbreaks in one place or district, as in Ghent and Nimeguen, London, Breslaw, the South of France, South of Germany, and Italy. In like manner cholera attached itself to Goa and Surat, to the Malabar and Coromandel coasts, to Bengal, to Calcutta and Bombay, and at various times to Java.

10. Both diseases are influenced much by season. This, I think, cannot be doubted, whatever the effect of particular meteorological changes may be. Both are, undoubtedly, diseases of heat and of hot countries, and essentially of the hot seasons of hot countries. That cold is inimical to the spread of both is certain; it is remarkable how constant the seasons have remained in some cases. July, August, September, and October were the great months for the epidemics of cholera nostras in former times. Cholera Indica has visited London epidemically four times, and the chief--nay, almost the whole—mortality

has been in those months. Neither disease is absolutely tied down by season, although they both have a distinct preference for particular seasons at particular places.

11. Both forms of cholera have always been thought, when epidemic, to exercise an influence on other diseases, as on diarrhœa, dysentery, or fever. Indeed, this influence on intermittent fever has been more observed in cholera nostras than in Indica. There is no question that in both forms diarrhœa is often succeeded by cholera, and that in both dysentery has been described as running into cholera, and cholera as ending in dysentery.

12. The close analogy of the cold fit in some intermittents, and the much closer of the algide form of pernicious fever, and also the resemblance of some forms of congestive typhus, have been pointed out with reference to both forms of cholera, so much so that many have regarded cholera as a form of fever.

13. The close analogy between the effects of some poisons,* for instance, elaterium or arsenic, and of

* I am not sure whether some respects, in which the action of cholera resembles that of an irritant poison, have often been pointed out.

When the dose of the poison is large, it destroys by general irritation, and not a trace of morbid change of structure is to be found after death. It follows from this law, that the larger the dose, or the greater the intensity of the poison, the more rapid its action, and the less the probability of finding any specific alteration after death.

This is exactly the case with cholera. Where death is

an attack of cholera, has often been indicated in the case of either disease, and an accordance has been shown between the post-mortem appearances caused by either form of cholera and by arsenic, down even to the shedding of epithelium, and the presence of the sporules, supposed to be characteristic of cholera. This has been shown in several cases of arsenical poisoning by Virchow and by Hoffman, quite recently.

14. With reference to the period of incubation of the diseases, extremely little is known about cholera nostras; indeed, it is only during the epidemics of the disease, that it could well have been observed; but the seizures in it, as in cholera Indica, were always marked by suddenness, and the period of incubation could not have been usually more than from eight to twenty-four or forty-eight hours, as is usually the case in cholera Indica. We know nothing of protracted incubation in cholera nostras;

rapid, no structural changes are observed; it is when the case has been protracted, that they are to be found.

Again, Majendie brought to light the curious fact, that if, after having poisoned the animal, and even after the poison has begun to act, we inject an aqueous fluid into its veins in such quantity as to cause an artificial plethora, as long as this artificial plethora can be maintained, the action of the poison is superseded. No sooner, however, does the plethora cease, than the poison acts again in its usual time, and even, perhaps, with more than its accustomed severity.

How often has this been illustrated in the case of injections into the veins in cholera—the wonderful reaction, so commonly followed by speedy collapse!

and the long periods for cholera Indica, sometimes as much as three weeks, in cases occurring on board ship, have been assumed, in order to account for outbreaks, which are capable of other explanations. On this head one cannot speak very positively, as our information is indefinite.

15. To these points of agreement in detail, one more general consideration may be added—this great practical difficulty, that even in India at the present day it is by no means always easy to say what is malignant cholera and what is not, except during the prevalence of epidemics. How often has one, on hearing that a friend had suffered from an attack of cholera, and recovered by the use of some new cure, exclaimed, that it could not have been a case of true cholera—how often in Indian Returns have cholera biliosa and maligna been confounded! In some returns of European soldiers in Madras, cholera biliosa has been set down as almost as fatal as cholera maligna. Owing to this difficulty, Mr. Jameson's* remark is quite a just one, that in the early part of the pestilence of 1817, many persons who died from cholera, were classed under the head of bowel complaints, or anomalous cases. Finally, in studying the history of cholera in all ages, and reading accounts of its different forms in India, it is difficult for even the most dispassionate to pronounce positively, which cases were cholera nostras and which cholera maligna.

* Bengal Report.

16. With reference to the intimate nature of the disease, and of the theoretical division "zymotics," one or two other points of resemblance are worth recording. Most practitioners have thought it possible to prevent the full development of either disease, whether by diluents, evacuants, or opiates. An imprudence of diet, or of treatment, during recovery, has been found in both to produce a relapse, that is an actual reproduction of the attack. In both, one attack gives no permanent immunity from a second one.

But, notwithstanding the close parallel it has been possible to draw, notwithstanding their many points of agreement, most practical physicians are of opinion that the two diseases are distinct.

We may, therefore, next consider some of the points of difference between the two affections.

With so many points of accordance between cholera nostras and cholera Indica, what are the points in which they differ most?

1. Cholera Indica is, on the whole, more independent of season; it is not so much of a summer disease as cholera nostras.
2. It travels much farther; the greatest epidemics of cholera nostras that we know of, ran over a single country, perhaps, but did not travel all over the globe.
3. Then cholera Indica is by the immense majority of physicians believed to be contagious, whereas the reverse is the case with nostras.

4. Cholera nostras, it is said, arises spontaneously; cholera Indica does not. But until the difficult subject of spontaneous generation is better understood, the distinction does not help one much.
5. The poisonous nature of the cholera excreta is almost universally believed in; whereas it has scarcely been ever suspected of those of the other disease—though the possibility of their being so still remains, and it was fully admitted in the case of the cognate diseases, dysentery and diarrhœa.
6. Then there is the undoubted greater intensity of symptoms, and far greater mortality, of cholera Indica.

Most of these points are differences of degree, but, granting their existence to the fullest possible extent, are they sufficient grounds for separating the two diseases? I shall not enter into a general examination of those differences, and shall confine my remarks only to the questions of comparative malignity, of contagiousness, and of specific poison.

(*a*) Is mere degree of malignity a sufficient ground for considering two diseases different?

Take influenza. When it is prevalent, you have every degree of lung affection, from a mere catarrh to a pnuemonia that proves fatal.

Take scarlatina. You may have the slightest rash possible, no sore throat at all, an attack for

which it is difficult to confine the patient to the house; or you may have a malignant disease, with sore throat, that proves fatal in a day or two.

Take small-pox. You may have slight fever, followed by a few pustules, or you may have the ordinary course of average small-pox, or you may have the horrors of the confluent, or of the hæmorrhagic form of the disease.

If we take the instance of plague, how various are its forms! In the first place, there is a general division, understood in the East, into mild and malignant; in the second place, the disease usually kills in three or five days, while there are instances of sufferers succumbing in a few hours.

In each of these diseases, in spite of their varying degrees of intensity, the unity of their different forms is not disputed.

Or take dysentery, the history of which has many points of analogy with that of cholera. You have it in Europe epidemic or sporadic—in one case contagious, in the other not; but scarcely ever does the worst epidemic form of it come up in malignity to some bad Indian forms of the disease. Yet no one has supposed the Indian form to be a different disease from the European, or the epidemic from the sporadic.

Or take all the varieties of European cholera itself. A slight attack of cholera nostras differs as much from an acute one of it, as an acute one of it does from an average one of cholera Indica. The disease has been subdivided endlessly, according to its degrees;

but the various forms of it in Europe have not been counted different affections. Why, then, should the Indian and European forms, which are often distinguishable with difficulty, be separated?

Mere difference in intensity appears to offer insufficient grounds for their separation; especially as the difference between slight and severe attacks of cholera is supposed by some to depend, not on the different quality of their poisons, but on the quantity of the morbid matter offered to the system, and on the fitness of the system to be influenced by it.

(*b*) Then cholera Indica is in these days almost universally believed to be in some degree contagious, whereas the opposite belief is entertained with respect to cholera nostras. Yet if it be true that epidemic diarrhœa is at times contagious, it is very unlikely that this should not be sometimes true of epidemic cholera nostras also.

But the whole subject of contagious and epidemic disease is a very complicated one. It seems highly probable, that all epidemic diseases are under certain circumstances more or less contagious, and it is well known, that contagious ones have periods when they spread widely—in other words, become epidemic—and periods during which they remain dormant.

We have this well illustrated in Calcutta in a very contagious disease, and in one but slightly so—in small-pox, with its specific poison, and in cholera; both are rarely entirely absent; both evidence their presence at particular seasons of the year, and also become epidemic at intervals, often, by the way, raging

together at the same time. Something of this kind must have occurred during the epidemics of small-pox and of cholera nostras in London, in Sydenham's day. The germs of cholera nostras must have remained there in some shape during the rest of the year, to be revivified and become epidemic every autumn, just as the germs of small-pox were for a time latent.

Or take the analogy of dysentery. Few at the present day admit it to be contagious. It certainly is not usually so. Yet there is little doubt that now, as in past ages, when the disease becomes epidemic, it is contagious.

On the whole, I think, we are scarcely warranted in saying absolutely, that an epidemic of cholera nostras may not be contagious, or in thinking that the difference in contagiousness affords sufficient ground for making nostras a different disease from Indica.

(*c*) But in addition to these differences as to malignity, contagiousness, and power of spreading, the prevailing belief at the present day is, that there is a specific poison present in cholera Indica. In that case, almost identical symptoms are produced in the absence and in the presence of a specific poison; and if the specific poison—at least what contains it—has been discovered in the case of cholera Indica, it is only after a very long search, and who will say that there may not be a specific poison in cholera nostras, when it is epidemic?

Supposing it to be established that there is a specific poison present in cholera Indica, in that case it

should produce some specific effects, as small-pox or typhoid poison do. Yet there are no structural lesions that are characteristic of the operation of the cholera Indica poison, as contradistinguished from the lesions of cholera nostras.*

We cannot, of course, expect to discover the cholera germ in a tangible form, any more than any other morbid poison; but it is extremely desirable, that we should have full and unquestionable evidence, respecting what are commonly believed to be the bearers, and by many the only bearers, of contagion, the dejections with their specific poison.

Some more satisfactory proof of the existence of a specific poison, is desired, than the apparent communicability of the disease by polluted drinking water, (the evidence of which is always open to exception, as at most only affording a presumption,) or than experiments on the lower animals, giving very doubtful results.

In short, I shall conclude this comparison, by remarking that broader lines of demarcation between the two diseases continue to be very much wanted.

* We know nothing of the fresh generation of any animal poison that we are well acquainted with, such as small-pox; we only know of its reproduction and multiplication. If, therefore, cholera is being constantly engendered afresh in India, its poison must surely be very different in nature.

NOTE.

ON ENDEMIC AND EPIDEMIC COLIC.

As it has been said by so high an authority as Hirsch* that no endemic colic has been described in the East, it may be worth while to say something on the subject.

One of the colics mentioned by Then Rhyne† can easily be identified with the endemic *pet sool* (stomach pain) of Bengal, so named owing to the lancinating pain in the stomach being supposed to resemble the effect of the trisula (three-spiked trident) of Shiva. This affection is to this day treated by violent pressure, and by binding a weight over the stomach. Various forms of stomach disease are very possibly, as Dr. T. W. Wilson has shown,‡ confounded under the name of *pet sool*. But probably it is a form of endemic colic. It leads to much wasting and atrophy, but never to paralysis, and is never epidemic.

Carreri's account of a flatulent colic in Bombay (very likely, as Dr. Morehead tells me, the *null* still common there), which has been already quoted,§

* Medizinische Geographie.
† Supra p. 104.
‡ Indian Annals, vol ii., p. 97.
§ Supra p. 113.

may represent one of the forms of disease that Then Rhyne alludes to; but though it continues to exist, it is not epidemic either. Martin,* in 1702, says that a certain Venetian was very successful in curing colics in India by the use of a heated circular plate of metal; and Paxman, in 1737, says that colic and colicky pains are common in India. We know less than we should do about the less prominent diseases of natives; but at the present day colic is known in Bengal, Bombay, in Marwar, and elsewhere.

I have not found any recent notice of endemic colic in Ceylon. There was a virulent colic at Newer Elia, in 1856, but it was traced to lead poisoning. As to colic in other parts of the East besides India, Then Rhyne himself tells us elsewhere,† that the colic passion was treated in Japan by acupuncture. It was therefore known in that country.

About much the same time as Then Rhyne, we have an account of two sorts of colics in Japan by Kaempfer.‡ The one he merely mentions as an endemic pain or colic, and gives no description of. The other he describes at length. It is not like ordinary colic, but a special spasm of the muscles of the abdomen, with much pain in the groin. The tympanitis is so excessive as sometimes to threaten suffocation; but apparently few or none died of the

* Supra p. 117. † Op. cit., p. 186.
‡ Supra p. 108.

complaint, which was always relieved by acupuncture. Those who recovered, whether men or women, often had affections of the genital organs of a chronic nature afterwards. But here I think it is plain (and he half suspects it himself) Kaempfer has made some confusion of colic with endemic forms of sarcocele, or with syphilis.

Kaempfer especially says of this disease, that it was got from drinking a fermented liquor made from rice, when it was drank cold. If you sipped it warm, it did no harm. Possibly there may have been lead or other poisoning from the process of distillation. But there is no mention of paralysis. While we thus hear a good deal about endemic colics in the East, none of them correspond with Then Rhyne's account of their leaving behind them paralysis, or of their being epidemic, which I suppose he meant, when he said the disease raged fatally all over the East.

Then Rhyne probably spoke rather vaguely, for at the very time when he was writing of the prevalence of colic in the East, Tachard* declared that all sorts of colics were little known in Siam. In fact, there is very little to show, that any true colic has ever been extensively diffused epidemically in any part of the world.

The wider question, after all, remains behind: Is there such an independent disease as colic?† Like

* Histoire Générale des Voyages, &c., vol. xii., p. 200.

† Sauvages described no fewer than twenty-two species of colic, so that the disease was more varied even than cholera.

ileus, which is no longer described as a distinct disease, is it not rather a symptom of diseased action? Did it not, much better than cholera, deserve the name of an indigestion, the term by which the older Indian writers were so fond of describing *mordeshin?* Is it possible for a colic, not to mention ileus, which has sometimes been thought contagious and epidemic, to spread further than the causes that have produced it —in other words, to become contagious or epidemic? It is not probable that it can, and the epidemic described by Paulus Ægineta was probably not a true colic. But granting the existence of an endemic vegetable colic* in tropical countries (which most modern authors are inclined to deny, except as the result of lead poisoning), it is a disease, the march of which is comparatively slow; it is never rapidly mortal, as we infer that the disease was, to which Then Rhyne alluded.

Then Rhyne's account of this colic may be compared with that given by Paulus Ægineta of the contagious epidemic of his day, which began in Italy, but overspread many Roman provinces. It was a colic, which produced epilepsy and paralysis. The epilepsy (convulsions?) was usually a fatal symptom—paralysis, on the contrary, a favourable one. There was loss of power, but not of sensation, in the extremities, and patients usually after a time regained their power. Unfortunately, the treatment

* On this subject see Boudin's Géographie Médicale, vol. ii., p. 377; and Morehead's Diseases of India, 2nd edit., p. 455.

recorded does not throw any light on the malady. Avicenna, while saying that colics were often epidemic, was evidently puzzled by these nervous symptoms described by Paulus.

Jordanus* compares with this epidemic a disease which he had seen spring up in his time—that is, within the last thirty years—and become endemic in Pannonia, in Austria, and also in some tracts of Germany. It was a colic with paralysis, and as young children, and even infants, were attacked with it, as well as adults, there can scarcely have been lead poisoning. Jordanus suggests no cause for it, but he remarks that, when studying in France and in Italy, he had never heard it mentioned, even in the lectures of professors.

As early as 1684 Ettmuller† observed, that Austria, Moravia, and Franconia, where colic prevailed, were "loca vinosa," but he does not hint at lead, though doubtless in this case it was in fault.

On the whole, I think, that in the present state of our information, it is probable that there are endemic colics without any connection with lead poisoning, that it is certain, that endemic colics do exist at the present day in some tropical countries, and that it is not probable that fatal contagious epidemics of colic can have been true colic.

* Luis Novæ Descriptio, 1580.

† Opera, 1684, p. 138.

SUPPLEMENTARY NOTE.

Until these sheets were printed, I had not seen Dr. Balfour's Statistics of Cholera (Madras, 1870). From it I gather a few additional names for cholera :—

Maradi ul aswad ..	Arabic.
Halqi, Bhaka ..	Arabic.
Wati Bedi	Canarese, Tamul, Teloogoo.
Wakul Jalab ..	Hindost.
Ukari Jalab	Mahratt.
Uri Kath	Tamul.
Jharoti	Nepalese.
Kai Dust	P. Hindost.
Bad Howai	P. Hindost.

Many of these names are descriptive of purging, while Bad Howai, *i.e.*, bad air, seems to exist as a name, though I doubted this at page 7.

It may be worth mentioning as to the pestilence which prevailed in India in the latter part of the seventeenth century, that Dr. Meade, early next century, talks of the plague as being well known at Surat.

With reference to the non-diffusion of cholera in the beginning of the eighteenth century, Captain Hamilton, in his account of India, although he alludes freely to the mortality of Europeans, does not mention cholera at all.

A reference by Dr. Bryden to Grant Duff's history enables me to say, that the General of the Mahrattas, Hurry Punt, mentions, about 1786, cholera having been fatal to their army engaged with Tippoo. This is an important notice of the disease in armies far removed from the coasts.

I have just received from Dr. Bryden a publication entitled, "Note on the Epidemic Connection of the Cholera of Madras and Bombay." It makes me partially regret, that I have not endeavoured to point out the connection between famines and meteorological changes with the spread of cholera. But I could have done so only in a vague and imperfect way, for the periods of which I treat.

When Dr. Bryden endeavours to generalise on those times, he is, owing to the scantiness of the information before him, and the liveliness of his imagination constantly outstripping not only facts, but legitimate inductions from such facts as do exist. I shall point this out in a few instances, at the same time remarking, that Dr. Bryden's paper affords the best evidence of the want of a collection of facts, such as I have endeavoured to present, and which I have already expressed a hope may serve as a corrective to over-bold speculation.

1. As to the occurrence of cholera at Arangal

(which was in central India, and not, as stated by me, near Delhi) some few years before 1343, I have Professor Dowson's authority for saying, that it is extremely doubtful whether the disease can be identified as cholera!

2. Dr. Bryden "takes this epidemic to have been the origin of Hecker's great black plague of 1348," seemingly not knowing the history of that pestilence, the nature of which has never been doubted, and which he is the first to identify with cholera!

3. Dr. Bryden, strangely entertaining the old belief that Bontius is the first European who gave an account of cholera in the East, sees some connection between his description of cholera in 1629, and the year in which an abnormal meteorology initiated in India the terrible famine of 1630-31. But Bontius talks of no new disease, of no epidemic—he merely describes cholera along with fever, dysentery, and other diseases of Java.

4. Exactly the same remark applies to the writings of De Thevenot, Fryer, and Dellon, who about the years 1666, 1674, 1676, described cholera (but no epidemic of it) as one of the diseases of the country from the interior near Surat down the coast to Goa. This Dr. Bryden describes as cholera on the southern highway, on which he considers Sydenham's cholera to have been consequent—*i. e.*, the London outbreaks were consequent on epidemics, which have never been recorded.

5. He thinks he finds the trace of the fact of an invasion in 1684 following the cholera of 1676.

We have already seen that there is no epidemic of 1676 on record, and that though there may have been some epidemics of cholera in 1684, the great mortality of that and of subsequent years was caused by a pestilential fever which, at all events without further information, we are not warranted in pronouncing to have been cholera.

6. Dr. Bryden says that in the years 1769-70, we have the first notice in Madras of the appearance of an epidemic after 1756; but it is almost certain that the violent epidemic of 1757, described by Orme, was cholera. Paisley, writing in 1774, recollected the disease to have been horribly fatal among the blacks in our first campaign in the country, and in 1766 Grose wrote of *mordeshin* as a disease of great severity, well known on the Malabar coast.

7. Dr. Bryden thinks that the bad remittent fevers of Calcutta about 1768-71 were cholera. What I have said in the text and in the note on the fever of 1762, is a pretty sufficient answer to this. What is said of that year applies equally well to the later period. A disease cured mainly by bark, marked by repeated fits of fever, sometimes with remissions of only four or five hours, with delirium, in which men sometimes committed suicide, and a disease of which Clark did not lose a single case, was surely, notwithstanding the presence of some choleraic symptoms, no cholera. Clark, and other navy surgeons, knew *mordeshi* and cholera morbus well, and could not have mistaken it for a fever.

In now leaving this subject, I am not without hope, that the history of cholera may eventually be made out more fully. For India, French, and English sources seem to be nearly exhausted; but I believe that some further accounts may still be found in Portuguese and Dutch records of their settlements. Something, too, may be made of native historians, although their accounts are apt to be so indefinite as not to be of much practical worth.

The history of choleraic fluxes in Europe has hitherto been very imperfectly examined, and a scrutiny of epidemics of dysentery, of diarrhœa, of colic, and ileus, and a further investigation of the *trousse galant* are among the things to be desired. When French writers spoke in 1684 of dysenteries, and not less troublesome diarrhœas prevailing universally, there must have been an extensive diffusion of an influence at least akin to that of cholera. The traces of such influences have only as yet been partially investigated.

ERRATA.

Page 44, line 15, for "and" read "tells that it."
Page 126, note, for "relative" read "friend."
Page 194, line 10, for "March" read "April."
Page 231, line 5, for "halqui" read "halgi."
Page 233, line 4, cancel "!"
Page 234, lines 26 and 27, cancel two lines, from "in which" to "single case," and insert "of great violence, coma, congestions of internal viscera, non-suppression of urine."

ADDENDUM.

Mr. Dick, writing in the Medical Commentaries for 1785, vol. x., of sunstrokes in the Carnatic, says that in the last war they were more fatal than the cholera morbus or dysentery, just as one might write of modern campaigns—for instance, the last Burmese one.

I.—INDEX OF AUTHORITIES.

II.—INDEX OF SOME SUBJECTS.

N.B.—Where not stated otherwise, the headings refer to Cholera.

LONDON: PRINTED BY RANKEN & CO., DRURY HOUSE, ST. MARY-LE-STRAND, W.C

October, 1883.

CATALOGUE OF WORKS

PUBLISHED BY

H. K. LEWIS, 136 GOWER STREET,

LONDON, W.C.

G. GRANVILLE BANTOCK, M.D., F.R.C.S. EDIN.
Surgeon to the Samaritan Free Hospital for Women and Children.

A PLEA FOR EARLY OVARIOTOMY.
Demy 8vo, 2s.

THOMAS BARLOW, M.D., B.S., B.SC.
Assistant Physician to the Hospital for Children, Great Ormond Street; Assistant Physician University College Hospital, &c.

ON THE DIFFERENCE BETWEEN CHILDREN AND ADULTS IN RELATION TO DISEASE. [*In preparation.*

FANCOURT BARNES, M.D., M.R.C.P.
Physician to the Chelsea Hospital for Women; Assistant Obstetric Physician to the Great Northern Hospital, &c.

A GERMAN-ENGLISH DICTIONARY OF WORDS AND TERMS USED IN MEDICINE AND ITS COGNATE SCIENCES.
Square 12mo, Roxburgh binding, 9s.

ROBERTS BARTHOLOW, M.A., M.D., LL.D.
Professor of Materia Medica and Therapeutics, in the Jefferson Medical College of Philadelphia, etc., etc.

I.

A TREATISE ON THE PRACTICE OF MEDICINE, FOR THE USE OF STUDENTS AND PRACTITIONERS. With Illustrations, Second Edition, large 8vo, 21s.

II.

A PRACTICAL TREATISE ON MATERIA MEDICA AND THERAPEUTICS. Fourth Edition, Revised and Enlarged. 8vo, 16s.

GEO. M. BEARD, A.M., M.D.
Fellow of the New York Academy of Medicine.

AND

A. D. ROCKWELL, A.M., M.D.
Fellow of the New York Academy of Medicine.

A PRACTICAL TREATISE ON THE MEDICAL AND SURGICAL USES OF ELECTRICITY. Including Localized and General Faradization; Localized and Central Galvanization; Electrolysis and Galvano-Cautery. Third Edition. With nearly 200 Illustrations, roy. 8vo, 28s.

A. HUGHES BENNETT, M.D.
Member of the Royal College of Physicians of London; Physician to the Hospital for Epilepsy and Paralysis, Regent's Park, and Assistant Physician to the Westminster Hospital.

I.

A PRACTICAL TREATISE ON ELECTRO-DIAGNOSIS IN DISEASES OF THE NERVOUS-SYSTEM. With Illustrations, 8vo, 8s. 6d.

II.

ILLUSTRATIONS OF THE SUPERFICIAL NERVES AND MUSCLES, WITH THEIR MOTOR POINTS, A knowledge of which is essential in the Art of Electro-Diagnosis. (Extracted from the above). 8vo, paper cover 1s. 6d., cloth 2s.

DR. THEODOR BILLROTH.
Professor of Surgery in Vienna.

GENERAL SURGICAL PATHOLOGY AND THERAPEUTICS. In Fifty-one Lectures. A Text-book for Students and Physicians. With additions by Dr. ALEXANDER VON WINIWARTER, Professor of Surgery in Luttich. Translated from the Fourth German edition with the special permission of the Author, and revised from the Tenth edition, by C. E. HACKLEY, A.M., M.D. Copiously illustrated, 8vo, 18s.

G. H. BRANDT, M.D.

I.

ROYAT (LES BAINS) IN AUVERGNE, ITS MINERAL WATERS AND CLIMATE. With Frontispiece and Map. Second edition, crown 8vo, 2s. 6d,

II.

HAMMAM R'IRHA, ALGIERS. A Winter Health Resort and Mineral Water Cure Combined. With Frontispiece and Map, crown 8vo, 2s. 6d.

GURDON BUCK, M.D.

CONTRIBUTIONS TO REPARATIVE SURGERY; showing its Application to the Treatment of Deformities, produced by Destructive Disease or Injury; Congenital Defects from Arrest or Excess of Development; and Cicatricial Contractions from Burns. Illustrated by numerous Engravings, large 8vo, 9s.

FREEMAN J. BUMSTEAD, M.D., LL.D.

Late Professor of Venereal Diseases at the College of Physicians and Surgeons, New York.

THE PATHOLOGY AND TREATMENT OF VENEREAL DISEASES. Fourth Edition, revised, enlarged, and in great part re-written by the author, and by ROBERT W. TAYLOR, A.M., M.D. With 138 woodcuts, 8vo, 25s.

ALFRED H. CARTER, M.D. LOND.

Member of the Royal College of Physicians; Physician to the Queen's Hospital, Birmingham, &c.

ELEMENTS OF PRACTICAL MEDICINE. Second Edit. Crown 8vo, 9s. [*Now ready.*

P. CAZEAUX.

Adjunct Professor in the Faculty of Medicine of Paris, &c.

A THEORETICAL AND PRACTICAL TREATISE ON MIDWIFERY INCLUDING THE DISEASES OF PREGNANCY AND PARTURITION. Revised and Annotated by S. TARNIER. Translated from the Seventh French Edition by W. R. BULLOCK, M.D. Royal 8vo, over 1100 pages, 175 Illustrations, 30s.

JOHN COCKLE, M.A., M.D.

Physician to the Royal Free Hospital.

ON INTRA-THORACIC CANCER, 8vo, 4s. 6d.

W. H. CORFIELD, M.A., M.D. OXON.

Professor of Hygiene and Public Health in University College, London.

DWELLING HOUSES: their sanitary construction and arrangements. With 16 pages of illustrations, crown 8vo, 3s. 6d.

J. THOMPSON DICKSON, M.A., M.B. CANTAB.

Late Lecturer on Mental Diseases at Guy's Hospital.

THE SCIENCE AND PRACTICE OF MEDICINE IN RELATION TO MIND, the Pathology of the Nerve Centres, and the Jurisprudence of Insanity, being a course of Lectures delivered at Guy's Hospital. Illustrated by Chromo-lithographic Drawings and Physiological Portraits. 8vo, 14s.

HORACE DOBELL, M.D.

Consulting Physician to the Royal Hospital for Diseases of the Chest, &c.

I.

ON DIET AND REGIMEN IN SICKNESS AND HEALTH, and on the Interdependence and Prevention of Diseases and the Diminution of their Fatality. Seventh edition, 8vo, 10s. 6d.

II.

AFFECTIONS OF THE HEART AND IN ITS NEIGH-BOURHOOD. Cases, Aphorisms, and Commentaries. Illustrated by the heliotype process. 8vo, 6s 6d.

JOHN EAGLE.

Member of the Pharmaceutical Society.

A NOTE-BOOK OF SOLUBILITIES. Arranged chiefly for the use of Prescribers and Dispensers. 12mo, 2s. 6d.

JOHN ERIC ERICHSEN.

Holme Professor of Clinical Surgery in University College; Senior Surgeon to University College Hospital, &c.

MODERN SURGERY; Its Progress and Tendencies. Being the Introductory Address delivered at University College at the opening of the Session 1873-74. Demy 8vo, 1s.

DR. FERBER.

MODEL DIAGRAM OF THE ORGANS IN THE THORAX AND UPPER PART OF THE ABDOMEN. With Letter-press Description. In 4to, coloured, 5s.

AUSTIN FLINT, JR., M.D.

Professor of Physiology and Physiological Anatomy in the Bellevue Medical College, New York; attending Physician to the Bellevue Hospital, &c.

I.

A TEXT-BOOK OF HUMAN PHYSIOLOGY; Designed for the Use of Practitioners and Students of Medicine. Illustrated by plates, and 313 wood engravings, large 8vo, 28s.

II.

THE PHYSIOLOGY OF MAN; Designed to Represent the Existing State of Physiological Science, as applied to the Functions of the Human Body. 5 vols., large 8vo, cloth. Vol. I.—The Blood; Circulation; Respiration. 18s. Vol. II.—Alimentation; Digestion; Absorption; Lymph and Chyle. 18s. Vol. III.—Secretion; Excretion; Ductless Glands; Nutrition; Animal Heat; Movements; Voice and Speech. 18s. Vol. IV.—The Nervous System. 18s. Vol. V.—Special Senses; Generation. 18s.

J. MILNER FOTHERGILL, M.D.

Member of the Royal College of Physicians of London; Physician to the City of London Hospital for Diseases of the Chest, Victoria Park, &c.

I.

THE HEART AND ITS DISEASES, WITH THEIR TREATMENT; INCLUDING THE GOUTY HEART. Second Edition, entirely re-written, copiously illustrated with woodcuts and lithographic plates. 8vo. 16s.

II.

INDIGESTION, BILIOUSNESS, AND GOUT IN ITS PROTEAN ASPECTS.

PART I.—INDIGESTION AND BILIOUSNESS. Post 8vo, 7s. 6d.

PART II.—GOUT IN ITS PROTEAN ASPECTS. Post 8vo, 7s. 6d.

III.

HEART STARVATION. (Reprinted from the Edinburgh Medical Journal), 8vo, 1s.

ERNEST FRANCIS, F.C.S.

Demonstrator of Practical Chemistry, Charing Cross Hospital.

PRACTICAL EXAMPLES IN QUANTITATIVE AN-alysis, forming a Concise Guide to the Analysis of Water, &c. Illustrated, fcap. 8vo, 2s. 6d.

HENEAGE GIBBES, M.D.

Lecturer on Physiology and Histology in the Medical School of Westminster Hospital; late Curator of the Anatomical Museum at King's College.

PRACTICAL HISTOLOGY AND PATHOLOGY. Second Edition, revised and enlarged. Crown 8vo, 5s.

C. A. GORDON, M.D., C.B.
Deputy Inspector General of Hospitals, Army Medical Department.

REMARKS ON ARMY SURGEONS AND THEIR WORKS. Demy 8vo, 5s.

SAMUEL D. GROSS, M.D., LL.D., D.C.L., OXON.
Professor of Surgery in the Jefferson Medical College of Philadelphia.

A PRACTICAL TREATISE ON THE DISEASES, IN-JURIES, AND MALFORMATIONS OF THE URINARY BLADDER, THE PROSTATE GLAND; AND THE URETHRA. Third Edition, revised and edited by S. W. GROSS, A.M., M.D., Surgeon to the Philadelphia Hospital, Illustrated by 170 engravings, 8vo, 18s.

SAMUEL W. GROSS, A.M., M.D.
Surgeon to, and Lecturer on Clinical Surgery in, the Jefferson Medical College Hospital, and the Philadelphia Hospital, &c.

A PRACTICAL TREATISE ON TUMOURS OF THE MAMMARY GLAND: embracing their Histology, Pathology, Diagnosis, and Treatment. With Illustrations, 8vo, 10s. 6d.

WILLIAM A. HAMMOND, M.D.
Professor of Mental and Nervous Diseases in the Medical Department of the University of the City of New York, &c.

I.

A TREATISE ON THE DISEASES OF THE NERVOUS SYSTEM. Seventh edition, with 112 Illustrations, large 8vo, 25s.

II.

A TREATISE ON INSANITY. With illustrations, large 8vo, 25s. *[Just published.*

III.

SPIRITUALISM AND ALLIED CAUSES AND CON-DITIONS OF NERVOUS DERANGEMENT. With Illustrations, post 8vo, 8s. 6d.

ALEXANDER HARVEY, M.A., M.D.
Emeritus Professor of Materia Medica in the University of Aberdeen; Consulting Physician to the Aberdeen Royal Infirmary, &c.

FIRST LINES OF THERAPEUTICS; as based on the Modes and the Processes of Healing, as occurring Spontaneously in Disease; and on the Modes and the Processes of Dying, as resulting Naturally from Disease. In a series of Lectures. Post 8vo, 5s.

ALEXANDER HARVEY, M.D.
Emeritus Professor of Materia Medica in the University of Aberdeen, &c.

AND

ALEXANDER DYCE DAVIDSON, M.D.
Professor of Materia Medica in the University of Aberdeen.

SYLLABUS OF MATERIA MEDICA FOR THE USE OF TEACHERS AND STUDENTS. Based on a selection or definition of subjects in teaching and examining; and also on an estimate of the relative values of articles and preparations in the British Pharmacopœia with doses affixed. Sixth Edition, 32mo, 1s. 6d.

GRAILY HEWITT, M.D.
Professor of Midwifery and Diseases of Women in University College, Obstetrical Physician to University College Hospital, &c.

OUTLINES OF PICTORIAL DIAGNOSIS OF DIS- EASES OF WOMEN. Fol. 6s.

BERKELEY HILL, M.B. LOND., F.R.C.S.,
Professor of Clinical Surgery in University College; Surgeon to University College Hospital and to the Lock Hospital.

THE ESSENTIALS OF BANDAGING. For Managing Fractures and Dislocations; for administering Ether and Chloroform; and for using other Surgical Apparatus. Fifth Edition, revised and much enlarged. with Illustrations, fcap. 8vo, 5s. [*Just published.*

BERKELEY HILL, M.B. LOND., F.R.C.S.
Professor of Clinical Surgery in University College; Surgeon to University College Hospital and to the Lock Hospital.

AND

ARTHUR COOPER, L.R.C.P., M.R.C.S.,
Late House Surgeon to the Lock Hospital, &c.

I.

SYPHILIS AND LOCAL CONTAGIOUS DISORDERS. Second Edition, entirely re-written, royal 8vo, 18s.

II.

THE STUDENT'S MANUAL OF VENEREAL DIS- EASES. Being a Concise Description of those Affections and of their Treatment. Third Edition, post 8vo, 2s. 6d. [*Just published.*

HINTS TO CANDIDATES FOR COMMISSIONS IN THE PUBLIC MEDICAL SERVICES, WITH EXAMINATION QUESTIONS, VOCABULARY OF HINDUSTANI MEDICAL TERMS, ETC. 8vo, 2s.

SIR W. JENNER, Bart., M.D.

Physician in Ordinary to H. M. the Queen, and to H. R. H. the Prince of Wales.

THE PRACTICAL MEDICINE OF TO-DAY: Two Addresses delivered before the British Medical Association, and the Epidemiological Society, (1869). Small 8vo, 1s. 6d.

C. M. JESSOP, M.R.C P.

Associate of King's College, London; Brigade Surgeon H.M.'s British Forces.

ASIATIC CHOLERA, being a Report on an Outbreak of Epidemic Cholera in 1876 at a Camp near Murree in India. With map, demy 8vo, 2s. 6d.

NORMAN W. KINGSLEY, M.D.S., D.D.S.

President of the Board of Censors of the State of New York; Member of the American Academy of Dental Science, &c.

A TREATISE ON ORAL DEFORMITIES AS A BRANCH OF MECHANICAL SURGERY. With over 350 Illustrations, 8vo, 16s.

E. A. KIRBY, M.D., M.R.C.S. ENG.

Late Physician to the City Dispensary.

I.

A PHARMACOPŒIA OF SELECTED REMEDIES, WITH THERAPEUTIC ANNOTATIONS, Notes on Alimentation in Disease, Air, Massage, Electricity and other Supplementary Remedial Agents, and a Clinical Index; arranged as a Handbook for Prescribers. Sixth Edition, enlarged and revised, Demy 4to, 7s.

II.

ON THE VALUE OF PHOSPHORUS AS A REMEDY FOR LOSS OF NERVE POWER. Fifth Edition, 8vo, 2s. 6d.

J. WICKHAM LEGG, F.R.C.P.
Assistant Physician to Saint Bartholomew's Hospital, and Lecturer on Pathological Anatomy in the Medical School.

I.

ON THE BILE, JAUNDICE, AND BILIOUS DISEASES. With Illustrations in chromo-lithography, 719 pages, roy. 8vo, 25s.

II.

A GUIDE TO THE EXAMINATION OF THE URINE; intended chiefly for Clinical Clerks and Students. Fifth Edition, revised and enlarged, with additional Illustrations, fcap. 8vo, 2s. 6d.

III.

A TREATISE ON HÆMOPHILIA, SOMETIMES CALLED THE HEREDITARY HÆMORRHAGIC DIATHESIS. Fcap. 4to, 7s. 6d.

DR. GEORGE LEWIN.
Professor at the Fr. Wilh. University, and Surgeon-in-Chief of the Syphilitic Wards and Skin Disease Wards of the Charité Hospital, Berlin.

THE TREATMENT OF SYPHILIS WITH SUBCUTA-NEOUS SUBLIMATE INJECTIONS. Translated by DR. CARL PRŒGLE, and DR. E. H. GALE, late Surgeon United States Army. Small 8vo, 7s.

J. S. LOMBARD, M.D.
Formerly Assistant Professor of Physiology in Harvard College.

I.

EXPERIMENTAL RESEARCHES ON THE REGIONAL TEMPERATURE OF THE HEAD, under Conditions of Rest, Intellectual Activity and Emotion. With Illustrations, 8vo, 8s.

II.

ON THE NORMAL TEMPERATURE OF THE HEAD. 8vo, 5s.

WILLIAM THOMPSON LUSK, A.M., M.D.
Professor of Obstetrics and Diseases of Women in the Bellevue Hospital Medical College, &c.

THE SCIENCE AND ART OF MIDWIFERY. With numerous Illustrations, 8vo, 18s.

DR. V. MAGNAN.
Physician to St. Anne Asylum, Paris; Laureate of the Institute.

ON ALCOHOLISM, the Various Forms of Alcoholic Delirium and their Treatment. Translated by W. S. GREENFIELD, M.D., M.R.C.P. 8vo, 7s. 6d.

A. COWLEY MALLEY, B.A., M.B., B.CH. T.C.D.

MICRO-PHOTOGRAPHY; including a description of the Wet Collodion and Gelatino-Bromide Processes, together with the best methods of Mounting and Preparing Microscopic Objects for Micro-Photography. With Illustrations and photograph, crown 8vo, 5s.

[Just published.

PATRICK MANSON, M.D., C.M.
Amoy, China.

THE FILARIA SANGUINIS HOMINIS AND CERTAIN NEW FORMS OF PARASITIC DISEASE IN INDIA, CHINA, AND WARM COUNTRIES. 8vo, 10s. 6d. [*Now ready.*

PROFESSOR MARTIN.

MARTIN'S ATLAS OF OBSTETRICS AND GYNÆCOLOGY. Edited by A. MARTIN, Docent in the University of Berlin. Translated and edited with additions by FANCOURT BARNES, M.D., M.R.C.P., Physician to the Chelsea Hospital for Women; Assistant Obstetric Physician to the Great Northern Hospital; and to the Royal Maternity Charity of London, &c. Medium 4to, Morocco half bound, 31s. 6d. net.

WILLIAM MARTINDALE, F.C.S.
Late Examiner of the Pharmaceutical Society, and Teacher of Pharmacy and Demonstrator of Materia Medica at University College.

AND

W. WYNN WESTCOTT, M.B. LOND.
Deputy Coroner for Central Middlesex.

THE EXTRA PHARMACOPŒIA of Unofficial Drugs and Chemical and Pharmaceutical Preparations, with References to their Use abstracted from the Medical Journals. Limp leather, med. 24mo, 6s. [*Now ready.*

J. F. MEIGS, M.D.
Consulting Physician to the Children's Hospital, Philadelphia.

W. PEPPER, M.D.
Lecturer on Clinical Medicine in the University of Pennsylvania.

A PRACTICAL TREATISE ON THE DISEASES OF CHILDREN. Seventh Edition, revised and enlarged, roy. 8vo, 28s.

DR. MORITZ MEYER.
Royal Counsellor of Health, &c.

ELECTRICITY IN ITS RELATION TO PRACTICAL MEDICINE. Translated from the Third German Edition, with notes and additions by WILLIAM A. HAMMOND, M.D. With Illustrations, large 8vo, 18s.

Wm. JULIUS MICKLE, M.D., M.R.C.P. LOND.
Member of the Medico-Psychological Association of Great Britain and Ireland; Member of the Clinical Society, London; Medical Superintendent, Grove Hall Asylum, London.

GENERAL PARALYSIS OF THE INSANE. 8vo, 10s.

E. A. MORSHEAD, M.R.C.S., L.R.C.P.
Assistant to the Professor of Medicine in University College, London.

TABLES OF THE PHYSIOLOGICAL ACTION OF DRUGS. Fcap. 8vo, 1s.

A. STANFORD MORTON, M.B., F.R.C.S. ED.
Senior Assistant Surgeon, Royal South London Ophthalmic Hospital.

REFRACTION OF THE EYE: Its Diagnosis, and the Correction of its Errors, with Chapter on Keratoscopy. Second edit., with illustrations, small 8vo, 2*s.* 6*d.*

WILLIAM MURRELL, M.D., M.R.C.P., M.R.C.S.
Lecturer on Materia Medica and Therapeutics at Westminster Hospital; Senior Assistant Physician, Royal Hospital for Diseases of the Chest.

I.

WHAT TO DO IN CASES OF POISONING. Third Edition, revised and enlarged, demy 32mo, 2s. 6d.

II.

NITRO-GLYCERINE AS A REMEDY FOR ANGINA PECTORIS. Crown 8vo, 3s. 6d.

WILLIAM NEWMAN, M.D. LOND., F.R.C.S.
Surgeon to the Stamford Infirmary.

SURGICAL CASES: Mainly from the Wards of the Stamford, Rutland, and General Infirmary, 8vo, paper boards, 4s. 6d.

DR. FELIX von NIEMEYER.
Late Professor of Pathology and Therapeutics; Director of the Medical Clinic of the University of Tübingen.

A TEXT-BOOK OF PRACTICAL MEDICINE, WITH PARTICULAR REFERENCE TO PHYSIOLOGY AND PATHOLOGICAL ANATOMY. Translated from the Eighth German Edition, by special permission of the Author, by GEORGE H. HUMPHREY, M.D., and CHARLES E. HACKLEY, M.D., Revised Edition, 2 vols., large 8vo, 36s.

C. F. OLDHAM, M.R.C.S., L.R.C.P.
Surgeon H.M. Indian Forces; late in Medical charge of the Dalhousie Sanitarium.

WHAT IS MALARIA? and why is it most intense in hot climates? An explanation of the Nature and Cause of the so-called Marsh Poison, with the Principles to be observed for the Preservation of Health in Tropical Climates and Malarious Districts. Demy 8vo, 7s. 6d.

G. OLIVER, M.D., M.R.C.P.

I.

THE HARROGATE WATERS: Data Chemical and Therapeutical, with notes on the Climate of Harrogate. Addressed to the Medical Profession. Crown 8vo, with Map of the Wells, 3*s.* 6*d.*

II.

ON BEDSIDE URINE TESTING: Qualitative Albumen and Sugar. Fcap. 8vo, 1s. 6d.

JOHN S. PARRY, M.D.

Obstetrician to the Philadelphia Hospital, Vice-President of the Obstetrical and Pathological Societies of Philadelphia, &c.

EXTRA-UTERINE PREGNANCY; Its Causes, Species, Pathological Anatomy, Clinical History, Diagnosis, Prognosis and Treatment. 8vo, 8s.

E. RANDOLPH PEASLEE, M.D., LL.D.

Late Professor of Gynæcology in the Medical Department of Dartmouth College; President of the New York Academy of Medicine, &c., &c.

OVARIAN TUMOURS: Their Pathology, Diagnosis, and Treatment, especially by Ovariotomy. Illustrations, roy. 8vo, 16s.

G. V. POORE, M.D., F.R.C.P.

Professor of Medical Jurisprudence, University College; Assistant Physician and Physician in charge of the Throat Department of University College Hospital.

LECTURES ON THE PHYSICAL EXAMINATION OF THE MOUTH AND THROAT. With an Appendix of Cases. 8vo, 3s. 6d.

R. DOUGLAS POWELL, M.D., F.R.C.P. LOND.

Physician to the Hospital for Consumption and Diseases of the Chest at Brompton, Assistant Physician to the Middlesex Hospital.

ON CONSUMPTION AND ON CERTAIN DISEASES OF THE LUNGS AND PLEURA. Being a Second Edition revised and extended of "The Varieties of Pulmonary Consumption." Illustrated by woodcuts and a coloured plate, 8vo, 9s.

AMBROSE L. RANNEY, A.M., M.D.

Adjunct Professor of Anatomy in the University of New York, etc.

THE APPLIED ANATOMY OF THE NERVOUS SYS-TEM, being a study of this portion of the Human Body from a standpoint of its general interest and practical utility, designed for use as a Text-book and a Work of Reference. With 179 Illustrations, 8vo, 20s. *[Just published.*

RALPH RICHARDSON, M.A., M.D.

Fellow of the College of Physicians, Edinburgh.

ON THE NATURE OF LIFE: An Introductory Chap-ter to Pathology. Second Edition, revised and enlarged. Fcap. 4to, 10s. 6d.

W. RICHARDSON, M.A., M.D., M.R.C.P.

REMARKS ON DIABETES, ESPECIALLY IN REFER-ENCE TO TREATMENT. Demy 8vo, 4s. 6d.

SYDNEY RINGER, M.D.

Professor of the Principles and Practice of Medicine in University College; Physician to, and Professor of Clinical Medicine in, University College Hospital.

I.

A HANDBOOK OF THERAPEUTICS. Tenth Edition, 8vo, 15s. [*Now ready.*

II.

ON THE TEMPERATURE OF THE BODY AS A MEANS OF DIAGNOSIS AND PROGNOSIS IN PHTHISIS. Second Edition, small 8vo, 2s. 6d.

FREDERICK T. ROBERTS, M.D., B.SC., F.R.C.P.

Examiner in Medicine at the Royal College of Surgeons; Professor of Therapeutics in University College; Physician to University College Hospital; Physician to Brompton Consumption Hospital, &c.

A HANDBOOK OF THE THEORY AND PRACTICE OF MEDICINE. Fifth edition, with Illustrations, in one volume, large 8vo, 21s.

*** The whole work has been subjected to a thorough revision by the author, many chapters having been entirely re-written and much new matter added, several new illustrations have also been prepared for this edition.

D. B. St. JOHN ROOSA, M.A., M.D.

Professor of Diseases of the Eye and Ear in the University of the City of New York; Surgeon to the Manhattan Eye and Ear Hospital; Consulting Surgeon to the Brooklyn Eye and Ear Hospital, &c., &c.

A PRACTICAL TREATISE ON THE DISEASES OF THE EAR, including the Anatomy of the Organ. Fourth Edition, Illustrated by wood engravings and chromo-lithographs, large 8vo, 22s.

J. BURDON SANDERSON, M.D., LL.D., F.R.S.

Jodrell Professor of Physiology in University College, London.

UNIVERSITY COLLEGE COURSE OF PRACTICAL EXERCISES IN PHYSIOLOGY. With the co-operation of F. J. M. PAGE, B.Sc., F.C.S.; W. NORTH, B.A., F.C.S., and AUG. WALLER, M.D. Demy 8vo, 3s. 6d.

ALDER SMITH, M.B. LOND., F.R.C.S.

Resident Medical Officer, Christ's Hospital, London.

RINGWORM: Its Diagnosis and Treatment. Second Edition, rewritten and enlarged. With Illustrations, fcap. 8vo, 4s. 6d.

J. LEWIS SMITH, M.D.

Physician to the New York Infants' Hospital; Clinical Lecturer on Diseases of Children in Bellevue Hospital Medical College.

A TREATISE ON THE DISEASES OF INFANCY AND CHILDHOOD. Fifth Edition, with Illustrations, large 8vo, 21s.

JAMES STARTIN, M.B., M.R.C.S.

Surgeon and Joint Lecturer to St. John's Hospital for Diseases of the Skin.

LECTURES ON THE PARASITIC DISEASES OF THE SKIN. VEGETOID AND ANIMAL. With Illustrations, Crown 8vo, 3s. 6d.

LEWIS A. STIMSON, B.A., M.D.

Surgeon to the Presbyterian Hospital; Professor of Pathological Anatomy in the Medical Faculty of the University of the City of New York.

A MANUAL OF OPERATIVE SURGERY. With three hundred and thirty-two Illustrations. Post 8vo, 10s. 6d.

HUGH OWEN THOMAS, M.R.C.S.

I.

DISEASES OF THE HIP, KNEE, AND ANKLE JOINTS, with their Deformities, treated by a new and efficient method. With an Introduction by RUSHTON PARKER, F.R.C.S., Lecturer on Surgery at the School of Medicine, Liverpool. Third Edition, 8vo, 25s.

HUGH OWEN THOMAS, M.R.C.S.

AND

RUSHTON PARKER, F.R.C.S.

Lecturer on Surgery at the Liverpool Royal Infirmary.

THE TREATMENT OF INTESTINAL DISEASES AND OBSTRUCTIONS. Third Edition, with Lithographic Plates. 8vo, 10s.

J. ASHBURTON THOMPSON, M.R.C.S.

Late Surgeon at King's Cross to the Great Northern Railway Company.

FREE PHOSPHORUS IN MEDICINE WITH SPE- CIAL REFERENCE TO ITS USE IN NEURALGIA. A contribution to Materia Medica and Therapeutics. An account of the History, Pharmaceutical Preparations, Dose, Internal Administration, and Therapeutic uses of Phosphorus; with a Complete Bibliography of this subject, referring to nearly 200 works upon it. Demy 8vo, 7s. 6d.

J. C. THOROWGOOD, M.D.

Assistant Physician to the City of London Hospital for Diseases of the Chest.

THE CLIMATIC TREATMENT OF CONSUMPTION AND CHRONIC LUNG DISEASES. Third Edition, post 8vo, 3s 6d.

LAURENCE TURNBULL, M.D., PH.G.
Aural Surgeon to Jefferson Medical College Hospital, &c., &c.

ARTIFICIAL ANÆSTHESIA: A Manual of Anæsthetic Agents, and their Employment in the Treatment of Disease. Second Edition, with Illustrations, crown 8vo, 6s.

W. H. VAN BUREN, M.D., LL.D.
Professor of Surgery in the Bellevue Hospital Medical College.

DISEASES OF THE RECTUM: And the Surgery of the Lower Bowel. Second Edition, with Illustrations, 8vo, 14s.

[*Just published.*

RUDOLPH VIRCHOW, M.D.
Professor in the University, and Member of the Academy of Sciences of Berlin, &c., &c.

INFECTION-DISEASES IN THE ARMY, Chiefly Wound Fever, Typhoid, Dysentery, and Diphtheria. Translated from the German by JOHN JAMES, M.B., F.R.C.S. Fcap. 8vo, 1s. 6d.

ALFRED VOGEL, M.D.
Professor of Clinical Medicine in the University of Dorpat, Russia.

A PRACTICAL TREATISE ON THE DISEASES OF CHILDREN. Translated and Edited by H. RAPHAEL, M.D. From the Fourth German Edition, illustrated by six lithographic plates, part coloured, large 8vo, 18s.

W. SPENCER WATSON, F.R.C.S. ENG., B.M. LOND.
Surgeon to the Great Northern Hospital; Surgeon to the Royal South London Ophthalmic Hospital.

I.

DISEASES OF THE NOSE AND ITS ACCESSORY CAVITIES. Profusely Illustrated. Demy 8vo, 18s.

II.

EYEBALL-TENSION: Its Effects on the Sight and its Treatment. With woodcuts, p. 8vo, 2s. 6d.

III.

ON ABSCESS AND TUMOURS OF THE ORBIT. Post 8vo, 2s. 6d.

A. DE WATTEVILLE, M.A., B.SC., M.R.C.S.
Assistant Physician to the Hospital for Epilepsy and Paralysis, late Electro-Therapeutical Assistant to University College Hospital.

A PRACTICAL INTRODUCTION TO MEDICAL ELECTRICITY. Second Edition, re-written and enlarged.

[*In the Press.*

FRANCIS H. WELCH, F.R.C.S.

Surgeon Major, A.M.D.

ENTERIC FEVER: as Illustrated by Army Data at Home and Abroad, its Prevalence and Modifications, Ætiology, Pathology and Treatment. 8vo, 5s. 6d. [*Just ready.*

DR. F. WINCKEL.

Formerly Professor and Director of the Gynæcological Clinic at the University of Rostock.

THE PATHOLOGY AND TREATMENT OF CHILD-BED: A Treatise for Physicians and Students. Translated from the Second German edition, with many additional notes by the Author, by J. R. CHADWICK, M.D., 8vo, 14s.

EDWARD WOAKES, M.D. LOND.

Senior Aural Surgeon and Lecturer on Aural Surgery at the London Hospital; Senior Surgeon to the Hospital for Diseases of the Throat.

I.

CATARRH, AND DISEASES OF THE NOSE CAUSING DEAFNESS. With Illustrations. [*In the Press.*

II.

ON DEAFNESS, GIDDINESS AND NOISES IN THE HEAD. Third Edition, with Illustrations. [*In preparation.*

E. T. WILSON, B.M. OXON., F.R.C.P. LOND.

Physician to the Cheltenham General Hospital and Dispensary.

DISINFECTANTS AND HOW TO USE THEM. In Packets of one doz. price 1s.

Clinical Charts For Temperature Observations, etc.

Arranged by W. RIGDEN, M.R.C.S. Price 7s. per 100, or 1s. per dozen.

Each Chart is arranged for four weeks, and is ruled at the back for making notes of cases; they are convenient in size, and are suitable both for hospital and private practice.

*** MR. LEWIS has transactions with the leading publishing firms in America for the sale of his publications in that country. Arrangements are made in the interests of Authors either for sending a number of copies of their works to the United States, or having them reprinted there, as may be most advantageous.

Mr. Lewis's publications can be procured of any bookseller in any part of the world.

List of works issued for the New Sydenham Society on application.

London: Printed by H. K. Lewis, 136 Gower Street, W.C.

16