Cholera epidemics of recent years viewed in relation to former epidemics : a record of cholera in the Bengal Presidency from 1817 to 1872 / by James L. Bryden.

Vital Statistics of the Bengal Presidency.

CHOLERA EPIDEMICS OF RECENT YEARS

VIEWED

IN RELATION TO FORMER EPIDEMICS:

A RECORD OF

CHOLERA IN THE BENGAL PRESIDENCY

FROM

1817 TO 1872.

BY

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CALCUTTA:

OFFICE OF THE SUPERINTENDENT OF GOVERNMENT PRINTING.

1874.

CALCUTTA:

PRINTED BY THE SUPERINTENDENT OF GOVERNMENT PRINTING,

8, HASTINGS STREET

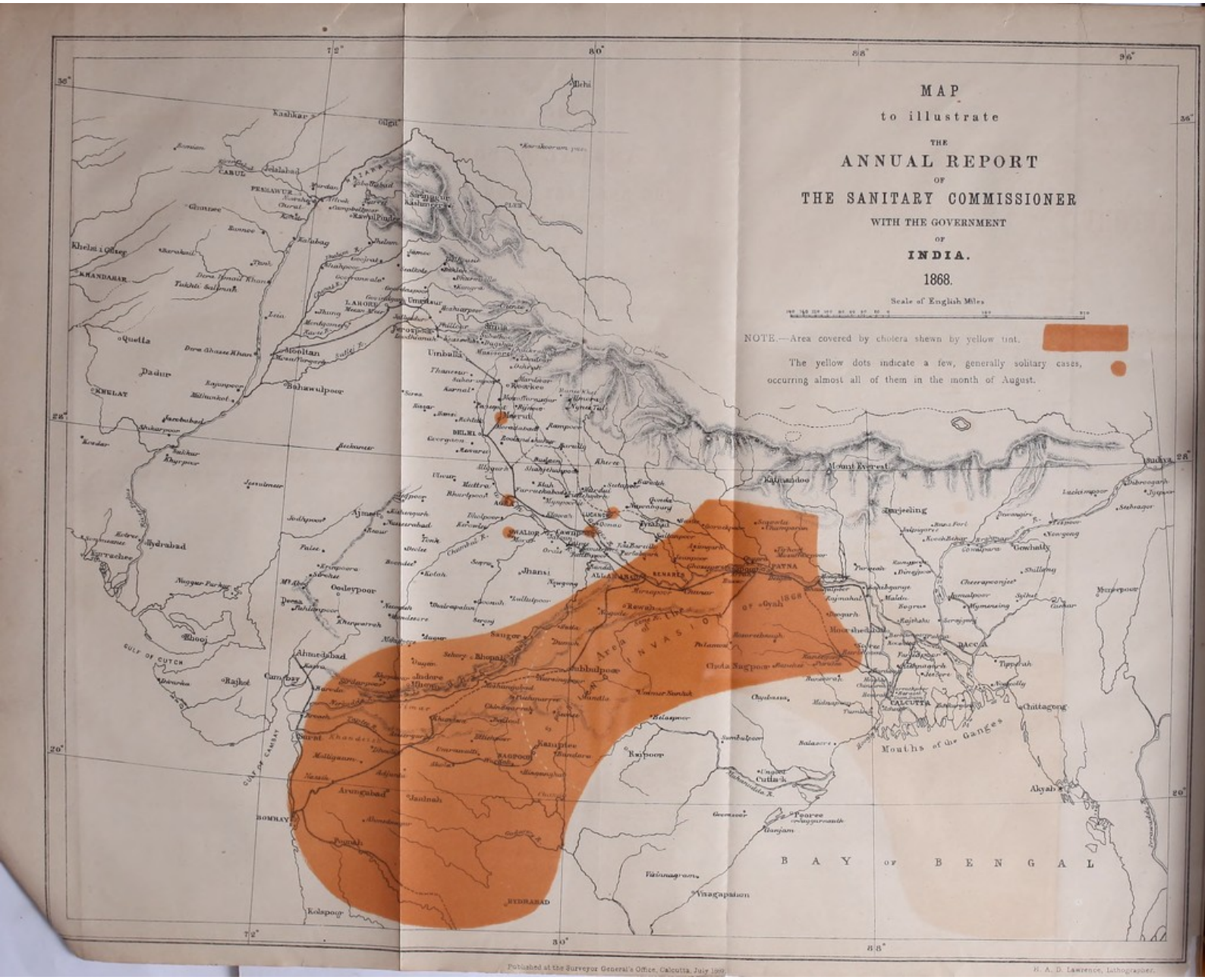
PREFACE.

SINCE the publication, in 1869, of the report reviewing the history of epidemic cholera in the Bengal Presidency up to 1868, the experience of two epidemics, carefully watched from their commencement to their termination, has afforded a test of the accuracy of the conclusions arrived at from a study of the cholera of the previous fifty years.

During the progress of these epidemics, the Government of India has required information as to the course likely to be followed by the cholera of the year. The anticipations furnished are incorporated in the reports on the General Aspects of Cholera in 1869 and 1872. In these reports, the facts observed during the epidemic are recorded, and the endeavour has been made to place each fact in the position in a system which it naturally holds, and which is defined by parallel history.

It has been found necessary to make a special study of the conditions under which the Madras and Bombay Presidencies are occupied by an invading cholera. The report on this important subject, which is bound up with this volume, was issued in 1871, and an appendix has been added in explanation of certain points on which a difference of opinion has arisen.

REPORTS CONTAINED IN THE VOLUME.


MAP
to illustrate
THE
ANNUAL REPORT
OF
THE SANITARY COMMISSIONER
WITH THE GOVERNMENT
OF
INDIA.
1868.
Scale of English Miles
NOTE.—Area covered by cholera shewn by yellow tint.
The yellow dots indicate a few, generally solitary cases, occurring almost all of them in the month of August.
Area of the Invasion of Cholera in 1868
BAY OF BENGAL
Mouths of the Ganges
Published at the Surveyor General's Office, Calcutta, July 1869.
H. A. D. Lawrence, Lithographer.

Epidemic Cholera in the Bengal Presidency.

A REPORT ON THE CHOLERA OF 1866-68,

AND

ITS RELATIONS TO THE CHOLERA OF PREVIOUS EPIDEMICS.

BY

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Printed by order of Government.

CALCUTTA:

OFFICE OF SUPERINTENDENT OF GOVERNMENT PRINTING,

1869.

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ADDENDA.

At page 240, while quoting the remarks of Mr. White, of Debrooghur, regarding the presumed fact, that in August 1860 coolie immigrants, landed from the Steamer *Adjai*, introduced the cholera of the year into Upper Assam, I stated, that I was under the impression that Mr. White had never again observed the same phenomenon of communicability. The epidemic of 1868-69 having covered Eastern Bengal and Assam to the North-East Frontier, the Commissioner of Assam lately instituted an inquiry as to whether immigrants might have been the means of introducing this cholera into the districts of his province, and the results, embodied in his report dated 15th July, have been published by the Government of Bengal. It is, I think, evident that the cholera of Assam of 1869 was a cholera revitalised throughout the province, and not primarily distributed. As early as June 1868, the cholera of this epidemic showed itself in Upper Assam, at the very time that it became epidemic in Burmah, at Tongoo and Mandelay, where the same cholera, manifested after reproduction, is at present (September 1869) raging. The spring cholera of the east, of 1869, epidemic between January and April, showed itself universally from Akyab to Debrooghur, and it is this spring cholera to which the report of the Commissioner of Assam has reference. As far as I am able to judge, this cholera was not introduced into Assam in 1869, but was redeveloped within the province from the cholera of invasion epidemic between June and August 1868. In his reply to the queries of the Commissioner, Mr. White makes specifically the statement to which I casually alluded, in the following terms :—

"During the time (nearly eleven years) I have been here, I have only once known an instance in which the introduction of cholera could be attributed to the influx of imported laborers from Bengal, and that was so far back as July 1860, when the Government Steamer *Adjai* arrived here with a large number of immigrants who suffered from cholera on the passage, and many were ill from that disease. On arrival they all went to the Maijan Tea Factory, and from thence the outbreak which followed soon after could be distinctly traced. The epidemic was, however, at the time coming up the valley from Bengal, having raged for some time before at Gowalparah and Gowhatty, and it is a question whether these laborers did more than accelerate its outbreak here by a few weeks.

"Owing to this introduction of the disease by immigrants, I for some time afterwards, and long before the Legislation of 1865, inspected the steamers on arrival and prevented the landing of passengers suffering from cholera. In 1864, when the tea speculation was at its height, the number of laborers who arrived, amounting to upwards of 600 a month, was so great and nearly every steamer having cholera on board, it was found impracticable and it would have been inhuman, to prohibit their landing. I then observed that, although patients were removed actually suffering from cholera to the various factories in the neighbourhood, it was never communicated to the old coolies. So complete was this immunity from contagion that in 1866 and 1867, when acting as Debarkation Officer, I never once prohibited the removal of cholera patients from the steamer to the several tea gardens to which they were consigned. As I incurred no little responsibility in doing so, I followed up and watched the results attentively, and I never heard of an instance of any of the old laborers on the garden to which the cholera patients were taken being seized; at times some of the new party of coolies who disembarked in health would be attacked on arrival at the garden, but never any of the coolies who had been previously there.

"Being much interested in the matter, I from time to time in former years enquired from the Medical Officers of the Assam and Jorehaut Companies, the two other principal centres of immigration, and their experience was similar to mine, that cholera was never propagated by fresh arrivals to either Cinnamara or Nazirah. There have been epidemics at both those places, but they could not be traced to introduction by recently arrived coolies."

At page 65, after the sentence ending "which are never reached in primary invasion," add—*except when monsoon influences pass the usual limits.*

STATISTICAL REPORT

ON THE

CHOLERA OF THE BENGAL PRESIDENCY OF 1866-68

CONSIDERED IN ITS RELATIONS TO THE

EPIDEMICS OF PREVIOUS YEARS.

INTRODUCTION.

During the sitting of the international sanitary conference at Constantinople in 1865, I was asked by the Sanitary Commissioner for Bengal to give my attention to the subjects on which the conference desired information, with the view that the results might be made available during the deliberations of this body. As the conference was already constituted, and as the questions proposed were being deliberated upon before the request was made to me, I had no hope of contributing material so systematised as to be useful as a guide, or likely to affect the results of deliberations based upon information received at an earlier period. I preferred carefully to study the whole question of the relations of cholera in connection with the occurrences of the past fifteen years, with the object of determining whether the recurrence of identical phenomena and the repetition of the same lessons year after year, might not become to us the indices of principles on which to frame generalisations as landmarks in the study of the cholera of this Presidency. The wide range of the subjects included, necessitated the study of cholera in all its relations; of the phenomena of geographical distribution; of duration in time; of the methods of dissemination; of the influence of climatic conditions; in short, of cholera taken as an object of Natural History.

The publication of the proceedings of the international conference, and the promulgation of the doctrine of the multiplication of the cholera miasm in the human economy and the constant diffusion of cholera as an epidemic by human intercourse, gave confidence to those observers in this country who, until very lately, suggested rather than maintained as a truth the transmission of epidemic cholera by human agency. The great outbreak among the pilgrims at Hurdwar in April 1867, and the subsequent diffusion of cholera over Northern India, alleged to have been consequent on the Hurdwar outbreak, has given an impetus to this doctrine towards an extreme from which the recoil of opinion in an opposite direction is unlikely to occur for years to come, unless the facts be shown in their true aspect and their actual significance be made clear. The Inspector General of the Medical Department has directed me to review the occurrences of 1867, in order to elucidate the relations of the cholera of Hurdwar to that of Upper India generally, and the extent to which the cholera of 1867 was indebted to the pilgrims for its geographical spread in that year.

By request of His Excellency the Commander-in-Chief, the Government of India has forwarded to me documents showing that the results of moving into camp during the prevalence of epidemic cholera, with the view to the mitigation of an outbreak impending, or which has actually commenced, have been in many cases unsatisfactory, and in some disastrous,—in one case cholera continuing its ravages, and in another, diseases due to exposure causing a heavy loss, which possibly need not have been incurred. His Excellency wishes that the facts may be put on record, and that the grounds may be clearly stated on which troops are ordered into camp in cholera seasons by the Medical and Sanitary Authorities.

It will be convenient to sub-divide this Report somewhat in the following manner, in relation to the questions to be specially treated:—

In the first section, the cholera of this Presidency will be studied in relation to its geography, and to the conditions which affect its growth, its distribution, and its decay; and in the second, the phenomena of the affection of communities will be illustrated. The results of these studies will be applied to the elucidation of the phenomena of the cholera of the latest Epidemic.

The opportunity has been afforded to me of placing on record in a systematic form, more particularly the occurrences of the fifteen years 1854-68; and I have linked on the experiences of previous years, as far as it has been possible to collect these, in order that I might take as the basis for the conclusions of this paper the widest range of statistical facts. I shall have

occasion to refer to the history of the epidemics of India from 1817 onwards, as illustrative of the behaviour of the cholera of recent years. The history of these epidemics is far from complete, and were it not for the indisputable evidence which, even in the condition in which I am enabled to present them, the statistical data afford of truths which are parallel to and explanatory of the facts of our times, it might have been as well to have confined the illustration of the subject to the experiences of the later period.

The period which I have specially chosen, affords for study the experiences of four different invading epidemics. It has long been known in a general way that cholera has not a perennial existence in Upper India; but the fact has not been appreciated at its proper value, that the conditions affecting the vitality of cholera as an epidemic, are not more favorable in Northern India than they are beyond the boundaries of Hindostan. If this statement be true, and if on the occasion of every epidemic invading Northern India, the phenomena are offered for our comprehension of their significance, at intervals short in comparison to those at which cholera as an epidemic is presented for the study of European observers, it is obvious that the recognition of this as a truth is of primary importance.

The general principle upon which I propose to systematise this Report, is one which has been recognised as true, more or less, by all writers who, for any considerable period, have had the opportunity of watching the course and sequence of epidemics of cholera. It is this, that every epidemic which recurs is a repetition more or less precise of epidemics which have preceded it. As far as I am aware, we have had as yet no elaboration illustrative of this general statement taken from the cholera of the Bengal Presidency. No attempt has been made so to systematise the epidemics of the past, that when the epidemics of the future come forward, the phenomena shall be viewed according to what may be termed their natural or normal aspects. The impressions of observers have not been based on misconception, and I accept the conclusion as the very groundwork of the study of the cholera of India.

The tendency of late years has been to study cholera more immediately in its relation to man, and to subordinate facts as they occur, as far as possible, to the theory of the distribution of epidemic cholera by human intercourse, and of its multiplication in the human economy. No observer in this country has ever held exclusively the doctrine so much in favour at present, and were we now to accept it as satisfactory and explanatory of the entire series of observed facts, it cannot be doubted that the progress of the study of cholera on a true because on a natural basis, would be indefinitely retarded. The present is an opportune occasion for re-opening this question on a basis of statistical facts. A bias has been given to the direction of sanitary measures by the doctrines promulgated; but however excellent the recommendations may be in themselves, no permanent or adequate good can come of them if they are directed against secondary objects and not at the root of the evil.

Again, an impulse has been given by the events of 1867, to the theory that the institution of quarantine is likely to be followed by the exclusion of epidemic cholera from the cities and districts of Upper India; and to those who seek to apply practical measures to the cutting short or to the mitigation of an epidemic, the prospect held out is an inviting one. Whatever may be the advantages of quarantine as a secondary measure, it is not going too far to assert, that future experience will never elevate quarantine into a position of primary importance as preventive of the spread of cholera, and that the hopes of those who now imagine that an epidemic of invading cholera must necessarily be cut short provided a sufficiently strict system of quarantine be carried out, are certain to be disappointed.

A clear comprehension of the natural characteristics of the cholera of Bengal, which may give direction to the measures by which its influence is to be met, is demanded as a national necessity. As the case stands at present, the fact cannot be concealed, that, in the past ten years, one-third of the mortality of the British Army of this Presidency has been caused by epidemic cholera; for, during the years from 1859 to 1867, out of a total mortality of 12,134, the deaths from cholera were 3,460, or 28·51 per cent. of the total.

Reckoning the general mortality of 1859 and 1860 as exceptional, and as influenced for the worse by the character of the material of which the Army was composed and by exposure in 1857 and 1858, the anticipation for the future is, that the mortality from cholera is not likely to be less than one-third of the total, unless some remedy more applicable to the case than those at present employed be discovered. Those who would point to the diminished mortality of the years from 1863 to 1866, as indicative of the efficacy of movement into camp as a remedy against invading cholera, have not given due weight to the fact, that, as far as regards the military stations most liable to the attack of invading cholera, the years from 1863 to 1866 constituted virtually, if not theoretically, a true interval of exemption between the epidemic of 1860-62 and that of 1866-67. And on the occasion of the reinvasion of 1867, the results of movement into camp disappointed the anticipations which the proposers of the measure had formed, so far as to demand from the highest Military Authority, an explanation of why it is that so little success has attended a step from which so much good was looked for.

The tendency to give undue weight to facts that are of secondary importance only, and to elevate them into the position of primary truths, has done much to retard the prosecution of the study of cholera on a healthy basis. A proposition that is true in itself may be of a significance very much more limited than those who hold it recognise. Some observers, knowing that they have a basis of facts to reason from, are very apt to maintain that those who would put a limitation on the truths which they advance, deny these truths

altogether; and they are inclined to hold the principles of other observers to be untrue, when the facts of their doctrines hold a position which is incompatible with the structure of a system as they have built it up.

I would not have it supposed that the difficulties of the case are met by admitting that the truth lies between two extremes. All truths which are clearly appreciable as such, must take their place in a system if the system aspires to be complete. From a basis a structure can be built up; without a basis it cannot. No number of secondary truths can ever of themselves complete a system if the fundamental truths be wanting. The truths advanced regarding cholera of late years, are, I believe, secondary only; and, therefore, I cannot receive them as the foundation of a system, however important a place they may occupy in the superstructure.

I observe, that at home, weight is laid on the excellent tendencies of these doctrines as giving direction to sanitary proceedings, and that those who oppose them are saddled with the responsibility of opposing what is good in its tendencies. In the absence of fixed principles sanitary proposals are but provisional. The general principles of sanitation the scientific investigator will not sacrifice; while the ultimate aspiration is, that from his labours, practical measures shall receive their direction, and be generally accepted because of their being in accordance with scientific truth.

I would have it recognised that the doctrines which I have here urged are fundamentally neither exclusive nor new. They are a development of the institutes which the best observers both at home and in this country have agreed upon. It has fallen to me to exhibit one aspect perhaps more powerfully than the aspect which springs out of a limited conception of the natural history of cholera, and I know that it will be contended, that I maintain this to be the one aspect of cholera to the exclusion of the other most in favour at present. I urge that the reception of exclusive doctrines must prevent the whole truth from being recognised. But one of the two doctrines is fundamental, *and must be recognised as such*. He who holds as his radical assertion, that cholera is essentially dependent for its growth and spread on its relations to man, and declines to entertain the doctrine of aerial transmission and reproduction in the soil, cuts himself off from what I believe to be the primary fact which must be received, before any adequate idea of the natural history of cholera can be taken in. Holding fast to this as a primary truth, we pursue it, and we carry on the study naturally up to the point at which we are led to enquire into the relations of cholera to the human race. Those who say dogmatically, that cholera is an object which has no relations except to man, and that, therefore, cholera must be transmitted from man to man and must be multiplied in the human economy, and that the materies so multiplied must be the means of infecting others, cut themselves off from what I believe to be the true basis of all enquiry. Those who do not, are prepared for an investigation of these questions, and are not driven into a corner in which they must take their stand or surrender their opinions. Step by step they are led on to recognise that it is an object and not a conception that is being studied, a thing as appreciable as if it had bulk or colour to make its presence evident to the senses, a thing with the attributes of a vitalised organism and with recognisable alliances, and, therefore, behaving in all respects like other vitalised and actually appreciable objects. Recognising this individuality, and knowing as a *primary* fact, that the cholera germ is earth-born and aerially conveyed, they are not prohibited from pushing enquiries into the behaviour of this object, when man, to whose system this object acts as a deadly poison, is concerned. When the conveyance of cholera from man to man, or from place to place by fomites, is proved, the fact is admitted; and the collection of evidence corroborative of such occurrences is an essential, although a secondary, portion of a complete investigation into the natural history of the cholera miasm. When it is said, that a cholera-stricken stream of pilgrims passes off cholera to travellers or others who meet it, the fact is not disputed, because it is known to be indisputable. When it is asserted, that cholera is multiplied in the economy and that the dejections are the medium by which the object when multiplied leaves the economy, and that a body of cholera patients is a focus of cholera, while the facts of 50 years' experience in our largest cholera hospitals, recorded by the best observers, negative the belief that, as the rule, those already suffering transmit cholera to those around, the door is left open for further enquiry, from a conviction, that multiplication in the economy may be a fact, although not of the practical significance which those who hold the exclusive doctrine are *compelled* to attach to it.

If the elevation of little truths to the position of great truths is mischievous, much more is the acceptance of a fallacy detrimental to progress in the right direction. It often happens that loose assertions pass current for accepted truths. The true relations of epidemic cholera to meteorological agencies are obscured by accepting in a general way statements which are incorrect, such as that cholera prevails during the blowing of the hot dry winds as well as with an atmosphere saturated with moisture, or with the extreme of cold as with the extreme of heat. So, too, we find the reporters of the International Conference taking for granted as a fact, that epidemic cholera in India may advance against the prevailing winds, and supporting their conclusions by what they allege to be a fact, but what, in reality, is a fallacious statement. The eradication of such fallacies, which have passed current for truths because uncontradicted by the production of the actual facts, will certainly occur *pari passu* with the production of the facts.

Various circumstances have combined to retard our knowledge of the laws regulating epidemic cholera. I have above referred to narrowness of view as one of these conditions. The study of cholera from an adequate, well connected, and thoroughly authenticated aggregate

of statistical data, can alone lead to accurate generalization, and to a due appreciation of the weight of a fact, or series of facts, in a systematic enquiry. The local view has the one aspect which it presents to the local observer, and from this he is apt to generalise. We have, for example, been told of the affection of Oude as a province, in 1863, by an infected pilgrim stream, and told of the affection of the Central Provinces from the pilgrim shrines of the locality in 1860 and 1864-65. To the local observer these appear as epidemics of which he is the centre. The investigator on a wider basis, recognises the cholera of 1860 as a great epidemic covering India from the frontiers of China to the mouth of the Nerbudda, the epidemic of 1863 as universal throughout the Gangetic provinces from the Bhurmpooter to Bundelcund, and the epidemic of 1864-65 as a great cholera spreading from the Bay of Bengal to the shores of the Atlantic. So, too, the affection of communities is a subject which can be advantageously studied only on a wide basis of observed and registered facts. The loose assertion so frequently repeated, that the adoption of certain measures was immediately followed by the disappearance of cholera, is made too often from a misconception of the part which cholera plays in the affection of bodies of men, and when the same means are subsequently applied by those who credit the statements made, the result is disappointment.

I would not have it supposed that in this paper I have woven the deductions from the facts of the period into a system which is perfect. Such opinions as I have recorded, have been arrived at after many previous misconceptions, and no one can be more aware of the fact than I am, that every year and every epidemic teaches something new, and throws a different or a clearer light on the conceptions derived from former experiences. I have tried to dispose the facts and figures in such a shape that it is open to every one to draw his conclusions from them, and these may be corroborative of my views, or they may not. I have tried to give shape to the study, and I have little doubt that some at least of the inferences which I have made, will be found available in the future when the laws of the cholera of India shall have been framed into a system.

As regards the data from which the deductions are made. The field of observation extends from the Assam Frontier in the north-east, to the valley of the Nerbudda and Western Malwa in the south-west; and from Pooree and Cuttack in the south-east, to the North-Western Frontier. The population of which the statistics are here employed, exceeds 160,000 daily under European medical supervision, and is representative of three distinct types. The European Army furnishes the results for between 40,000 and 50,000 men, women, and children located within this area; the Native Army numbers 60,000 men; and the Jail population of the Presidency varies from 50,000 to 55,000.

For the correctness and completeness of the figured statements I am responsible. They have been drawn by my own hand, from the monthly and weekly returns furnished at the time that the events occurred, and in no case are they drawn from second-hand or from annual sources of information. These afford a true index of the presence of cholera, whether endemic or epidemic; and the indications which they give are confirmed by such general statements relative to the cholera of localities as I have been able to gather from the official sources at my disposal, or from the general death registration which has been carried out for some years back in Upper India.

The experience of one type can never contradict that of another; and whatever statistics of the general population it has been in my power to collect, have been illustrative of and have never contradicted, the indices given by the types. The value of the statistics employed will be best judged of from the sequel; but I think it right to ask that no preliminary objection be taken to the data which I shall employ.

The area included within the limits of the Presidency, wide as it is, is not too extensive for the study of the geography of epidemic cholera. Indeed it is too limited, seeing that the boundaries of natural areas are curtailed by political divisions, and that the most essential connecting links are thus cut. Still, within the limits of the Bengal Presidency there are several areas which are truly natural provinces, and which are complete in themselves when the cholera of Bengal is studied in its geographical relations.

I do not say that a more extended series of observations might not have been advantageous to a more accurate study. I have employed the whole data which are in my hands, and I am not conscious of having made use of them to forward, beyond what is legitimate, any view of my own. I would willingly have deferred to place on record my opinions, in order that further data might be accumulated; but the facts of the past have been demanded, and, therefore, I have set them down in order here.

Whatever conclusions I have come to, have not been built up upon theories of my own which I have brought to the study of cholera. Like others, I may have brought my impressions derived from authentic records or from personal experience; but the study on a statistical basis has produced its own results, and has led me, step by step, through many phases of error and misconception, to shape the result in the form in which I now publish it as representing the opinion which I hold provisionally, and liable to correction from future experiences.

I find it most instructive to review the different aspects which the subject has presented, under the limitation of facts and with short experiences. The retrospect shows that to have started in the study with a plan ready sketched out, would have been of little use. It became evident at a very early stage, that it was from an aggregate of statistical facts and from those facts alone, that the subject would fall systematically into order. And these data I therefore propose to give as an essential introduction to the conclusions to be based upon them.

The author of the report on the cholera of 1861 in Northern India, has well observed, that much of the mystery that hangs over the Natural History of Cholera is owing not to the difficulties of the study so much as to the neglect of the systematic study of cholera in India. And yet, as he states, the natural facilities for such a study are very great; cholera is never absent, and all meteorological phenomena occur with a regularity and intensity unknown in the temperate regions of higher latitudes. He adds (para. 338 of report),—"This is a branch of inquiry in which literally nothing has been accomplished, nor indeed can we find that any serious attempt has hitherto been made in India even to point out its importance, and almost all our scientific knowledge is derived from European observation. It would be difficult to find a better example of the vast practical interest of those statistics of science the collection of which in India has hardly up to the present time been commenced." And yet again he writes,—"When we consider the regularity with which the same phenomena constantly recur, and the excellence of the opportunities which exist for their observation, we cannot doubt that it is in the power of science to solve many problems regarding them, which nothing but our deliberate neglect and ignorance have suffered to remain in mystery."

In consequence of the want of scientific information regarding the behaviour of cholera in this country, the demand for a special investigation into the generation and development of cholera in India, was made during the sitting of the Constantinople conference by the international commission, but the proposal was objected to by the British delegates. It was therefore resolved "to invite the attention of the respective Governments of the countries believed to be the birth places of cholera, to the utility of undertaking or continuing strict local enquiries upon the generation and propagation of the disease."—(Report, Indian Ed., page 293).

A report containing the substance of the following paper was forwarded to the Sanitary Commission in July 1865, and in 1866, I had an opportunity of explaining and illustrating the general propositions to a conference of Medical Officers convened by Dr. Murray, Inspector General for the Upper Provinces. These papers have been re-written, and the statistical data have been brought down to the present date.

SECTION I.

THE NATURAL HISTORY OF THE EPIDEMIC AND ITS SUCCESSIVE REPRODUCTIONS.

IN THIS SECTION THE AFFECTION OF THE HUMAN ECONOMY BY THE DISEASE CALLED CHOLERA, IS REGARDED AS THE INDEX MERELY OF THE PRESENCE IN A CERTAIN SITUATION OF AN OBJECT WHICH HAS AN INDIVIDUALITY OF ITS OWN, AND WHICH, BECAUSE OF THIS INDIVIDUALITY, GIVES ORIGIN TO THE EPIDEMIC MANIFESTATIONS OVER AN AREA. OF THESE MANIFESTATIONS CERTAIN ARE DUE TO WHAT THE OBJECT IS IN ITSELF, OTHERS TO THE CONTROL OF ITS PROPAGATION AND DIFFUSION BY NATURAL AGENCIES.

SECTION I

INTRODUCTORY.

THE METHOD IN WHICH THE NATURAL HISTORY OF CHOLERA IS TO BE STUDIED, AND THE GENERAL ARRANGEMENT OF THE MATTER OF THE FIRST SECTION.

THE natural sub-divisions of this section are two: the first should treat of the phenomena manifested by cholera which are due to its own individuality; the second, of those which are due to its subordination to external agencies.

Taking the affection of human beings as the index, the first thing which I propose to show is, that in any year and in every year, the cholera of the Bengal Presidency has a geography which can be demonstrated; that the affection of certain areas only in certain years is a fact; and that this affection is subordinate to what cholera is in itself, and in its relations to natural agencies. In the sequel these areas will be defined, and they will be proved to be natural areas or provinces. The reasons why they are so will be studied in detail.

Over and above its subordination to natural agencies which retard or accelerate the manifestation of cholera, it will be shown that the phenomena of the vitalisation and decay of cholera are manifested in subordination to what cholera is in itself. This is the unknown something of which authors speak, which to us, in this country, is made clear from the strict and absolute laws regulating the revitalisation, decay, and death of cholera, which also fall to be studied in this section. The observation of these laws enables us to define almost to a day when a latent cholera shall reappear, or when a cholera which is in epidemic vigour shall come to its termination, as we can foretell when a tree shall put forth its bud, or when the leaf shall fall.

The accurate study of the same phenomena necessitates the employment of a nomenclature which is rigorous; we are called on to apply precise terms to certain phenomena, and to call the same phenomena, wherever manifested, by the same terms throughout.

A clear comprehension of these preliminaries will enable us to speak of cholera as having a natural history of its own, and to apply to it terms which are comprehensible when employed on this understanding; and the general idea may be received, that the cholera of each year may have a habitat, as regards which we have to tell how and why cholera came to take up its abode in it.

The fundamental proposition of this section is very simple. It is this, that in Upper India cholera has not a permanent habitation; that, at intervals of years, the cholera of the provinces of Upper India is renewed by invasion from without; and that in certain areas of the Lower Provinces cholera has a permanent and perennial abode. Hence the primary geographical sub-division of the area of the Bengal Presidency is into two—the area of endemic cholera, and the area of epidemic cholera.

The second proposition is, that the invasion of the epidemic area is not dependent on contingencies, but is governed by laws which are natural and capable of definition. When it has been proved that the geographical sub-division of the epidemic or invaded area is a fact as relates to invading cholera, I propose to show that the same areas are related not to epidemic cholera only, but to the natural agencies which influence the health of communities for good or for evil; that the part which cholera is called upon to play is forced upon it; and that it has no locomotion in itself, and has no capability for the selection of a habitat beyond that which is assigned to it by natural and meteorological agencies alone.

But invasion is, necessarily, secondary to reproduction. Previous to manifestation the revitalisation of cholera as an object is a primary necessity. The first study of cholera as an object is that of its periods of dormancy and revitalisation. The periodical recurrence of the same series of phenomena is an *universal* fact in whatever situation cholera is met with, whether it be in the endemic or in the epidemic area. The reproduction of cholera is a vital phenomenon; invasion is of meteorological significance merely, and the two ideas should never be mixed up. The reproduction and decay of the object producing the disease cholera, whether in the endemic or invaded area, is as truly a phenomenon of season as is the phase of vegetation of each month or series of months. It is regulated in the time of its occurrence, that is, its appearance is accelerated or retarded, by the speciality of geographical site, and by the meteorology connected with and natural to this geographical site. But controlled as cholera is by meteorological agencies, it must never be forgotten that reproduction and decay are vital phenomena always and essentially, and *that they occur because cholera is a vitalised object, and not because of the prevalence of certain meteorological phenomena.*

I have said that the natural tendency of the cholera which invades Upper India is to decay and death. But not the less is the vital phenomenon of dormancy and renewal displayed during the period for which it continues in epidemic vigour, that is, in life. Revitalisation in different portions of the epidemic area is retarded for weeks or months in comparison with the dates prevalent within the endemic area; and the extent of the retardation is regulated in

relation to the physical aspect of the occupied situation, or to the meteorology natural to the province of the epidemic area occupied by the cholera which has made its invasion. In the epidemic area the repression of a cholera normally due to re-appear because of having made its invasion, is a phenomenon which is often apt to be powerfully exhibited. Nor is this to be wondered at, seeing that the cholera is on a foreign soil, and prone to decay under the operation of agencies adverse to its vitality. But the fact of recurrence is as true here as it is in the case of the cholera of the endemic area, and is truly indicative of the renewal of vitality or of the cessation of a period of dormant existence.

Having studied these preliminary questions we find ourselves in a position to define accurately what is meant in speaking of an epidemic of cholera within the epidemic area. The definition is as follows: An epidemic is a new emanation of the cholera miasm from within the endemic area, invading from the margin of the epidemic area lying in contiguity to the confines of the endemic area, and covering within a certain limit in time, one, or more, or all, according to circumstances, of the natural provinces of the epidemic area, and generally, certainly as the rule, occupying anew provinces which have become vacant by the death of the cholera of the epidemic, the predecessor of the epidemic now in progress of invasion; destined to live out the life-period normal to it in the epidemic province, unless exceptional meteorological conditions shall repress or kill it before the date of its normal demise; and certain to become revitalised in the occupied area in such situations as foster the germ and preserve it alive through its period of dormancy, in each year of its epidemic existence.

From the study of a succession of epidemics the normal duration of the life of the invading cholera of Upper India may be reckoned; and from strict parallels in different epidemics, the limitation of the invading cholera to certain areas, the season of invasion, the phenomena accompanying it, and the dates of revitalisation normal for a province already occupied.

The Epidemic *extends over years*. It has a true limit in time. The history of the epidemic embraces the behaviour of an invading cholera from the day of its invasion to the day of its decay, within the entire geographical area occupied either in the first or in the succeeding years of its epidemic life. In virtue of what cholera is as an object of Natural History, the epidemic is made up of a certain number of different and successive renewals, reproductions, or revitalisations occurring in each year of the lifetime of the epidemic.

The typical Reproduction shows the natural behaviour throughout its period of revitalisation of a cholera revitalised over an area on a certain date; its lifetime is included between the dates of its appearance and decay. Whether in the endemic area or in a natural province of the epidemic area, *the cholera miasm is revitalised for a certain number of weeks or months only at a time*. This revitalisation is the equivalent in Natural History of the renewal of vegetation in a certain geographical situation at certain seasons, and with a certain climatology. Besides becoming apparent by the affection of communities, it is during the continuance of a Reproduction that cholera is manifested to us under the aspect of a moving or progressing epidemic.

The Outbreak is a local manifestation of cholera. The study of the Outbreak is the history of cholera in relation to a community, and not to a geographical area. The Outbreak has a limit in time as definite as is that of a Reproduction or of an Epidemic. Since the Outbreaks of a provincial area taken collectively, are the manifestation of a Reproduction, it follows, that no Outbreak can survive beyond the date of the natural decay of the Reproduction of which it is a part. Any community within an invaded area is, in theory, liable to attack at any time during the persistence of the Reproduction. Every Outbreak has its place in a Reproduction and in an Epidemic.

Every Outbreak consists of an aggregate of individual cases of cholera, and, therefore, each of these cases has a place in a Reproduction and in an Epidemic of air-conveyed and soil-generated cholera.

Over and above what is comprehended in this classification, there is yet another group of cases which occur during an epidemic period, and then only, but which has not its origin primarily from an air-conveyed cholera. This group is made up of cases of cholera transmitted from those who have been subjected to the choleraic influence, or from fomites impregnated with the virus of cholera. The instances of the dissemination of cholera by such agency may be comprised in a group termed "Dependencies of outbreaks." But this is to be observed, that while the aggregate of a certain number of Outbreaks of soil-born cholera constitutes a Reproduction, which again has its place in an Epidemic, there is no evidence to show, that, in this country, any aggregate of cases of cholera derived secondarily from true Outbreaks through human agency, has ever, by the combination, produced the phenomenon distinctive of a Reproduction, that is, a provincial manifestation of cholera; and, consequently, it never can have given rise to an Epidemic.

If this distinction be true, then this group has a place of its own, and we are not called upon to study it as necessarily connected with the Outbreak, the Reproduction or the Epidemic.

One of the most important chapters of this section is that which takes cognizance of the parallels afforded by different epidemics—parallels not occurring as mere coincidences by a chance combination of events, but inculcating the truth and forcing us to the belief, that it is in subordination to natural agencies alone that the same phenomena of relation to space and to season occur with recurring epidemics. It is in these parallels that the history of the past may be read by the light of the history of the cholera of the present time; and it is the recorded parallels which, when a system shall have been established, will be employed for the anticipation of the occurrences of an epidemic years before they actually happen. This is not a mere fancy. Its truth will be shown not only when we compare one with another the

epidemics of these fifteen years, but when we go back to review the records of the cholera of the fifty years that are past. The study of these parallels follows that of the geography and of the statistical facts of the cholera of the period, and it takes its place naturally after the completion of the study of the Epidemic, and of the statistics of the epidemics of Upper India of recent years, since it falls to be shown in what respects these epidemics have resembled each other and in what they have differed. Generally speaking, the grand parallels of any epidemic are clear; but sometimes, the minor details are complex and difficult to refer back to similar events in the past. Often the parallels are perfect; occasionally, we are disposed to regard them as incomplete. And yet we cannot but feel, that the complexity lies in our want of comprehension, and the incompleteness in our inability to grasp as a body the facts which every epidemic affords. This we must not overlook, that the manifestation of parallels is under the control of natural agencies, and that the disparities of these in the course of different epidemic periods, must have due weight in estimating the completeness or incompleteness of parallel facts.

Much advantage also will be gained by giving, in this Section, due consideration to the alliances of the object cholera with other morbific agents which react upon the human economy, and which have an equal value with cholera when regarded from a natural history point of view. The miasm of influenza, malaria, and cholera is in each case a distinct individuality; it is immutable, and it has the value in a system, of a thing which has been created. Typhus and small-pox have the same value, but with these the miasm of cholera has nothing in common. On the other hand, much of the natural history of malaria and influenza has a parallel in the history of cholera; and the behaviour of the one throws light frequently upon what is less clear in the operation of the allied miasm. In the case of epidemic malaria, of which I shall have to speak hereafter, the individuality of the epidemic influence is sufficiently well marked to render the presence of the miasm unmistakeable, and to bring into prominence its relations to season and locality. Much of this individuality is lost when the miasm is in a state of decadence; and, indeed, so far is this the case, that some have not hesitated to assert, that there is no specific miasm engaged in the production of what we know by the term malarious fever. The impress which cholera leaves on the human economy leaves no doubt as to the presence of the existent something which we have to recognise, and it is seldom that we can fail to trace its connexions, geographical and meteorological.

Where the alliance is natural, consistency is maintained throughout when comparison is made; in cases where there is no natural alliance, in place of finding the objects compared drawn together by a common bond of union, the contrast becomes the wider in proportion as the natural history of each is properly appreciated. The laws of Typhus are, in India, *diametrically* opposite to those of cholera, and no observer, with a knowledge of the laws to which the two agents are subordinate, would ever place them together for the purpose of searching for a natural alliance.

The following quotation from Copland* having reference to influenza, might almost have been penned with reference to cholera as it is to be described in this section, substituting the one term for the other throughout. Copland writes,—"That influenza neither originated in nor was diffused by contagion, direct or mediate, seems satisfactorily proved by the nature of the disorder, and by the phenomena and circumstances connected with its appearance and spread. No facts have been adduced of a contagious property, according to the meaning I have attached to the term, having belonged to it, whilst numerous circumstances, showing that it was devoid of such property, have been observed by all who were practically acquainted with it. The almost simultaneous outbreak of the epidemic in distant countries, the rapidity with which it traversed immense spaces, the fact of its often pursuing, in its spread, a different course from that of human intercourse, the great numbers attacked at the same time when it appeared in a district or town, and the frequent suddenness of the seizure, showed that it proceeded chiefly from a very generally diffused change in the atmosphere that modified or infected the system in a determinate manner; that this malady depended principally upon atmospheric influence, these and other considerations fully prove; but that in some instances, other agents or causes concurred with, or aided this, the principal cause, may be admitted. These other concurring or aiding causes seem to have been the ordinary exciting causes of catarrh, and infection proceeding directly from those laboring under the malady. It was often observed that communication with those already attacked appeared to favor the development of the complaint in the healthy; for when an individual came with the disease from a distance, the inhabitants of the house in which he arrived were usually the first attacked. But it must be conceded, that this infection was a very subordinate cause to that upon which the epidemic principally depended, and that it was merely a concurrent and contingent circumstance in the diffusion of the complaint."

The general scheme of this Section is contained in the following arrangement, and it is somewhat in this order that the subject is taken up in the sequel:—

SECTION I.—THE NATURAL HISTORY OF CHOLERA.

Sub-Section A.—General Enquiry into the Phenomena of Epidemic Cholera.

Chapter I.—The cholera of each year has a geography which is definite and can be demonstrated.

* Dictionary, page 434, Art. Influenza.

CHAPTER II.—The cholera of any year or period has not a manifestation continuous throughout each month of the year or period; it is exhibited in a succession of manifestations alternating with seasons of dormancy.

CHAPTER III.—Besides having a distribution in space, that is, a geography, epidemic cholera has a distribution in time. A cholera of the epidemic area which can be recognised as new and invading, re-appears throughout a succession of years; the period from its first invasion to its final disappearance is the duration of an epidemic of cholera.

CHAPTER IV.—Every epidemic is a repetition of epidemics which have preceded it, and the parallels between different epidemics are as fixed and stable as is the recurrence of the phenomena of the meteorology of an invaded area.

SUB-SECTION B.—SPECIAL ENQUIRY INTO THE RELATIONS OF CHOLERA, AND INTO THE CIRCUMSTANCES UNDER WHICH THE PHENOMENA DISTINCTIVE OF CHOLERA ARE MANIFESTED.

CHAPTER V.—The phenomena of the invasion of an unoccupied area.

Separate propositions to be considered in this chapter.

(a).—Certain areas enjoy comparative exemption from cholera in every year; in others it is endemic and perennial.

Certain areas are occupied by cholera in each year, while others are free from its presence.

The area of the Bengal Presidency may be mapped out into two primary divisions, the areas respectively of endemic and epidemic cholera; the epidemic area is essentially an invaded area.

(b).—The *invaded* area has a direct relation to cholera already existing beyond its boundary line; when the boundary is overstepped, an endemic cholera becomes epidemic and invading. Cholera, however, may become truly epidemic within its endemic area without the transgression of the endemic limits, but in this case invasion of the epidemic area is imminent within a limited period.

(c).—When cholera invades an unoccupied area, the *source* of invasion and its *direction* are exhibited to us; the geographical limit to which an invading cholera extends is also made evident.

(d).—If the great epidemic area of this Presidency (within which cholera has no *perennial* existence) be invaded at more points than one, if the direction of invasion in each case be capable of recognition as the same on the occurrence of each fresh invasion, and if the geographical limits of the invading cholera be fixed and definite, then the epidemic area becomes sub-divided into as many *epidemic provinces* as there are separate points and directions of invasion.

(e).—If each of these provinces be clearly capable of definition by the consistency of its *characteristics* in every year, the index being the general prevalence or non-prevalence throughout it of sickness and mortality, and of certain special diseases; if the separate divisions of the great epidemic area have necessarily no characteristics in common in any year (excluding altogether the question whether cholera be absent or present); if the history of each province repeats itself constantly and with precision after a succession of years, so that we can at once recognize the parallels—then, the *cholera provinces* are the natural divisions of the area of the Bengal Presidency; and they are natural not for cholera alone, but in relation to all influences, the general prevalence of which determines the standard of health among the population.

(f).—The geographical distribution of an invading cholera is purely a phenomenon of meteorological significance. Epidemic cholera is never in any case spread *over a definite geographical area* by human intercourse alone; nor can human agency cause the boundaries of a natural province which has been occupied by cholera to be transgressed, so that a cholera *epidemic from such a source* shall appear in the province immediately adjoining, and become generally diffused among its inhabitants.

(g).—Cholera has no locomotive power in itself, and the geographical distribution of an advancing epidemic is essentially dependent upon the existence of *a vehicle*. A cholera which has no vehicle afforded to it is anchored, and is shown in localised outbreaks only. A cholera of a *dry and hot season*, when such a cholera is found, is a *reproduced* and not a *primarily invading* cholera. In connexion with the phenomena of reproduction to be presently alluded to, and the conditions which retard or accelerate it, the epidemic distribution of cholera is effected in the different regions of Hindostan, at the seasons when this vehicle is afforded; epidemic advance occurring in one region in March and April, in a second subsequent to the 20th June, and in a third in October, November, and December. The vehicle required is in all cases, and wherever epidemic advance is in progress, a humid atmosphere.

(h).—The prevailing wind is the agency which directs the course of an advancing epidemic and determines its limitation in geographical distribution. The assertion that cholera may advance against a prevailing wind is contrary to fact,

and the phenomena brought forward in support of it are, generally speaking, those of a cholera reproduced over various, and possibly widely separated, portions of the same natural province, months or years subsequent to the original invasion; or they may be related to the cholera of two natural and distinct provinces, each invaded from a separate source and in a different direction, in which cholera may be in existence at the same time.

CHAPTER VI.—The phenomena of reproduction in each year of an epidemic, and the duration of the epidemic in years.

This chapter should treat of the aspect of a reproduced cholera, as distinguished from a cholera in actual course of distribution, and of the behaviour of an invading cholera after an area has been covered, under the following heads:—

(a).—Since it has been shown that the epidemic area of this Presidency, or any of the provinces of the area, may become free from a cholera which has made an invasion, it follows, that an invading cholera has a definite life-period, to be reckoned from the date at which it leaves its endemic province, at the termination of which it dies; and the geographical area covered by it is free from cholera, provided a new invading epidemic has not made its way into it, and introduced within it a new source of reproduction.

(b).—Reproduction is distinctly a provincial manifestation. But a cholera which has invaded an epidemic province is not necessarily reproduced over the whole area of the province; many portions of such an area are entirely unsuited for its reproduction, while others which are well adapted to its requirements, afford the breeding grounds whence it emanates when renewed, in the vigour of epidemic manifestation. Besides being renewed in these localities, a cholera in its second or third year after invasion is liable to come forward in many special situations which have afforded to it the opportunity for localisation; that is to say, such localities retain cholera and foster it, while its life is extinguished in others less favorable to its existence.

(c).—The reproduction of cholera in each year is essentially a vital phenomenon proper to the miasm of cholera as an object of Natural History. The phenomenon is manifested wherever cholera is met with, whether in its endemic or epidemic provinces. It is the equivalent of the budding of a tree or the flowering of a plant. The date of reproduction is regulated by the normal conditions of the geographical position in which cholera finds itself; for example, the very same reproduction which occurs in one locality on the 20th February is delayed in another to the 20th April, and yet the two are one and the same phenomenon. The duration of each of these reproductions is the duration of a provincial epidemic outburst, and when the period for which it has come forward is at an end, the cholera is again dormant until its normal period of revival comes round. Hence no combination of conditions can prolong the vitality of cholera in any general manifestation beyond a definite time; and no cholera can be artificially propagated so as to prolong beyond this normal period such a general manifestation.

(d).—Cholera has *special seasons of reproduction* in every year. Each of these is distinct, and it can be absolutely demonstrated; but the date of each reproduction must be studied in connexion with the special locality of its occurrence, and statistics in the mass render obscure what is beautifully evident on analysis.

(e).—Cholera may become an invading epidemic in any of these reproductions, and does become so provided a vehicle be afforded to it at the same time. By determining the date of these reproductions normal for any locality, we can predict at what dates a cholera which has made its invasion shall naturally re-appear.

(f).—In each year of the period which constitutes the life-time of an invading Epidemic, the natural revivals of the miasm are to be looked forward to; and at the very end of this period the cholera may be as deadly in its character as at the beginning of its epidemic life. A cholera which then disappears is actually dead, and without a history of reinvasion no cholera can again appear within the same province of the epidemic area.

In studying the subordination of epidemic cholera to meteorological agencies, I have been compelled to notice and illustrate the facts of provincial revitalisation as well as the phenomena which accompany primary distribution. Hence, I have been obliged to treat, in anticipation, of many subjects which would properly have appeared in this chapter. I shall, therefore, only briefly sum up the conclusions under these heads deduced from the illustrations already given, and then endeavour to show how far the epidemic history of the past 50 years is a consistent history, and how far the facts and phenomena coincide with those of the period more especially under review.

I shall conclude the Section by placing the aspects of the facts of the epidemic of 1866-68 in the light in which they appear to me when viewed in relation to the occurrences of previous epidemics.

CHAPTER I.

THE CHOLERA OF EVERY YEAR HAS A GEOGRAPHY WHICH IS DEFINITE, AND CAN BE DEMONSTRATED.

THE Natural History of the Cholera of Bengal Proper and of Eastern Bengal and Assam I shall consider in another place. Here, I propose to show that the history of the cholera of the epidemic area of this Presidency is capable of being strung into a continuous narrative extending from one year to another. In the succeeding chapters I shall speak of this cholera as invading, as reproduced, and as dying out; the present is designed to indicate the simple fact of the presence or absence of cholera over the areas occupied by the types under observation, throughout a series of years. I shall, therefore, merely reproduce here the cholera tables of each year for each of the types,* and call attention shortly to the indications afforded by these tables, and supplement the facts indicated by such explanatory or corroborative statements as may enable the reader clearly to comprehend the statistical data upon which the narrative is based.

Definition of the term, "the interval between two epidemics."

It is expedient to go back to an interval between two known epidemic periods, to a year or years in which over certain districts of Upper India, cholera has ceased to manifest its existence. It can be readily conceived how in a field so wide and of which the natural aspects are so varied, the phenomenon of extinction occurs in certain provinces of the epidemic area, and in others is represented only by decline to a minimum of manifestation; how epidemic lines defining the boundaries of natural areas are, as a rule, shaded lines and not abrupt definitions; and how even the districts lying between the endemic area proper and the provinces recognised as epidemic, may be a neutral ground, one observer insisting that these constitute truly a portion of the endemic area, while another, with an equally accurate knowledge of the facts of the case, holds that they are not entitled to be so regarded. Some are in the habit of saying, that it is very doubtful whether any city or district of Upper India is ever free entirely from cholera. Whether this be a fact or not, and it certainly is not asserted to be so on statistical data, perennial persistence is not a fact in the Natural History of the cholera of the Upper Provinces. This history leaves no door open for the assumption, that the germ pre-exists in these provinces, and that epidemic manifestation is a mere phase in the life of this existing cholera developed under certain conditions, known or unknown. Shaded our lines may be, but the shape which they give to the areas which they limit is scarcely on this account the less definite; it may be that in many cases local causes specially foster cholera, but no collection of such cases can alter the facies of a cholera epidemic as regards its relations to time or to space.

The use of the term, "the interval between two epidemics," may in one province of the epidemic area imply that the cholera of invasion has declined to a minimum, and in another, that the cholera of invasion has become extinct; in either case, it implies that the province is enjoying a respite which is to be broken after a certain period by the irruption from without of an invading cholera.

I have chosen as convenient, the interval between the epidemics of 1849-53 and 1856-58, and I commence the narrative by describing the geographical relations of cholera in this Presidency previous to the invasion of 1856.

Definition of the two Primary Divisions of the Epidemic Area.

In speaking of the epidemic area of the Bengal Presidency, I shall frequently have occasion to use the terms Eastern and Western Divisions as applied to two portions of the area. When I may do so, it will be understood that it is of the epidemic area of our North-Western Provinces only that I speak, and that the Central Provinces are not included, nor yet the province in the extreme south and west, which I shall speak of afterwards as the province of the south-west monsoon proper. In the Eastern Division are included the Gangetic Provinces from Behar westwards, Oude, the eastern half of the Jumno-Gangetic Doab, and Bundelcund; and in the Western, Rohilcund, Meerut, Agra, Central India properly so called, and the Punjab. The line of 80° East Longitude will very nearly define the demarcation of these two divisions.

CHOLERA OF 1854 AND 1855.

For several years previous to the annexation of Oude the bulk of the European Army was massed in the Western Division; in the Eastern, the British Army was represented by a single Battery at Cawnpore, and a second at Benares, by the Invalid Battalion occupying Chunar Fort, and a Battery and Regiment at the eastern extremity of the division cantoned at Dinapore. The

EUROPEAN ARMY, 1854.

Burmah and Pegu	...	2,426
Bengal Proper.		
Fort William	... ...	921
Dum-Dum	... ...	195
Chinsurah	... ...	788
		1,904

Eastern Division.		
Dinapore	... ...	878
Benares	... ...	77
Cawnpore	... ...	77
		1,032

* These tables are placed in the Appendix.

EUROPEAN ARMY, 1854,—*(continued.)*

Western Division.

Agra	...	977
Meerut	...	2,159
Umballa	...	1,854
Dugshaie	...	919
Subathoo	...	1,018
Kussowlie	...	
Wuzeerabad	...	948
Jullundur	...	987
Sealkote	...	1,112

Western Division,—(continued.)

Govindghur	...	74
Meean Meer	...	1,429
Ferozepore	...	856
Mooltan	...	92
Rawul Pindee	...	956
Peshawur	...	2,331
		15,712

Army of Bengal ... 21,074

distribution of the European Army in 1854 is shown in the margin. Out of a strength of 21,000, 2,400 men were on service in Burmah and Pegu, 1,900 were cantoned in Bengal Proper, 1,050 in the Eastern Division, and 15,700 in the Western Division of the Upper Provinces.

It is obvious that no account can be taken of so small a body as representative of the population of the eastern division. The experience of subsequent years, however, teaches, that from the presence or absence of cholera among a body of 16,000 European soldiers having the distribution in the western division here indicated, a very fair idea may be formed of the prevalence of cholera in, or of its absence from, the various districts of the area.

From January 1854 to June 1856, not one fatal case of cholera occurred among the European Troops occupying the western division of the epidemic area.

Forty-eight deaths from cholera, in all, occurred in the European Army of the Presidency in 1854. The distribution of these deaths is shown in the following statement:—

Deaths from Cholera in the European Army of the Bengal Presidency during 1854.

PLACE OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
Burmah and Pegu	...	5	11	...	1	...	...	...	...	5	5	...	27
On the Ganges	...	...	...	...	...	...	...	...	...	...	...	3	3
Calcutta	...	...	4	...	...	...	...	...	...	...	...	2	6
Dum-Dum	...	...	...	1	...	...	...	...	...	...	...	...	1
Chinsurah	...	2	1	4	...	...	...	...	...	1	...	...	8
Benares	...	...	...	...	...	...	1	...	...	...	...	...	1
Meerut	...	...	...	...	...	...	...	...	...	...	1	...	1
Peshawur	...	...	...	...	..	...	...	...	1	...	...	...	1
TOTAL ...	...	7	16	5	1	...	1	...	1	6	6	5	48

The two fatal cases returned as cholera from Peshawur and Meerut, are exceptional to the distribution which I have stated to hold good in these years. I find the following explanations given regarding these two cases. The Medical Officer in charge writing of the case at Peshawur says:*—"This man died from ebrietas, on the day after his admission, in collapse resembling that of cholera." The Superintending Surgeon of Meerut with reference to the case in his division writes thus, in his general report for the year:—"There has not been a single case of any epidemic disease, either in the form of cholera or of any other, in Meerut, or in any station of the circle." Whatever cholera, therefore, may have existed in Upper India in 1854, was limited to the eastern division, as far as its presence is illustrated by the European Soldier as a type.

The Cholera History of the British Army in 1855 is a repetition of that of 1854. Sixty-four deaths occurred with the following distribution:—

Deaths from Cholera in the European Army of the Bengal Presidency during 1855.

PLACE OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
Burmah and Pegu	3	6	...	3	...	...	...	...	...	1	...	...	13
On the Ganges	1	...	...	...	...	...	...	...	...	...	4	1	6
Calcutta	1	3	4	8	4	...	...	...	...	...	...	1	21
Dum-Dum	...	...	...	1	...	...	...	4	...	...	...	...	5
Chinsurah	4	...	...	...	1	...	3	...	...	...	...	...	8
Berhampore	...	...	...	...	...	...	...	...	2	...	...	...	2
Dinapore	...	...	...	...	6	...	...	...	...	...	...	...	6
Dugshaie	...	...	...	...	...	...	..	1	...	...	...	...	1
Nowshera	...	...	...	...	...	...	...	...	...	...	1	...	1
Peshawur	...	...	...	...	...	...	...	...	...	...	1	...	1
TOTAL ...	9	9	4	12	11	...	3	5	2	1	6	2	64

The case at Nowshera occurred among a party of convalescents removed from the Peshawur Valley on account of fever. It has long been known that the cases of fatal collapse occurring

* Report of 1st Troop, 2nd Brigade Bengal Artillery, for 1854.

in the course of Peshawur fever, have been, in nearly every year, a blemish to our record of cholera. I may have occasion to make allusion to this circumstance in showing the distribution of cholera in years before 1854 and 1855, and I have on this account placed here the remarks which these two cases have called forth from the Officers who had charge of them, which distinctly state that such cases are not to be accepted as cases of cholera, because they are returned under the head of cholera.

In the report of H. M.'s 24th Regiment for 1855, with reference to one of these cases, Surgeon Gamble writes:—

"A remarkable feature occasionally results from the peculiar poison producing this intermittent fever, namely, that symptoms occur so truly simulating cholera that it were hardly incorrect to name the disease by that most formidable nomenclature. The cold clammy surface, the peculiar up-turned eye, cramps, suppression of urine, purging and vomiting, with a feeble circulation (becoming less and less distinct till it fails to be perceptible), are all present. Quinine to cinchonization acts as a charm." The details of another of these cases are thus given by the report of Her Majesty's 8th Regiment for 1855:—"The man was admitted on the 23rd November, suffering from an attack of fever and ague of rather a severe character. He had had several relapses of the disease. On the evening of the 24th, he was suddenly seized with all the symptoms of true Asiatic cholera, collapse, lips, hands and feet blue, suppression of urine, and cold breath. All means employed failed to relieve him, and he died at 2 o'clock on the morning of the 25th. It is a curious fact connected with the peculiar nature of the Peshawur fever, that it often attacks patients with the symptoms already related, particularly those who have had frequent relapses of the disease, and to a person not prepared for it, death would be set down as caused of an attack of cholera. Other patients were attacked in the same way, but their cases yielded to treatment."

I can find no explanation regarding the case returned as cholera from Dugshaie. It is not alluded to in the annual report of the Regiment.

It matters little whether these be regarded as true cholera or not. But from the observation in later years, of cases apparently isolated, I think it worth noting here that cases of cholera holding a true place in an epidemic, have been attributed to the exaggeration of the symptoms of malarious poisoning in the debilitated constitution.

Cholera of the Native Army in 1854 and 1855.

I shall not illustrate further what I have said regarding the form of choleroid disease apt to prevail at Peshawur. I call attention merely to the fact that while in 1854 and 1855, the rest of the Punjab affords no case of fatal cholera, in each of these years three cases are found in our records among the Native garrison of Peshawur.* The explanation given in the case of the European Soldier holds good in the case of the Native Troops cantoned in this station.

The strength and distribution of the Native Army in 1854 is noted in the margin. In the western division of the epidemic area, a force of 92,000 men was cantoned; in the eastern, a force of 22,500; in the districts under the influence of endemic cholera, 12,000 men were located. This Army lost 90 men from cholera in 1854.

Native Army, 1854.

Bengal Proper	7,965
Eastern Bengal and Assam	3,895
Gangetic Provinces from Futtehghur eastward	22,448
Rohilcund, Meerut, and Agra	20,221
Central India	13,627
Punjab	57,939
TOTAL	126,095†

Deaths from Cholera in the Native Army of the Bengal Presidency during 1854.

PLACE OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
On the march	...	6	...	2	...	...	...	...	...	...	...	...	8
Calcutta	...	2	1	1	...	...	...	...	...	...	1	...	5
Barrackpore	...	...	3	...	...	...	...	...	1	1	2	3	10
Dacca	...	1	1	...	...	...	...	...	...	...	...	...	2
Chittagong	...	...	...	...	1	...	...	...	...	...	...	...	1
Gowhatty	...	...	...	1	...	...	...	...	...	...	...	...	1
Out-post of Debrooghur	...	...	...	...	...	1	...	...	...	...	...	...	1
Sumbulpore	...	...	...	...	...	1	...	...	...	...	...	...	1
Bhaugulpore	...	...	...	...	...	...	...	...	...	...	1	...	1
Dinapore	...	...	5	6	3	...	1	...	...	...	...	...	15
Ghazeepore	...	...	...	...	1	...	...	...	...	...	...	...	1
Benares	1	...	...	4	22	...	...	...	...	...	...	...	27
Allahabad	...	...	...	1	2	...	...	...	...	...	...	...	3
Cawnpore	1	...	...	1	1	...	...	...	...	...	...	...	3
Agra	...	...	1	...	...	...	...	...	...	...	...	...	1
Mundlaisir	...	...	...	...	...	1	...	...	...	...	...	...	1
Sirdarpore	...	...	...	...	...	...	...	1	...	...	1	...	2
Mehidpore	...	...	...	...	...	...	2	...	...	...	...	...	2
Bhopal	...	...	...	...	...	1	1	...	...	...	...	...	2
Peshawur	...	...	...	...	...	1	1	...	...	...	1	...	3
TOTAL	2	9	11	16	30	5	5	1	1	1	6	3	90

* The strength of the native portion of the garrison of Peshawur was upwards of 8,000.

† The strength here given is that of July 1854. It does not include the men absent on furlough.

With the exception of the cases at Peshawur above alluded to, one fatal case of cholera only is recorded among the 78,000 men stationed in the Punjab, and in the Meerut, Rohilcund, and Agra Districts. It is not worth while to enquire whether this single case was, or was not, a genuine case of cholera. The statistical fact shown is, that as far as the Native Army was an index, in these districts of the western area cholera was either extinct or at an absolute minimum of prevalence. Gwalior and Rajpootana show no case of cholera; but the seven deaths of Bhopal, Malwa, and Nimar in the extreme south-west, are the indication of the presence of true epidemic cholera which made its invasion in the end of June. Of this and its relations, I shall speak in a subsequent chapter. The presence of cholera is indicated by this type in every station of the Gangetic Provinces from Cawnpore eastwards, in March, April, and May.

Deaths from Cholera in the Native Army of the Bengal Presidency during 1855.

Place of Death.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
On the march	17	4	...	9	...	...	...	...	...	...	...	...	30
Stations of Bengal Proper ...	...	...	6	6	3	4	2	...	...	3	1	2	27
Dacca	...	1	2	...		...	...	2	...	1	...	...	6
Dorundah	...	...	...	...	...	...	...	...	...	...	1	...	1
Hazareebaugh	...	...	...	...	...	4	1	...	...	...	...	...	5
Camps in the Sonthal Districts	...	...	...	...	...	...	2	15	...	3	3	1	24
Bhaugulpore	...	...	...	...	...	...	...	...	...	...	4	1	5
Dinapore	...	...	...	3	10	1	...	...	...	...	...	...	14
Benares	...	...	...	1	3	1	...	...	...	...	...	...	5
Lucknow	...	...	...	..	...	...	...	...	...	1	1	...	2
Seetapore	...	...	...	...	...	...	...	...	2	...	...	...	2
Allahabad	...	1	...	..	...	...	...	...	1	...	...	...	2
Cawnpore	...	...	...	...	...	...	...	2	4	1	...	...	7
In boats on the Ganges near Cawnpore ...	...	...	...	...	...	...	...	...	40	...	...	...	40
Mynpoorie	...	...	...	...	...	...	1	...	...	...	...	...	1
Moradabad	..	...	...	...	...	...	...	1	...	...	...	...	1
Hansi	...	...	...	...	...	...	...	...	...	...	...	1	1
Peshawur	...	...	...	..	1	1	...	...	...	...	...	1	3
Total	17	6	8	19	17	11	6	20	47	9	10	6	176

Again, as in the case of the European Army, the experience of 1854 is repeated in 1855; in the extreme south-west, however, evidence of the presence of cholera is no longer furnished in the returns from Malwa or Bhopal. In the Western Division of the epidemic area, a death of Moradabad in August and a second at Hansi in December may be regarded as the forerunners of the epidemic of 1856. I believe both of these to have been cases of true epidemic cholera, the indications of an epidemic in progress from the east represented to us in the above table by the deaths of Hazareebaugh and the Sonthal districts, and of Dinapore and Benares of the earlier months; by the deaths of Oude, Allahabad, and Cawnpore of August and September; and by the loss in September on the Ganges below Cawnpore of 40 men of the 8th Native Infantry.

General distribution of cholera among prisoners in 1854 and 1855.

The jail population gives for 1854 and 1855 a history entirely consistent with that of the Native and European Armies. Out of a prison population of 25,000 in the western division, four fatal cases are shown in 1854. In 1855, a single fatal case only appears over the same area; it occurred at Jhansi in December, and it was a true forerunner of the epidemic of the year following.

The epidemic of the extreme south-west, of 1854, is shown in the affection of the jails of Hoshungabad, Nimar, and Neemuch.

The jails of the eastern division of the epidemic area were generally affected in both years. The Table of 1855 in particular, shows cholera to have been universally distributed between Hazareebaugh and Cawnpore.

The details of the admissions from cholera during 1854 and 1855, among Native Troops and Prisoners, form the first tables in the Appendix containing the returns of the past fifteen years.

Summary of the History of the Years 1854 and 1855.

General indication of distribution afforded by the cholera of the three types in the interval preceding the epidemic of 1856.

In 1854, the limitation of the cholera of the epidemic area was to two distinct provinces; the one, that portion of the Presidency lying east of Cawnpore, the other, that lying to the west and south-west of the Gwalior territories. The intermediate territories, Central India, Agra, Meerut, Rohilcund, and the Punjab to its remotest station, were free from cholera.* No portion of the cholera of the south-west

* Nagpore was not included in the Bengal Presidency in 1854. The Nagpore force, as is shown in the Madras Returns, out of a strength of 3,400, lost only one man from cholera in 1854, and no death occurred in 1855. The jails of Nagpore also appear to have been free from cholera in 1855. In some of the Jail Reports for 1856 I find it stated, that until that year cholera had been absent from the districts for four years.

entered the Gwalior territories while epidemic in Bhopal and Malwa; and the cholera of the east showed no disposition to establish itself in the intermediate area. I find no history which would lead to the inference that the cholera of the east was an invading cholera; the facies of this cholera causes me to regard it as a reproduction of the cholera of 1853, a very severe epidemic in the districts bordering on the Ganges.

The year 1855, repeating the history of 1854, exhibits the western division of the epidemic area free from cholera from Nagpore in the south-east, to the Peshawur Frontier in the north-west. The provinces intervening, namely, Central India, Agra, Meerut, Rohilcund, and the Punjab, were entirely free from cholera.

But the facies of the cholera of the eastern division of the epidemic area underwent a change in 1855. It was no longer shown in local outbreaks, but was an epidemic in motion from Hazareebaugh in the east to Jhansi in the west, truly epidemic in the Doab from Cawnpore to Allahabad and in the Gangetic Provinces to the east. Three cases I have indicated in the western division as probably true outrunners of this moving cholera of the east; one at Moradabad in August, a second at Hansi in December, and the third, also in December, at Jhansi.

It is in the report from Jhansi for 1855,* that I find the most westerly indication of the presence of cholera epidemic from the east; it is stated that during the months August, September, and October cholera was very prevalent and very fatal in Jhansi. In the district immediately to the east, the report is precisely the same. The report from Nowgong states, that although the city of Nowgong nearly escaped, cholera was very prevalent and fatal during the months August, September, and October in all the large cities and populous villages of Bundelcund. The report from the Futtehpore and Cawnpore Districts lying to the north between the Jumna and Ganges is the same.†

The appearance of cholera on the plateau of Hazareebaugh and its subsequent presence throughout Bundelcund, has in every epidemic from 1817 downwards, implied, that all the intervening country has been swept by an advancing epidemic. The rising of cholera far in the east over the hills which enclose the endemic cholera basin, gives a sure warning that after no long interval the entire geographical area which I have called the eastern division of the epidemic area, will be covered by an invading cholera. *This province is to us the area of the epidemic cholera of the year* 1855; *the area extending from the south-east of the Presidency to the extreme north-west, and lying to the south and west of the Eastern Division of the Epidemic Area, is to us the exempted area of* 1855.

Cholera of 1856.

Cholera of 1856 of the European and Native Armies.

The quiescence of the moving cholera of 1855 during the early months of 1856, is marked by the absence in the European Army during the first five months of the year, of fatal cholera, in any portion of the epidemic area. There was little in 1855 to indicate the enormous volume of the cholera which in its reproduction and reinforcement was to constitute the great cholera of 1856; and up nearly to the end of May, no one unacquainted with the part which cholera invading from the east is destined to play in the epidemic area, could have foretold, that within two months the exempted area of 1855 from Nagpore to the Jhelum, was to be covered *universally*, and desolated by the advancing epidemic.

As in 1854 and 1855, so in 1856, the European Army was very inadequately represented in the eastern division. One Regiment was added to the strength in consequence of the annexation of Oude, and the 52nd Regiment was sent to occupy Lucknow. On the 20th June cholera attacked this Regiment, and carried off 46 men out of 66 seizures. In the table for the Native Army, however, the presence of cholera as an epidemic throughout the eastern division in April is clearly shown, and as early as March in the extreme east, in the camps in the Sonthal country. In April, the 19th Native Infantry marching down the Grand Trunk Road met cholera on two separate occasions at an interval of ten days, and lost 30 men out of 116 who were attacked; and in the same month, the 34th Native Infantry proceeding in boats from Cawnpore to Allahabad fell in with cholera at the place where the 8th Native Infantry were attacked in the end of August in 1855, and lost 30 men out of 70 seizures. The Goruckpore District suffered heavily at the same time, and early in May the valley of Nepaul was invaded. In the south, early in March, the Nagpore territories, which for four years had been free from cholera, were reinvaded.

Up to the 20th May, cholera had not as an epidemic occupied any portion of the western division of the epidemic area. In the Native Army, a single death is recorded at Moradabad, Delhi, Wuzeerabad, and Kangra in April, and at Meerut in May. I think there is reason to conclude, that these cases were the outrunners of the advancing epidemic.

The invasion of the western division was effected not through the Doab from east to west, but through the districts lying south of the Jumna. The report of the Civil Authorities from Shahjehanpore, the most easterly of the districts which I have grouped as the province of Meerut and Rohilcund, states:—"The district has been singularly free from the cholera epidemic which has raged throughout the North-Western Provinces. Individual cases have occurred in

* Report on the Civil establishments at Jhansi for 1855, by Surgeon Boyes.

† Oude was not annexed until 1856. Had the statistics of this province been available, the cholera history of the year would have been the same, namely, that of an invading cholera.

all parts of the district, but on the edge of the Terai alone, did any sufficient number of cases come to notice to warrant special attention."*

It was in May that the western division of the epidemic area was entered. Cholera was reckoned to have become epidemic in the Agra District from the 21st May. The Allyghur and Agra Districts were invaded simultaneously; but in May and June, this cholera made no progress beyond these limits, and was confined to the Agra, Muttra, and Allyghur Districts. It was not until July that this cholera began to move northwards, north-westwards, and westwards.

In the movement northwards, it was on the 15th July that Meerut was attacked. In Bolundshuhur the Death Register dates from the 23rd July; in Moradabad from 20th July; and in Budaon from 24th July. In Bareilly, some cases occurred in the end of June simultaneously with the epidemic appearance of cholera in Oude; but the Civil Authorities date the true outbreak between the 15th and 29th July (Official Report, p. 51). In the first week of August the moving epidemic reached Mozuffernuggur, Seharunpore, and Deyrah; and Bijnore became affected on the 14th.

The movement to the north-west was simultaneous with the movement to the north. The limit of invasion of the year in this direction was reached exactly in the time occupied in the progress northward of the same cholera from the Agra District to the Himalayas; for it was on the 7th August that Meean Meer was struck, and this station, or Goojranwalla, forty miles beyond it, is reckoned as the limit of the invasion of 1856.

The movement to the extreme west of the western division of the epidemic area of the Presidency occupied exactly the same time as the movements to the north and north-west. The report from Ajmere dates the appearance of the cholera from the beginning of August (p. 56); and it was on the 12th that the jail was attacked. Meantime, Bhurtpore, Jeypore, and Gwalior had been covered; and the 8th August I find to be the day on which the Superintending Surgeon of the Gwalior Circle (Dr. K. Kirk) communicated to the Medical Board that the cholera which had shown itself some weeks previously had begun to prevail as an epidemic in his district.

How much further to the west than Ajmere the cholera of August extended we need not here enquire. Beyond the desert, we find it at Mooltan before the end of the month. This seems to have been the cholera which reached Persia on 17th September; for Persia appears generally to be invaded in the same year in which cholera as an epidemic enters our North-Western Provinces. This was the case also in 1860 and 1867.

Very little explanation of the tables for 1856 is required after what has been said above. The table for the European Army, shows, in the western division, the June epidemic of Agra carried forward in July and August towards the north and north-west, and at an end in the first week of October. The table for Native Army shows the same thing, and in this type the extreme range of the invading cholera of August in the north-west is pointed out. Jhelum was the last station touched in the advance.

Secondary appearance of the invading cholera of 1856 in the Punjab in October and November.

The Jail Table shows the jails of Umballa and of Dhurmsalla in the hills, still suffering in the end of October. At the same time cholera reappeared in the Battery at Mooltan; and on the very first day on which it descended from Kussowlie to the plains, Her Majesty's 32nd Regiment marched into the epidemic, losing 44 out of 66 men attacked. On the same day, the 31st October, the 2nd Sikh Regiment, being under orders to march from Dhurmsalla to Hazara, was removed from Dhurmsalla from the fear that it might be attacked by the prevailing cholera; but the precaution proved unavailing, and for eighteen days the Regiment carried cholera with it on the march and lost 32 men out of 55 who were attacked. Beyond the Jhelum and on the east of the Indus, cholera also showed itself in October, and the 3rd Sikh Regiment on its march from Hazara to Dera Ismail Khan, met it in the Rawulpindee District. This was the end of the epidemic of the year in the western division of the epidemic area.

Comparative and absolute exemption of portions of the area lying within the extreme range of the invading cholera of the Punjab.

I have described the invasion from the south-eastern extremity of this division as proceeding in the two directions, to the north and to the north-west; the first striking the hills at Deyrah, the second having the station of Jhelum as its limit. In the fork between these lie the Jullundur and Sirhind Districts. These enjoyed a complete immunity during the epidemic advance of July and August, although intersected by the great highway of communication with the affected districts in the east, south, and west. In the beginning of September, Umballa was threatened, but it was not until October that it suffered, and the Jullundur Doab escaped altogether for the year. The Regiments in the hills beyond Sirhind, at Kussowlie, Dugshaie, and Subathoo, escaped also. Sealcote and Wuzeerabad were out of the range of the cholera of July and August 1856. Dr. Graham reports concerning Sealcote:—"To the best of my knowledge, not a single case occurred at Sealcote."

Indications of epidemic distribution afforded by the Jail Table of the year.

For the epidemic cholera of the eastern division of the epidemic area, the Jail Table for 1856 gives an accurate history. In the east and south-east the existence of the epidemic is indicated in March in Hazareebaugh, Jubbulpore, and Nagpore, and in nearly every jail in the valley of the Ganges in March and April. The jails in the east, Monghyr, Bhaugulpore, and Purneah, suffered extremely. In many of these jails cholera reappeared in July. Simultaneously with the appearance of cholera in the Agra District and in the western

* The outbreak in the jail is exceptional to this statement.

division of the epidemic area, the jails of Shahjehanpore, Futtehghur, Banda, Humeerpore, Oraie, Jubbulpore, Seonee, and Chandah suffered. The tendency to revival of the cholera of the year as an epidemic in November is shown in the jails of the Behar Provinces. The fact of the epidemic revival of November is better illustrated, however, in the table for the Native Army, which shows the enormous losses of the Native Regiments passing down the Ganges in boats in November and December. In the western division, besides the jail outbreaks at Umballa and Dhurmsalla above alluded to, the jail at Bareilly gives 11 admissions in November after a clear interval of three months.

In the western division, in the epidemic advance of July, the jails of Etah, Mynpoorie, Budaon, Bareilly, Moradabad, Meerut, Delhi, and Muttra were attacked. In August, the jails of Dumoh, Mozuffernuggur, Ajmere, Bijnore, Deyrah, Almorah, and Dhurmsalla suffered; in September, those of Saugor, Ferozepore, Umritsur, Jhelum, and Googaira; and in October, those of Rohtuck, Kurnaul, and Umballa. In October the jail at Dhurmsalla was re-attacked.

In the progress of the figures from the left hand to the right in these tables the movement of the epidemic from east to west and from south-east to north-west is beautifully depicted.

Twenty-one days sufficed to cover universally the area indicated as that actually invaded in 1856, from Ajmere in the west to Bareilly in the east, and from the Agra and Allyghur Districts in the south-east to the Lahore District in the north-west. Except in the localities indicated, this cholera was almost extinct before the end of September. In these few weeks, it is computed that at the very lowest estimate, 50,000 persons were carried off in the North-Western Provinces. For the Punjab no estimate has been made of the loss caused by this invasion.

Cholera of 1857.

Cholera of 1857.

I have not drawn up a table for the cholera of the Native Army for 1857. From May this army was disorganised, and the returns are too incomplete to render the reduction of their contents into order satisfactory. To illustrate the cholera of the European Army, I have constructed a Death Table only, taking the details from the Nominal Roll of Deaths. In this respect it is incomplete, that the loss of several of the Regiments which suffered most severely from cholera with Havelock's Force at Cawnpore and in Oude, is omitted; for the 64th and 78th Regiments being on the strength of the Bombay Presidency, and the Madras Fusiliers on the strength of the Madras Presidency, furnished no returns to Bengal. The results shown for the Cawnpore District will therefore indicate to us simply the fact that in the advance on Cawnpore in July and August this force suffered extremely.* After May 1857, Civil Authority was in abeyance throughout Northern India between Benares and the Punjab, and little progress had been made towards its reconstruction by the end of the year; and it was not until after the Rohilcund campaign of the hot season of 1858, that the district jails of the North-West were fully reoccupied. It will be understood, therefore, that for the last half of 1857 the jail population of these provinces is not represented unless in exceptional instances.

The area of the geographical distribution of the cholera of 1857 was precisely that of the invading cholera of 1856; the cholera of 1857 was a cholera revived over the invaded area of 1856. Cholera still persisted in 1857, in the south and west, in Nagpore, in the vallies of the Nerbudda and Taptee, and in the Saugor and Jubbulpore Districts; in the North-West Provinces, from Agra in the south, and Bareilly in the east, to the Lahore District in the west; and in the eastern division it continued virulent from Cawnpore, Banda, and Nagode in the west, to the eastern limit of the epidemic area, and occupied the Gangetic Provinces from Chota Nagpore to the Himalayas. In the province of Oude it was indicated to us by the loss in the Residency of Lucknow, where the 32nd Regiment alone lost 45 men during the months of the seige.

Whatever amount of locomotion the cholera of 1857 possessed, was displayed within the limits of the area invaded in 1856; and the history of reinvasion by newly invading cholera is wanting.

During the months from November 1856 to March 1857, the invading cholera of the western division disappeared; it was dormant. The only exception to this statement is the fact, that in some of the Terai districts immediately below the mountains, a few cases continued to appear in December and January. On the 13th March, the Head Quarters of the 66th Goorkhas marching towards Almorah, encamped at Kaladoongee at the base of the hills, and the detached Wing entered the Terai 70 miles to the east on its way to Lohooghat; both Wings were simultaneously attacked by cholera, and 56 men died out of 114 seizures. At the same time the Sirmoor Battalion stationed at Deyrah at the foot of the Mussoorie Hills suffered. This was the reawaking into epidemic life of the cholera of 1856. But the plains of Upper India did not afford to it the conditions necessary for epidemic manifestation in these months; and it was not until the end of April that it showed itself, and until May, that the presence of the renewed cholera was general. In April, the pilgrims returning from Hurdwar suffered, and two European soldiers died at Roorkee, and two at Subathoo. In May, the 9th Lancers in the cantonments of Umballa were attacked; the Bengal Fusiliers and Her Majesty's 75th descending from Dugshaie and Kussowlie on their way to Delhi, marched into the cholera on

* The details have been furnished since this was written, and are added in a foot note to the table for 1857.

the day on which they left their hill station, as had occurred to H. M.'s 32nd Regiment on the 31st October 1856; and many Regiments coming from the Punjab, Native and European, got cholera before they reached Umballa. Subathoo and Dugshaie were attacked before the end of May, and the Nusseeree Battalion of Goorkhas marching from Simla to Seharunpore carried cholera from the 24th May to 3rd June, the day in which it reached its destination. In March, cholera appeared in the jail at Umritsur, giving intimation of its reappearance as far to the west as was the limit of the primary invasion.

The Jail Table for the Punjab indicates an interval between the cholera of May and August 1857 by the absence of any admission; in August and September, the general presence of cholera is shown by its appearance in the jails of Thanesur, Umballa, Jullundur, Hoshyearpore, Dhurmsalla, and Umritsur. There was no admission in October.

This was the cholera from which the army of Delhi suffered so much. From the commencement of the seige until the 4th October it persisted, with but one interval, from the 27th July to the 27th August; and even during this interval, several fatal cases occurred.

Agra and Meerut suffered much less; seven men of the Meerut garrison died, and five died at Agra.

Cholera was universally renewed also over the Central Provinces. The battery at Saugor lost three men, and 20 cases appeared in the jail at Saugor between May and August. The jails of Nursingpore, Jubbulpore, Seonee, and Nagpore in the Central Provinces suffered between April and September. The column which formed the nucleus of the Central India Force of 1858, met the same cholera in July while marching through Khandeish on the way to Mhow.

I find no record of cholera beyond the Jhelum or in the districts beyond the Indus. No progress towards the north-west of the Punjab was made in 1857; nor have I any information of epidemic advance before May 1858, when the Rawulpindee and Huzara Districts were covered by an invading cholera.

I have already shown that the eastern division of the epidemic area was still covered by cholera in 1857; and what I have said above of the western division, is sufficient to demonstrate the fact of the presence of cholera from Nagpore and the valley of the Nerbudda in the south, to the Himalayas in the north. By the first week of October, this cholera, speaking in general terms, was dead or dormant.

Cholera of 1858.

Cholera of 1858.

In the statistics of 1858 the geography of the cholera of Upper India is exhibited in a new phase. *Cholera has nearly disappeared from the eastern division of the epidemic area and from Central India,* while it is still shown in epidemic force in the western division. Meerut and Rohilcund are not free from cholera; and from Delhi and Umballa westward to the frontier, many severe outbreaks mark the existence of the epidemic cholera derived from the invasion of July and August 1856.

Cholera of 1858. Phenomenon of the decay of the invading cholera of 1855-56 in the eastern division of the epidemic area.

Over the eastern division, cholera had declined to a minimum. In the Native Army taken as a type, the phenomenon of disappearance is total; that is to say, out of a force of upwards of 30,000 employed throughout these districts in 1858, and exposed in the field to every vicissitude of season, not a single death from cholera was reported. Out of a jail population of 8,000 distributed between Patna and Futtehghur, three deaths only were attributed to cholera, one in the jail at Ghazeepore, a second in the jail at Mirzapore, and a third in the jail at Allahabad.

The Death Table for the European Army occupying the eastern division, the war province of 1858, shows the number of deaths given below:—

Cholera Deaths of the European Army of the War Provinces of 1858.

Place of Death.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Dinapore ... ... ,,	877	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahabad ... ... ,,	1,692	...	...	...	...	2	...	...	3	...	...	...	...	5
Ghazeepore ... ,,	435	...	...	...	...	3	...	...	..	..	...	...	...	3
Benares ... ... ,,	557	...	...	...	2	3	...	2	...	...	...	...	...	7
Goruckpore and Oude ... ,,	17,024	...	...	...	2	...	...	...	1	1	1	...	1	6
Allahabad and Cawnpore ,,	4,788	3	...	4	1	...	1	...	1	...	1	...	...	11
Total for the War Provinces of 1858	25,373	3	...	4	5	8	1	2	5	1	2	...	1	32

The cholera deaths of British soldiers returned at Benares and Allahabad in 1858, must not be regarded as showing that cholera was present in these stations at the time. These stations are situated at the termination of the lower section of the Trunk Road leading out of Bengal Proper, and while marching on this lower section, troops are in every year liable to the attack of cholera, and they carry the cholera with them to the terminal stations. Another source of fallacy is, that, in former times, the Monthly Return prepared by Superintending Surgeons did not always clearly exhibit the fact, even in the Death Roll, of cholera having

occurred on the march and not subsequent to it; and detachments which had marched during the month were frequently returned with the station occupied at the end of the month opposite to their statement of sickness and mortality. It is certain that some of the fatal cases of the terminal depôts at Benares and Allahabad were due to cholera acquired on the Grand Trunk Road above Raneegunge, from which cholera is seldom absent.

It will be observed that this loss was confined almost entirely to the stations on the Ganges. In the Army of Oude, traversing every part of the province and even its Terai districts, six deaths only occurred. The contrast with 1857 is very striking, when, within the same area, the Field Forces were decimated by cholera.

The Army of Central India of 1858 was not on the strength of the Bengal Presidency; it is, however, a well-known fact that this force had no loss from cholera.

Cholera of the western division of the epidemic area in 1858.

Over the western division of the epidemic area, the experience of all the three types shows well, that cholera still existed throughout the northern provinces of Upper India. The Meerut, Delhi, and Umballa Districts still retained cholera in 1858. In May 1858, as in May 1857, cholera appeared at Umballa and Dugshaie, and simultaneously as an invading epidemic in the Rawulpindee and Hazara Districts. In this year, troops marching beyond the Jhelum got cholera in May. In July and August, this cholera was, as in the same months of 1856 and 1857, in full vigour in the Punjab. In July, Abbottabad and Murree were attacked by the invading cholera of May; in August, a severe outbreak occurred in the Delhi Jail, and another among the troops at Jullundur; and, in September, a Field Force proceeding from Lahore towards Dera Ismael Khan became affected in the second march after leaving Lahore, and the jail at Hoshyearpore was attacked in the same month. Up to the end of October, nothing more was heard of cholera in the Punjab, until suddenly it appeared, for the first time for many years, in the Peshawur Valley, and the valley of Kohat was invaded within a few days. It was on the 7th August 1856 that Meean Meer was struck; it was on the 26th October 1858 that this same cholera entered the vallies of Peshawur and Kohat. The same cholera which within 21 days covered the entire epidemic area of 1856 and extended far beyond Hindostan to the west, occupied two years and nearly three months in finding its way over little more than 100 miles of country intervening between the Jhelum and the Frontier.

This cholera of Peshawur of the end of October and November 1858, was a deadly cholera. No European Soldier who was attacked survived; the Native Troops lost 12 men out of 15 attacked; and the prisoners, 4 out of 6. At Kohat, the Native Regiments lost 18 out of 39 men attacked.

Termination of the epidemic of 1856-58.

Nowhere within the western division of the epidemic area did this cholera of 1856-58 revive in 1859. The cholera so deadly up to November 1858, was not revitalised in 1859, and from Nagpore to Cabul, India was free from the epidemic invading in 1856.

Cholera of 1859.

Reoccupation of the eastern division by the invading cholera of 1859.

While cholera was at a minimum in the eastern division of the epidemic area in 1858, and while 32 deaths in all occurred among the armies in the field, the case was very different in the endemic province. Few parties of soldiers passing through Calcutta on their way to the Upper Provinces, or preparatory to embarkation for England, escaped; and before the end of the year, 373 deaths had occurred in Bengal Proper. This cholera of 1858 was epidemic within the endemic area. In 1859 also, it was evident that here, in the endemic province, cholera was in motion as an epidemic, when on the same night in August, the Barrackpore and Dum-Dum cantonments were struck, and 100 men were carried off within ten days.

I described the cholera of the early months of 1855 as a cholera in motion from Hazareebaugh in the east to Bundelcund and Jhansi in the west, and I defined its epidemic area to be, geographically, exactly what I have termed the eastern division of the epidemic area; over the western division of the epidemic area I showed that cholera had no existence in 1855.

The cholera of 1855 was not palpably a cholera invading an *unoccupied* tract of country; but in 1858, the same tract was free from cholera altogether in certain portions, and within the others cholera was at the minimum of decline.

The epidemic area of the cholera of 1859 was the epidemic area of the cholera of 1855; the exempted area of 1859 was the exempted area of 1855. Cholera epidemic from the east, covered the eastern division from Hazareebaugh to Bundelcund, leaving intact the districts to the west, and no cholera was, in 1859, reproduced within the western cholera area of 1858; that is to say, the western area from the extreme south-east to the extreme north-west had no cholera in 1859. The geography, therefore, is definite, and the map of 1855 may stand for the distribution of the cholera of 1859.

In the tables, the distribution of 1859 is shown with great precision. Among the European Troops the enormous losses in all stations from Banda and Cawnpore eastwards, contrast with the absolute exemption of every station to the west. In the Native Army the distribution is perfectly parallel; exemption over the western area was complete with the exception of a single case in December, a forerunner probably of the epidemic of 1860, similar to the case to which I drew attention in the table for 1855. Among the entire jail population of Rohilcund, Meerut, Agra, Central India, and the Punjab, a single fatal case is recorded; this

was returned by a Native Doctor in charge of the small jail at Kurnaul, and I do not regard this instance as exceptional to the generalisation which I have made.

The western limit of the invading cholera of 1859 is indicated in the reports from the districts lying south of the Jumna. I have spoken of the eastern cholera of 1855, brimming over the edge of the endemic basin on to the plateau of Hazareebaugh, as sending a warning to the highlands of Bundelcund of the approach of the epidemic; the warning and the sequel were both demonstrated in 1859 as in 1855.

The European Regiments of the Banda District suffered in 1859 as is shown in the table of the year. This indication is the most westerly which we have for the year of the presence of cholera, and here it was distinctly an invading epidemic. It is important to observe the date of the outbreak with reference to the date of the appearance of previous and subsequent epidemics. The Civil Surgeon of Banda writes: "It was on the 7th May 1859 that I was informed by the Magistrate that cholera was prevailing in his district. * * On the 16th May cholera appeared in the town of Banda." This cholera was immediately linked on to the great eastern cholera of Cawnpore, Allahabad, and Nagode, and the Gangetic Provinces to the east. The line of 80° east longitude will define with sufficient accuracy the western limit of the cholera of 1859 in the Northern Provinces.

As far as our records inform us, cholera did not invade Nagpore or any station of the Central Provinces in 1859. Certainly as an epidemic, cholera did not visibly cover these provinces before March 1860 in succession to the invasion of March 1856.

Cholera of 1860.

If the cholera of the Eastern Division of the epidemic area has followed the parallel of the invading cholera of 1856, it will be found invading to the westward, in the extreme south in March; and in May, it will be found universal between the Vindhya Mountains and the Jumna and still invading to the westward.

The epidemic cholera of this year has a special and most instructive geography.

In the south the invasion did occur. The Nagpore territories and the valley of the Nerbudda were covered universally by cholera invading from the east in March 1860; but the cholera of May of Agra and Central India was but a warning of the coming invasion. The actual advance of the epidemic occurred in the end of June, and early in July it became evident that a cholera wave had swept across Central India from east to west. In August, cholera was universal in the western division of the epidemic area from Jhansi in the east to Goonah and Augur in the west. This cholera is shown in the table for European Troops by great loss in every station of the area which was occupied, the chief being Agra, Muttra, Jhansi, and Morar; and in the Jail Table by the dreadful outbreak in the Agra Jail, in which upwards of 800 prisoners were attacked. The table for the Native Army shows the same limitation of this cholera with great accuracy.

In the eastern division of the epidemic area the cholera of 1859 was renewed in great vigour throughout Bundelcund, the Cawnpore and Allahabad Districts, in every station of Oude, and universally in the Gangetic Provinces; a single glance at the tables for the European Army and jails will show this. It was from this universal cholera that Nagpore was covered in March. Its limit in the west was the Shahjehanpore District.

Thus, I have shown an enormous and vital body of cholera occupying the east of the epidemic area, and a second body of invading cholera, equally powerful and universal, pressing from the south upon the north-western portion of the western division; Bareilly, Meerut, Allyghur, and Delhi threatened on the east and threatened from the south, by one of the greatest cholera epidemics on record. And this was the result. No cholera invaded these districts, and they proved a barrier which neither the cholera of the east nor the cholera of the south, could break through; and to the North-West Frontier, the Punjab was as free from cholera in 1860 as in 1859.

A single death among European Troops is noted at Bareilly. Proceeding from east to west this is the last recorded death of the eastern area; and even this carries us too far to the west, for the man actually contracted the cholera from which he died, while escorting a party of soldiers' wives from Cawnpore, who were also attacked on the road. The case is thus alluded to in the report of the 42nd Highlanders for 1859: "On the 15th March, the women commenced to arrive from Calcutta. They had suffered from cholera on the way, and one woman died a few days after arrival more from fatigue simulating cholera than anything else; but a Sergeant who came up with the women was attacked with cholera on the 17th and died the same day. There was not another case in the station afterwards." It is a coincidence worthy of being noted, that in 1859 the last European Soldier died of the cholera invading from the east, at the same station.

Muttra was the last station reached in the invasion from the south in 1860, if we except the case of a prisoner who died in the Goorgaon Jail in August, while cholera was epidemic in the Muttra District; this case was undoubtedly an indication of a threatened cholera.

Precise limit of the western invasion of the epidemic of 1860 in the North-Western Provinces.

I am inclined to consider the only three fatal cases of cholera returned in the Punjab among European Troops, as true indices of the aborted invasion. The following is the history attached to these cases. From this history, some would say that they were not cases of genuine cholera; others, that they were the outrunners of the cholera of 1861:—

Cases returned from stations beyond the epidemic limit of the year. Report, 79th Highlanders, Meean Meer.

"One fatal case of doubtful cholera occurred in a man who had been suffering from an indolent ulcer of the leg; he sank very rapidly, and must have been the subject of an attack of cholera or of a very virulent attack of malarious fever."

Report, 5th European Cavalry, Meean Meer.

"One death occurred from cholera. The first symptoms were purging, vomiting, and cramps followed by prostration. He died suddenly on the seventh day, when he seemed to be improving." I am authorised by the officer who had charge of the case to state that the diagnosis was doubtful.

Report, Her Majesty's 24th Regiment, Ferozepore.

The third case was possibly not a case of cholera. The man, a Sergeant of very intemperate habits, died in collapse after a fever of seven days' standing.

The exempted area of 1860 in Meerut and Rohilcund, the famine tract of 1860-61.

To illustrate the geography of the cholera of 1860, not a special map, but the famine map of 1861 might have been employed. The exempted cholera area of 1860 was the famine tract of 1861, almost to a mile; the area over which cholera was epidemic in 1860, escaped famine in 1861. The significance of this fact will be discussed in a future chapter.

In the last three months of 1860 cholera was dead as an epidemic. Indications of vitality were, however, shown in some cases; thus, in December, the camp of the Lieutenant Governor, N. W. Provinces, marched into a vitalised cholera between Bhurtpore and Agra, a locality which had been affected in the invasion of August.

Scinde had been unvisited by cholera for years, but, in September 1860, both Upper and Lower Scinde were invaded. This cholera was the same which entered the Nerbudda Valley in March, and which covered Central India in August. During the cold season of 1860-61, this invading cholera of September died out in Scinde also.*

Cholera of 1861.

Reference to the tables for 1861 shows, that it was not until the end of June that the cholera dormant from September 1860 began to move upon the area uninvaded in the primary advance; no fatal case of cholera occurred in the first five months of 1861 even in any part of the invaded area of 1860, in any of our types. I make the reservation that this cholera did not show itself as an epidemic *in motion*. The facies of a cholera in motion is totally different from that of a cholera merely revitalised; and this facies was wanting in the cholera of 1861 before the end of June and the first week of July. To one accustomed to recognise it, the distinction has this significance;—that the cholera of 1860 might, in May and June 1861, have been very general over the area of the previous year among the general population (as, in fact, it was), and yet neither our cantonments nor jails would be affected; the exempted area of 1860 would not be encroached on by one mile; and the most extensive gatherings of human beings, although composed of men drawn from the districts of the infected area, would remain free from cholera provided the gathering took place within the exempted area of the year preceding. I say this with reference to the cholera of the western division of the epidemic area only; for in the eastern division, the cholera of the first half of the year has, speaking generally, an aspect different from that of the western division of the same months. From the experience of recent years, I am in the habit of dating the reappearance of the reproduced cholera of the western division from the 20th April, making at the same time, allowance for its reappearance in Terai districts, weeks or even months earlier, as we found the cholera of 1856 revitalised on the 13th March 1857 all along the base of the hills; and admitting the possibility, under peculiar and abnormal conditions, of the appearance of cholera in the open districts as early as the 15th March, a circumstance of which we have had no experience in our times, but which actually did occur in 1838, when the Muttra District suffered severely.

The most northerly indication which we had of the advance of the cholera of 1860, was into the Goorgaon District.† In the end of May 1861 cholera re-appeared in the south of the Goorgaon District (p. 61); cholera became prevalent in the western parts of the Muttra District in the end of May (p. 105); cholera was general throughout the principality of Bhurtpore in the months of April and May‡ (p. 144); cholera made its appearance in the Ulwar Territory early in May last (p. 144); in the north-west of the Allyghur District cholera appeared at Atrolee on 23rd May (p. 74); cholera appears to have been prevalent in the Agra District early in June (p. 108). The above are the statements taken from Strachey's Report, which show the reawaking into life, although not into a vitality combined with the power of locomotion, of the cholera of 1860. It will be observed, that in these statements there is not a single indication of the presence of cholera east of the Jumna, with the exception of the cholera of Atrolee; it was in another phase of existence that the invaded area of 1861 was covered. In Northern Scinde, the cholera of September 1860 was revitalised in April 1861, at a date as early as the same cholera in the States west of the Jumna.

Dates of revitalisation and invasion in 1861. The numbers refer to the pages of Strachey's Report.

* Grierson's Report on the Scinde cholera of 1861, quoted by Strachey, (p. 143).

† It was in the Jail at Goorgaon that the last and most northerly indication of epidemic advance in 1860 was shown.

‡ In the Bhurtpore District cholera first broke out in the village of Kythwara in *the end* of April (p. 147); in the table (p. 150), the 26th April is the day noted.

It was early in July 1861, that the cholera of 1860 began to move to the north, north-west, and west, over the exempted area of 1860. "Cholera was widely spread through the states of Rajpootana in July." * * "It reached Gwalior in the middle of that month." * * "At Nusseerabad the disease appeared towards the end of July." * * "The first undoubted case of cholera occurred at Meean Meer on the 31st July." * * "On the 17th July cholera broke out in the poor-house established in the Cantonments of Umballa for the relief of sufferers from the famine which prevailed." "On the 31st July it appeared in the city of Umballa." * * "On the 17th July the town of Thanesur was attacked." * * "From the 5th July onwards the epidemic continued to prevail in the city and suburbs of Delhi; up to the 10th fifteen deaths occurred." * * "Cholera appeared in the city of Meerut on the 8th July." * * "At Ghazeeabad cholera first appeared on the 8th July." * * "Cholera is said to have appeared at Shamlee, the largest town of the Mozuffernuggur District, about the 22nd July." * * "The first case of cholera at Seharunpore is said to have occurred on the 10th July." * * "At Roorkee cholera first appeared in the poor-house on the 23rd July." * * "A fatal case of cholera occurred among the work-people employed in the Mohun Pass, in making a carriage road to connect Seharunpore with the Dehra Doon, on the 1st April;* there were no more cases until the 26th July, when the disease broke out epidemically." * * "Cholera attacked the town of Bijnour on the 25th July." * * "Cholera is said to have first appeared in the Sumbhul Subdivision of the Moradabad District early in July." * * "Cholera is said to have first appeared at Bareilly on the 5th July."

"Early in July, when the rain had well set in, cholera reappeared in Bhurtpore" (p. 144). * * "In the city of Jeypore cholera appeared about the 2nd of July." * * "Cholera broke out at Ajmere on the 6th July." * * "In Nusseerabad the first cases occurred on the 27th July." * * "In the Deolee District cholera arrived early in July." * * "In Kotah it commenced in July." * * "In Shalra Putun it prevailed as extensively as at Kotah and during the same months." * *

These extracts from Strachey's Report give very clear indication of the area occupied in 1861; and the area occupied on or before the 31st July, was the limit, in this Presidency, of the invading cholera of 1861.†

Distinctive character of the cholera of the eastern and western divisions of the epidemic area in 1861.

The areas which suffered least were those lying to the south and east of the western division of the epidemic area. The Cholera Commission notice incidentally this separation of the cholera of the eastern division from that of the western division of the epidemic area. "It will be observed," they write, "that we have traced no connection between cholera in Allahabad and Cawnpore with that which occurred in the districts further to the north," (p. 192). "In the district of Bareilly the epidemic seems to have been widely diffused, but to have been nowhere virulent." * * "In Budaon the disease appears to have been common, but to have been nowhere very fatal." * * "It is stated that the disease did not assume an epidemic form in any part of the Shahjehanpore District." * * "There is no information regarding the total mortality of the Etah District, but the disease was apparently not very fatal." * * "Although the disease was heard of in many parts of the district, it was nowhere at all virulent; cholera can indeed hardly be considered to have prevailed epidemically in the Mynpoorie District." * * "The number of deaths is not known; but although the disease appears to have been very common in many parts of the Etawah District, it was apparently not very fatal."

The following is the report from the adjacent districts lying to the south of the Jumna as given by Deputy Inspector Rind of the Saugor Circle :—"The districts of Banda and Nagode were slightly visited. The towns visited were widely apart, and it did not seem to visit any intermediate place. It may be considered to have stopped at Kirwee, as the few cases which occurred at Banda may, I think, be viewed as of a sporadic nature."

The line of country to which these extracts have reference, was a belt of minimum separating the cholera of the east from that prevailing in force from Meerut to Cabul; for although the north of the Punjab entirely escaped invasion in 1861, cholera had passed, on a more southerly parallel, through Bikaneer and Bhawulpore into Cabul, giving us the only evidence of its passage by attacking the outposts beyond the Indus.

The exempted area of 1856 was the exempted area of 1861. "Cholera did not spread epidemically through any of the districts of the Punjab north of Lahore" (Strachey's Report, p. 4).

Areas of comparative and absolute exemption in the Punjab, the same as those of 1856.

The fork between the cholera invading to the north and the cholera invading to the north-west, was also exempted, as in 1856. "The country lying between the Beas and the Sutlej" called the Jullundur Doab, enjoyed generally the same immunity (p. 44)." * * "The district of Loodianah, which lies immediately to the south of the Sutlej and due east from Ferozepore, appears also to have entirely escaped the attack of cholera. It prevailed, however, epidemically at Umballa, the district adjoining Loodianah on the south; and this may be considered to be the northern limit of the tract in which the late epidemic assumed a virulent form." This sentence has reference to the limb invading from south to north. The Ferozepore District was left out in

* Probably a true forerunner of the invading cholera of July.

† Compare the Tables showing the invasions of 1856 and 1861, and the history of the limitation of the cholera of 1856, as given at p. 20.

the first invasion, and was not entered until September, when a secondary wave passed over the covered area, exactly as we traced it sweeping over the Umballa Cantonments on the 4th September in 1856. This struck Umritsur on the 2nd, and Ferozepore on the 3rd September; and the outbreak among the prisoners employed at Lahore in arranging the cholera camps for the European Troops, occurred on the 4th, a coincidence to be noted in estimating the value of the deduction that the gang acquired this cholera while engaged on these duties on 27th and 30th August (p. 35).* Sealkote and Kangra also escaped as in 1856.

The fact plainly taught is, that the invaded area of 1861 was the same as that of 1856, and that the districts exempted, or comparatively exempted, were the same in both epidemics; and that the original invading wave reached the limits of the area of the year within three weeks after it began to move, when the power of locomotion had been superadded to its vitality.

Cholera of the eastern division of the epidemic area in 1861.

The cholera of the eastern division of the epidemic area holds a secondary place in the cholera history of 1861. It was a cholera of the third year having made its invasion in 1859. It was still vital throughout all districts in the east from Futtehghur to Behar, appearing at its usual seasons, but with none of the characteristics of a fresh or invading cholera.

Area of geographical limitation in the extreme south-west.

The south-western limit of the invaded area of the year was absolutely defined, at a limit which, as I shall have occasion to show, is in every year and in every epidemic, true and natural. I quote from Strachey (p. 147) :—"It did not spread into the Meywar Territory, at least into that portion of it between Nusseerabad and Neemuch. Neemuch was quite exempted from cholera during the year"—(p. 148)—"Cholera does not seem to have prevailed to any extent along the high road between Ajmere and Palee. The small cantonment of Erinpoorah on the direct traffic track, had not a single case, nor could Dr. Eddowes hear of any village having suffered on the Marwar border."

Cholera of 1862.

Parallels in the geography of the cholera of 1862 with that of 1857-58.

We are to look for the same geography in the cholera of 1862 as in the cholera of 1858, since the statistics of both years represent an epidemic cholera in its fourth year in the eastern division of the epidemic area, and in its third year in the western. If the parallel holds good, the eastern division will be found the exempted area of the year, while from Meerut and Rohilcund westwards to the frontier, the cholera of 1860 and 1861 will still be found in epidemic vigour, although destined to die in October or November and to leave the western division free from cholera.

Let it be remembered, that the cholera of 1860, the year of invasion, did not enter Rohilcund, Meerut, or the Punjab; consequently, although 1862 was the third year of the cholera, still it was only the second in the invasion of these provinces. Let this be kept in mind, and let the phenomena of the year 1862 be read as parallel with the phenomena of the two years 1857 and 1858, and the parallel will be found perfect for the area invaded in 1861.

The history of 1857 showed cholera revived along the base of the hills early in the year; cholera among the returning Hurdwar pilgrims, in the cantonments of Umballa, Subathoo, Dugshaie, and in the districts west of Delhi, in May; and general in the rainy season from Meerut and Agra to Umritsur.

The history of 1858 showed cholera still present in Meerut and Delhi; cholera at Umballa and Dugshaie in May, and invading the Rawulpindee District and Hazara in the same month; powerful outbreaks at Hoshyearpore, Jullundur, Abbottabad, and Murree during the monsoon season; and the invasion of the Peshawur and Kohat Vallies in October, followed by extinction of the invading cholera of 1856.

The cholera of 1862 played in one year the part played by the corresponding cholera of 1857-58 in these two years. The repulsion of the cholera of 1860 from the famine tract, brought about a true loss of a year to the invading cholera, as far as the Punjab, Meerut, and Rohilcund were concerned, and the invading epidemic of 1860-62 actually died out within a week of the time occupied by the parallel epidemic of 1856-58. The epidemic of 1856 having entered the western portion of the epidemic area, began to move in the first week of July 1856, and was dead in the first week of November 1858; the epidemic of 1860 having entered the western portion of the epidemic area, began to move in the first week of July 1861, and was dead in the first week of November 1862. Thus both survived for exactly the same time within the area of invasion, that is, for two years and four months.

The facts of 1862 were as follows :—The appearance of cholera among the returning Hurdwar pilgrims, and in all the districts west of the Jumna from Delhi northwards to Umballa, in May; in the Dhurmsalla District cholera occurred even in April, and at the same time it was raging in Cashmere; and, just as the cholera of 1860 reappeared in April 1861 in Scinde simultaneously with its appearance in the Bhurtpore State, so in 1862, before the end of April, cholera had appeared in the Bunnoo District, leaving untouched the country intervening between the Jhelum and the Indus exempted from invasion in 1857, although covered in May 1858. In the

* The difficulty in connexion with the conclusion is already admitted, that out of the same gang, 20 men remained day and night in attendance on the sick, and not one of those who had been thus employed, suffered, when the rest of the gang was attacked.

monsoon season, cholera was universal from Gwalior, Jhansi, Agra, and Meerut to Peshawur, the Doab between the Jhelum and the Indus being an exempted area as in the earlier months; at this time the Sealkote District, untouched in 1861, suffered with the Lahore and Umritsur Districts. The cholera which had appeared on the frontier in April, entered the valley of Peshawur in June, and persistently maintained its ground for the four months following, appearing in a succession of outbreaks with clear intervals between; on the 3rd of November this cholera of Peshawur died, and the epidemic of 1860-62 was at an end.

Minimum of 1862, parallel with that of 1858, in the eastern division of the epidemic area.

Turning to the eastern division of the epidemic area to enquire for the parallel of 1858, there is no difficulty in recognising the fact of the decline of cholera to a minimum in this province. Out of an army of 13,500 British Soldiers occupying the Gangetic Provinces, Oude, Cawnpore, Bundelcund, and Jubbulpore, only one death from cholera occurred in 1862. The man who died was a recruit, seized while on board a river steamer proceeding from Mirzapore to Allahabad; he died in the General Hospital at the latter station. It is also worthy of notice, that on the day after leaving Mirzapore, on the 10th May 1862, a severe outbreak commenced in the 25th Native Infantry on board the river steamer, in which fifteen men died. There was evidently in this locality, a body of cholera vitalised, while generally over the eastern area cholera was extinct or devitalised. Among the Native Troops of the eastern division a single fatal case only is found, and this man also died at Allahabad. For the jail population of Benares, Oude, Cawnpore, and the Central Provinces a total of seven deaths is shown, occurring in six different jails. The minimum of manifestation of 1858 was remarkable and striking, but the parallel fact of 1862 is a phenomenon probably rarely witnessed to the extent shown in this year.

In comparing the two epidemics of 1856 and 1860 in their third year, in the western division, there is one difference only which strikes the observer, namely, the extreme severity of the cholera of 1862 in Jhansi, Agra, and Gwalior, as compared with that of 1858 in the same districts. I think that the lesson which this teaches is the same taught by the cholera of Peshawur of this year, that a cholera having once invaded an area, may be in as perfect vitality at the end as at the beginning of its career; and I shall have occasion to show, that it is not at all necessary that the year of invasion should be the year of the maximum of manifestation.

Cholera of 1863.

If the parallel of 1863 with the years 1855 and 1859, holds, we shall find 1863 a year of cholera invading from the east in the early months, covering anew the exempted eastern division of the epidemic area of 1862, and leaving untouched the western division.

Minimum of the western division of the epidemic area in 1863.

The minimum of the western area in 1863 is thus shown: Excluding the Agra District, two deaths only are recorded in Rohilcund, Meerut, Central India, and the Punjab among European Troops, one at Umballa, the other at Rawulpindee; of these two, the latter is a doubtful case which occurred in the person of a phthisical patient who had been in hospital for many months. The Native Army shows one death in the Hazara District, and two in the Frontier Force. The jail population shows no fatal case of cholera.

I have excluded the Agra District. There can be no doubt whatever, that this district was touched by an epidemic cholera in 1863. On the 20th May, in the very week on which cholera became epidemic in 1856, and in several former epidemics, cholera appeared in the jail; again in July and August both jail and cantonments suffered, and, simultaneously, two mild cases appeared in the Muttra Cantonment, and the fatal case at Umballa among the European Troops, already mentioned. One case occurred also in the jail at Etawah and another at Allyghur. This Agra cholera of 1863 had a peculiar phase. Dr. Murray who has described it, says:—"The disease appeared to be confined to Agra and the vicinity, and did not spread over the country like a wave, as on previous occasions." To my idea this was typically an epidemic and invading, and not a reproduced cholera. It was a true out-runner, indicative of the existence of the body of an epidemic in progress from the east. Although we cannot trace the geographical continuity, a glance at the tables, especially the Jail Table, shows its coincidence with the great cholera of the year, epidemic and invading both in the east and in the south, universally reoccupying for the third time in these fifteen years, the eastern division of the epidemic area.

We cannot connect on this cholera of Agra with that of the east through the Doab, for the Futtehpore District and Western Oude was the limit of the eastern cholera. Nor can we trace it continuously as in 1855-56 and 1859-60, through the districts south of the Jumna. The report is the same from all:—"No epidemic has occurred at or near the Station." *Nowgong.* "No epidemic." *Humeerpore.* "There was no epidemic during the year." *Oraie.* "Not a single case of cholera has occurred during the year."—*Jhansi.*

Invading eastern epidemic of 1863, its area and western limit.

But this exempted tract was the limit set to a great cholera invading from the east and occupying the entire eastern area from the Bhurmpooter westwards; for in the first six months of the year, cholera prevailed as an epidemic all over the Nagode District, lying immediately to the east of those above noted as exempted. From the plateau of Hazareebaugh to the extreme western limit of Oude, this cholera was universal throughout 1863, over the exempted area of 1862. The report for Behar states that not a single village of any considerable size escaped. From Benares, Jounpore, and Goruckpore the report is the same;

throughout Oude to the extreme northern and western limits, cholera prevailed; for it is clear from the tables that although the districts south of the Jumna escaped, Allahabad, Cawnpore, and Futtehghur in the Doab, suffered. In June and July, we find the districts in the east and north-east of the Central Provinces immediately joined on to our eastern cholera province, affected, cholera appearing in the jails of Jubbulpore, Mundla, Seonee, Bandara, and Raepore. Thus, over the area which in 1862, showed cholera extinct, or at an absolute minimum, an universal sheet of cholera was spread, from Nagpore to the Himalayas, in 1863; while over the epidemic tract of 1862, the western division of the epidemic area, from Shahjehanpore and Bareilly to the North-West Frontier, cholera was dead.

Cholera of 1864.

Cholera of 1864. Minimum of the western division, and the absence of invasion.

The cholera of this year is very interesting in its geography. The cholera which touched Agra in 1863 was not revived in 1864; the western division of the epidemic area was not encroached on by the invading cholera of 1863 either from the east or south; and throughout the area no cholera existed, or else the indications given of its existence were the most trifling. Each of our three types furnishes but one fatal case, which may or may not have been a case of true cholera. On the 19th April, a prisoner died in the Umballa Jail. Of this man Mr. Bateson writes:—"There were no cramps, there was universal warmth of surface, nor were the eyes sunken, although, in other respects, the symptoms of cholera were complete." A Sergeant of the 90th Regiment at Meean Meer, was struck down in May with choleraic symptoms on returning from an entertainment, and died. The third case, which occurred in a Native Detachment, has no history attached to it. It is of no moment to decide as to these cases being genuine or not; I am inclined to believe that both of the cases noticed were due to the cholera miasm. Mr. Dallas, the Superintendent of Jails in the Punjab, has attempted to trace for me the presence of cholera along the base of the hills, in districts where it would have been most likely to survive; but two police stations of the Kangra District alone note cholera as existing for a time in 1864.

General revitalisation over the eastern division of the epidemic area.

Over the eastern division of the epidemic area, the invading cholera of 1863 was universally revitalised in 1864, as is well shown in the tables for European Troops and for Prisoners. It is a most remarkable coincidence, that the most westerly death of an European Soldier, should in this year, as in 1859 and 1860, have occurred at Bareilly.

The geography of the invaded area of 1864 very important.

But the chief interest of the epidemic cholera of 1864, lies in the fact, that while this eastern cholera was forbidden to intrude into the western division of the epidemic area, it spread itself from east to west throughout Nagpore, throughout the valley of the Nerbudda, and above the Vindhya, through Saugor, Bhopal, and Guzerat to the Western Coast, between March and May. The Bhopal Territory was reached on the 3rd May, and for months before, the districts lying to the south of the Vindhya had been ravaged. This cholera left all to the north of the districts mentioned, untouched. Central India Proper was as truly an exempted tract in 1864 as was Agra, Meerut, and the Punjab. By all precedent, this cholera was due to appear in the north-west of India in 1864; I have noticed the tract south of the Jumna, barring its progress from the east in 1863, and now, in 1864, the barrier was still unbroken, and the sheet of cholera was spread from east to west, from sea to sea, *on a lower parallel*, leaving Agra, Gwalior, Rajpootana, Bikaneer, Cabul, and Persia, to share immunity with Rohilcund, Meerut, and the Punjab.

Cholera of 1865.

Invasion of the western division of the epidemic area of May 1865.

In the third year of the epidemic life of the cholera of 1863, an offshoot was directed towards the north-west of India. Before this invasion occurred, cholera had covered the eastern epidemic tract from the Himalayas to Nagpore, and had, in 1864, stretched thence westward to the sea. With this great body of cholera thus curved round the Northern Provinces, and crossing the pathway by which the northern provinces of India are entered, and lying directly in the way of the influences which bear cholera onwards, it was impossible that Agra, Gwalior, Meerut, and the Punjab should escape invasion in 1865. The fact that invasion had occurred, was made evident to me by the occurrence of a few cases between the 15th and 30th May, which showed that in these weeks, the area of the year had been occupied by a cholera which had struck even the peaks upon which our hill stations are perched. A prisoner died of true cholera in the jail at Hissar (May 16th); an Artilleryman was struck down at Meerut (12th May); a man of the Governor General's Body Guard, at Deyrah, was attacked (in the last week of May), and a man of the small European Detachment at Phillour (May 19th); at Dugshaie, a soldier of the 101st got cholera (26th May); and a fatal case occurred at Kussowlie (5th June).

These cases were indicative of the presence of a body of cholera epidemic in the Banda, Jhansi, Gwalior, Etawah, and Agra Districts, clearly enough shown in our records. It is the cholera of July and August of our tables. This cholera did not reach Lahore in its advance towards the north-west, but was stopped in the Ferozepore District, where its presence is recorded in the Mortuary Returns for the Punjab for 1865; the limb directed

northwards, seems to have reached the Kangra District on 15th July, if the Police Reports are to be credited. The last which we hear of this cholera in 1865, is as prevailing in the city of Meerut in October and November.

This was a cholera *invading* in the third year of its epidemic life, and it was destined to die in the fourth year of its epidemic existence; the occupation of a new soil tended in no way to the rejuvenescence of this cholera. In the tables of our types, cholera had no existence in 1866 over this invaded tract of 1865; the cholera of November and December 1866, has a history totally unconnected with that of this cholera of 1865.

Cholera of the Central Provinces, of 1865.

This inevitable offshoot, was but the shadow of what might, under other conditions, have been an epidemic of 1864 and 1865 in the north-west, as great, if not greater than any which ever preceded it. This was its character in its diversion to the south, the most dreadful cholera on record in these provinces, universal from Nagpore westwards to the sea. The same cholera of May 1865, was simultaneously cutting off the Mhow Artillery Detachment below the Simrole Ghât in Khandeish, was striking our stations of the Simla Hills and the mountains of Abyssinia, and was decimating the pilgrims of Western Arabia. It was in epidemic life as early as March, to the east. In April, the valley of the Nerbudda was swept down to the sea; Nursingpore, Hoshungabad, Nimar, Guzerat, and beyond, Kattywar and Lower Scinde (where our invalids of the season from the Punjab, were attacked before they went on board ship), were all included in the area of this cholera in the early months of 1865. This great cholera is happily represented in our returns for European Troops, only by a loss of eighteen men at Saugor, and six at Jubbulpore.

In the eastern division of the epidemic area of our Presidency, this great cholera is represented to us simply under the aspect of a third year cholera, that is, as general throughout the division, but shown only in localised outbreaks, some of which were severe.

Cholera of 1866.

Taking our parallel from 1858 and 1862, the cholera of the year 1866 was due to be at a minimum of prevalence; nearly extinct over the eastern division, and at an end as an epidemic, in the western division of the epidemic area, since 1866 was the fourth year from the fresh invasion of 1863.

Exempted area of 1866.

In the western division of the epidemic area, the cholera of 1863, invading in May 1865, never revived, if the absolute disappearance of fatal cholera from our cantonments and jails in 1866 be taken as the index of the presence or absence of cholera. Up to November 1866, not a single fatal case of cholera was recorded in the western division of the epidemic area, except that of a single prisoner of the Agra Jail, who died in August, a case the true forerunner of the epidemic of the end of the year. In the eastern division, one case only of fatal cholera was recorded among the entire jail population of the area, and that a doubtful one. But the statistics of the stations of European troops situated on the Ganges, put the fact in a different light. It is quite true that over nearly the whole area the cholera of 1863 was extinct; but it was equally true, that in July, the aura of a fresh invasion swept up the valley of the Ganges and across Bundelcund to its most westerly limits.* From this, our stations on the Ganges, *and these alone*, suffered; four European Soldiers died at Allahabad, and one at Futtehghur.

Newly invading cholera of July and August 1866.

Turning to the Jail Table for 1866, we see at once the body of the epidemic, of which this was the aura, coming up from the east, and note its absolute limitation in geographical space; a line drawn from north to south, from Katmandoo in the Nepaul Hills to Pooree on the coast of the Bay of Bengal, will define the western limit of this advancing cholera. It was universal throughout Cuttack, Midnapore, Chyebassa, Hazareebaugh, Behar, Shahabad, and Tirhoot, up to the foot of the Himalayas, before August 1866.

This is now the fourth time since 1855, that we have traced cholera rising in the east from the sea level, appearing on the hills which close in the endemic area, and covering as in a mist the plateau of Hazareebaugh, and Chota Nagpore, with an offshoot up the valley of the Ganges simultaneous with the advance of the body of the epidemic into the Behar Provinces.

We do not require to take a parallel from our own times to define the relation of this cholera, or the probable history of its career. This distribution and limit of July and August 1866 was precisely parallel with that of July and August 1817, as Jameson describes it. The parallel is wonderfully perfect. Jameson writes:—"The only spots on the eastern side of the Ganges beyond the precincts of Bengal (Proper), attacked by the epidemic in the autumn of 1817, were Mozufferpore and Chupra, the principal stations of the Tirhoot and Sarun Districts, and the cantonment of Ghazeepore. The districts south of the Ganges were simultaneously attacked. Cholera broke out in the city of Patna on the 11th of July, and spread to Dinapore and the adjacent villages in August, and in the same month it became epidemic in Bhaugulpore and Monghyr." (Report, pp. 5 and 6).

* This visited the Futtehpore Jail and District as mentioned in a note to the Death Table for the jails of the Presidency for 1866.

The next stage in the advance of this cholera of July and August 1817, affords the parallel of the geographical distribution of the end of October and the beginning of November 1866; and I make the quotation now, in order that the geography of the cholera of these months may not be conceived of as a distribution isolated or abnormal; I shall have occasion to call attention to the same phenomenon of advance in intervening epidemics also. Jameson continues (Report, p. 11): "And now the epidemic began to show one of the most striking peculiarities which characterised its march. It no longer pushed its influence without distinction or apparent choice in all directions and throughout each track coming in its way. It began to affect particular lines, and to fix itself in particular divisions of country; wholly restricting itself for the time to the course of those lines and divisions. Instead of shooting up from Mozufferpore, Chupra, and Ghazeepore through the contiguous districts of Goruckpore and Jounpore to the provinces of Oude and Rohilcund, it wholly left that part of the country, and for many months confined itself to the tracts lying west of the Ganges and Jumna. Thus, from the beginning of November, when it quitted Mozufferpore, until the end of March (1818), when it broke out in Allahabad, it does not appear that any one spot of the immense tract stretching to the east of these rivers from the northern point of Scharunpore to the southern boundary of Tirhoot was visited by the disease. It will be afterwards seen that, in the following year, a new stream of the pestilential virus, issuing in various directions, made a great part of this (unoccupied) tract suffer for its previous immunity."

The advance of October and November, parallel with that of the same months in 1817.

"Although the epidemic would seem to have beset Zillah Mirzapore and to have slightly appeared in the camps at Oonchara and Mongawa near the northern extremity of Rewah, it did no great mischief, until, in the end of the first week of November, it reached the centre division of the grand army then encamped under the personal command of the Marquis of Hastings near the banks of the Sinde in Bundelcund."

Then follows the account of the great outbreak of 7th November 1817. This was the response of Rewah and Bundelcund to the invading cholera of July and August, brimming over the hills shutting in the endemic basin. It is certain that the sources of information at Jameson's disposal regarding the extension of this cholera further to the west, were limited, as it was at the time an enemy's country. But in 1866, the case was different, and the aspect of the parallel cholera was that of an invading cholera of a known provincial distribution; of a cholera invading from the east, which had entered the western division of the epidemic province from the south, *before the eastern division of the epidemic area had been covered by the same cholera*. This was the cholera which appeared at the Durbar at Agra in the first week of November 1866.

An epidemic cholera invading at an unseasonable time is, as a rule, a weak body of cholera; at least, observers generally would reckon it to be so. To me, however, it has not this significance. In my estimation, it is the vehicle for manifestation that is wanting or limited, and not the amount of the miasm that is deficient. The most powerful body of cholera is almost innocuous if the agency to which it owes its mobility is withdrawn. Hence, the few outbreaks in which cholera showed itself in the western division of the epidemic area in November and December, were significant to me, not of the invasion of a weak body of cholera, but of an invasion from a body of eastern cholera, of which the strength was not to be estimated by the immediate effects. This I represented at the time, and the same idea was incorporated in the following letter to the Sanitary Commissioner, dated 25th February 1867, which also defines the geography of this cholera of the close of 1866, except that the western extension was greater than is here stated; for the invasion extended in these months far to the west into Rajpootana, where it re-appeared as an epidemic in April and August 1867.

This letter has reference to what I have described as *the limb invading to the north*, in the invasions of 1856 and 1861; it was written in anticipation of the geography of the epidemic of 1867. I wrote:—

"I think it right to suggest to you the chance of an outbreak of cholera at Hurdwar and over the adjoining districts in April and May. The invading cholera of November was, I think, spread over the whole area of Rohilcund, &c., even up to the hills; and if this was the case, we are bound to expect its re-appearance from all parallel history. The cholera of the years 1783, 1852, 1857, and 1862 teaches the same lesson throughout, that a cholera of this distribution will re-appear in April. To me, the cholera of November and December 1866 is indicated in five deaths of the 36th Native Infantry at Ghazeeabad, and one in the 8th Native Infantry at Moradabad; a sepoy of the 3rd Goorkhas died on 17th December while on detachment at Rampore; and another man of the Sappers was attacked while returning to Roorkee from his home in the Putteala District. Dr. Walker also notices two fatal cases in the Roorkee Bazar on 4th and 23rd December; and we know generally, the fact of the appearance of cholera in Delhi and the neighbourhood at the same time."

"I do not know the strength of the body of cholera so distributed; but I dread universality of spread as much as the strength of special outbreaks, for we never know what the main body may be of which these trifling indications are the mere index. * * I shall show you upon what my apprehensions are founded."

"This cholera has no immediate epidemic connexion with the cholera of the east of July and August 1866, which we may expect (in 1867) to occupy the eastern division of the epidemic area, that is, up to the line of 80° east longitude."

The few cases which occurred in the jails of Nagpore are to be regarded as the remains of the cholera of 1864-65, the equivalent of a cholera of the fourth year in the eastern division of the epidemic area. I make this statement from a retrospect of the events of 1867. It could not have been anticipated that the diversion of the great eastern cholera of 1866 to the north-west, should have utterly cut off the materies required for invasion on this parallel from east to west. But such was the case, and in 1867, while cholera was universal from Gwalior to Persia, not a single case is recorded over the epidemic area of 1864-65, and the Central Provinces were absolutely free from cholera.*

Cholera of 1867.

I have above accurately described the geography of the cholera dormant in the interval between the invasion of 1866 and the manifestation of 1867. According to what I have stated, we should find the history of 1855, 1859, and 1863 repeated over the eastern division of the epidemic area, and the history of 1857-58 and 1862 reproduced over the western division of the epidemic area. To the general observer, the phenomena of distribution will be parallel with those of 1857, showing cholera universal from Behar to the Punjab.

And this is what did occur. Cholera was universal in the east up to Northern and Western Oude, and in the Shahjehanpore District; the northern and western limits of the eastern division were the blackest spots upon the Cholera Map of 1867. This eastern cholera I reckon to have been the great cholera of Northern and Western Oude and of Shahjehanpore and Bareilly. As early as March, as in 1818, Allahabad was attacked, and cholera was reported in the Banda and Cawnpore Districts in May. But it is evident from the history of the year, that it was upon Oude and the districts north of the Ganges generally, that the force of the eastern invasion fell. This was the cholera indicated in the last paragraph of my letter.

Cholera of 1867 in the eastern division.

In April, cholera was universal in the east over the area of invasion of July 1866, from Hazareebaugh to the foot of the hills; and in May 1867, as in 1856 and 1860, the valley of Nepaul was invaded by the epidemic.

Speaking from the experience of 1857 and 1862, I had fixed the 20th April as the date at which a cholera distributed within the western division of the epidemic area was due to revive.† It was on the 12th, that cholera showed itself at Hurdwar, and it was general among the pilgrims within four or five days after this date. The dates and distribution of the cholera of 1862 correspond with sufficient accuracy; in short, the tables for 1862 and 1867 are, as nearly as possible, reproductions one of the other, as far as concerns distribution within the western division. There is this difference only, that the cholera of May 1867 descended into the Peshawur Valley in place of appearing a few miles further to the south. At Bunnoo on the frontier, cholera appeared on 20th April in 1862, the Peshawur Valley remained untouched until July, and the Rawulpindee District was passed over altogether. In 1867, the Rawulpindee District was covered in May, as in 1858, and the Peshawur Valley immediately beyond was covered simultaneously, although it remained absolutely free from cholera under the parallel circumstances in 1858, until the 26th October, when it was entered from another direction.

Cholera of 1867 in the western division.

The history of this cholera I shall have occasion to consider at length in a subsequent chapter; here, I indicate merely the fact, that Nagpore and the Central Provinces were free from cholera in 1867, that the eastern division of the epidemic area was covered by a freshly invading cholera, and that the cholera of the western division was a second-year cholera reproduced in April and in May from the invading cholera of November 1866 over the districts covered in November 1866, and during the year extended from Deolee in the south-west—the south-western limit being *precisely* that of the cholera of 1861—to the Rohilcund Terai in the north-east, and advanced westward as an invading epidemic to beyond the Peshawur Frontier, to Cabul and to Persia.

Exempted area of 1867, and the limitation of the epidemic area in the south and west.

Cholera of 1868.

The cholera of 1868 possesses two chief points of interest, its geography in the south, and its repression over the northern provinces.

In March, the invasion of the east of the Jubbulpore District was reported; and in May, June, and July, there was a severe outbreak among the European Troops at Jubbulpore, the only severe outbreak of the year in the epidemic area of the Presidency. In June, the Jail Table shows cholera in the jails of Mundla and Seonee; and in July, there was cholera in the jails of Nagpore and Nursingpore. On 21st August, a fatal case occurred in the European Regiment at Saugor, marking the invasion of this district. By this time, all the districts to the south had been covered; for, even as early as the 14th August, cases had appeared in the Bengal Cavalry Regiments stationed at Malligaum in the Bombay Presidency, and cholera was reported to be prevailing in the neighbourhood at the same time. It was in

Re-invasion between March and May 1868 of the exempted area of 1867.

* A few cases of cholera was reported from Mundla, the district of the Central Provinces lying furthest to the north-east; this district suffers in common with our eastern epidemic province.

† Letter to the Sanitary Commissioner for Bengal, 28th July 1865.

the week ending the 15th October that this cholera entered the city of Bombay, and Poonah was attacked simultaneously. In December, the attack of Native Regiments marching in Khandeish and Malwa, gave evidence that these territories had been re-occupied. While this report is being printed (March 1869,) the same cholera has appeared in the Mhow Cantonment; and in consequence of its re-appearance in Khandeish, the movement of troops between Bombay and Central India has been put a stop to. Thus, in these months, there was a distinct invasion along the track which I have elsewhere described as the southern epidemic highway, and the entire exempted area of 1867 was covered anew. And while this body of cholera was moving westward in October 1868, another offshoot was moving to the south; and the Madras Presidency, which had enjoyed a respite for two years, following the death of the epidemic of 1864-65, was re-invaded. In the beginning of 1869, this cholera was prevailing epidemically at Hyderabad; and the marching of Regiments was prevented by the prevalence of cholera along the routes.

Phenomenon of repression in the Northern Provinces.

In the Northern Provinces, the marked feature of the year was the inability of cholera anywhere to localise itself in virulence. As a third year cholera both in the eastern and western divisions of the epidemic area, it is possible that even, under favorable conditions, the manifestation of the cholera of 1868 in Upper India might have been in no great power. With the conditions afforded by the climatology of 1868, manifestation was powerfully repressed, and it was only when the general character of the season was temporarily altered, that an attempt at re-appearance over a very wide area was made, in August and September. This is very well illustrated in the tables for the European and Native Armies.

I do not think that the invading cholera of the south, of Madras and Bombay, is, like the material of the epidemic of 1863-65, a cholera immediately emanating from the endemic area, and destined to increase in power in 1869 and 1870. It appears to me but a portion of our Bengal Epidemic of 1866-67; and, if this be the case, I do not look for great power of manifestation, even in a tract so congenial as that invaded in 1868.

A new invasion is, however, to be watched for; and should the fact of the occurrence become apparent in 1869, its possible connexion with this invading cholera in the south must not be overlooked.

CHAPTER II.

THE CHOLERA OF ANY YEAR OR PERIOD IS NOT A MANIFESTATION CONTINUOUS THROUGHOUT EACH MONTH OF THE YEAR OR PERIOD; IT IS EXHIBITED IN A SUCCESSION OF MANIFESTATIONS ALTERNATING WITH SEASONS OF DORMANCY.

This chapter is designed to show the facts of the alternations of manifestation and dormancy of cholera whether in its endemic or in its epidemic area, but not the causes of these phenomena.

I have carefully defined the term "an epidemic" as applied to the invading cholera of the area beyond the limits of endemic cholera. An epidemic is due to the presence of a body of cholera; the materies is the same, existent for a period of years, destined to die in the end, and having a definite part to play during its life-period. At one time, this body of cholera is manifestly existent within the area invaded, but at another, it gives no sign of its existence. We know, however, that it exists, and we can anticipate the fact of its reappearance; therefore, we speak of cholera under these opposite conditions as dormant and as revitalised.

We are apt to associate the motion of cholera with its vitality; but vitality is not essentially associated with power of locomotion, although a cholera in motion necessarily gives a manifestation of vitality far beyond that afforded by an anchored cholera; it may be the case, that a dormant as well as a vitalised cholera, may undergo epidemic distribution. What we have to note here is, not the absence of motion leading to the phenomenon of the repression of the manifestation of a vitalised cholera, but a dormancy beyond the control of any contingent circumstances; and we have to study a vitality which has no essential relation to the agencies which may control the extent of its manifestation.

It is true that invasion and vital manifestation appeal to our senses at one and the same time; but vitalisation is not the cause of invasion. Cholera does not become an invading epidemic *in virtue of its having become revitalised.*

Many of the facts of the alternations in the disappearance and reappearance of cholera, are entirely concealed in the massing together of statistical data relating to cholera; and the neglect to reduce to the locality and date of its occurrence every case of cholera afforded by our types, has been the chief cause of the absence of generalisation from the experience of each year.

I have had occasion in speaking of the history and geography of these recent years, to call attention to the fact of the almost total disappearance of cholera in Upper India, in every year, from the first week of October up to the 20th April. I have, however, had occasion to allude to many occurrences exceptional to this statement. I have noticed cholera in the Umballa District as late as November 1856; cholera along the base of the hills below Nynee Tal in March 1857; cholera epidemic at Peshawur in October and November 1858; cholera epidemic at Peshawur up to the first week of November in 1862; cholera prevailing in the city of Meerut in October and November 1865; cholera distributed as an epidemic over Meerut and Rohilcund in November 1866; and cholera again in the frontier in October 1867. Such exceptions, due to speciality of conditions and speciality of locality, are of no weight in opposition to the generalisation, that in these provinces cholera does not show a vital existence from the end of September up to the last ten days of April; in my estimation, the occurrence of these cases is only significant of the truth, that with the conditions afforded, it was normal and proper that the manifestation should occur. It is one of the advantages of studying cholera in so vast a field as that which this Presidency presents, that the contrast of the natural and normal aspects which cholera offers in different and widely separated portions of the field, enables us to view these contrasts as harmonies in a system, which, indeed, would be no system at all, if it did not recognise cholera under these aspects, as modified and adapted to the physical aspect of the locality of their occurrence. The dweller in Eastern Bengal observes cholera prevalent around him during the very same time that it is extinct in the northern provinces; and he dates his epidemic season from the beginning of October to the May of the year following. Were the population under observation, in parallel circumstances in the two provinces, and were their statistics taken in the mass, the cholera of the Presidency would be shown to be nearly as prevalent in one month as in another. And yet how incorrect would be the generalised statement. As so stated, the generalisation would be no more a scientific truth than is the popularly accepted error, that neither the snows of Russia nor the hot winds of India are inimical to the development and progress of cholera.

Putting aside as irrelevant to the question at issue, any consideration of the seasons of invasion of the epidemic area, and viewing cholera simply as reproduced within an invaded area, or within an area in which it is endemic, the circumstances attending the reappearance of cholera wherever it be manifested, prove the manifestation to be an assertion of its vitality by the object the cholera miasm; and not the less do the facts of its decline and decay prove, that it is a vitalised object which is sinking into dormancy. I speak of the cholera of reproductions, which I have explained to be, in the epidemic province, the revitalisations of the cholera of an epidemic for a certain number of months in each year, and exhibited to us in the outbreaks within a provincial area.

I wish to show here what are in the different provinces of this Presidency, the normal periods between the reproductions of cholera; that is, the periods for which in each year we

are entitled to expect that a cholera which we know to be present, shall cease to manifest its existence.

I have above given the caution against regarding the motion of cholera and the vitality of cholera as one and the same thing. I have been in the habit of regarding the reproductions of cholera in each year in this Presidency as three: the first, persistent from about the middle of February to May; the second, manifested from about the 20th June to the end of September; and the third, beginning at the end of October and lasting until December. In so doing, it is possible that I may not have paid sufficient attention to the warning which I have given. It is possible that I may have elevated into the position of separate reproductions, manifestations which denote simply the fact that mobility has at these seasons been communicated to a cholera vital throughout the interval. Thus, those living in the Gangetic Provinces beyond Bengal Proper, know, that cholera may be looked for in March and April, and again in July and August, and that not unfrequently, a third visitation will occur in November. There are some who would say, that of these three manifestations each is a separate revitalisation; while others would prefer to regard them merely as indicative of an impulse given, at these seasons, by the prevailing conditions, to the manifestation of a cholera miasm persistent in life from March to November. The difficulty is the greater, since the estimation of both may be correct. The analogy of cholera life is with that of vegetable existence; and as the plant, vital throughout, shows its flowers, or puts forth its new leaves at intervals, under the influences of season, so may this cholera become vigorous in itself as well endowed with mobility, when those influences under which revitalisation occurs and motion is communicated, which we have reason to believe to be the same in both cases, predominate.

This reservation being made, and the causes for which I make it being clearly understood, I shall divide the cholera of the year into three: the cholera of the spring, the cholera of the rains, and the cholera of the cold season. The cholera of the spring is the cholera manifested between February and April; the cholera of the rains, is the cholera in evident existence from the 20th June to the end of September; and the cholera of the cold season, is the cholera of the end of October and of November, December, and January. Each of these three manifestations has a history and geography peculiar to it. The homologue of each will, under all circumstances, be found in the various epidemic divisions of the Presidency: thus, a spring cholera will be found in the Punjab or in Nagpore as well as in Lower Bengal or in Assam; a cholera of the rains will be found in the endemic province and the countries bordering on it, as well as throughout the monsoon area of Upper India; and a cholera of the cold season will be found in Rohilcund and the adjoining Terai, as well as in the districts east of the Bay of Bengal. But the very fact of the predominance of the cholera of any one of these manifestations in any area of our Presidency, is sufficient of itself to call for the recognition of this as a natural area, distinct in its relation to natural influences from the other geographical areas in which at the same season, the aspect of cholera is different.

In the tract which I have called the western division of the epidemic area, a cholera of invasion is vitalised in certain localities about the 20th April, and generally, in the first fifteen days of May; thus, it has an existence of barely two months before the commencement of the manifestation coincident with the setting in of the monsoon influences, and during these two months, the conditions necessary for mobility are afforded only exceptionally; thus, we found the spring cholera anchored in the western division for the six weeks preceding the invasion of the first week of July in 1856 and 1861. In the eastern division of the epidemic area, including Jubbulpore and Nagpore in the south, the spring cholera is a great cholera; with conditions which are not abnormal, this cholera may be revitalised and may be a moving epidemic as early as March, and when we meet it epidemic in April, we recognise it as the cholera due in April in any year. Within the endemic area, this is the predominating cholera of the year, due to appear on any day after the middle of February, persistent up to May, and at the close of that month disappearing as an epidemic.

The cholera of the monsoon season is as wide in its distribution as is the range of the monsoon. This is specially the cholera of the epidemic area, waking into life within a fortnight or three weeks after the rains have set in, and mobile over the entire area of Upper India *within the limits of monsoon influence.* It is equally a cholera of the eastern and western divisions of the epidemic area; and its limit in time is the same in both areas, although in the western division, the outbreaks of September are liable to be more severe and numerous than those of the same month in the eastern division. It is a mistake to suppose that this cholera is unknown in the endemic area. If absent as an epidemic from its centre, it is abundant around its margins, and great invasions from such a source may occur, as, for example, the cholera of Dum-Dum and Barrackpore of August 1859, which was a cholera invading apparently from the north-west of the endemic province.

Recalling the history of the cholera of October and November of the epidemic area, on two occasions only, have we found this cholera displayed under the aspect of a moving epidemic, namely, in 1858, on the frontier, and in the invasion of the western division of 1866; when marched in upon, its presence has on several occasions been shown, as in the case of Her Majesty's 32nd Regiment at Kalka on 31st October 1856, of the escort of the Lieutenant Governor, N. W. Provinces, between Bhurtpore and Agra in December 1860, and of the Goorkha Company of the 9th Native Infantry between Fyzabad and Lucknow in December 1863. It is not until the shaded line separating the endemic from the epidemic

province of cholera is reached that this cholera asserts its importance. From Patna to Chittagong and the Assam Frontier, this cholera of the closing months of the year, is, in every district, vital, and may become in any district a great epidemic cholera. This cholera is due in the endemic province as soon as the diluvial tracts submerged during the rains, reappear. In Calcutta it appears after the 15th October.

As typical for the provinces in which they are situated, I have tabulated the admissions from cholera for the twelve years ending 1867, in certain jails which are liable to attack. These statements show the comparative predominance of the cholera of the spring, the rains, and the cold season. In these typical jails, the facts are the same as I have, in the previous paragraph, stated them to be when applied to provinces.

The following are typical examples showing the predominance of cholera at definite seasons relative to locality; the numbers represent the admissions from cholera in each month of the twelve years 1856-67:—

1.—*Backergunge—A Jail of the endemic province in the Sunderbunds, on the diluvium, and scarcely elevated above the sea level.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions of each year.	Deaths.
1856	2	...	...	6	8	3	1	...	...	14	4	2	40	17
1857	1	1	...	5	...	...	...	...	...	...	7	1	15	2
1858	...	...	...	1	5	...	...	...	...	...	8	3	17	9
1859	...	...	...	9	...	1	...	...	...	...	22	1	33	22
1860	...	...	11	3	...	...	...	...	...	...	...	5	19	12
1861	1	...	...	5	1	2	...	...	...	...	1	4	14	8
1862	...	...	3	6	4	...	...	...	...	...	...	...	13	8
1863	...	...	24	23	12	4	1	...	...	...	4	37	105	50
1864	3	2	19	7	...	1	...	...	...	6	5	1	44	17
1865	...	...	4	...	5	...	...	...	...	...	4	...	13	1
1866	...	...	...	2	3	2	...	...	...	...	...	1	8	5
1867	...	...	7	3	...	1	...	...	...	...	...	1	12	5

The cholera of this jail is typical for the endemic basin, taken as a whole and without reference to the behaviour of the cholera of its margins. Cholera predominates at two seasons—in the early months from March to June, and from the end of October to December. The cholera of the monsoon season, of July, August, and September, is unrepresented.

2.—*Midnapore—A Jail of the Laterite, on the margin of the endemic cholera field, little elevated above sea level.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions of each year.	Deaths.
1856	...	...	...	...	...	...	...	...	...	1	...	...	1	1
1857	...	...	4	5	1	103	4	...	...	...	...	...	117	68
1858	..	...	49	57	...	...	...	1	...	...	...	...	107	43
1859	...	...	...	10	...	1	...	...	...	...	...	1	12	...
1860	...	1	32	15	...	140	7	...	...	...	4	...	199	93
1861	..	...	12	3	...	...	...	...	...	...	...	...	15	5
1862	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1863	...	...	1	...	...	1	...	...	...	...	...	...	2	None.
1864	...	2	3	...	1	...	...	...	...	...	...	...	6	4
1865	...	...	...	...	...	...	1	1	...	...	...	...	2	None.
1866	...	21	6	...	...	13	2	...	...	...	...	...	42	23
1867	...	...	1	...	...	...	1	...	...	...	...	...	2	1

The cholera of this jail is typical for that of the districts bordering on the endemic basin. The type is deficient in this respect, that it does not adequately represent the cholera of these localities of October and November; the outbreaks of 1864 and 1867 of these months, were important manifestations, although the prisoners did not suffer.

The spring cholera is the predominating cholera, and is at its end in April, May being a month of exemption. The cholera of June and July is the homologue of the monsoon cholera of the epidemic area, which it precedes by about fifteen days; in the absence of cholera in August and September it is associated with the endemic province.

3.—*Bhaugulpore—A Jail of the Valley of the Ganges probably within the endemic area, 154 feet above sea level.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions of each year.	Deaths.
1856	...	...	4	38	...	...	1	1	...	...	16	...	60	38
1857	...	1	...	4	4	16	15	7	10	1	...	...	58	26
1858	...	...	...	...	...	63	3	2	...	2	...	...	70	40
1859	...	...	...	...	39	1	7	36	9	...	...	...	92	39
1860	...	...	...	38	29	...	...	...	...	...	...	...	67	30
1861	...	...	...	...	33	1	...	...	...	...	...	...	34	14
1862	...	...	...	...	27	...	1	...	...	...	...	...	28	11
1863	...	...	...	13	26	...	...	...	...	...	...	...	39	10
1864	...	...	...	5	24	12	15	1	...	...	...	...	57	10
1865	...	...	...	...	3	...	...	2	1	...	...	...	6	1
1866	...	...	...	3	9	1	...	1	32	...	...	...	46	16
1867	...	...	...	...	3	...	...	1	10	...	...	...	14	5

The cholera of Bhaugulpore is very intimately related in season to that of Midnapore. The spring cholera reappears every year in March or April; but May is not altogether a month of exemption. The cholera of the rains shows itself towards the end of June; this cholera, however, is not extinct in July, as at Midnapore, but is a great cholera in August and even in September. As in 1856, cholera may become epidemic in October and November; it is not an abnormal circumstance that cholera should occur here at this season.

4.—*Patna and Deegah—A Jail on the great kunkur clay,* 185 *feet above sea level, and also typical for the valley of the Ganges; water close to the surface, and the fields irrigated from shallow wells.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions of each year.	Deaths.
1856	...	...	8	16	1	...	...	1	1	1	2	...	31	5
1857	...	1	2	...	5	5	4	43	21	...	1	...	82	31
1858	...	...	1	1	...	...	...	...	...	...	...	...	2	.....
1859	...	...	...	...	...	...	1	...	1	18	25	2	47	25
1860	...	...	...	...	2	1	12	21	1	1	...	...	38	14
1861	...	...	...	...	...	2	31	...	...	...	...	...	33	14
1862	...	...	...	...	...	...	...	10	...	3	...	...	13	3
1863	...	...	23	...	2	...	31	18	...	...	...	...	74	20
1864	...	...	2	24	1	...	...	1	...	...	...	...	28	8
1865	...	...	1	54	...	...	...	...	5	1	8	...	69	29
1866	...	...	15	4	4	...	13	81	8	...	...	...	125	46
1867	...	...	...	13	1	...	...	3	37	7	21	...	82	51

In this typical example, the balance is very evenly held between the cholera of the spring and the cholera of the monsoon. The minimum of May marks the termination of spring cholera; the minimum of June, the commencement of monsoon cholera.

While the spring cholera is thoroughly illustrated, the monsoon cholera of July, August, and September, is quite as well marked as in the northern provinces of India. The tendency to the reappearance of cholera in the end of October and in the beginning of November is shown in six years out of the twelve. The cholera of these districts has distinctly two associations—the one to endemic cholera, the other, to the cholera of the epidemic area.

5.—*Allahabad—A Jail typical for the cholera of the eastern division of the epidemic area.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions of each year.	Deaths.
1856	...	...	...	1	29	...	...	...	...	...	...	...	30	19
1857	...	...	...	...	...	...	...	...	...	...	...	...	No jail records.	
1858	...	...	...	...	...	...	1	...	...	...	...	...	1	1
1859	...	...	...	...	20	26	6	14	13	...	...	...	79	49
1860	...	...	...	10	1	2	...	...	...	...	...	...	13	8
1861	...	...	...	...	56	3	6	1	...	...	...	...	66	26
1862	...	...	1	1	...	...	...	...	...	...	...	...	2	1
1863	...	...	1	2	...	...	4	...	1	...	...	1	9	5
1864	...	...	...	1	...	101	...	1	...	...	...	...	103	28
1865	...	...	...	...	...	...	...	8	...	...	...	...	8	2
1866	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1867	...	...	24	3	...	...	...	...	...	...	...	...	27	14

In all the examples hitherto given, from sea level upwards, the cholera of March has been powerfully developed. In the Allahabad Jail, one serious outbreak only is noted in these twelve years, but this must be accepted as indicating what is a fact, that in any year, under favouring influences, cholera may come forward here in March. Viewed as a type however, the cholera of April and May of this jail takes the place of the cholera of March and April of the districts further to the east; the minimum of Patna of May, is a maximum in the spring cholera of Allahabad; and here, a monthly record does not suffice to draw the line of distinction between the spring cholera and that of the rains, which has been clearly drawn in every jail to the east; the interval is obliterated, and the cholera which analogy teaches us to regard as of two distinct periods, is apparently one continuous manifestation from April to September. In many years, and in every year in fact if the area for which this jail is typical be viewed throughout its extent, the cholera of the districts represented is without difficulty separable into its two normal manifestations; and the more readily so, because in the eastern division of the epidemic area, the cholera of the spring is frequently a moving and not an anchored cholera, as it is, as the rule, in the western division.

6.—*Nagpore—A Jail of the plains of the Central Provinces,* 935 *feet above sea level, in the extreme south of the Presidency.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions of each year.	Deaths.
1856	...	...	24	6	13	...	2	2	...	...	...	...	47	18
1857	...	...	..	...	...	...	...	...	...	...	...	...	No records.	
1858	...	...	1	...	...	...	...	...	...	...	...	...	1	...
1859	...	...	...	...	...	..	...	...	...	...	...	...	None.	None.
1860	...	...	*	*	...	*	*	...	...	...	...	...	44†	15
1861	...	...	..	...	...	...	...	...	...	...	...	...	2†	...
1862	...	...	...	...	...	...	1	1	...	...	...	...	2	...
1863	...	...	...	...	...	...	1	...	4	14	1	...	20	8
1864	...	...	24	3	...	...	1	...	...	...	...	...	28	2
1865	...	...	7	13	1	2	68	11	...	...	...	...	102	54
1866	..	...	...	...	...	...	...	7	...	...	...	...	7	7
1867	...	...	...	..	...	...	...	...	...	...	...	...	None.	None.

The other Jails of the Nagpore territories, 1860 *to* 1867.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions of each year.	Deaths.
1860...	...	...	7	14	49	1	2	...	...	...	...	...	73	36
1861...	...	...	...	...	4	4	...	...	...	...	...	...	8	7
1862...	...	...	...	...	...	...	28	1	...	...	...	...	29	11
1863...	...	...	...	...	...	9	41	...	...	...	...	...	50	20
1864...	...	...	1	12	6	43	...	...	...	...	...	...	62	31
1865...	...	...	2	6	42	9	59	6	1	1	...	...	126	70
1866...	...	...	...	...	...	...	61	21	2	...	...	...	84	48
1867...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

It is in March of any year that the appearance of the cholera of the Nagpore territories is due; the cholera of the rains is also a cholera of earlier occurrence by a few weeks than in the districts of Northern India, showing little tendency to run into September. Whether or not there be a clear interval between the cholera of the spring and of the monsoon depends upon contingent conditions; the interval was distinctly shown in 1860, when the spring cholera disappeared after the 15th May, and was succeeded in the end of June by the monsoon cholera. The following statements taken from the reports of the jails for the year, prove this disappearance and the fact of the occurrence of a true interval, in 1860:—

Nagpore.—Cholera occurred between 1st March and 25th July. "No cases were admitted in May."
Bandhara.—"No case occurred after the 15th May; two months later it prevailed in the town."
Chanda.—5th to 17th May. "Cholera prevailed in the city some months later."
Raepore.—"The first admission was on 22nd March; the last admission on the 18th August."

Considering their distance from the sea, the plains of Nagpore have a very trifling elevation,* and it is evident that their geographical situation exposes them to the same influences which in the east of our Presidency determine the early appearance of the cholera of any year. The relation of this locality to cholera, is, in truth, the same as that of our districts bordering

* Hingenghat is 610 feet, and Nagpore 935 feet above the sea.
† From the Annual Report of this jail I find that the cases of 1860 occurred in March and April and in June and July; the monthly details are wanting in the jail records for 1860 and 1861.

on the endemic area, typically shown in the cholera of the Midnapore Jail, or of the jails low down in the valley of the Ganges. There is no more important fact in the Natural History of the Cholera of the Presidency than this, and I shall frequently have occasion in the sequel to inculcate its significance.

7.—*Jubbulpore,* 1386 *feet above sea level,* 160 *miles north of Nagpore.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions of each year.	Deaths.
1856...	...	...	1	...	...	51	49	...	...	...	...	...	101	61
1857...	...	...	...	6	36	1	3	18	3	...	...	...	67	44
1858...	...	...	1	...	...	...	...	...	...	...	...	...	1	None.
1859...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1860...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1861...	...	...	...	...	...	...	2	...	...	...	...	...	2	1
1862...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1863...	...	...	...	...	...	...	29	...	...	...	...	...	29	8
1864...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1865...	...	...	...	...	...	2	1	...	...	...	...	...	3	2
1866...	...	...	...	...	...	...	...	2	...	...	...	...	2	2
1867...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.

The Jubbulpore District is apt to come under the influence of spring cholera in any year. The facts from the districts lying to the south, south-east, and east of Jubbulpore show the predominance of the cholera of the spring months more powerfully; but a cholera of April and May is as normal for Jubbulpore as for these territories. As is the case further to the south and east, the monsoon cholera has the tendency to appear in June and July rather than in August and September.

The cholera of October and November is not an usual manifestation in the Jubbulpore or Saugor District; exceptionally however, it is met with. On the plains of Nagpore on the contrary, Regiments marching may meet a vitalised cholera in any month of the cold season after it has been distributed as an epidemic.

8.—*Central Jails of the north-west, typical for the western division of the epidemic area.*

Year.	Central Jails.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions of each year.	Deaths.
1856 ...	Agra ...	...	...	...	...	3†	442	132	...	...	...	2	...	579	234
1856 ...	Meerut ...	...	...	...	...	...	...	72	75	...	...	1	...	148	90
1856 ...	Bareilly ...	...	...	...	1	1	...	131	...	...	...	11	...	144	65
1856 ...	Lahore ...	...	...	...	...	...	...	1	302	181	...	...	...	484	244
1860 ...	Agra ...	...	...	...	...	...	...	...	809	7	...	...	...	816	175
1860 ...	Bareilly ...	...	...	2*	3*	...	...	...	...	...	...	...	...	5	1
1861 ...	Agra ...	...	...	...	...	...	2	171	20	...	...	...	...	193	67
1861 ...	Bareilly ...	...	...	...	...	...	...	...	11	1	...	...	...	12	5
1861 ...	Meerut ...	3	...	...	...	...	...	32	635	...	...	...	...	670	335
1861 ...	Lahore ...	...	...	...	...	...	...	...	1	...	...	...	...	1	...
1862 ...	Agra ...	...	...	...	...	...	...	...	123	...	...	...	...	23	12
1862 ...	Lahore ...	...	...	...	...	...	...	1	81	12	...	...	...	94	41
1863 ...	Agra ...	...	...	...	...	7†	...	49	58	...	...	...	...	114	45
1865 ...	Agra ...	...	...	...	1	...	...	13	18	...	...	...	...	32	20
1865 ...	Bareilly ...	...	...	...	...	...	...	...	...	...	1	...	...	1	1
1866 ...	Agra ...	...	...	...	...	...	...	...	1	...	...	...	...	1	1
1867 ...	Agra ...	...	...	...	...	...	...	...	...	1	...	...	...	1	1
		3	...	2	5	11	444	602	2,034	202	1	14	...	3,318	1,337

Passing from south-east to north-west over the space intervening between Jubbulpore and Agra, an area is reached in which the statistics of cholera present a contrast radically distinct from those of the cholera of the east or of the south of the Bengal Presidency. From Agra to Lahore it is the monsoon cholera which predominates; and the representation given above is no exaggeration of the fact. It is quite true that cholera may be vital and epidemic in May or in November within this area, but it is during the continuance of the monsoon, from its commencement to its termination, that epidemic manifestation occurs in its intensity. May cholera takes the place of the cholera of March and April of the south and east. It was a cholera of May which we have traced in epidemic vigour at Agra in 1856; in May 1857, prevailing over the Umballa District; in May 1858, epidemic in Rawulpindee and

* These cases belong to a cholera of the eastern division of the epidemic area; Bareilly was the last station to the west reached by the eastern invasion of 1860.

† Cholera of Invading Epidemics.

Hazara; in May 1861, in the territories west of the Jumna covered in 1860; in May 1862, epidemic from Hurdwar to the Frontier; on 20th May 1863, striking the prisoners of the Agra Jail; in May 1865, sparsely epidemic over Meerut and the east of the Punjab; and in May 1867, epidemic over the same area that was covered by the cholera of May 1862. These examples teach clearly, that the early cholera is not unrepresented, but that it is, in this situation, repressed from manifesting its existence for a certain period, by the conditions which it finds in this western division of the epidemic area. Six admissions are shown at Bareilly in March and April in the table showing the cholera of the Central Jails. The Bareilly District is under eastern as well as under western influences; the five admissions of 1860 were the most westerly representative of the great cholera of the eastern division of that year, and should be cut out of this table as having no association with the cholera of the other years and stations. The November cholera of this area is marked by a slight attempt at renewal in the jails of Agra, Meerut, and Bareilly in November 1856, after the great epidemic of the monsoon season had passed; this is the same manifestation which I have traced in the same month, epidemic at the base of the hills beyond Umballa and below Dhurmsalla.

These cases are typical; that is, they truly and accurately represent the experience of the population generally of the districts for which they have been here produced, and what they teach holds good, not for these twelve years only, but for all time. I might have deferred bringing these forward until I came to treat of the causes which bring about the disparities shown in these illustrations. But it is essential, even for the general consideration of the whole subject of the laws of cholera, to pave the way so as to prevent any misunderstanding of terms, when it becomes necessary to employ the terms "dormancy" and "reappearance," in speaking of the materies of an epidemic. These illustrations will be associated in the mind with the aspect of cholera in this Presidency, not as a thing casually occurring or dependent for its appearance or decay on any mere contingent circumstance, but as bursting forth as the leaf bursts forth and decaying as the leaf decays, in subordination to the conditions offered in the geographical situation which it occupies.

It will be understood, that, although, in these illustrations, the statistics of invading and reproduced cholera are mixed up, the combination is immaterial; invasion and reproduction are popularly regarded as synonymous terms, and the period of the occurrence is very much the same in both cases.

It is the recurrence of absolutely identical parallels which proves the truth, that the cholera re-awaking within the epidemic area, is a revitalisation of the very cholera distributed months or even years before, and not a fresh invasion succeeding the cholera of the previous epidemic. From what has here been said, the conclusion may be drawn, that wherever, throughout this Presidency, cholera is met with, its manifestation is intermittent, the periods of recurrence and disappearance being the same, within certain laws and limits, in each year, and that these differ for almost every province according to its geographical situation; that the disparities are necessities, not contingencies, and are shaded off harmoniously wherever consistency requires that the line of distinction shall cease to be abrupt.

These remarks have reference to the cholera of provinces. It is an universal truth, that cholera has no power of continuous manifestation throughout the year in any province. It is no answer to say, that in Calcutta or in Dacca cholera may be met with in every month of the year, and in every year; or that in some portion or other of the endemic tract, cholera is always prevailing. Scientifically speaking, the intervals are as truly observed in Bengal Proper as in the northern provinces, and it is as unreasonable to expect an utter cessation of cholera throughout its perennial habitat, as it is to expect a total disappearance of its vegetation because of the necessity for its renewal with the revolving seasons.

CHAPTER III.

BESIDES HAVING A DISTRIBUTION IN SPACE, THAT IS, A GEOGRAPHY, EPIDEMIC CHOLERA HAS A DISTRIBUTION IN TIME. A CHOLERA WHICH CAN BE RECOGNISED AS NEW AND INVADING REAPPEARS THROUGHOUT A SUCCESSION OF YEARS; THE PERIOD FROM ITS FIRST INVASION TO ITS FINAL DISAPPEARANCE IS THE DURATION OF AN EPIDEMIC OF CHOLERA.

In order to render intelligible the geography of the cholera of recent years, and to assist in the general comprehension of the tables illustrating the first chapter, I have been obliged in some measure to anticipate the contents of the present chapter.

I have described as a new and invading cholera, the eastern cholera of 1855, of 1859, of 1863, and of 1866. I have described this cholera as in motion from the east towards the west, and I have followed out the geography of the four epidemics of which this new cholera formed the materies. From the history of these four epidemics from their beginning to their end, I shall try to show what an epidemic is, and what is, in this Presidency, the normal duration in time of a cholera emanating from the endemic source, or, in other words, for how many years the materies of an epidemic shall retain its vitality in the epidemic area.

It would be premature here to detail the history of the various emanations of cholera from within the endemic basin, which, since 1817, have covered Northern India or the Central Provinces; it will suffice to state generally, the fact, that during these fifty years, a fresh cholera has issued forth every fifth or sixth year, and has been marked by phenomena of distribution, both in time and in space, corresponding with the phenomena of the past fifteen years. It is our misfortune, that each of these emanations has not been systematically watched, and the facts placed on record; and at the present day, it is difficult, if not impossible, to piece together the fragmentary data, whether statistical or documentary, in such a shape as to make it evident that the behaviour of these old epidemics was the same as that of the more recent. But there are parallels and landmarks which can be tangibly grasped, of such a character that we know, that what lies between the gaps has existed, although now forgotten and unrecorded. It must not be overlooked that some of these gaps were unavoidable, since the territories under British dominion did not in those days form the unbroken sheet which they do in our times. I hope before concluding this paper to put on record something in regard to each of the epidemics which have made their invasion between 1817 and 1855, which may be recognised as illustrative of and as illustrated by, the events of the past fifteen years.

After the illustrations and explanations of the previous chapter, the term reproduction or revitalisation, may now be employed without its meaning being misunderstood; when I speak of an epidemic, for example, that of 1855-58, it is of one and the same body of cholera, that I shall speak, having an interrupted manifestation, being manifest for a certain number of months in each year, and dormant during the remaining months.

Distribution in time of the epidemic of 1855-58.

Distribution in time of the invading cholera of 1855 in the eastern division of the epidemic area.

The minimum of manifestation throughout the Gangetic Valley and in the eastern division of the epidemic area so striking in 1858, 1862, and 1866 preceding the epidemics of the years following, was not so strongly marked in 1854. Throughout the Gangetic Provinces, the year 1853 was noted for the virulence of its cholera, and this cholera was very generally reproduced in the spring of 1854. Still, the disparity between the year of invasion and the year preceding it was sufficiently marked. The mortality of the jails of these provinces stands thus for the last six months of 1854, and it contrasts broadly with the results in the same jails in the year of invasion :—

Jails of the Eastern Division—July to December 1854.	July.	August.	September.	October.	November.	December.
Deaths from cholera in the jails of the Dinapore Circle	4	1	2	6	6	1
Deaths from cholera in the jails of the Benares Circle	...	...	...	...	...	...
Deaths from cholera in the jails of the Cawnpore Circle	2	...	...		...	...

During the last six months of 1854, out of a jail population of 16,750, in the Gangetic Provinces, twenty-two deaths only occurred, and with two exceptions, these were confined to the most easterly circle of jails; of the twelve deaths of October and November, eleven occurred at Bhaugulpore and Purneah, the most easterly jails of the most easterly group.

Cholera Admissions of the Jails of the eastern division of the epidemic area in the Epidemic of 1855-58.

Year.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Died.
1855 ...	14,914	1	1	20	25	21	102	93	276	102	42	19	3	705	295
1856 ...	16,007	...	8	68	249	93	93	51	25	25	10	24	4	650	298
1857 ...	8,092*	2	3	14	25	55	56	228	167	51	16	3	...	620	266

The invasion took place during the monsoon season of 1855. Its virulence as an epidemic was maintained throughout 1856, and was expended with the close of the monsoon of 1857.

The minimum of 1858, was represented in the jails of the eastern division of the epidemic area by ten deaths out of a population of 8,193; but of these, seven occurred in the jail of Gya. With the exception of this jail and those of Ghazeepore, Mirzapore, and Allahabad, each of which furnished a single death, the jails of the Gangetic Provinces were free from cholera during 1858. In fact, as far as the jail population was concerned, epidemic cholera had no existence.

The jails of Bhaugulpore, Purneah, and Hazareebaugh lie within the endemic province rather than upon its shaded margin, and I therefore exclude them in estimating the minimum of the cholera of the Gangetic Provinces of 1858.

The minimum shown in the case of the European and Native Armies has been already alluded to. Among the Native Army in the same provinces, the minimum of 1858 is represented in the table of the year, by the absence of a single case of fatal cholera out of a force of 27,763.

The European Armies of the War Provinces lost, in all, thirty-two men from cholera in 1858, and this number would be diminished by one-half, if the cholera acquired while marching on the Trunk Road, were struck out, as having no connection with the cholera of the area within which the men affected died.

I have in the first chapter and in the tables illustrating it, shown how the cholera of 1855, 1856, and 1857 affected the Native and European Armies in the eastern division, and how extreme was the suffering of the latter in 1857 in the provinces from which cholera was entirely absent in 1858.

Distribution in time of the epidemic of 1855, which invaded the western division of the epidemic area in May 1856.

In the eastern division the European Army was not represented by a strength sufficiently large typically to exhibit the phenomena of the area, in 1855 or 1856. But for the western division, the statistics of the European Army are abundantly illustrative for the period of the duration of this invading epidemic, from the month of its invasion to the month of its extinction. It has been shown that cholera was unrepresented within this area in 1854 and 1855, and up to the 20th May 1856, when it was entered from the south-east through the Agra District. Taking the statistics of the European Army cantoned within the area for the year of invasion and the two following years, the figures stand thus:—

Deaths from Cholera in the European Army cantoned in the western division of the epidemic area during the three-year period 1856-58.

Year.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Deaths.
1856 ...	15,105	...	...	...	...	...	76	24	370	84	4	44	...	602
1857 ...	15,193†	...	1‡	...	4	68	79	137	86	127	20	...	...	522
1858 ...	14,486	...	...	1	...	4	1	32	26	23	5	3	...	95

This is an accurate picture of the duration of the epidemic of 1856-58 in the western division—vigorous from the day of its invasion to the day of its death, with the normal periods of dormancy intervening, amounting to five months in each year; taking the province as a whole, ending in each year in the first week of October, and reproduced in the first week of May; and dying out at the close of the third year after invasion. The areas within this province occupied and the areas exempted in each year have been sketched, and the dates of invasion and decay have been noted in a previous chapter.

Cholera of the Central Provinces, 1856-58.

The year 1856 is well remembered throughout the Nagpore territories as a year of invading cholera. The statistical facts are shown in the Jail Table for the year. The records for 1857 are deficient, but it is well known that cholera prevailed throughout Nagpore in this year as well as in 1856, that it was general throughout the vallies of the Nerbudda and Taptee, and that it

* Cawnpore Circle wanting.
† Strength of April 1857.
‡ A man proceeding by bullock train, who got cholera between Umballa and Jullundur.

prevailed even north of the Vindhya Range. The weak European Battery shut up in Saugor during 1857, lost three men from this cholera. There are no data to inform us whether cholera did or did not prevail in the Central Provinces in 1858. I have already said that our troops in the field in Central India did not suffer from cholera in 1858. The Central Provinces and Central India, however, are two different tracts of country, and must not be mistaken the one for the other; and the more so, because they have a contrasted meteorology and a widely contrasted relation to epidemic cholera.

The Central Provinces, Central India, Rohilcund, Meerut, and the Punjab enjoyed, in common, immunity from cholera during 1859.

Summary for the Epidemic of 1855-58.

1855.—The year of invasion from the east. The invading cholera confined entirely to the eastern division of the epidemic area.

1856.—The year following the invasion of the eastern area. Cholera in the spring reproduction, covering the Central Provinces, and entering the Agra District from the east; during the monsoon season, universal over the area covered in 1855, and by the invading spring cholera of 1856, and advancing as an invading epidemic from the south-east to north-west, from the districts covered in spring as far to the north-west as the Jhelum and no further; but with an extension to the west undefined by the limits of our Presidency.

1857.—The third year of an invading cholera in the eastern division of the epidemic area; the second year in the western division of the epidemic area. Cholera universally in epidemic vigour both in the spring and monsoon reproductions over the entire area covered in 1855 and 1856. This cholera made no further advance towards the north-west into the districts remaining uninvaded in 1856.

1858.—The fourth year of an invading cholera in the eastern division of the epidemic area; the third year in the western division. Cholera extinct or at a minimum throughout the eastern division of the epidemic area; dead over many portions of the western division, but wherever the local conditions in any degree favour vitality, in vigorous manifestation up to the close of the year.

1859.—The fourth year after the invasion of the western division of the epidemic area. Cholera extinct throughout the western division.

DISTRIBUTION IN TIME OF THE EPIDEMIC OF 1859-62.

Epidemic of 1859-62 succeeding the epidemic of 1856-58.

The epidemic of 1859-62 is included between the years of minimum in the eastern division 1858 and 1862, and between the years of minimum in the western division, 1859 and 1863; it was thus, as in the case of the epidemic of 1855-58, an epidemic dead in the fourth year following invasion, both in the eastern and western division of the epidemic area.

Among the jail population in the eastern division of the epidemic area, this epidemic is represented to us by the following admissions:—

Cholera Admissions of the Jails of the eastern division of the epidemic area in the Epidemic of 1859-61.

Year.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Died.
1859	10,363*	...	1	7	111	82	33	56	61	26	19	41	8	445	227
1860	11,619	2	...	58	158	105	46	135	158	48	7	2	1	720	330
1861	13,448	1	...	5	69	108	45	127	53	25	2	10	...	445	180

Excluding, as in 1858, the jails of Bhaugulpore and Monghyr, which in 1862 gave twenty-five deaths, the total mortality among the jail population of the eastern area amounted in 1862 to eleven; of these the Patna Jail gave three, the jail at Seetapore two (returned as cholera biliosa), and the remaining six cases were distributed through six different jails. The extreme debility of this cholera of 1862 is marked by the fact of these eleven deaths being the result of forty-nine admissions.

Subsequent to the events of 1857 and 1858, a large proportion of the European Army was massed in the eastern division of the epidemic area, and the statistics of this body are exactly corroborative of the experience of the jail population.

Admissions from Cholera in the European Army cantoned in the eastern division of the epidemic area during the three years of the Epidemic of 1859-61.

Year.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Died.
1859	25,275	3	2	10	59	193	47	71	195	37	13	5	5	640	338
1860	17,368	...	16	109	255	25	31	21	38	22	6	9		532	299
1861	14,625	1	...	1	5	13	15	39	52	6	2	2	1	137	86

* Excluding the jails of Oude, of which many were opened only in 1859; in several of these cholera was present.

Out of a force of equal strength, in 1862, a single death represented the fatal cholera of the year—a man landed, at Allahabad, moribund, from a river steamer.

In the Native Army the epidemic of these years was similarly represented, although, as usual, by a very much smaller ratio. The admissions of each month were as follows :—

Admissions from Cholera in the Native Army cantoned in the eastern division of the epidemic area during the three years of the Epidemic of 1859-61.

Year.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Died.
1859	27,369	...	1	...	2	10	28	20	115	24	...	1	5	206	80
1860	17,467	1	10	68	97	41	52	7	10	2	2	1	...	291	141
1861	9,771	...	...	2	9	19	16	11	9	4	5	1	...	76	29

The minimum of 1862 was represented by a single fatal case; this, also, occurred at Allahabad. This is the only fatal case noted in twelve admissions from different stations of the area.

The spring cholera of 1860 covered the Central Provinces, from Nimar in the west to Raepore in the east, as early as March, and Saugor and Bhopal, above the Vindhya Mountains, suffered immediately after the first fall of rain on 5th June. At the usual season of its prevalence, in the districts south of the Jumna suffering in common with the eastern division, cholera raged; but it was not until the monsoon months that Jhansi, Agra, and Gwalior suffered; and beyond these districts, the cholera of 1860 made no progress whatever towards the north-west. Nevertheless, this limited cholera was typical for a cholera which might have had its distribution as far as Lahore in 1860, a point which it did not attain until the monsoon season of 1861.

The European Army of these provinces, in the epidemic of 1860 and the two years succeeding the invasion, gave the following admissions :—

Cholera Admissions in the European Army occupying the western division of the epidemic area in the Epidemic of 1860-62.

Year.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Died.
1860	26,897	...	1	1	3	2	4	26	283	72	5	2	1	400	194
1861	26,728	...	1	1	2	1	4	359	943	142	3	2	..	1,458	946
1862	27,588	...	...	...	4	6	3	131	304	103	69	5	1	626	331

The deaths in Her Majesty's 93rd Regiment in the Peshawur District, in the first week of November 1862, brought to a close the epidemic of 1859-60.

In October 1863, there was a case returned as cholera at Rawulpindee; to this I have already referred as a doubtful case, occurring in a phthisical patient many months in hospital. I do not reckon the only outbreak within this area in 1863, that of Agra, as exceptional to the disappearance of cholera within this area. I regard it as a true offshoot of the great cholera in progress at the time from the east, which was at the time covering the unoccupied eastern division of the epidemic area and the north of the Central Provinces. There is no reason that a cholera when first moving as an advancing epidemic, should not reach as far to the west as to Agra; Jhansi was affected in 1855, and the offshoot of the new cholera of 1866 crossed from east to west even into Rajpootana. As I have already noticed, this Agra cholera of 1863 was most normal in the dates of its appearance, first striking the jail almost on the very day from which the invasion of 1856 is reckoned, namely, the 20th May, and in its coming back again with the monsoon on 7th July.

The jails of the western division of the epidemic area (excluding those of the Central Provinces) gave the following admissions during the years following the invasion of August 1860 :—

Admissions from Cholera in the Jails of Agra, Rohilcund, Meerut, and the Punjab during the three years of the Epidemic of 1860-62.

Year.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Died.
1860 ...	17,645	...	...	...	4	1	...	...	810	8	...	...	...	823	177
1861 ...	20,504	...	...	...	...	1	18	258	713	63	2	...	...	1,055	495
1862 ...	18,888	...	...	...	1	3	16	39	199	17	24	...	..	299	122

As we found the cholera of 1855-56 disappearing in the Peshawur and Kohat Districts in October 1858, so do we find, now, the last representative of the cholera of 1859-60 in the jails of Kohat and Peshawur in October 1862. Throughout Rohilcund, Meerut, and the Punjab no fatal case of cholera was recorded in any jail in 1863, and but one admission; apparently exceptional to the fact of the disappearance of the cholera of this area, was the cholera of Agra of 1863 above alluded to as a freshly invading cholera.

Summary for the Epidemic of 1859-62.

1859.—The year of invasion from the east. The invading cholera confined entirely to the eastern division of the epidemic area.

1860.—The year following the invasion of the eastern area. Cholera in the spring reproduction, reappearing over the eastern area generally, and covering the Central Provinces by invasion; during the monsoon season, universal over the area covered in 1859, and by the invading spring cholera of 1860, and advancing as an invading epidemic from the east, from the districts south of the Jumna as far to the north-west as to Muttra and Bhurtpore, and no further, covering at the same time the Jhansi, Agra, and Gwalior territories, and advancing even into Scinde and Persia.

1861.—The third year of an invading cholera in the eastern division of the epidemic area; the second year in the western division. Cholera universally in vigour both in the spring and monsoon reproductions in the area covered in 1859 and 1860. Advancing as an invading epidemic in the western division from south-east to north-west, stopping short in the Lahore District in the north-west, although covering at the same time Bikaneer, Bhawulpore, and Cabul.

1862.—The fourth year of an invading cholera in the eastern division of the epidemic area; the third year on the western division. Cholera extinct or at a minimum throughout the eastern division, but in vigorous manifestation up to the close of the year in very many portions of the western division.

1863.—The fourth year after the invasion of the western division of the epidemic area. Cholera extinct throughout the western division, if we regard the cholera of Agra as an invading cholera, as I judge that this as well as the cholera simultaneously invading the north and east of the Central Provinces, ought to be regarded.

DISTRIBUTION IN TIME OF THE EPIDEMIC OF 1863-66.

The reinvasion after the minimum of 1862 (which we found to be represented in the jails by a total of eleven deaths) had a distribution among the jail population of the Gangetic Provinces as under:—

Cholera Admissions of the Jails of the eastern division of the epidemic area in the Epidemic of 1863-65.

YEAR.	STRENGTH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.	DIED.
1863 ...	17,197	1	3	294	42	82	57	439	137	35	46	48	4	1,188	498
1864 ...	17,688	...	6	16	127	70	165	16	53	2	1	1	1	458	148
1865 ...	18,601	...	1	1	104	3	2	40	31	48	27	18	...	275	114

In noting the disappearance of cholera in the fourth year after invasion, that is, in 1866, we are compelled to recognise the invasion following that of 1863; for with the monsoon of July 1866, the south-western portion of Bengal Proper, Chota Nagpore, and the Behar Provinces were covered from the Bay of Bengal to the Himalayas with the material of a new and great epidemic. It is, therefore, in the provinces lying to the west of Behar alone, that the minimum exists. And the Jail Table of 1866, as printed, showed but a single death of a prisoner in all the jails of the Gangetic Districts, Oude, and Cawnpore, who died in August at Futtehghur. In a note to the Death Table of the year, however, a severe outbreak is referred to as occurring in August in the lock-up at Futtehpore, in which twelve prisoners died. This and the cases which occurred in the European Regiment at Allahabad at the same time, were linked on with the invading cholera of July 1866, and this offshoot was noticed in other stations of the Ganges, for example, in Buxar and Mirzapore. I have no hesitation in stating, that these cases were not reproductions of the epidemic cholera of 1863-66; for, besides the history attached to them, the history of the same cholera later in the year, proves, that if this was not the actual body of the cholera invading Agra and Rajpootana in October, it was a portion of the same, and the immediate precursor of it.

Cholera admissions of the European Army in the eastern division of the epidemic area, 1863-65.

Year.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Died.
1863 ...	12,855	4	...	2	14	3	1	79	55	9	8	...	...	175	136
1864 ...	11,753	...	...	2	2	2	3	9	6	66	2	...	...	92	71
1865 ...	11,254	4	...	...	27	2	3	...	19	13	...	1	2	71	57

With the exception of the eight cases and four deaths at Allahabad which I have mentioned above, there was in 1866, as in 1862, but one death of an European soldier west of the Behar Provinces, between Dinapore and the Peshawur Frontier; he died at Futtehghur at the time that the only case representative of cholera among the jail population appeared. It is interesting in connexion with the history of the invading cholera of 1866, to note a single death in the Agra Jail in August (the only representative of cholera in the western division, in the monsoon months); this I believe to have been a true outrunner, from the east, of the cholera which appeared in the end of October.

Taking the parallels of 1856 and 1860, the cholera of 1863 was due to reappear by revitalisation, or by reinforcement, or by both, in the Central Provinces in March 1864; and the reappearance did occur. Taking the same parallels, the western division of the epidemic area was liable to be entered in May, and to be covered by the monsoon cholera of 1864. But here we are at fault. Neither in the types under observation, nor yet from any record, can it be shown that epidemic advance into this area did occur. We may take the case of the prisoner in the Umballa Jail in April, and that of the Sergeant at Meean Meer in May, to represent a cholera invading in the spring of 1864; I prefer, however, to say, that the cholera due to have appeared in the western division, was lost to us for this year, and appeared only when its appearance was inevitable in 1865, and even then in limited volume and curtailed in geographical distribution. The invading cholera of 1865, did not, like the cholera of 1856 and 1861, reach the Lahore District, but was abruptly cut short in the Ferozepore District, which was the north-west limit of this small but true epidemic, which, as a scientific fact, covered the entire western epidemic area as far to the east as Meerut, and to the south as Gwalior. This advance was well represented among the general population, and it is very clearly demonstrated in our types. If the Mortuary Returns of the Punjab are to be believed, this cholera was attended with a loss of 3,000 lives in the Ferozepore District. In 1866, as in 1858 and 1862, this cholera of the Ferozepore District seems to have been carried on to the Rawulpindee District and to the Frontier. Had our types been taken as demonstrative of the fact of the absence or presence of an epidemic, we should utterly have failed to trace this weak body of cholera in its third year after invasion, but with the assistance of the Mortuary Statistics to bridge over the difficulty, the parallel of 1864-66 stands substantially the same with 1856-58 and 1860-62, although the power of the body of the cholera invading in 1865 (the second year) is in no way to be compared with that of the invasion of 1861 (also a second year cholera). The body of the cholera from which this offshoot occurred, did not advance epidemically even into the Agra District. But immediately to the south, it was a dreadful epidemic, which cut off 36,000 people in Etawah, Jhansi, Jaloun, Humeerpore, and Banda.

The following table shows the geography of the epidemic of 1865, which in May made its sporadic invasion into the western division of the epidemic area. It was in the districts south of the Jumna, and geographically connected on to the Central Provinces, which suffered so heavily, that this cholera of the North-Western Provinces was concentrated:—

Deaths of the general population of the North-Western Provinces in the cholera of 1865, *which was derived from the invading cholera of* 1863, *and was confined as a virulent epidemic to the districts lying south of the Jumna.*

Districts South of the Jumna. (Tract of maximum).		*Western Division of Epidemic Area.*	
Banda	2,748	Agra	308
Humeerpore	8,829	Muttra	92
Jaloun	10,190	Etah	247
Jhansi	9,948	Allyghur	151
Etawah	3,513	Bolundshuhur	200
Lullutpore	748	Mynpoorie	581*
		Moradabad	965*
		Meerut	854*
		Mozuffernuggur	107
		Seharunpore	344
		Bijnore	99
		Deyrah Dhoon	1
		Terai	45

* Geographically connected on with the tract of maximum.

The deaths of the second column indicate the presence of the cholera which sent its offshoot into Meerut, Rohilcund, and the Punjab between the 15th and 31st May. It was extinct in 1866.

Cholera Deaths of the western division of the epidemic area in the Epidemic of 1864-66.

EUROPEAN TROOPS.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1864	..	...	...	...	1	..	...	...	...	...	...	...	1
1865	...	...	...	...	...	1	2	8	3	1	1	...	16
1866	...	...	...	...	...	...	...	...	...	..	13*	...	13*

NATIVE TROOPS.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1864	...	...	...	...	...	...	...	...	...	...	...	1	1
1865	...	...	...	...	...	1	3	8	1	...	...	...	13
1866	...	...	...	...	...	...	...	...	...	...	19*	...	19*

JAIL POPULATION.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1864	...	...	...	1	..	...	...	...	...	...	...	...	1
1865	...	...	...	...	1	...	8	14	...	1	...	...	24
1866	...	...	...	...	...	...	...	1*	...	...	...	..	1*

But there must have been a reason why this epidemic of 1864-66 of the western division of the epidemic area proved an aborted epidemic. The eastern invading cholera of 1863 was very far from being a weak body of cholera; although, to judge from its effects on the European Army, it was very much weaker than that of 1855 and 1859.

The fact seems to be, that in place of its volume having been divided between two invasions, each of a different geography, as in 1856 and 1860, when the spring cholera became a great cholera over Nagpore, and the monsoon cholera a great cholera over our northern provinces, the cholera of 1863 was swept clear out of the highway leading to our North-Western Provinces, and was thrown as a body over the Central Provinces, in which it provided the materies of an epidemic greater than those of 1856 and 1860; the epidemic of the northern portion of the epidemic area being at the same time reduced to the shadow which became the invading cholera of May 1865 shown in the preceding table.

All that need be said of this cholera is, that reproduced or reinforced in the spring of 1864-65, the Central Provinces from sea to sea were covered by it, and from this great sheet of cholera, occupying the southern epidemic highway, emanated the cholera of Arabia, Eastern Africa, and Europe. This cholera was still represented in 1866, as reference to the Jail Table will show:—

Jail population of the Central Provinces—Cholera Admissions in the Epidemic 1863-66.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Died.
1863...	...	...	...	...	...	33	93	1	6	22	1	..	156	59
1864...	...	...	25	15	18	50	18	23	3	3	...	...	155	63
1865...	...	...	9	36	51	22	129	17	2	1	..	..	267	143
1866...	...	...	1	...	...	...	61	33	5	..	...	...	100	57
1867...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.

* Marking the invasion from the east of the new epidemic, 1866-68.

The year 1867 was the fourth year after the invasion of the Central Provinces, and was marked by the universal disappearance of cholera throughout the area covered in 1863 and 1864; in fact, throughout the Central Provinces, from east to west, there is no record of cholera from any district. As I have explained, the cholera of Mundla was no exception, since this was a portion of the great cholera of 1867, universal in the eastern and western divisions of the epidemic area to the north.

Summary for the Epidemic of 1863-66.

1863.—The year of invasion from the east. Cholera confined to the eastern division of the epidemic area, the Agra District being the western limit of the invasion. The stations of the north and east of the Central Provinces were invaded in June.

1864.—The year following the invasion of the eastern area. Cholera general in the same area, both in the spring and monsoon reproductions; revitalised and probably reinforced in spring in the Central Provinces, but making no advance into the northern provinces of the western division.

1865.—The third year of invasion in the east. Cholera still general, both in the spring and monsoon reproductions. Universally reproduced also over the Central Provinces. Advancing by invasion of the western division of the epidemic area towards the north-west as far as into the Ferozepore District, but in epidemic vigour only in the tract south of the Jumna.

1866.—The fourth year of an invading cholera in the eastern division of the epidemic area. Cholera at a minimum or extinct west of the Behar Provinces. In the Central Provinces, cholera in the third year following invasion, still existing. In the northern provinces of India, still existing, but at a minimum.

1867.—The fourth year of an invading cholera in the Central Provinces; cholera extinct. A fourth year in the northern provinces; cholera would have had here also no existence but for the reinvasion by the new epidemic, that of 1866.

Distribution in time of the Invading Epidemic of 1866.

I have in a previous chapter, noticed the parallel between the invasions of 1817 and 1866. In considering the distribution of this cholera in time, I believe that we should not have erred had we regarded the invasion of 1866, although limited in its geographical distribution, as representative of a first year's cholera, such as that of 1855, 1859, or 1863. Had the parallel held good, then over the eastern division of the epidemic area, the years of persistence of this cholera would have been—1866, 1867, and 1868, with 1869 as a year of minimum, corresponding in character with the years 1854, 1858, 1862, and 1866, minus the invading cholera of that year.

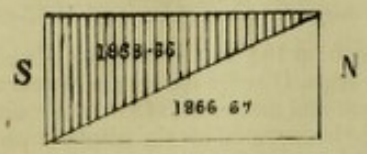
But it must never be forgotten that all epidemic history is subordinated to the operation of natural agencies, and any anticipations formed have been disturbed by the exceptional character of the meteorology of the year 1868, in relation to which the phenomenon of repression has been generally manifested. For reasons which I shall state afterwards, I do not think that there were grounds to anticipate, in 1868, from the cholera of 1866-67, a revival of very great epidemic strength in the northern provinces of India. Still, repression and unnaturally rapid decay consequent upon the prevalence of conditions prejudicial to continued vitality, reduced the death-rate of the year for the general population, to a minimum much lower than was to be anticipated, having regard to parallel epidemic history. Whether cholera can possibly survive in Northern India through such a year as 1868, the experience of 1869 will show. But at the same time, reinvasion from the belt of cholera stretched across the Central Provinces in 1868 is possible, and should be watched for.

I look upon the cholera invading the Central Provinces and Madras and Bombay in 1868 as a third year cholera, a true offshoot of our invading cholera of 1866-67, and it will be interesting to watch the progress and duration of the epidemic in relation to this theory. The commencement of a new epidemic may also now be looked for at any time, and there is little chance of its appearance being delayed beyond 1870.

The parallel of the invasion of the Central Provinces in the year following the invasion of the Gangetic Provinces from the east, was utterly wanting in 1867, and it occurred only in the spring of 1868. As far as we can judge, the conditions for invasion from the east were favorable in the spring of 1867; but one essential condition was wanting, namely, the pabulum of an epidemic. The explanation seems to be, that, as in 1863 the body of eastern cholera was withdrawn from our North-Western Provinces to become the great epidemic of Central India of 1864-65, so in October 1866, the cholera which would in March 1867, following the parallels of 1817, 1821, 1856, and 1860 and other years of invasion, have become the invading cholera of Nagpore, was bodily removed, and entered the epidemic highway leading to the north-west of India in place of remaining where it was, and seeking in the next spring the epidemic highway through Central India. The part played in 1866-67, was precisely the converse of that played in 1863-64, and had the role of these two epidemics not been so played, and had the cholera of the north and south been equitably adjusted, the four epidemics of our period would have been precisely parallel one with the other. The materies of an epidemic is a plaything in the hand of the influences which direct its distribution, and its future depends upon the meteorological

conditions of the geographical area from which it has its starting point. The experience of these years shows—first, that two epidemics, extending over years, may run a course perfectly parallel; next, that the cholera, the body of an epidemic, may be diverted from the north to become a great cholera in the south; or, thirdly, that the body of the epidemic may be diverted from the south, to become a great cholera in the north.

In a diagram, the case is thus displayed :—



A typical epidemic appearing both in the Central Provinces and in Northern India, such as that of 1856 or 1860, is represented by the perfect parallelogram; while such an epidemic as that of 1863-65 is shown by the half only. In this case the epidemic predominated in the south; but a second epidemic, as was the case with that of 1866-67, may predo minate in the north without appearing at all in the south, or only typically and not substantially.

The track which cholera pursues beyond Hindostan is also regulated by the agencies conflicting at the fountain head; either the southern or the northern cholera is the base of an epidemic emigrating from Hindostan. When the materies of an epidemic is distributed thick throughout the epidemic highway in the Central Provinces, the western extension is through Guzerat, Kurrachee, Southern Persia, and Arabia to the Mediterranean; when through Bundelcund, Agra, Ajmere, Bikaneer, and Cabul, it is towards Northern Persia and the shores of the Caspian that the epidemic travels.

Perfect though these parallels be, we shall be as often wrong as right in our anticipations regarding the career of epidemics, until the records shall have been very much extended, and shall have been accurately studied with reference to the significance of the phenomena and their relations to the agencies by which they are regulated.

In a succeeding chapter, the general principles taught by the history of the epidemics of this period, will be shown to be confirmed by previous epidemic history, as far as we now can draw inferences from data which have passed without special record, or which have been looked at in the light of some special theory when recorders have attempted to make use of them for purposes of generalisation.

CHAPTER IV.

EVERY EPIDEMIC IS A REPETITION OF EPIDEMICS WHICH HAVE PRECEDED IT, AND THE PARALLELS BETWEEN DIFFERENT EPIDEMICS ARE AS FIXED AND STABLE AS IS THE RECURRENCE OF THE PHENOMENA OF THE METEOROLOGY OF AN INVADED AREA.

In the first chapter, the distribution in space of the epidemic cholera of the past fifteen years was shown; in the third, the distribution in time of the epidemics of the period was considered; and in the second, the intervals between the various manifestations occurring during each epidemic, natural for the different geographical situations of an invading cholera, were suggested. For the comprehension of their natural history, it is essential to conceive of the epidemics of this Presidency under these different aspects; as having a distinct geography and a distinct limit in time, with certain periods of dormancy recurring throughout epidemic existence, differing for different situations, but natural for these situations.

It has been shown, that after sub-dividing the epidemic area into provinces, the geographical distribution of one epidemic is repeated with more or less precision in every recurring epidemic, the parallel being, in many cases, absolutely identical, and in others less perfect, although the typical fact of its occurrence is quite apparent. It has been shown, that the intervals between the manifestations of epidemic existence are for the same locality, the same in each year; and that the recurrence of the manifestations of each year during the occupation of an invaded area, are to be looked forward to at seasons which are natural, but which vary with geographical situation.

The special aspects of the cholera of the eastern and western divisions of the epidemic area in each epidemic contrasted.

I have exhibited the space which I have mapped out as the eastern division of the epidemic area, as free from cholera, or as having cholera at a minimum, in 1854, 1858, 1862, and 1866; and I have shown the same area to be the limit of invasion in 1855, 1859, and 1863, when in the districts to the west cholera had no existence, and in 1867, when cholera from a different base had invaded the districts beyond. I have traced the cholera of this area as having a behaviour of its own, peculiar to it and consistent throughout, and an aspect which cuts it off from the cholera of any other territorial distribution. Its intervals of dormancy also, are different from those of other portions of the epidemic area,

The following tables will illustrate the special aspect of the cholera of the eastern division in relation to season, and its contrast with the aspect of the cholera of the western division of the epidemic area. The figures fall as they do, not by chance, but because the cholera of each of these provinces has a natural aspect which is proper to it:—

JAIL POPULATION OF THE EASTERN DIVISION OF THE EPIDEMIC AREA, 1859-65.

Cholera Admissions of each month for the period.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1859-65 ...	5	30	438	653	390	321	629	522	151	100	83	12	3,334
Admitted in each month per cent. of the total admissions.													
1859-65 ...	·15	·90	13·14	19·59	11·69	9·63	18·87	15·65	4·53	3·00	2·49	·36	100·00

JAIL POPULATION OF THE WESTERN DIVISION OF THE EPIDEMIC AREA,* 1860-67.

Cholera Admissions of each month for the period.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
1860-67 ...	...	...	...	17	43	55	379	1,842	97	27	2	...	2,462
Admitted in each month per cent. of the total admissions.													
1860-67 ...	...	...	...	·69	1·75	2·23	15·40	74·82	3·93	1·10	·08	...	100·00

* Excluding the Central Provinces.

EUROPEAN ARMY OF THE EASTERN DIVISION OF THE EPIDEMIC AREA, 1859-67.

Cholera Deaths of each month of the period.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1859-67 ...	4	4	59	219	131	64	127	278	110	18	8	1	1,023

Died in each month per cent. of the total deaths.

1859-67 ...	·39	·39	5·77	21·41	12·81	6·26	12·40	27·18	10·75	1·76	·78	·10	100·00

EUROPEAN ARMY OF THE WESTERN DIVISION OF THE EPIDEMIC AREA, 1859-66.

Cholera Deaths of each month of the period.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1859-66 ...	...	...	...	1	8	5	339	1,007	257	61	10	...	1,688

Died in each month per cent. of the total deaths.

1859-66 ...	...	...	...	·06	·47	·30	20·08	59·66	15·22	3·62	·59	...	100·00

I have already explained, that the cholera of the western area will reappear after the 20th April, and with the means of epidemic diffusion, will be shown as a moving epidemic; and that hence the cholera of May of any year following invasion, may show itself in the west as a great cholera, as it did in 1857, 1862, and 1867. But the truth is not the less plain, that the representation of the cholera of April and May, must in the east, be of a very different weight in the general estimate, when we find 481 deaths from cholera in the European Army recorded in the first six months, against 14, recorded in the districts lying immediately to the west during the same time.

The contrasts of areas enable us to determine the parallels proper to each which illustrate the behaviour of the contained or invading cholera. The parallels are as fixed as is the recurrence of the phenomena of the meteorology of any area; and this is true both as regards reproduced and newly invading cholera. If the phenomena be those of invasion, it holds true, that they are coincident in time with the spread of natural agencies over the same area; if of reproduction, then, manifestation is precisely regulated in relation to the geography and the physical aspect of the region occupied. The contrasted statements above given, simply express the fact, that the physical aspects of the two provinces are different. I shall show that the influences invading them are propagated from different bases; and this difference in the direction of their invasion cuts them off one from the other so completely as to prove the fact that they are under two meteorological systems which are distinct.

A contained cholera may in the eastern division reappear in any year in March; a contained cholera in the western division, will not reappear provincially before the 20th April. In the eastern, the reproduced cholera of March and April will, in all probability, be a moving cholera; in the western, the chances are against its finding the means of locomotion, although it may find them. Invasion of the eastern area occurs with either the spring or the monsoon cholera, and as often with the one as with the other; the invasion of the western area of May 1865, teaches that invasion of the western division may occur with the spring reproduction, but we know that this is exceptional, and that it is in the monsoon season that invasion normally or, at least, most frequently, occurs.

Invasion in May is quite normal as far to the west and north as to Agra.

In the second chapter, I have indicated what is for each portion of the Presidency the normal season of invasion or reproduction. Cholera at sea-level and in the region of perennial moisture and early heat, is reproduced in February of every year. In the east and south, in the endemic basin, or on its margins, or in tracts of a similar aspect, the cholera of March is a great cholera; this in any year may be found in vigour and mobility from one sea to the other, across the plains of Nagpore, from the mouth of the Nerbudda to the Bay of Bengal, and low down in the valley of the Ganges. In the tracts lying along the foot of the hills, I showed cholera to be general after the 13th of March in 1857; and in 1867, as early as the 20th February, cholera was reproduced in

the Terai below Nynee Tal. The cholera of April and May, is a great cholera in the endemic province, and is the great cholera of our eastern province shown in the Tables given above; it is apt to be as powerful as is the monsoon cholera over the Gangetic Provinces, Oude, Cawnpore, Bundelcund, Jubbulpore, and the Central Provinces; and it is as normal to Malwa and Guzerat in the west as it is to the Behar Provinces in the east. The eastern districts bordering upon the western division, such as Cawnpore, Banda, or Humeerpore, get this cholera in May, and very seldom earlier in the year; May is the month of reproduction or invasion normal for these districts. In the western division, reproduction begins late in April; it is not general until the first fortnight in May, and except in seasons such as 1862 or 1867, the miasm is liable to be fixed, and therefore but little apparent until the monsoon appears.

The same dates are maintained when invasion is in progress:—March for the extreme south; March for the extreme east, except in certain seasons of special meteorology, when the whole of the eastern division may be covered in this month; April for the valley of the Ganges and the western parts of Central India, such as Bhopal and Malwa; May for Cawnpore and the districts south of the Jumna, and for Saugor. In the western division of the epidemic area, the 15th May is the earliest date at which invasion has been recognised in our time, namely, in 1856, 1863, and 1865; generally it occurs with the monsoon reproduction. The cholera of May 1867 was a secondary invasion proceeding from within the area already occupied; the invading cholera of Rawulpindee, Hazara, and Peshawur of May 1867, was strictly homologous with the May invasions of 1856, 1863, or 1865.

Following the track of the monsoon which affects the western epidemic division of our Presidency, in a line from Juggernauth to Lahore, the dates of reproduction or invasion extend from the 20th June to the 7th August, becoming later gradually as progress is made towards the limits reached by the monsoon influences in the north-west; for one province the end of June and July is normal; in another, the cholera of July predominates; in a third, that of August. Where the monsoon ends, there the epidemic of the year ends: in 1856 and 1861, it was at Lahore; in 1865, in the Ferozepore District. The limit of the monsoon is marked geographically by the north-western desert, which is, on every occasion, the limit in the north-west of a cholera invading with the monsoon from the south-east.

Since the reproduction and invasion of cholera takes place in coincidence with the conditions of a locality and the presence of normally invading agencies, it follows, that where for the time, conditions other than those normal for the season are found, the phenomena of reproduction or invasion must be repressed or accelerated in relation to these existing conditions. This is a necessary consequence if what has been alleged above be true, that whatever variations there may be, are due to natural causes and not to contingencies. In certain years, our eastern division of the epidemic area becomes in the months before the setting in of the monsoon identical as regards its meteorology with the western area, and the hot westerly winds prevail over the east from Cawnpore to Dinapore for weeks at a time. In such a season, eastern influences are in abeyance for the time, and the reproduction of the cholera existing within the area is repressed in proportion to the predominance of the westerly influences. In a season of the maximum of the prevalence of western influences, the eastern area will show the same dates for reproduction and invasion that are normal for the western division; and when eastern influences prevail for the season at a maximum, coincidently with the presence or invasion of cholera, early and abundant manifestation is to be looked for. Invasion in progress may even be brought to an abrupt stand-still, when the influences which govern it fail, as happened in 1860, when the failure of the monsoon over the famine area of 1861, was attended by the repulse of cholera invading from the east and south.

These introductory observations will suffice to indicate, in a general way, what cholera is in itself, and how it comports itself in its various relations. What has been stated shows, that whatever phenomena occur, occur primarily in subordination to what cholera is as an individuality; that its secondary manifestations are played in direct relation to surrounding influences; that it has a mobile as well as a sessile existence; and that the phenomena attending mobility must be studied apart from those of vitality. The generalisations of these chapters will now form the basis of a more detailed examination, illustrated by the facts of the period.

CHAPTER V.

THE PHENOMENA OF THE INVASION OF AN UNOCCUPIED AREA.

PROPOSITION A.—CERTAIN AREAS ENJOY COMPARATIVE EXEMPTION FROM CHOLERA IN EVERY YEAR; IN OTHERS IT IS ENDEMIC AND PERENNIAL.

CERTAIN AREAS ARE OCCUPIED BY CHOLERA IN EACH YEAR, WHILE OTHERS ARE FREE FROM ITS PRESENCE.

THE AREA OF THE BENGAL PRESIDENCY MAY BE MAPPED OUT INTO TWO PRIMARY DIVISIONS, THE AREAS RESPECTIVELY OF ENDEMIC AND EPIDEMIC CHOLERA; THE EPIDEMIC AREA IS ESSENTIALLY AN INVADED AREA.

Comparative liability to cholera of different portions of the epidemic area.

Repression or acceleration is a phenomenon of season subsidiary to the presence of the material of an epidemic. It is not true as some would suggest, that the repression of a constantly existing cholera by the operation of meteorological agencies and the acceleration of its manifestation by others, are sufficient to account for the phenomena of the epidemic appearance of cholera in one year and its disappearance in others over Upper India. Repression at a certain season is not followed by extinction, but the manifestation kept back for the time, comes forward as soon as the repressing agencies are substituted for others favorable to the manifestation of epidemic existence. Reproduction is normally repressed over the western division of the epidemic area in each year up to the 20th April; and for two months and a half later the movement of the revitalised cholera is repressed, but it is not scientifically true to say, that this area is an area of comparative exemption because of its liability to cholera being confined within so small a number of months in the year. In the eastern division as well, the most violent and moving cholera may be repressed in its career and hindered from manifestation, as in 1860, when throughout the Gangetic Provinces and Oude, the epidemic was brought to a stand between the 16th and 21st April; or, an example of the converse, as when, in June 1864, the cessation of westerly influences was followed at once by the appearance of cholera over the area.

These manifestations are secondary only. Whether cholera may be repressed or accelerated in its appearance has nothing to do with the question of the comparative exemption from cholera of certain areas of this Presidency. The eastern division of the epidemic area may show cholera vital throughout from March to September, while the western shows, as the rule, epidemic life only from July to September; but this is a question of degree, and stands apart from the essential consideration, which is, the relative liability of either tract to epidemic invasion. It is true at the same time, that the capabilities for retaining and localising epidemic cholera of any area, may be accurately gauged by the acceleration of its revitalisation in any year.

In sketching the geography of epidemic cholera, I have demonstrated, that throughout the entire epidemic area from north to south and from east to west, cholera may disappear as it disappears beyond the boundaries of Hindostan, and, I repeat, that no suggestion as to the possibility of repression, can account for the phenomena, which are distinctly those of extinction from the death of the material of each epidemic. I have showed, that up to the day of the invasion of 1856—March in Nagpore, May in Agra, and August in the Punjab—the Central Provinces, Central India, Agra, Rohilcund, Meerut, and the Punjab were free from cholera for the two years previous; how over the same extent of country, cholera was dead in 1859 and 1860 up to the invasions of 1860 and 1861; and how, a third time, it disappeared during 1863 and 1864 from Rohilcund, Meerut, and the Punjab; and how but for the invasion of 1866, cholera would have been lost again in 1867, as it was actually lost in the Central Provinces. I have showed also, how in the eastern division, that is, in the Gangetic Provinces, Oude, Cawnpore, and Bundelcund, cholera was lost or at a minimum in the fourth year following each invasion, in 1858, 1862, and 1866.

These are the exemptions of certain years. It is very important to enquire whether there are any portions of the epidemic area that are perennially exempted, or which enjoy a marked immunity on the occasion of invasion, or in years subsequent to invasion. This question is not to be answered by figured statements only, but from a comprehensive grasp of the histories of epidemics. This question can be studied only in connexion with and under the law, that the range of epidemic cholera is rigidly limited to areas of natural influences.

Northern Punjab.

The invasion of the western area from the south-east terminated in 1856 and 1861 in the Lahore District, and that of 1865 in the Ferozepore District, while all the districts to the north and north-west remained uninvaded. On no occasion in the history of invading cholera with which I am acquainted, has the high Punjab ever been reached, although forerunners may have been thrown out as warnings of its existence in the east and south; when the Frontier was attacked in 1858, 1862, or 1867, it was by a cholera secondarily invading, reproduced from the cholera of 1856, 1860, and 1866, spread over the east and south of the Punjab in the years before. The primary invasion extends only up to the limits of monsoon influences from the south-east; it is with the spring rains and the easterly winds of May that the districts beyond the Jhelum and Indus lying beyond the monsoon influence from the south-east, of July and August, are entered; examples are,

the invasion of the Rawulpindee District in May 1858, of the Bunnoo District on 20th April 1862, and of the Rawulpindee and Peshawur Districts in May 1867. When invasion of such an area has occurred, attack may take place at any time subsequent to the occupation, because invasion is a phenomenon of provincial and not of local significance; thus, the Peshawur Valley was entered in July 1862 and in the end of October 1858, as well as with the advancing epidemic of May 1867. The geographical situation of the high Punjab does not place it beyond the reach of epidemic influence, but it limits that influence in time. Out of the four years of the persistence of the epidemic of 1855-58, Peshawur suffered for twelve days only, while the stations of the eastern area were liable to attack at any time throughout the four years; in the epidemic of 1859-62, Peshawur suffered for four months only.

Mooltan District.

What is true of the Northern Punjab holds good generally for the south of the province also. Mooltan and other stations lying to the west of the desert, are touched by the monsoon on rare occasions only, and are not reached but as the exception, in the first year of an invading epidemic. In such a year as 1856, when the weather was so unseasonable that it might have been said that in the western division the monsoon lasted from the end of May up to October, Mooltan was reached at the same time with Lahore, and also Googaira lying half way between. Mooltan may be reached also by the May cholera of these provinces, as in 1867; but there can be no doubt that this region is the one probably least liable to cholera of any included within the epidemic area of this Presidency. Districts lying but a little to the south of Mooltan, are situated on the second epidemic highway by which cholera crosses from the east of our Presidency into countries beyond the limits of Hindostan,* which leads through Bundelcund, Agra, Gwalior, Ajmere, Bikaneer, Bhawulpore, and Rajanpore, and these enjoy no such immunity as the Mooltan and the districts lying immediately to the north and west. This immunity seems to be due to the fact, that this tract lies in the fork between the monsoon influences proceeding from east to west, and those proceeding from south-east to north-west in the western epidemic area, which by their divergence leave the interval a desert.

Jullundur Doab.

I have shown how a similar portion of the western epidemic area is generally exempted in primary invasion, lying between the range of the influences proceeding from south-east to north-west and those invading directly to the north, namely, the Jullundur Doab, and adjacent districts; this area is not exempted from secondary invasion, as the events of 1857 and 1858 and 1867 prove. In connexion with this exemption, I have referred to Umballa and the districts adjoining, as remaining unaffected in the great epidemic of 1856 up to the 4th September, when all the districts to the east and west had been occupied a month earlier.

Certain tracts of Central India.

There is another tract which would, I believe, show consistently a minimum of liability to invasion had we the statistics of a population to demonstrate the fact; this is the country lying to the south of Jhansi and Gwalior in the neighbourhood of Seepree and Goonah. This is, I think, scarcely reached by influences from the south-west, and it is at the same time out of the direct track of eastern influences. This much is certain, that it lies between two natural provinces; it is not a track across which cholera can reach Gwalior from Indore, nor Indore from Gwalior. It is the tract of country lying immediately to the south of the line limiting influences proceeding directly from the east to the west on the northern route; it was, for example, an exempted tract in 1867, when to the north, from Gwalior to Peshawur, the cholera of the year was universal. We have no experience, however, to show what actually is the state of the case as regards this area.

Tract lying immediately to the west of the line limiting eastern invasion.

Perhaps the most important tract of minimum in the epidemic area is that separating eastern influences from those having the south-east for their base. This is the tract which I have traced from Mr. Strachey's narrative of the cholera of 1861, at page 26. It lies immediately west of the western limit of the invasions from the east of 1855, 1859, and 1863. I regard this as a tract as distinctly neutral as it is possible for any tract separating two epidemic provinces to be. We have no record of cholera crossing it from east to west or from west to east. From the earliest times the record is consistent. Jameson shows how, in 1818, eastern cholera was repelled from its margins, finding its western limit in the Shahjehanpore District.

Jameson writes:—"When cholera had reached Cawnpore in the following spring, it showed a marked aversion to Bareilly and the other tracts east of the Ganges." Again, after speaking of the epidemic at Bithoor and its neighbourhood, Jameson adds:—"But cholera appeared little disposed to extend far on that direction—Bareilly, Moradabad, and almost every other town in the same line enjoyed their wonted health. The town and district of Shahjehanpore, however, formed a remarkable exception to the general healthiness of the province of Bareilly."

Again, we find Jameson indicating to us this exempted tract between the eastern and western invasion of 1818:—"On the Jumna, the epidemic spared Culpee and almost every intermediate village between it and Etawah." Etawah was reached in May 1818 as Agra was reached in May 1856 and May 1863.

* I have alluded to the route through Nagpore and the Central Provinces as the southern epidemic highway.

In the records of later epidemics, for example in that of 1826, we find the Superintending Surgeon of Meerut describing the ravages of cholera west of the Jumna while Meerut is still unaffected; and we find Mackinnon asking, how it is that those who say that cholera travels by human intercourse from Agra to Delhi, never venture to allege the same of cholera as to its passing from Agra to Cawnpore. This was the eastern limit of our western cholera of 1858 and 1862 and of 1861, as it was the western limit of the cholera of 1855, 1859, 1860, and 1863.

Exemption must be used as a comparative term in speaking of this tract. It is exempted as compared with the Banda, Humeerpore, or Oraie Districts lying to the south; as compared with Western and Northern Oude and Cawnpore, lying to the east; and as compared with the Meerut and Agra Districts lying to the west of it. A great eastern cholera will march up to this limit, as did the Shahjehanpore cholera of 1818 or 1867; a great cholera from the south will not leave it uninvaded. But taken altogether, this is a tract of wonderful exemption, as the statistics of its jails show:—

THIRTY YEARS—1839-68.

Deaths from Cholera in the Jails undernoted.

YEAR.	BOLUNDSHUHUR.	ALLYGHUR.	ETAH.	MYNPOORIE.	ETAWAH.
1839	...	3	No record.	2	...
1840	...	1	None.	...	...
1841	...	...	...	...	...
1842	...	...	...	...	...
1843	...	...	...	...	1
1844	...	...	...	1	...
1845	...	...	...	...	...
1846	...	...	...	...	...
1847	...	...	...	...	...
1848	...	...	...	1	...
1849	...	...	...	...	...
1850	...	...	...	...	...
1851	...	...	...	...	...
1852	...	...	...	...	...
1853	...	...	...	...	...
1854	...	...	...	...	1
1855	...	...	...	...	...
1856	...	...	14	...	...
1857	...	...	...	...	...
1858	...	...	...	...	...
1859	...	...	...	...	...
1860	...	...	...	...	...
1861	3	...	...	...	...
1862	...	...	...	...	...
1863	...	1	..	...	...
1864	...	...	...	...	...
1865	...	...	...	...	1
1866	...	...	...	...	...
1867	...	1	1	...	...
1868	...	...	...	...	...

It would be wrong to infer that in epidemic seasons cholera is absent from these districts; it is a minimum of manifestation and not the absence of cholera that is to be anticipated. Even, at long intervals, a maximum may be found if the circumstances prove suitable. Thus, all these districts suffered extremely in the year before this table commences, 1838, when Bolundshuhur Jail lost forty-nine prisoners, Allyghur thirty-six, Etawah eighty-four, and Mynpoorie twelve. In a minor degree this applies also to the Bareilly District. Since the occupation of Bareilly by European Troops in 1858 the cholera record has been singularly favorable, as the statement annexed proves:—

European Troops, Station Bareilly, 1859-68.

YEAR.	STRENGTH.	ADMISSIONS.	DEATHS.
1859	823	1	1
1860	1,008	1	1*
1861	1,188	5	5
1862	1,096	.....	.....
1863	916	.....	.....
1864	881	1	1
1865	853	3	2
1866	845	.....	.....
1867	805	3	2
1868	.....	.....	.....

* An imported case.

These are, as far as I know them, the only portions of the plains of the epidemic area that can claim comparative exemption from cholera in primary or secondary invasion. We should not be justified in saying that any square mile of the area can lay claim to absolute exemption. The districts above referred to, have their liability to cholera diminished, because they lie upon the borders of epidemic provinces, or beyond primary invasion. The significance of their comparative exemption is this, not that these districts are deficient in the local conditions necessary for the retention of a passing epidemic, but that the material of an epidemic is excluded from them owing to the failure of the vehicle which is necessary for its conveyance into any area which is to be invaded. The dissemination of epidemic cholera is as wide and as diffuse and as universal as is the spread of air-borne influences; the repression in space of advancing cholera is exactly limited by the failure of the same influences; and no secondary agency can carry an advancing epidemic beyond the lines which are those geographically defined by natural agencies.

Comparative exemption of hill stations.

The comparative exemption from cholera of our hill stations is due more to elevation than to situation. Several are apt to suffer to a trifling extent, and in the case of these, the statistics of imported cases are so mixed up with those said to have been acquired on the spot, that the actual facts of local liability to cholera are difficult to arrive at. When Darjeeling is said to have cholera in its bazars, it is raging in the Terai below, and the coolie population are found dying all along the road leading from the plains to the hills. During our period of observation no European Soldier has died from cholera at this station,* and I believe that there is every ground to hope for exemption in the future.

The valley of Nepaul has a population extremely susceptible to the attack of cholera. This valley is entered on every occasion of eastern invasion in the second year, and its ravages extend over months. The conditions afforded to it are such as favor its spread among the Nepaulese as if it were a contagious pestilence.

At Nynee Tal, one admission was reported in 1862; this is the only case of these years. Nynee Tal will always, I believe, enjoy immunity from cholera in connexion with its geographical situation in the tract of minimum between eastern and western influences.

No case of cholera has occurred in the Landour Depôt during this period.

The Simla group of stations cannot lay claim to the same extent of immunity; still, considering their situation, their statistics must be reckoned as very favorable. In the great invasion of 1845, both Kussowlie and Subathoo suffered severely, in common with every station of the western area then occupied (see the Table for the year 1845). Kussowlie lost thirty-eight men out of 137 attacked, and Subathoo forty-two out of 133 attacks. This fact must, however, be taken to denote the possibility rather than the probability of attack in so heavy a ratio. †

In the next great outbreak, that of 1852, when Umballa lost seventy-three men, there was not a single death in Kussowlie, Subathoo, or Dugshaie, although each station gave several admissions, showing that cholera had passed over them while Umballa was suffering. In the succeeding invasion, that of 1856, not a single death occurred at these hill stations out of a strength of 2,150, but on the very day on which the 32nd Regiment descended from Kussowlie, the 31st October 1856, the great outbreak commenced, in which the Regiment, although moving daily, had forty-two deaths. In the invasion following, that of 1861, when Umballa had fifty-three deaths, as in the two previous invasions, not a man was affected at the three hill stations. In the little invasion of May 1865, which I have described as covering Meerut and Rohilcund almost universally, although sparsely, two men‡ and a woman were struck at Kussowlie, and at the same time, a man of the 101st Regiment on the opposite hill, at Dugshaie. In the invasion of November 1866, there was no cholera at these stations. In the invasions of 1852, 1856, and 1861 elevation alone saved these stations, for they lay in the direct track of the invading cholera.

Liability of hill stations to suffer in secondary invasion.

But this group of stations is very liable to attack with the spring cholera of the year following invasion. The cholera of May 1857 threatened them at the time when the garrisons were withdrawn to join the Delhi Force. Already in April two men had died at Subathoo; the Nusseeree Battalion marching through Subathoo three weeks later, was believed to have there acquired the cholera which the men carried on with them to Seharunpore, as it was raging at the time in the bazars. The small depôt of the 1st Fusiliers at Dugshaie lost twelve men in May and June, and had the Regiment not been withdrawn before, it would in all probability have suffered heavily. In May 1858, cholera again appeared in Dugshaie. Following the invasion of 1861, none of these stations were attacked by the widely and vigorously revitalised cholera of 1862. In the epidemic of 1867, Kussowlie escaped with a single admission, and Dugshaie had none; but cholera clung to the Regiment of Subathoo from April to September. In an affected locality elevation is one of the first safeguards

* The case of April 1866 was an imported case, developed subsequent to arrival, in a man of the battery which was attacked while marching from the Bhootan Territory to Darjeeling.

† I am unacquainted with the circumstances attending the outbreak at Kussowlie in 1845. So heavy a ratio of attack is contrary to the experience of all subsequent epidemics, and it may be significant of something beyond the simple fact of the affection of the station of Kussowlie.

‡ Both cases were fatal.

against attack, but from a valley once occupied cholera has great difficulty in making its exit. Whether it be the Nepaul Valley, the great valley of the Simla hills, or the valley of Peshawur, the history is the same. Dr. Munro tells us how in the Peshawur Valley between July and October 1862 his Regiment was on four different occasions subjected to attack; and so again in 1867, the cholera is described as turning round and round for weeks, unable to effect its escape. Subathoo, it is true, is a station of low elevation (4,000 feet), but it will probably be found the best policy when the adjoining valley is invaded, not to remove the Regiment even from this hill top to a lower situation where it may fall into a persistent cholera. The warnings of October 1856, and of May 1857, when the Fusiliers and 75th Regiment suffered so severely, teach, that on these occasions, descent from a hill top implied immersion in a cholera-containing stratum.

The valley of Cashmere suffers almost as much as that of Nepaul. It suffered in 1858, 1862, and 1867, the years of secondary invasion in the Punjab.

Murree and Abbottabad suffer in common with the district lying between the Jhelum and the Indus; they were affected in 1858 and 1867 when the Doab was covered, and remained unaffected in the epidemic of 1857 and 1862 when this tract remained unaffected.

An elevation of so many feet above sea level is not from the mere fact, protective against cholera. Abruptness of ascent combined with elevation, will probably be found to be the requisite for exemption. Where there is a funnel directing cholera in a definite direction into the interior of the hills invasion will certainly occur. Stations, such as Kussowlie or Mussoorie, having an abrupt ascent from the plains, are far less likely to suffer severely than those to which the ascent is gradual; a plateau, such as that of Hazareebaugh, is as liable to be swept by cholera as are the plains above which it is elevated by 2,000 feet.

Decay in strength of the cholera miasm in years of minimum.

In connexion with the disappearance of cholera from provinces, the decay in strength of cholera in years of minimum, is a very remarkable phenomenon. I believe it to be general in such years, although at the very same time the cholera of the year may be evident in a virulent form in certain special situations of any province. When in 1862 cholera was at its lowest degree of manifestation in the eastern province, the 25th Native Infantry suffered severely on the Ganges; and yet I recall the fact from my own experience, that in this year cholera patients did not die, and other observers in the same province made the same remark. The significance of the fact I was not acquainted with at the time of its occurrence. Dr. Walker, late Secretary to the Sanitary Commission, informs me, that for years preceding the epidemic of 1856, the cases which seemed to be cases of true cholera in the great jail at Agra, which was under his charge, did not prove fatal; and that the treatment employed when tried in the invading cholera of 1856 was of no avail. In 1858, in the six months from January to June, the Grand Army of Oude lost only one man out of eighteen admissions attributed to cholera. In the western area in 1859, after the disappearance of the cholera of 1856, the Cholera Table for European Troops shows twenty-two admissions, in thirteen stations, without a single fatal result; and the table for the jail population, an equal number of admissions with one death, and that in a doubtful case. In such cases we are apt to seek an explanation in error of diagnosis. I do not think that we are justified in doing so; for the character of the symptoms and the date of the occurrence of such cases, point to the effects of a true choleraic influence on the constitution.

Area of perennial existence, the area of endemic cholera. Definition of the term "Endemic."

It is necessary that there should be no misunderstanding when the term "endemic" is applied to the cholera of a certain area. Some have one conception of the meaning of the term; others, another. Some would say that where cholera is met with in every year, there it is endemic; others would limit endemic cholera to the geographical area within which it is on every occasion generated prior to invasion of the epidemic area. Some, speaking loosely, are ready to assert that cholera is never absent from any of the great cities of India, and that it may therefore be considered to be endemic in these; others, with more reason, can point to the experience of cities, such as Patna, and say that cholera must be endemic in such a locality, inasmuch as in the memory of the present generation, cholera has never in any year been absent. I think it better to connect the fact of invasion with the cholera of a physical area of defined characteristics, and not to accept the mere fact of the constant presence of cholera for a certain distance beyond the defined margins as necessarily constituting the occupied tract a portion of the endemic province. The line is, in truth, a shaded line, especially towards the north, where the Ganges enters this province. Speaking as a physician, it is perfectly correct to say that cholera is endemic in the Behar Provinces; speaking as an epidemiologist, it is more correct to say, that the Behar Provinces lie on the shaded tract beyond and out of the endemic limits.

The statement, that cholera may be found in any year in the cities of Northern India, is not based on statistical facts. I am inclined to think, that the minimum reached in many years in the northern provinces of this Presidency is absolute; and it is beyond dispute, that from such a minimum as a focus, cholera never becomes revitalised to form an evident epidemic, when the life period of an invading cholera is accomplished. In the cities of the eastern area, however, which lies in immediate proximity to the confines of the endemic region, cholera will be found in

every year. I can point to no year since 1855, in which it can be with truth affirmed, that cholera has disappeared from the eastern division of the epidemic area. The minimum of 1858, 1862, and 1866 was still a minimum, and in April, July, and November cases of cholera, if carefully searched for, would probably have been found in every station of the valley of the Ganges, from Cawnpore or Futtehghur downwards to Dinapore. To say that cholera is endemic in this province because cholera will be found to exist in every year, is not correct; it persists because of being reinforced by fresh invasion from behind—a fact prominently brought out by the evident decay of such years as the three above mentioned, followed by the renewal from a fresh body of cholera. In the cities of the western area, such as Meerut, Agra, or Lahore, I believe that cholera does actually disappear, although the repeated epidemics which have swept through this area of late years, prevent the fact from being made so evident as it would otherwise be. This persistence, however, is also due to reinforcement, and not to the fact that in such localities a cholera which has located itself, remains perennially as a consequence of its having found a suitable habitat.

The epidemic area I have defined as including the portions of the Nagpore territories which furnish returns to Bengal, Central India, the Punjab, the North-Western Provinces, and Oude, and I have included also the Behar Provinces and Chota Nagpore.

I do not think that we are entitled to infer that cholera is endemic east of Allahabad in the Gangetic Districts, using the term in the sense in which I have above defined it. In the Behar Provinces, invasion is always distinctly marked, coming either from the east or south, and they participate in the comparative immunity of years of minimum. The same, however, is true of the cholera of the endemic area also; for this, too, has its years of minimum and of true epidemic prevalence within its own limits. Intensity and persistence both denote in Behar approach to the endemic area, so much so that the Behar Provinces with Chota Nagpore might almost have been made a distinct province intermediate between the eastern epidemic province and the endemic area proper. A glance at the table showing the prevalence of cholera in the jails for thirty-six years past (*vide* appendix), shows how wonderfully persistent is this cholera of Behar. I have considered it better, however, to take the line of the Rajmehal hills as the western boundary line of the endemic area, and I have made it to include Monghyr, Bhaugulpore, and Purneah. Here cholera may be looked for in every year in April and July, and very often in November also. To the south, cholera is expected at Hazareebaugh every year in April; and the adjoining stations of Bengal Proper on the laterite elevations bounding the diluvial deposits, are constantly subject to the same invasion when the winds pass over the breeding grounds at the seasons of revitalisation.

The breeding grounds of the endemic region in the extreme south-east of this Presidency and the phenomena of invasion, are well described by Dr. Bensley, of Midnapore, in his very interesting paper replying to the questions submitted by the French Government in anticipation of the Conference at Constantinople. From this report I abstract the following, which relates to the diluvial district at sea-level, lying west of the Hooghly, and bounded on the west by laterite elevations, the terminations of the trap systems of Central India:—

"The conclusion that one naturally arrives at is, that low marshy lands intersected by estuaries and by numerous streamlets, all under tidal influence, favor the preservation of the cholera poison. We find cholera endemic on the eastern sea-bordering country known as Higeelee, and this tract of land appears to be oftener invaded by epidemics than any other part. But it is not alone a favorable soil that is essential to the rise and progress of an epidemic. Were this the only thing required, we should have it for ever ravaging those parts; whereas, although occasional cases occur throughout the year, yet epidemic visitations arise after greater or less intervals of time. Confining my experience to the Midnapore District, we have had epidemics in March and April, in June and July, and in November, December, and January. To my mind, a something beyond the cholera germ is necessary for an epidemic. A seed possessing fertility will germinate at times under circumstances which are considered unfavorable to germination; but with air and a due supply of water, it springs up quickly and healthily. The cholera germs lie hidden in the ground. Occasionally they are extricated in sufficient quantity to develop a few cases of cholera; but when the atmospheric condition, which is air and water to the cholera seed, presents itself, their vitality is roused into full play. I confine my remarks to Higeelee, that part of the Midnapore District where cholera has its nursery. This atmospheric condition (shall we call it a cholera vapour?) progresses through the air, and it is attracted to, and is resuscitated by, swampy lands and localities that revel in sanitary defects. We have sufficient grounds, I think, for ascribing much of the advance of an epidemic to currents of wind. It has been stated that cholera has progressed in the face of a wind, but I should be disposed to receive statements of this sort with caution, especially in those instances when cholera passes over a large tract of uninhabited country to attack the dwellers at the opposite end, or when cholera passes from one country to another over a large expanse of water. The epidemic that visited this district in February 1866 commenced in the Higeelee tract, which I have already designated the nursery of cholera, and progressed steadily in a north and westerly direction, backed up by a favorable wind.* The severest visitation we had, was in November 1864, soon

* It was this body of cholera which became the invading cholera of 1866, covering Behar in August, and the districts to the west in October and November; and which in its revitalisation became the epidemic of 1867 of Northern India.

after the great cyclone of 4th October, when a storm wave rolled over the tract of country lying to the west of the mouth of the Hooghly and over some of the northern parts of the Higeelee country. Cholera swept through the country like wildfire, and the houseless and starving inhabitants were carried off in countless numbers before relief could reach them. The condition of this tract of country was never one of great healthiness; but it will require years and the absence of epidemic visitations, to bring back this district to what it was. The symptoms were very violent and the cholera the most rapid that I have ever witnessed or read of, but the range of the epidemic was not wide. Starting on the western shores of the mouth of the Hooghly, it spread in a north-westerly direction, attacking Tumlook, and it stopped at a village twenty-four miles east of Midnapore, where it appears to have exhausted itself. In a southerly direction it invaded the sea borders of the Higeelee District as far as Contai."

I know no better account of the behaviour of cholera in its endemic region than the above, extracted from Dr. Bensley's paper. He clearly appreciates the natural history of cholera, and the three requisites for epidemic manifestation, the vitalisation, the medium of diffusion, and the directing agency; and he gives us with accuracy, the dates of the budding forth of the cholera germ in the endemic area—February, March, and April, June, and October and November.

Dr. Bensley also well expresses the fact, that nothing in the geological speciality of any locality, nor yet its elevation, exempt it from the attack of an air-borne endemic cholera. He instances his experience of Raepore in the south, in the Central Provinces, a station of the laterite, which is subject to frequent and violent invasions of cholera; and we know the same to be true of Sooree, of Raneegunge, and of Hazareebaugh with an elevation of nearly 2,000 feet. He writes:—"Cholera is not met with in the town of Midnapore as an ever-existing evil. This may be owing to the advantage which the station has in being sixty or seventy feet above the level of the surrounding country, and its situation on the eastern extremity of the great laterite range which runs through a portion of the Central Provinces and Chota Nagpore. I think, *as far as frequency is concerned*, that there is truth in the idea that cholera is neither so frequent nor so violent in the laterite country as in the alluvial. In the Higeelee District, which is mostly alluvial, cholera is ever-existing, while in Midnapore it is not endemic; but *as far as regards intensity*, I think that cholera, when it does occur, is quite as severe at Midnapore as at Higeelee."

Cuttack and Pooree also are within this south-eastern endemic area, and the dates of reproduction in each year are the same as in Midnapore. In February and March, when cholera invades towards the Central Provinces, it is the Juggurnauth pilgrims who are blamed as forming the vehicle of diffusion; it is in the end of June, that great outbreaks frequently occur at Juggurnauth; and in 1867, it was in November that a great outbreak was reported. Mr. Stewart, in a special report on the cholera of Juggurnauth, writes:—"To state that Pooree is at any time free from cholera would be risking the truth. The same may be said of Cuttack; cholera is seldom absent. Epidemics alone attract notice. Past experience shows that the end of the hot season and beginning of the rains is the most usual time for outbreaks."* The first fall of rain has been noticed to be the signal for the immediate appearance of an outburst. The Reverend Mr. Buckley writes:—"One reason, doubtless, of the great mortality is the time when the principal festival is held, late in June or early in July. There is, however, a great difference between one year and another as to the prevalence of cholera. I have been at festivals where the mortality, as far as I could observe, has been very slight; but when a heavy fall of rain occurs either at Pooree or on the return journey, disease and death may be confidently expected."

Statement showing the months of Prevalence of Cholera in the Endemic Tract for which Calcutta is typical.

Months.	General Population. Cholera deaths of Calcutta—26 years (Macpherson).	Cholera deaths of the General Hospital,—9 years,—1860-68. (Brougham).	Admissions of Native Troops. Calcutta, Barrackpore, and Dum-Dum—10 years—1858-67.
January ...	7,150	11	13
February ...	9,346	40	33
March ...	14,710	93	70
April ...	19,382	75	64
May ...	13,335	96	83
June ...	6,325	78	43
July ...	3,979	27†	28
August ...	3,440	33‡	26
September ...	3,935	20	24
October ...	6,211	33	29
November ...	8,323	33	34
December ...	8,159	8	25

* The equivalent of the July cholera of the epidemic area.
† Seventeen of these cases occurred in the one year, 1866.
‡ Twenty-four of these cases occurred in the three years, 1866-68.

These statements show that from Calcutta cholera is never absent. They show that in every year cholera is ready for revival in the end of February, that it remains vitalised until June, and that it reasserts its presence as an epidemic towards the end of October. The distinction of two periods included between February and July cannot be made from such data as those given, nor would it be suspected, had we not the indications of the epidemic area as a clue. The difficulty might readily be met by admitting that this period is the spring and summer of endemic cholera, and that it persists in vitality throughout, with an interval of decline only, and not of decay.

The statistics of the jails of the districts lying west of the Hooghly for 1860, seem to me to show beautifully the seasons of reproduction normal for all parts of the endemic area. The entire submergence of the breeding grounds lying near the sea level as soon as the monsoon fairly sets in, hinders general manifestation in June and July, which therefore takes place only around the margins of the basin.

Jails of Pooree, Midnapore, and Cuttack in 1860, *an example typical for the Endemic Province and its margins.*

JAIL.	Jan.		Feb.		March.		April.		May.		June.		July.		August.		Sept.		Oct.		Nov.		Dec.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Pooree	...	...	1	...	2	...	...	...	...	...	4	2	1	...	...	...	...	...	...	...	...	...	...	...
Midnapore	...	...	1	1	32	13	15	8	...	...	140	66	7	2	...	1	...	...	...	...	4	1	...	1
Cuttack	...	...	...	...	9	2	1		...	...	1	...	4	...	...	...	...	...	...	...	...	...	1	...

Within the endemic area the statistics of a non-epidemic year, or year of minimum, perfectly illustrate the fact of the great diminution of the rain months with a maximum in April and October. For example, the admissions of the jail population of Bengal Proper, taken as a province, for 1865, were as under in each month:—

Jail Population of Bengal Proper, 1865 *; a statement to show the maximum of prevalence in the spring in a non-epidemic year.*

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
5	7	25	106	34	27	9	16	10	69	37	3

The statistics of the Bhootan Field Force operating in the endemic province in Northern Bengal, in the same year, give an illustration quite parallel:—

Cholera Deaths of the Bhootan Field Force in Lower Assam and Northern Bengal, 1865.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
...	1	4	37	33	22	5	1	...	...	10	...

But when the higher lying districts become affected by an invading cholera, it is in June, July, and August that the maximum is shown. Thus, taking the epidemic year 1866, the admissions of the jail population of the same province were as follows:—

Jail Population of Bengal Proper, 1866 *; a statement to show the maximum of prevalence in the Monsoon Season in an epidemic year.*

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
6	42	136	82	85	183	221	164	58	18	11	38

This disparity is owing solely to the predominance of *epidemic* cholera in the endemic area, and to the fact of its affecting the higher lying stations occupying the margins of the endemic basin, which in any year have their cholera in June, July, and August.

For Bengal Proper, the cholera statistics of Calcutta will serve as typical, and for Eastern Bengal and the Sunderbuns the statistics of Backergunge Jail already given (at page 37). The cholera admissions of the jail at Sylhet show precisely the same relation to season :—

Cholera Admissions—Jail at Sylhet, 1854-67 *(fourteen years).*

Average Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Died.
433	3	11	15	30	45	2	...	...	16	25	3	2	152	79

The jails of Chittagong, Noacolly, and Tipperah show for the same months, figures parallel with those of Sylhet and Backergunge.

The history of cholera in Sylhet in 1817 and 1818 shows that fifty years have made no difference in the relations of this cholera to the natural agencies which determine reappearance at definite seasons. The dates of the recurrence of this endemic cholera hold good up to the present day.

Jameson writes :—" In Sylhet its career has been singularly various. After retiring in October 1817, and being for several months dormant, it returned in the end of March and subsisted until the setting in of the rains, when it a second time nearly disappeared. But about the middle of October it suddenly increased all over the district to as great a degree and with greater fatality than on its first appearance. It gradually declined in December, and withdrew in the end of the year. Finally it made its fourth visit in the commencement of the present hot weather."*

Deaths from Cholera in the Jails of Assam (thirty years), 1839-68.

Year.	Gowalparah.	Gowhatty.	Nowgong.	Tezpore.	Seebsaugor.	Debrooghur.
1839	7	22	1	6	No Jail ...	No Jail.
1840	9	17	3	2	No Jail ...	No Jail.
1841	1	1	...	...	...	...
1842	...	3	...	...	...	1
1843	6	28	20	8	...	1
1844	1	4	...	...	...	...
1845	3	...	...	...	...	...
1846	28 †	10 †	...	...	...	...
1847	6	10	1	8	5	1
1848	1	1	...	3	...	1
1849	...	...	...	...	...	...
1850	...	...	...	...	...	...
1851	2	22	14	...	...	...
1852	...	8	...	5	4	1
1853	11	4	6	7	2	1
1854	...	...	...	...	...	...
1855	...	...	...	...	...	...
1856	6	...	...	...	...	...
1857	12	10	...	2	...	...
1858	...	...	...	2	...	...
1859	8	1	5	...	...	...
1860	43	20	3	...	3	10
1861	6	...	...	...	...	5
1862	5	4	...	...	...	7
1863	2	12	5	1	...	...
1864	2	2	...	...	...	...
1865	...	11	...	9	...	...
1866	3	2	...	...	1	2
1867	1	1	...	...	...	...
1868	...	...	...	...	...	1

For so extensive a country as Assam the few data at our disposal afford no very satisfactory estimate of events. Several points, however, are quite evident. It is clear that in Lower Assam, cholera is as persistent as in the Behar Provinces; in Gowalparah and Gowhatty Jails only five years out of the thirty are marked by exemption from fatal cholera. But it is equally clear that certain years are years of invasion, when cholera is carried over Upper Assam; and the dates of the invasion of Northern China will be found to correspond to these, showing that in the

* Report on the cholera of 1817-20. p., 35.

† An invading cholera of November and December.

north-east the limit is undefined. In the table we can note the invasions of 1843, of 1846-47, of 1851, of 1853—the same which committed such terrible ravages in the Gangetic Valley although diverted from the Western Division—of 1856-57, of 1860—a very great cholera in all parts of Assam—and of December 1862 and 1863.

Lower Assam. Admissions from Cholera in the Jails of Gowalparah and Gowhatty, 1856-67.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
1856 ...	...	...	...	3	1	...	...	1	...	...	...	5	10
1857 ...	19	...	19	...	...	1	...	...	...	...	1	...	40
1858 ...	...	...	...	...	...	...	...	1	...	...	...	...	1
1859 ...	...	...	...	...	...	...	...	...	...	5	3	3	11
1860 ...	...	...	4	4	48	...	4	...	12	23	...	...	92
1861 ...	...	...	...	...	2	...	1	...	...	3	...	2	8
1862 ...	...	...	...	1	1	...	...	4	...	...	1	7	14
1863 ...	2	...	...	1	1	...	1	16	...	1	...	...	22
1864 ...	...	...	...	3	4	...	11	5	2	1	...	...	26
1865 ...	...	...	1	20	...	2	...	...	...	...	...	...	23
1866 ...	...	6	2	3	1	...	1	...	...	...	...	1	14
1867 ...	...	...	...	...	2	1	...	...	1	2	1	...	7
TOTAL ...	21	6	23	35	60	4	18	27	15	35	6	18	268

This table tells of the relation in season of this cholera to that of Bhaugulpore or of Patna, on the opposite margin of the endemic basin. The minimum of June is indicated, which is a very constant interval also in the valley of the Ganges between the April and July cholera. The cholera of the spring and of the monsoon is well marked here; for this region possesses sufficient elevation to subject it to the cholera of the monsoon season. But it is the cholera of the spring and the October cholera which predominate, and cholera is not abnormal even in December and January in this land of perennial moisture.

Cholera is not endemic beyond the hills on the eastern bank of the Bhurmpooter, although it is probable that even Upper Assam occupies a relative position nearly resembling that of the Behar Provinces, a country not antagonistic to the vitality of invading cholera, but in which the supply of cholera requires to be kept up by reinforcement from behind to ensure its constant presence. This tract of country lying to the east of the Bhurmpooter and invaded from west to east, enjoys the same years of minimum as the tracts of Upper India, invaded from east to west.

The province of Endemic cholera defined.

The region of endemic cholera of this Presidency, is the basin having the hill country east of the Bhurmpooter for its eastern margin, and the Rajmehal and Cuttack hills for its western margin. Its northern limit is the Terai of the Himalayas from Lower Assam on the east, to the Terai of the Purneah District on the west; and its southern limit is the sea border of the Bay of Bengal, from Pooree in the west to beyond the mouth of the Bhurmpooter in the east. It has two natural outlets—the valley of the Ganges, including the level country between the Rajmehal Hills and the Himalayas, and the valley of the Bhurmpooter between the Cossyah Hills and the Eastern Himalayas. These are natural outlets towards the west and north-east, but an endemic cholera vitalised for epidemic invasion, may brim over at any part of the margin of this basin. The epidemic invading towards the east, penetrates the valleys of the tributary streams, and overtops the highest hills of the eastern ranges. The Rajmehal and Cuttack Hills form no barrier to a cholera invading towards the west.

Its characteristics.

This province possesses a climatology which is peculiar to it, and a population whose physical characteristics appear to have become adapted to its climatology, and whose diseases take on their special aspect in relation to it. The whole region is under influences from seaward; it is a region of perennial moisture, from the drainage of its own bounding hills, and as the outlet of the enormous bodies of water forming the Ganges and Bhurmpooter, which carry off the floods of India from the watershed between the Jumna and from the Sutlej eastwards, and from much of Central India also, from the northern and southern slopes of the Himalayas, and from the hill countries between Assam and the valley of the Irrawaddy. It receives, too, the full strength of the monsoon; its rain-fall is double when contrasted with that of any other province of this Presidency, and at high elevations the rain-falls, as of Cherra and Darjeeling, are almost incredibly large.

The ground moisture is always within a few feet or inches from the surface, and it requires only the waters of inundation derived from the striking of the monsoon on the hills, to place vast tracts of it under water, which continue submerged in every year until the cessation of the monsoon and the falling of the rivers, permit them to rise; it is with the inundation of these tracts that cholera disappears, and it is with their reappearance that cholera reappears upon the diluvial soil and districts adjacent immediately invaded from it. It is a region

which possesses a vegetation of its own; the cocoanut palm may be taken as typical, for it is to the region of endemic cholera in this Presidency that this tree is confined. The fact of its perennial moisture is shown by the circumstance, that ferns flourish within it, while they decay and disappear immediately after leaving its western margins. The fern will be found on the Ganges in the walls of the fort at Monghyr, but it is never seen in the walls of the forts of Buxar and Chunar. If looked for in these situations, it will be found lining the inside of wells, and further to the west it disappears altogether. The aspect of the population alters with the aspect of the country. It is a rice-feeding population, because rice is the natural product of the inundated diluvium. With the variation in the aspect and habits of the population liability to disease increases, and the combined conditions cause the diseases due to anæmia to come forward as characteristic. When placed under conditions necessarily in some measure prejudicial to health, prisoners succumb to the diseases induced by anæmia in a far greater proportion than in any other province of our Presidency; the normal liability to death is double what it is in Meerut or Rohilcund, and three times what it is in the Punjab.

Death rates for the diseases undernoted in the Jails of Bengal Proper, of Rohilcund and Meerut, and of the Punjab—a contrasted statement.

Diseases.	Died annually per 1,000 of strength on the average of the seven years, 1859-65.		
	Bengal Proper.	Meerut and Rohilcund.	Punjab.
Cholera	18·27	11·63	2·03
Dysentery and Diarrhœa	42·17	14·29	8·99
Anæmia and Atrophy...	3·38	3·19†	1·11†
Dropsies	3·53	·41	·27
Phthisis pulmonalis	4·91	1·52	·55
Pneumonia*	3·66	2·45	1·65
All other causes, excluding Jail Typhus	31·89	13·95	11·88
All causes, excluding Jail Typhus	89·54	47·44	26·48

Characteristics of the Upper and Lower Provinces contrasted.

Mackinnon contrasts the characteristics of the Lower and Upper Provinces in the following sentences:—"The winds blowing up the Bay of Bengal and prevailing in the Lower Provinces are saturated considerably with moisture; rain falls there in great abundance, about seventy inches in the year; the soil is alluvial, low lying, and greatly intersected with various receptacles for water, and covered with verdure; the vegetation is rank and luxuriant, and the rays of the sun being vertical strike with great intensity on the earth, but the heat is modified by the other circumstances mentioned. Far to the north-west all is found the reverse of this. The winds are dry and parching; the fall of rain is scanty and less regular (scarce twenty inches fall on the banks of the Sutlej); the soil is less alluvial, and more dry and mineral in character; and the rays of the sun fall more at an angle, but this is counterbalanced by the scanty vegetation in the hot months and distance from the sea."

This slight sketch, studied in connexion with the facts detailed in the first and second chapters, will suffice to show what are the general relations of the cholera of this Presidency to the different tracts which make up its area. Liability to attack and exemption from cholera, have been traced to distinct relations to climate, season, and meteorological agencies, and the one important conclusion is, that no phenomenon in the Natural History of Cholera is due to chance or contingency, any more than is the budding or flowering of the vegetation of any tract of country.

I have not the materials to enable me to connect on the natural history of the cholera of Madras and Bombay with that of Bengal. It can, however, readily be predicted, that taking the relations of this cholera to elevation above sea level, monsoon agencies, and geographical situation, the manifestations in season will be the same as they are in different tracts of the Bengal Presidency.

THE DEFINITION OF THE TERM—A NATURAL PROVINCE; AND THE SUB-DIVISION OF THE PRESIDENCY IN RELATION TO THIS DEFINITION.

Propositions B. to E.

B.—The epidemic area is essentially an invaded area. The *invaded* area has a direct relation to cholera already existing beyond its boundary line; when the boundary

* Generally asthenic.

† Generally a sequela of typhus in the jails of Northern India.

is overstepped, an endemic cholera becomes epidemic and invading. Cholera, however, may become truly epidemic within its endemic area without the transgression of the endemic limits, but in this case invasion of the epidemic area is imminent within a limited period.

C.—When cholera invades an unoccupied area, the *source* of invasion and its *direction* are exhibited to us; the geographical limit to which an invading cholera extends is also made evident.

D.—If the great epidemic area of this Presidency (within which cholera has no *perennial* existence) be invaded at more points than one, and if the direction of invasion in each case be capable of being recognised as the same on the occurrence of each fresh invasion, and if its geographical limits be fixed and definite, then the epidemic area becomes sub-divided into as many *epidemic provinces* as there are separate points and directions of invasion.

E.—If each of these provinces be clearly capable of definition by the consistency of its *characteristics* in every year, the index being the general prevalence or non-prevalence throughout it of sickness and mortality, and of the prevalence of special diseases which are in a great measure subordinate to meteorological agencies; if the separate divisions of the great epidemic area have necessarily no characteristics in common in any year (excluding altogether the question whether cholera be absent or present); if the history of each province repeats itself constantly, and with precision, after a succession of years, so that we can at once recognise the parallel, then the *cholera provinces* are the natural divisions of the area of the Bengal Presidency; natural not for cholera alone, but in relation to all influences the general prevalence of which determines the standard of health among the population.

Grounds for the sub-division of the Presidency for statistical purposes.

I have often been asked on what grounds I have sub-divided the area of this Presidency while massing in one statement the statistics of a definite geographical space. It has been objected, that the different areas are not those included each under one Medical Inspectorship, and that they are not political provinces. I allude to the statistics of areas, such as Bengal Proper, Behar Benares Oude and Cawnpore, Meerut and Rohilcund, and the Punjab. When first I undertook to study the natural history of disease in relation to season and locality, I was led from want of an existing standard, to map out the provinces which promised to give results special and uniform when taken as a whole, according to an ideal plan, drawn partly from my own experience and partly from the writing of authors on the diseases of Upper India. That my first conceptions were in some degree erroneous or short of the truth, cannot be imputed to me as a fault. The arrangement was provisional, and the details were carefully preserved for rearrangement in accordance with the experience of a period of years. It may have been noticed, that the division of the eastern from the western province was first made in the printed statements for 1864, and that it was continued in subsequent years, in relation to my later views. For the sake of comparison, I have rearranged the statistics of the five years 1859-63, and the tables superseding those already printed for the provinces implicated, will be published in an appendix to the tabular statements for the decennial period 1860-69. But it is necessary to give the explanation, that I have to some extent consulted convenience, and also, that I have not felt myself bound to adhere to limits that seemed natural when further sub-division promised inappreciable results. Had the vital statistics of an entire population been at my disposal the case would have been different; for it is obvious that a population cannot be adequately represented by a few hundred prisoners, or by a single European Regiment confined to one station of the area. Community of suffering or exemption is frequently also a question of degree; and we could not with justice, include the country between Jubbulpore in the south-east and Ferozepore or Lahore in the north-west, and say, that in this we have a natural province under one great system. It would be true; but at the same time, the question of the amount of influence exercised by monsoon agencies in the different portions of the natural area requires to be taken into account. The rain-fall of the south-east is very much greater than that of the districts north and west of Delhi, as we shall have occasion to show further on; and striking contrasts also are of frequent occurrence in different parts, when this area is viewed as a whole. The stoppage of the monsoon of 1860, and the results consequent upon the limitation of its distribution, affords an example of the sub-division for the year of this natural area into two portions, each with characteristics radically contrasted.

Because monsoon influences may in certain years fail to affect such stations as lie usually within their reach, and because the limits of the natural province become for the year circumscribed, we cannot on this account alter the geographical limit adopted as the standard in a statistical system. Such cases are only to be met by consulting the details for stations, which are carefully given; and when, for example, the Punjab is affected to an extraordinary degree, and in consequence the fever ratio of Peshawur runs up to a maximum so high as greatly to affect the general ratio for the province, the general statement should always be read with the details for stations as guide.

Considering the materials which I am required to employ, the general arrangement gives in use, not unsatisfactory results. Taking the Jail Tables for reference, the following modifications might, perhaps, with greater regard to precision be adopted :—

(1). In the south-east, Raepore, Mundla, and Jubbulpore might take their place with the stations of Chota Nagpore, which are entirely under influences from the east; the stations of Nagpore, although liable to be affected from the east, are under western influences also. (2). Jhansi and Ajmere suffer in common with Agra, and should be added to the province in which it is included. (3). Shahjehanpore is retained in the same province more as a portion of Bareilly than as a district suffering in common with those further to the west; it is generally affected from the east. (4). The distinction between the North-Western Provinces and the Punjab is unnatural; the climatology of the Punjab is a direct continuation of all influences felt west of 80°, and *vice versâ*. The western area should thus naturally include but two provinces—the one, subject to climatic influences from the south-west, although affected, at certain seasons, also from the east; the other, affected from the south-east only.

In the east, from the Behar Provinces westward to 80°, is a great and natural province; this requires no modification when regarded simply as a province. But it is quite in reason that we should hesitate to include such a climate as that of Behar and Chota Nagpore with the climate of Oude and the eastern half of the Doab. The meteorology of such years as 1817, 1859, and 1866 seems, moreover, to indicate, that this area has a very natural limit of its own, due not to its physical geography, but to its natural meteorology. This sub-division would include Jubbulpore, Mundla, Raepore, Sumbulpore, Chyebassa, Ranchee, Hazareebaugh, and the Behar Provinces Proper lying west of the Rajmehal Hills, namely, Gya, Patna, and Shahabad south of the Ganges, and Chupra, Tirhoot, and Chumparun north of the Ganges. The natural western limit north of the Ganges would be the western limit of the Behar Districts; but in the south it would be much more indefinite, as the limit is extended to the west in proportion to the distance to which it is found to the south. Such an arrangement would leave remaining in the east, only the great basin, the region of endemic cholera, which has been shown to be a true and natural province; for with the few opportunities of observation which we possess, the separation of Assam, Cachar, Sylhet, and Chittagong from this tract would be productive of no more accurate result in our general tables.

Whether I shall in future frame the statistics of this Presidency according to this amended plan, is a point requiring very careful consideration. I think it right in the meantime, to show the defects that at present exist, and which are capable of remedy when the statistics of the general population become available for tabulation.

The importance of Invading Agencies in determining the standard of health in Upper India.

Those who know what the climate of Upper India is when monsoon influences are withdrawn, and when solar influences are no longer in sufficient strength to induce disease, can best appreciate what is the truth, that invading agencies are those which determine the character of the year as regards health, throughout the area of this Presidency which I have called in speaking of cholera, the epidemic area. In speaking of the invasion of cholera, I shall have occasion to show what are the meteorological characteristics of epidemic and non-epidemic years; here I note the fact only, that the epidemic area is naturally to be mapped out according to the direction of invasion, and the limits reached by invasion from a known base. It is by the extension of influences during the monsoon season, that these areas are defined in this system; but it is essential to keep in view, that there are natural provinces of spring influences as well as of monsoon influences, and that these are of equal importance in estimating the phenomena of epidemic cholera. The spring winds and spring rains have their natural cholera areas as well as the winds and rains of July and August; hence arises the necessity for studying epidemic advance under either system, and it is from neglect to do so, that the utterly erroneous deduction has been made and insisted on, that the advance of cholera may occur in directions opposite to those in which natural agencies invade. In this study there is nothing complex, provided the distinction be not overlooked between an invading and a reproduced cholera. The error has been committed and the distinction has not been made; and it is needless to say, that it is unprofitable to attempt to draw parallels relating to cholera when the circumstances are different, or to try to trace the fact of invasion in a year when no invasion has occurred, under the idea that there has been freshly distributed cholera, while, in truth, the manifestation has been that of a cholera revitalised within an already invaded area. These erroneous deductions have been placed on record and received as the record of facts, while they are in reality but the theory of the writers. Those who know best how to observe, can best appreciate how rigid are the laws which direct and limit the advance of epidemic cholera.

If from the effects of monsoon agencies, I have been able to define the limits which are normally reached in every year by influences from a certain base, it follows, that the area covered from the limit reached, backward to the base from which invasion occurs, is a province under one aspect as regards its invading meteorology, which, as I have said, determines in Upper India the aspect under which the province is shown for good or for evil in any year.

What have represented themselves to me as the monsoon systems which define natural provinces are shown in the following diagram :—

Diagram to illustrate the relation of the area of the Bengal Presidency to the South-West Monsoon, and influences derived from it.

1.—The province of the south-west monsoon proper.
2.—The province lying to the east of the Bay of Bengal, also invaded from south-west to north-east.
3.—The province immediately under influences from the Bay of Bengal, invaded from the east and south-east, comprising the province of endemic cholera and the eastern division of the epidemic area.
4.—The western division of the epidemic area, before reaching which influences proceeding directly from the east up the valley of the Ganges and across Oude, fail. It is entered from the south-east through the districts lying south of the Jumna.
(a).—The tract which I have described in various epidemics, for example, those of 1856 and 1861, as occupied in the northern extension of influences which have entered the western division of the epidemic area.
(b).—The tract occupied in the north-western extension.
(c).—The tract occupied in the western extension.
5.—The province lying beyond primary monsoon influences, comprising the north-western desert and the Trans-Indus territories, which are never reached in primary invasion.

Lithographed at the Surveyor General's Office, Calcutta, September 1869. H. A. D. Lawrence, Lithographer.

EXPLANATION.—The diagram represents the aspect of the Bengal Presidency during the prevalence of the south-west monsoon only, or during the months from June to September. The provinces of the spring are entirely different; thus, for example, influences derived from eastern sources may spread between March and May from east to west across the tract which, in June and July, becomes the province of the south-west monsoon proper, and is entered from the south-west and invaded from south-west to north-east.

The portion of province No. 1, lying in the Bengal Presidency, is the tract which I have described as the southern epidemic highway; the westerly extension *(c)* in province No. 4, is the tract which I regard as the northern epidemic highway. Nagpore and Saugor are index stations when the southern tract is occupied; Ajmere, Bikaneer, and Bhawulpore are index stations on the northern highway.

The occupation of Agra and Gwalior from the east clearly denotes invasion of province No. 4. Jhansi is generally associated with Agra and Gwalior, but not necessarily so; in the geography of the epidemic of 1866-67, Jhansi lay to the south of the occupied area, while Gwalior was included within it. Jhansi or Agra may be reached in primary invasion from the east without the general occupation of the western province as a province; this was the case in 1855 and 1863.

Bareilly and Shahjehanpore are, provincially considered, frontier stations, invaded frequently by influences epidemic within province No. 4, but quite as often by influences prevailing to the east of 80°. In the North-West, Sealcote and Rawulpindee lie beyond primary invading influences, while Ferozepore, Lahore, and even Jhelum are included in the monsoon area.

All of these are provinces under one monsoon from the south-west, but two natural provinces only of the epidemic area have this as a monsoon of which the influences progress from the south-west to the north-east. From the Bombay Coast as a base, the province of Nagpore and Central India up to a definite line, have monsoon invasion proceeding from south-west to north-east; and from the north of the Bay of Bengal (where the obstruction offered by the continent to the advance of south-western influences is no longer felt), invasion again occurs over Eastern Bengal and Assam from south-west to north-east. Beyond a certain line limiting the extension of monsoon influences from the Bombay Coast (that is to say, proceeding from south-west to north-east), the influences operating in the continent of Hindostan being more powerful than those advancing from the south-western coast, a second line of monsoon influence is determined, crossing that of the influences from the south-west. To the north of the line limiting south-western influences, the Bay of Bengal is the base of departure, and from Pooree to Lahore it is from the south-east that, monsoon agencies set in, in every district. The limit in the north-west is a natural limit; the monsoon dies here, and the rain-fall diminishes inch by inch until its failure causes the great north-western desert, as a natural result. In our North-Western Provinces, it is to the west of 80° E. Longitude that this prevalence of monsoon agencies proceeding directly from south-east to north-west is felt; the districts of this area are invaded through Jhansi, Gwalior, and Agra, and through the tract lying south of the Jumna. The Gangetic Provinces, Oude, and the eastern half of the Doab receive the monsoon from the north of the Bay of Bengal as a base. In the south, there is no line distinguishing the point of departure from that of the agencies setting out for the western division of the epidemic area, but at the north of the Bay monsoon directed agencies turn as on a pivot, and progress up the valley of the Ganges from east to west; and the influences thus setting out, attain as their western limit, Western Oude, Shahjehanpore, Futtehghur, and the Jaloun District, and the area covered constitutes a province which is true and natural.

From its physical geography and special attributes, the province of endemic cholera is a natural province, considered apart altogether from invading agencies; it stands naturally constituted. It admits of no sub-division. It is a basin within the hills which form its margins, with features which are special to it. But the case is very different in the provinces of Upper India.

The different stations of the plains of Upper India, whether east or west of the epidemic line of 80°, are all under one general aspect. The watershed between the Jumna and Sutlej is little over 1,000 feet above sea level. The fall is gradual, to 185 feet at Patna, thus,—

Umballa	... 1,026	Meerut	... 859	Lucknow	... 535
Kurnaul	... 912	Bareilly	... 693	Allahabad	... 316
Delhi	... 827	Futtehghur	... 635	Benares	... 252
Agra	... 657	Cawnpore	... 408	Patna	... 185

This is no diluvial basin, but the tract of the great kunkur clay, which is dense, impervious to water, and water-containing only in its interstratified sand beds; not a mere local deposit, but a formation filling the basin between the hills of Central India and the Sub-Himalayan ranges. Geologically, every one of the above-named stations is on the same footing, and except, perhaps, in the Behar Provinces, the influences arising from the nature of the soil and the approach of water to or its recession from the surface, are the same throughout. I say this advisedly, for the facts indicate to me not so much localised conditions, although these have, of course, an importance apart from any other considerations, as the general meteorological aspects of any year as powerful in determining the ratios of disease for natural provinces.

There is, therefore, nothing in the physical features of the Gangetic Provinces nor yet in the geology of the area to indicate, that there is in Upper India a line of separation of two natural provinces; the index is afforded solely by the facts of invading meteorology. Statistically, we are compelled to take the same absolute limit for every year, but it can be well understood, that were we at liberty slightly to modify the geography of each year in relation to its precise characteristics, the results would be even more striking than those here to be shown.

I take the statistics of the years from 1859 onwards, to illustrate the fact, that the influences prevailing in each year in the west of the Doab are different both in kind and degree, from those prevailing in the east. It may be as well to explain, that the rain-fall of the west of the Doab in 1859 and 1860 was exceptionally small, and that, in consequence, the western division became the famine area of 1861. Forewarning of the famine was given by the comparative failure of the monsoon from the south-east. Baird Smith states the case thus:*—"The famine of 1837-38 was in fact the crisis of five or six years of great climatic irregularity. Such irregularity seems to be indeed a characteristic preliminary sign of a complete suspension of the usual rain-fall, and I trace it more or less distinctly through the series of the greater droughts. Similarly, 1858, 1859, and 1860 gave cause to fear from their very abnormal character, that a like climax might be impending in 1861. It was at any rate expedient to give serious attention to so grave a possibility, and to take such precautionary measures against its effects as might be prudent and practicable. The Government of India came to this conclusion, and I confidently believe, that the early anticipation of its being possible that a great calamity might have to

* Report, p. 18.

be provided against, contributed very materially to the prompt and decisive action by which it was met when the time of need came."

The contrast in the ratios for the European Troops in the east and west is as under. The material was essentially the same in either case, namely, the new army of 1857-58 :—

EUROPEAN TROOPS, 1859.

An epidemic year in the east, in Dinapore, Benares, Oude, and Cawnpore. A non-epidemic year in the west, in Rohilcund, Meerut, and Agra. *

	In the East.	In the West.
Died per 1,000 from all causes ...	61·95	25·09
Cholera	14·15	·25 †
Fevers	9·27	3·84
Dysentery and Diarrhœa ...	19·33	6·79
Hepatitis	6·53	4·22
All other causes	12·67	9·99

EUROPEAN TROOPS, 1860.

An epidemic year in the east, in Dinapore, Benares, Oude, and Cawnpore. A non-epidemic year in the west, in Meerut and Rohilcund.

	In the East.	In the West.
Died per 1,000 from all causes ...	48·35	22·70
Cholera	21·58	... ‡
Fevers	6·21	3·91
Dysentery and Diarrhœa ...	7·10	3·76
Hepatitis	3·97	4·36
All other causes	10·49	10·67

EUROPEAN TROOPS, 1861.

The case was about to become reversed. The year 1861, *was an epidemic year in the west, with a rain-fall much above the average, but a healthy year in the east.*

	In the East.	In the West.
Died per 1,000 from all causes ...	25·02	46·92
Cholera	5·66	21·52
Fevers	3·11	5·97
Dysentery and Diarrhœa ...	4·22	6·93
Hepatitis	2·87	2·77
All other causes	9·16	9·73

EUROPEAN TROOPS, 1862.

In this year, the minimum of epidemic influence was reached in the east; in the west, the invading influences were not those of an epidemic year, although the invading cholera of 1861 *was universally reproduced.*

	In the East.	In the West.
Died per 1,000 from all causes ...	14·67	23·37
Cholera	·08	5·14
Fevers	2·95	3·23
Dysentery and Diarrhœa ...	2·70	3·83
Hepatitis	3·12	3·82
All other causes	5·82	7·35

The cholera ratios for the four years following, are as under :—

		In the East.	In Rohilcund and Meerut.
Died per 1,000 of the average strength	1863	11·66	*Nil.*
,,	1864	6·77	·16 §
,,	1865	5·55	·78 ‖
,,	1866	2·89	*Nil.*

* Agra is thrown in here in 1859, because this was the only station occupied south of Meerut. Troops had not in 1859, settled down into cantonments in the south and west.

† The equivalent of two deaths, one at Shahjehanpore, the other at Bareilly; both should naturally be included in the loss of the eastern area, leaving the cholera ratio for the west *nil.*

‡ None of twenty-nine cholera deaths, which give the ratio of 4·36 shown in the printed table for 1860, belong to the natural province. Twenty-four of these deaths occurred at Muttra, which was struck by cholera from the south-east in common with Agra, Jhansi, and Morar. The five deaths of March and April, belong to the eastern cholera of Bareilly and Shahjehanpore.

§ A case at Bareilly; under eastern influences.

‖ The result of the slight epidemic of 1865, invading from the south-east.

It seems to me very evident, that with an equalised meteorology, these two provinces will give almost identical results; but it is not less clear, that, in almost every year, the influences and the resulting ratios are widely different.

Within the tract which became the famine area of 1861, we find in 1860, the maximum of health, while beyond its eastern boundary, all ratios are in excess of the average. Knowing the history of the cholera of the south-east of 1860 with its limitation by the southern boundary of the famine tract of 1861, we naturally look for the same phenomenon in stations south of the epidemic line at which the monsoon failed, namely, a maximum rate for cholera, and also for fevers and bowel complaints, with a minimum rate for fever and bowel complaints in stations north of the line, coincident with the absence of cholera. The figures are as under :—

EUROPEAN TROOPS, 1860.

Admission-rates per cent. of Strength for the Cholera Area of 1860.			*Admission-rates per cent. of Strength for Stations beyond monsoon influence in* 1860.		
	Fevers.	*Diarrhœa.*		*Fevers.*	*Diarrhœa.*
Jhansi	203·26	23·16	Bareilly	17·46	8·73
Morar	139·95	27·91	Moradabad ...	20·95	6·05
Agra	76·50	18·42	Meerut	39·66	9·24
Muttra	89·93	14·25	Umballa	27·96	10·09
			Jullundur ...	24·39	5·02
			Ferozepore ...	26·70	5·16

I know no fact more strikingly illustrative of the effects of the absence of monsoon influence in the famine tract in 1860 than this, that not one European Soldier out of a force of 2,300, died of dysentery or diarrhœa in this year at Meerut. The Regimental Medical Officers attributed this to the more extensive employment of ipecacuanha in the treatment of dysentery; to me it appeals, chiefly, as a climatic phenomenon, a modification of type in relation to the absence of influences which are powerful to induce such diseases. The anticipation of a permanent minimum in the death-rate for dysentery was not realised, and we find twelve deaths at Meerut in 1861 attributed to dysentery and diarrhœa. In the report of the Meerut Artillery Division for 1860, Dr. Mactier alludes to the climatology of the year as follows :—"The past season has proved one of the most remarkable on record in consequence of the almost entire failure of the periodic rains. The total fall during the year has been eight and half inches. The first fall took place on 17th July, a mere shower; and in August only five inches fell. It is a common remark that an unseasonable year is a sickly one. Such, however, has certainly not been our experience of Meerut during 1860. Few stations could have been more healthy, and in very few, I imagine, will the rate of mortality be found so small."

I shall take a final illustration from the medical history of the eastern province, to show that all stations of a natural area suffer in common. It must not, however, be concluded from the absence of cholera shown in the latter half of this table, that cholera is *necessarily* absent in a non-epidemic year, or that an unhealthy year must be characterised also as a cholera year.

EUROPEAN TROOPS.

Stations of the Eastern Division of the Epidemic Area in 1860 *and* 1862. *A contrasted statement.*

Stations.	1860,—an Epidemic Year.					1862,—a Non-epidemic Year.				
	Strength.	Died per 1,000.	Number of deaths.			Strength.	Died per 1,000.	Number of deaths.		
			Cholera.	Fever.	Dysentery.			Cholera.	Fever.	Dysentery.
Dinapore ...	887	46·22	8	11	5	665	15·27	Nil	...	2
Benares ...	1,447	73·94	33	21	13	1,142	13·14	...	5	2
Allahabad ...	2,460	46·34	27	20	26	1,107	18·97	...	2	5
Cawnpore ...	1,228	54·55	24	8	17	1,259	14·30	...	1	6
Gondah ...	965	24·87	18	1	3	787	5·08	...	...	1
Fyzabad ...	1,054	33·21	20	2	6	1,254	5·58	...	...	...
Roy Bareilly ...	876	21·69	1	1	2	587	3·41	...	...	...
Lucknow ...	2,216	31·14	22	8	7	2,093	15·29	...	1	8
Seetapore ...	1,018	18·66	3	2	5	606	8·25	...	1	...

The contrasted admission-rates of the stations of Central India below noted, in epidemic and non-epidemic years, show very well the rise above the normal average in epidemic years.

EUROPEAN TROOPS.

Admitted per cent. of the average strength.

	Epidemic years.					Non-epidemic years.				
	Years.	All Causes.	Fevers.	Dysentery and Diarrhœa.	Cholera.	Years.	All Causes.	Fevers.	Dysentery and Diarrhœa.	Cholera.
Jhansi	1860	354·54	203·26	43·91	5·49	1863	179·24	54·85	17·25	...
	1861	308·35	181·22	26·00	·00	1864	155·68	34·69	9·33	...
	1862	339·92	213·39	26·92	6·63	1865	196·55	89·95	...	·15
Morar	1860	277·79	139·95	37·21	13·60	1863	179·95	61·75	12·08	...
	1861	287·43	148·73	26·50	18·99	1864	170·03	61·08	9·71	...
	1862	222·33	124·43	22·36	6·29	1865	171·39	42·60	...	1·08
Agra	1860	217·85	76·50*	22·13	9·29	1863	176·32	66·99	31·93†	2·87
	1861	367·94	217·62	40·66	9·34	1864	168·44	70·66	13·52	...
	1862	249·18	145·10	13·36	5·72	1865	183·34	57·54	14·61	...

It will be observed, that I attach to the terms epidemic influence and epidemic agency a meaning which is definite, and that I do not employ them with reference to a thing which is unappreciable. Absence of epidemic influence, I use as implying the non-prevalence of such meteorological conditions as in any province determine the rise above the average of the local manifestation of disease, and which afford the least amount of vehicle for the importation of evil influences from without. An epidemic year affords, if not a large rain-fall with a full geographical distribution, at least an average one; and often there will be found the phenomenon of a moist atmosphere at an unusual season, for some of the worst of the epidemics of this Presidency have had their rise and distribution after the cessation of the monsoon rains. To my idea, an atmosphere of moisture supplies every requisite for the spread of epidemic cholera or epidemic malaria, without the superaddition of a something which is mysterious.

I fear to digress too far from the subject immediately in hand by further illustration of the attributes of natural provinces and of the characteristics of epidemic and non-epidemic years. I cannot, however, pass the subject without a single paragraph regarding the relations of the stations of the higher Punjab to influences from the south-east. I have said that influences predominating in Agra and Meerut are continued into the Punjab up to the monsoon limit. In such years, therefore, as 1859, 1860, or 1866, the death ratio runs down towards the north-west, thus :—

EUROPEAN TROOPS.

Died per 1,000.

Year.	Eastern Province.	Meerut and Rohilcund.	Punjab.
1859	61·95	25·09	20·18
1860	44·99	22·70	14·20
1866	22·54	15·30	14·41

In such years, the usually unhealthy stations of the north-west, such as Mooltan and Peshawur, show a maximum of health scarcely attained elsewhere in the Presidency, a fact which is often obscured in an annual ratio, inasmuch as the very conditions producing a non-epidemic season, are apt to redevelop the phenomena of fever in constitutions rendered susceptible to fever by suffering in the year previous, and to raise the death-rate by the undue prolongation of the season in which heat apoplexy prevails.

In a non-epidemic season in the Punjab, the fever rate of September and October exhibits no predominance; on the contrary, these months are marked by the steady decline of fevers, while the reverse is the case in epidemic years.

EUROPEAN TROOPS, PUNJAB.

Fever Admissions of 1859, 1860, *and* 1866, *characteristic of the distribution in months in a non-epidemic year.*

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1859... ...	293	265	373	1,260	1,744	1,825	1,299	964	607	711	679	316	10,336
1860... ...	190	183	231	767	1,051	859	854	957	793	680	435	279	7,279
1866... ...	325	224	208	290	1,071	832	994	708	652	649	448	427	6,828
Three years...	808	672	812	2,317	3,866	3,516	3,147	2,629	2,052	2,040	1,562	1,022	24,443

* Scarcely an epidemic year, although a cholera year; there was not half of the usual rain-fall, and the limiting line of epidemic influence was in the Agra District.

† Diarrhœa coincident with the cholera outbreak.

The above statement beautifully illustrates the maximum of the hot months, May, June, and July, and the decline of fever in the malarious months, August, September, and October, owing to the absence of the humid fever-bringing wind below described.

In such years, if undisturbed by heat apoplexy, the death-ratios of the stations bordering on or beyond the limits of the north-west monsoon are wonderfully small.

EUROPEAN TROOPS.

Died per 1,000, *in the non-epidemic years* 1859, 1860, *and* 1866.

STATION.	1859.		1860.		1866.	
	All Causes.	Apoplexy.	All Causes.	Apoplexy.	All Causes.	Apoplexy.
Ferozepore	14·02	3·80	9·21	...	7·02	...
Mooltan	19·42	9·71	26·31	10·77	3·63	...
Peshawur	15·15	2·65	12·08	...	13·02	·52
	Deducting Apoplexy.		Deducting Apoplexy.		Deducting Apoplexy.	
Ferozepore	10·22		9·21		7·02	
Mooltan	9·71		15·54		3·63	
Peshawur	12·50		12·08		12·50	

The following extract from Mr. Verchere's Report for 1861, on Kohat, a station which may be grouped with the above, shows, that he recognises well what I have described as epidemic influence. I think it right to explain, that I do not unreservedly adopt his views on the non-specific character of the malaria poison, while fully coinciding with him in the belief that the phenomena which he here describes are due to general and non-specific influences; to the question of the diffusion and characteristics of epidemic malaria, I shall return in considering the natural distribution by provinces of miasmata related in character to cholera. Mr. Verchere writes:—"From the middle of July to the middle of October a few puffs of the southern monsoon blow with a south-east direction. This wind is very trying, being a feeble, humid, and warm wind, and it is exceedingly enervating. With this wind comes the endemic fever of the autumn. Not that the southern monsoon brings the fever malaria with it; for I have before in previous reports expressed my opinion, that 'malaria' is a mere word and expresses nothing. With the monsoon comes the fever. A different state of the atmosphere, and especially a very different state of electric tension, are induced by the warm and humid wind, and the effect on the nervous system is the fever."

From its proximity to the mountains on the frontier, the rain-fall of Kohat is greater than that of stations of the plains lying in the track of the monsoon, and heavy rain can frequently be seen falling on the mountains, while no fall takes place in the adjacent stations of the plains.

It is important to note, that the limitation of cholera to the monsoon area may hold even in years of reproduction subsequent to invasion, and that the special climatology of the Trans-Indus territory may cause the appearance of cholera here, while the intervening districts to the east from the cholera limit of the previous year, remain apparently unaffected. Thus the cholera of 1862 universal in the east of the Punjab, appeared also epidemically along the Trans-Indus Frontier from April to November, while the Doab between the Jhelum and Indus remained unaffected. The exemption of this Doab in 1862 has been attributed to the effects of the quarantine established at Jhelum and Attock; but to my mind the explanation is unsatisfactory, because I find the parallel phenomenon in the parallel year 1857, when no precautions were taken and when no quarantine was established.

The meteorology affecting the epidemic area of the extreme south-west of the Presidency, is very shortly and neatly summed up by Dr. Arnott of Bombay. In treating of the Kurrachee cholera of 1846 he writes:—"What was wanting for the appearance of this cholera may have been supplied about the beginning of June, when the weather begins to partake of the peculiarities of the south-west monsoon, which sets in along the coast of Malabar, the Concan, and Guzerat about the end of May, or the commencement of June. Although the annual fall of rain at Kurrachee and throughout Scinde does not probably average four inches, yet the winds then blow steadily from the south and south-west and are loaded with moisture. Clouds accompany the winds, and sweep over the southern coast of Scinde; whilst, most likely, those electrical changes which usher in the monsoon elsewhere, are also more or less felt. Previous to the appearance of the clouds the sun is powerful, and when the winds lull the weather is hot and sultry. Such a state of the atmosphere when epidemic influence prevails, is favorable to the appearance and propagation of disease, and may have called into active operation the choleraic influence then prevailing."

The following are, as I appreciate them, the provinces naturally traced on the area of our Presidency:—

1*st*.—Assam and the districts lying east of the Bhurmpooter, invaded from the south-west.

2*nd*.—The province of endemic cholera having the geography which I have described.

3*rd*.—The eastern division of the great epidemic area, comprising all districts east of 80° East Longitude, invaded from the east.

4*th*.—The western division of the epidemic area, invaded from the south of the Jumna from east to west, and from south-east to north-west, including all districts lying west of 80° and east and south of the Desert.

5*th*.—The districts lying west of the desert north of Mooltan, including the Punjab north of the Jhelum, beyond primary monsoon influences, and, therefore, an area secondarily invaded.

6*th*.—The province of the south-west monsoon proper, invaded from the south-west in the monsoon season, of which the north-western limit is represented in our Presidency by a curved line, commencing a little to the south of Ajmere and Deolee in the south-west and extending to Nagpore and Raepore in the east, but not reaching to the Coromandel Coast which escapes this monsoon.

Throughout Northern India spring rains to the extent of several inches are due from the east, and these are of extreme importance, as it is coincidently with their occurrence that epidemic influences spread secondarily, as the rule. It is to these, rather than to the monsoon rains, that the agriculturist trusts in the province lying beyond the reach of the monsoon. Over the eastern division of the epidemic area, the east winds, which always bring moisture, very frequently prevail in the early months, and the degree of their prevalence and the amount of the moisture which they bring with them, determine the character of the season; for in proportion to the prevalence of the east winds, the hot and dry normal westerly winds are withdrawn. This is also a distinguishing feature cutting off the eastern from the western division.

Importance of the Spring Rains both in relation to primary and secondary invasion in the different epidemic provinces.

So it is over the south. In Saugor, Jubbulpore, and Nagpore all moist winds and rains are from the east in the early months, and so constantly and powerfully do they prevail, that the area of their prevalence is a spring province with features peculiar to it.

Hence, if Nagpore, Jubbulpore, and Saugor are entered by influences from the east having their origin in our Presidency, it is not in the monsoon season, when the winds and rains are coming from the west that we look for evidence of invasion, but in the spring months, from March to May when east winds and moisture are in progress from east to west or from north-east to south-west; and it is in March 1818, March 1821, March 1856, March 1860, and March 1868, that we find invasion to occur. I have shown, as regards the eastern division of the epidemic area, that it is as frequently with the rains of the spring as with the rains of the monsoon, that this province is covered. And I have also shown, that in the western division, it was with the spring rains of May, in 1858, 1862, 1865, and 1867, that the secondary advance of invading cholera occurred; and how it was after long continued and abnormal east winds of May, that the great invading cholera of 1856 came upon Agra.

If the advance of cholera be limited by monsoon agencies, the geographical limits of the cholera of the monsoon season must be found as well defined and as antagonistic as there are provinces under different systems having different bases of departure for the influences invading them.

Generalisation from statistical data that the cholera provinces are natural and meteorological provinces.

And no demonstration can be more beautifully perfect than that bearing out such a theory.

The eastern province was universally covered in 1855, 1859, and 1863, when cholera had no existence in the western division; it was an exempted area in 1858 and 1862, while cholera still persisted in the western.

It was from the south-east that the western division was entered in 1856, 1860, and 1866, and on every occasion, invading cholera has had its limit of primary invasion in the north-west, at a point coinciding with the termination of monsoon influences from the south-east. The extreme north of the Punjab has never been reached in primary invasion.

The cholera of the northern provinces of 1861 and 1867 had its limit in the south precisely at the line cutting off south-western influences having their origin from the western coast, and the cholera of 1854, 1864, and 1865, a cholera under the south-western system, had its northern termination at identically the same line.

Of the cholera of Assam I have already spoken as having its invasion in the line of the south-west monsoon, and of its invasion and progress being coincident with that of a second limb of the same cholera invading and progressing in the opposite direction, that is, from east to west, up the valley of the Ganges.

The dweller in every province knows whence the cholera comes that affects the population; the dweller at Lahore knows that the cholera comes from south-east, and that he has every chance of attack when cholera is in motion west of the Jumna; the dweller in Saugor or Bhopal looks for his cholera of the monsoon season from the south or south-west, dreading it when he hears that it is epidemic in the vallies of the Nerbudda or Taptee; the dweller on the Ganges knows that the easterly winds of April and July will surely bring cholera with them; and when cholera is epidemic in Lower Assam, the dweller in Upper Assam knows that advance is imminent, and is apt to see, in cases of cholera imported from lower down the Bhurmpooter, not the warning only of invasion, but the actual focus of the cholera which is advancing upon him as an air-borne epidemic.

But it will be asked, are there no well authenticated examples opposed to this wide generalisation? I know of only two instances in which it has been persistently held, that cholera advanced against monsoon agencies. It has been stated that cholera crossed the continent from Calcutta to Bombay in the teeth of the monsoon in 1818; and again, that cholera marched down from Central Asia to Peshawur, to Lahore, and to Meerut between 1843 and 1845. The assertions are plausible only to those who do not know the facts upon which they are founded, or to those who cannot recognise the fallacy of the reasoning upon the phenomena which actually did show themselves. To these cases I shall subsequently refer at length.

The effect of the north-east monsoon as displayed in the Madras Presidency.

We lose sight too much of the effects of the north-east monsoon when our observation is confined to the Bengal Presidency. I have explained how in the Bengal Presidency the manifestation of cholera in relation to climatology coincides in the extreme east and in the extreme south, and I therefore suppose that there should be in the north of the Madras Presidency a great cholera of the end of the year corresponding to our cholera of Dacca, Chittagong, or Assam; and if this be a cholera invading from the south-west of Bengal Proper as a base, this portion of our Presidency must be the commencement of a natural province extending into Madras and Bombay, of which we lose sight entirely in the system above sketched. The Madras report of the epidemic of 1818 thus describes the meteorology of the northern provinces of the Madras Presidency, and I have reproduced this description as being of extreme interest in epidemiology, and essential for the correct comprehension of the part which cholera plays on the southern epidemic highway.

"The north-east monsoon commences generally in October, and is attended with dry weather over all the Peninsula, excepting on that narrow stripe of coast forming its eastern side, which is washed by the Bay of Bengal, and commonly known as the Coromandel Coast. On this stripe, the north-east monsoon brings the periodical rains, which commence sooner or later in October, terminating sooner or later in December. From this last period till towards the end of February, the north-east wind, or monsoon, now a dry wind, continues to prevail, and the weather remains cool, and in many places cold. The north-east wind then ceases, and from this period till towards the end of May the winds are irregular, and the heats are intense all over. In the Bay of Bengal and on either of its shores, the winds at this time are chiefly from the south, and are remarkable for their *humidity*, heat, and relaxing effects. About the middle or end of May the south-west monsoon commences, and is attended with the periodical rains in all parts of the Peninsula, excepting the Coromandel Coast, which then suffers great heat and drought; these rains cease in August or September, when the climate becomes generally sultry and variable until the north-east monsoon sets in again. Thus there are two great and most important distinctions of climate. The Coromandel Coast has its rainy along with its cool season, and its hot season may be said to be always dry. All the rest of India has the rainy season along with the heats of June, July, August, and September, when the sun is to the northward of the Equator. These rains, indeed, in some degree, temper the excessive heat, but their intervals are often distinguished by an intense force of the solar rays and by dead calms, and that whole period is subject to all the effects of heat and moisture combined, acting on the soil and vegetation. The Nagpore and Hydrabad States and all others to the west and south are subjected to the rains from the south-west monsoon. The Northern Division* experiences the rains of the north-east monsoon, but this tract feels also the occasional influence of the south-west rains."

"The north-east monsoon not unfrequently carries its rains far to the westward of the limits assigned, and, in like manner, the south-west monsoon refreshes the eastern parts with occasional heavy showers. In some of the more elevated tracts, though the sun be vertical, the air is cold during the rains, especially where the wind blows fresh; but in lower situations, and where the soil is inundated, the air is often extremely hot and oppressive, and is surcharged with moisture."

"The flat open plains of Nagpore seem to approach in character to the alluvial districts of the Ganges; for at the very base of the Peninsula, and at a distance of 400 miles from either the eastern or western sea, they attain only an elevation of 800 or 900 feet. Hingunghaut, situated 50 miles south of Nagpore, is only 700 feet above the level of the sea."†

"The general appearance of the countries above and below the ghauts‡ is considerably different; the former are distinguished by a dry soil, intersected by streams of running water, having but few tanks, and the general cultivation being that of dry grain; the latter are more open and flat, sandy, watered chiefly by tanks, and affording great fields for rice cultivation."

The provincial distribution of epidemic malaria.

I shall now illustrate the truth, that the invasion of malarious fever, when exhibited in an epidemic form, has a relation to season and geography parallel with that of the cholera invasion.

The miasm which is known by the name of the malaria poison has not to the same degree the individuality which distinguishes the cholera miasm. Some have doubted whether there be a something specific producing what is called malarious fever and allied diseases, because climatic changes alone and without the superaddition of a specific poison, operating in relation to human material of a certain predisposition, produce effects which to the local observer are suggestive of the presence of a specific miasm where no miasm exists. The natural recoil has been to the opposite extreme. When it has been appreciated, by

* Of the Madras Presidency.
† See p. 39.
‡ In the Central Provinces.

competent observers, that the prevalence of a fever of purely climatic significance has been unjustly attributed to the localisation of a specific miasm by insanitary conditions, the tendency is to deny altogether that a specific miasm exists, the effect of which is to produce fever. The natural history of epidemic malaria is yet to be studied; and the study will be more difficult than that of cholera by so much as the individuality of the miasm of malaria is inferior to that of the cholera miasm. It is through its history traced as that of an epidemic, that we shall come in time to know its normal behaviour in this Presidency. I can do little more than state the broad facts which have been brought under my observation, which show to me this miasm as a something having tangible effects, as having a history capable of being written, and as the materies of periodic epidemics having a definite geographical distribution. My remarks are little more than suggestive, and I offer them chiefly that they may give direction to the observation of the facts relating to epidemic malaria in the future. What I have to say here is, however, sufficient to show, that the epidemic history of the one miasm is strikingly allied to and illustrative of that of the other.

The effects of epidemic malaria are very different from those which result in Upper India from the malaria which is supposed to have a local and perennial existence. In its worst form, it is the yellow remittent—the jungle fever, a type of fever which in Upper India is no more endemic than is the cholera miasm. It is wrong to use the term type without the explanation that the same miasm which in one situation or at one elevation produces yellow remittent fever, followed possibly by the typhoid state, in another situation or at a higher elevation, shows its effects as a pure intermittent. The yellow relapsing fever caused by a typhus poison, and communicated from man to man, has been mistaken for this yellow fever; and an epidemic even of this malarious fever has been erroneously associated with one of yellow typhus. But the natural history of these two yellow fevers is diametrically opposite, in their relation to season, and to the circumstances of the populations affected. When the characteristics of each have been clearly laid down, no mistake need occur as to their identity.

It is no unnecessary part of the study of cholera to place here on record the details of these epidemics of malarious fever. As air-borne or geographically distributed epidemics, they have not hitherto been properly recognised. In the future they will certainly recur, and the details may then be studied with a knowledge of what it is that they belong to and whence they spring, and then the truth of the parallels between the air-borne cholera and air-borne malaria poisons, which now we can do little more than guess at, will come to be recognised, and the want of striking individuality in the malaria poison will be compensated for by the more accurate appreciation of the significance of its phenomena.

Although not necessarily coincident, it not unfrequently happens, that epidemics of the cholera and malaria miasms become developed parallel with each other, or at trifling intervals; as examples, we have the epidemics of 1850, and 1856, and 1860, in the western division, and those of 1859 and 1866 in the eastern division of the epidemic area.

In speaking of the meteorology attending the cholera epidemic of 1866-67, I shall have occasion to trace the geography of the malaria of the first of these years, and to show its statistics. Here, I shall define the geography of two epidemics only of previous years, each of a different provincial distribution and confined to the limits of the provinces which are natural for epidemic cholera. The first, that of October 1859, was confined to the eastern division of the epidemic area; the second, that of 1850, was distinctly a malaria of the western division of the epidemic area. Both were universal over the areas covered; they were as universally distributed in fact, as is an epidemic of cholera over its natural province.

It is no more true to say of either of these malarious epidemics, that it was due to local malaria called into epidemic vigour by a special meteorology, than it is to say the same thing of cholera. To any one who has had experience of such a malaria, the fact is evident, that it is an air-conveyed miasm which has covered the area; aggravated and localised it may be by conditions peculiar to certain situations, but a miasm invading, which had previously no existence, and which is destined to die. The epidemic of October 1859 remained in intensity for three months, and scarcely a single individual living within the sphere of its operation escaped; and the deaths of districts were reckoned by the thousand. So deadly and unusual was this visitation, that it has actually been regarded as an epidemic typhus; but beyond the fact that in many cases the symptoms of the fever were so severe as to approach in character to those of typhus, the epidemic had no characteristic to associate it with a visitation due to the typhus poison. It was a malaria in its purest and most intense form, varying according to circumstances from the true intermittent to deadly yellow remittent; and all its alliances were with the cholera miasm.

No visitation of such intensity had been known for sixty years previously. Happily the fever was under the influence of quinine, and hence comparatively few of the European Soldiers died. In two fatal cases which came under my own observation, the aspect was exactly that of typhus. These occurred in a detachment of Her Majesty's 6th Regiment, which occupied temporary barracks on the ground level; and all, both officers and men, suffered from the fever in the remittent form; in the detachment of the Naval Brigade, 100 strong, occupying quarters in the fort of Buxar, a mile distant, elevated about 40 feet above the level of the Ganges, every case without exception was intermittent, although the fever was equally universal. There was no difference of opinion among the Medical Officers who had experience of this epidemic; indeed, nearly all of them suffered in common with the general population. Dr. Sutherland, of Patna, writes :—" Never was the superiority of European medical treatment more obviously and decidedly exemplified than in the treatment of this disease, which

swept off hundreds of the population and in some places left none to till the ground." It was the general subject of remark, that the jail population of the area was almost entirely exempted from this fever, apparently in consequence of being shut up every evening at sunset.

It rained daily from the 1st to the 6th October, and the wind blew steadily from the east the whole time. As soon as the rains ceased the fever commenced.

Its geography is very accurately defined. It was universal from Hazareebaugh to Cawnpore; it was not felt at Futtehghur, Seetapore, Shahjehanpore, nor Bareilly. In the Purneah District in the east, it raged with great malignancy. The table which follows shows the fever at Hazareebaugh and universal in the valley of the Ganges, where it was localised, and reached its maximum in November:—

Distribution of the epidemic malarious fever of October 1859. *European Army of the Eastern Division of the Epidemic Area.*

Stations.	Strength.	Fever Admissions.			Admitted per cent. of Strength in October and November.	Remarks.
		September.	October.	November.		
Hazareebaugh	430	21	119	89	48·37	The invading malaria of October localised in the valley of the Ganges, and at its maximum in November.
Dinapore	1,053	41	123	286	38·90	
Shahabad	242	16	40	95	55·78	
Sasseram	265	10	100	177	104·53	
Ghazeepore	802	18	204	297	62·47	
Benares	1,006	101	143	276	41·65	
Sultanpore	758	42	152	153	40·24	
Roy Bareilly	998	75	141	123	26·45	Little tendency to localisation, marked by decline in November.
Fyzabad	1,632	102	161	130	17·83	
Allahabad	1,800	289	387	273	36·67	
Cawnpore	1,543	89	248	79	21·19	
Futtehghur	887	49	44	76	13·53	Altogether beyond the epidemic influence.
Lucknow	3,716	269	299	149	9·36	
Seetapore	946	60	38	17	5·81	
Shahjehanpore	650	8	11	9	3·08	
Moradabad	419	8	9	3	2·86	
Bareilly	920	27	9	8	1·85	

Dr. Rice, then of Sangor, described an epidemic fever as prevalent in his district in the hot and monsoon months of 1859, and in this he thought that he recognised a typhus. Now, we know from abundant experience of late years, that typhus dies in May as surely as small-pox becomes extinct, and, therefore, I have long regarded with suspicion the conclusion arrived at in this instance. A parallel epidemic, that of 1866, had a distribution as far south as Jubbulpore, and I find the Surgeon of Her Majesty's 23rd Regiment, in describing the fever, incidentally stating, that Dr. Rice had in this case also been inclined to regard the disease as a typhus. It would appear rather, that the fever of 1859 in the south, of Raepore, Dumoh, Saugor, and Bhopal, was geographically continuous with that of the Gangetic Valley and Chota Nagpore, and a portion of the same epidemic, having a distribution parallel with that of the cholera of the same provinces. It is at least important that in following out the geography of epidemics of malaria in the future, the distribution of this southern fever of 1859 should not be forgotten.

Epidemic of the malaria miasm confined to the western division of the epidemic area.

The malaria epidemic of 1850 was confined to the western division. In the following extracts, the exempted area is clearly defined as that separating the eastern from the western division of the epidemic area. Thus the Superintending Surgeon of Meerut writes, that it was felt in all but the eastern part of his division; and that Shahjehanpore seemed to be free from any epidemic; and that the atmospherical influence was felt in a diminished degree over Bareilly and Meerut. From this eastern limit to Goojrat and Lahore in the west, was one unbroken sheet of malaria; the natural province being exactly the same as in the case of the cholera miasm.

The reports of the year for Shahjehanpore, Banda, Humeerpore, and Oraie, which I have examined, make no mention of the unusual prevalence of fever in 1850; the epidemic covered exactly the area of such a cholera as that of 1856 or 1861. The great fever of 1829 had a similar area; but this I need not notice here.

The extracts which follow, show the range and character of the fever of 1850. My inference with regard to it is, not that any unusual meteorology developed *in situ* the germs of pre-existing malaria, but that as the cholera miasm is disseminated by aerial influences over the same area, so was this fever of 1850, a miasm distributed with the monsoon. No such universality and strength of revitalisation is ever likely to occur with a mere fortuitous combination of meteorological conditions, and we know that in the case of cholera, epidemic appearance in this area is not due to any such combination.

The following is an extract from Dr. Renny's Annual Report of Meerut for 1850:—

"Fever prevailed extensively over a great portion of the Meerut Division at the close of the rainy season of 1850, and was felt, more or less, in all but the eastern part. It assumed so much of an epidemic appearance that the description of it comes most aptly under this section of the present report. This epidemic seemed to depend on atmospherical influence,

and was extensively prevalent over the North-Western Provinces and Punjab; Ferozepore being, as far as is known, the only exception of a large station being exempted. In the Meerut Circle the same powerful atmospherical influence was observable in the Saharunpore and Delhi Districts, and the intervening country running along the Jumna; that is to say, the same districts that are in all years subject to malarious mischief, were, under the epidemic impulse, much more unhealthy than usual. This is to be seen in the returns of the Saharunpore and Delhi Jails in the months of September and October 1850; the mortality caused thereby is however recorded chiefly in the months of November and December, because the destructive nature of the fever was marked by the frequent relapses it gave rise to. Meerut did not show much indication of the epidemic, and the jails on the north side of the Ganges, Bijnore, Moradabad, and Bareilly, are reported healthy during the year; yet the same atmospherical influence, in a diminished degree, over these places, was observed in the Military Hospitals at Meerut and Bareilly in the increased admissions of fevers. In the eastern quarter, Shahjehanpore seemed to be free from any epidemic, and Almorah is reported as being more than commonly healthy."

The following extract from the report of the Saharunpore District shows the true malarious character of this fever of 1850, and its identity with the fever of the eastern division of 1859, described in the previous paragraph:—

"So general was the epidemic in its seizures, and so frequently fatal in its effects, that from the return of deaths sent to the Magistrate, it appears that one in fifteen of the inhabitants of the city have been carried off; amongst the European residents of the station, only five escaped sickness by going to the hills before they were attacked. In several, it assumed the remittent form; one case ended fatally, and several others were in danger from head symptoms. One case, I feared, would end in typhus; all these cases of remittent fever have recovered completely, but those who suffered from the less alarming form of intermittent fever are still, with but few exceptions, troubled with enlargement of the spleen, and are constantly laid up with attacks of intermittent fever up to this date. There appears to have been a peculiar property in the epidemic of the past year to induce enlargement of the spleen. I caused all the patients who presented themselves for treatment at the dispensary on or about the 1st December, to be examined for spleen; and twenty-two out of fifty-three were found to have the organ enlarged; whilst out of above 300 prisoners in the jail, only eight were found at the same period to have splenic enlargement. The disease appears to be the ordinary epidemic of the rainy season, more than usually virulent."

The two extracts which follow, show the western limit of the epidemic and its extreme virulence even at this limit; this is a phenomenon parallel with the great intensity of the cholera of Meean Meer, the last station reached in years of invasion.

Goojrat District, 1850.—"The great epidemic of fever which raged so universally in the Punjab at the latter part of the past year, also visited this station, with a mortality exceeding all belief. In one of the neighbouring towns, among a population supposed to be 10,000 souls, the deaths counted in one month were 556. Not one in ten escaped, and nearly a third of the number attacked fell victims. It commenced at the latter part of August, prevailed with the utmost violence through the two entire months of September and October, declined slowly in November, and disappeared by the middle of December. The high and the advantageous position of the jail enabled it to withstand the disease for a considerable time, and in the end its inroads were mild and slight compared to the fatal violence with which it raged among the population around. Our jail was in this respect so completely defended, that it was a subject of remark, that not a single dead body was brought from the prison, while in the city scarcely a house escaped."

This phenomenon of the exemption of the prisoners, is the same which we observed in the eastern epidemic of 1859, and attributed to the fact of the shutting up of the prisoners from atmospheric influences prevailing after nightfall.

Lahore District, 1850.—"An epidemic fever prevailed in the district from the commencement of August to the middle of November. It attacked all classes of individuals without exception, and assumed all types and forms. The intermittent was the most obstinate and least dangerous form, and the quotidian was its usual type. All its stages were very well marked. Some patients became delirious during the hot fit, and in the interval, they enjoyed a tolerably good health for the first three or four days, after which period they generally became emaciated and were confined to their beds. Enlargements of the spleen and dropsy have been the usual consequences of protracted agues, and these cases often proved fatal when neglected."

"Among the acute symptoms, are to be enumerated, a white-furred yellow or brown tongue, and a yellow skin and conjunctiva, showing that this fever was in many cases what is called a bilious remittent."

Western limit of the fever of 1850.

The fever of 1850 does not seem to have prevailed beyond the Jhelum, and the European Regiment at Rawulpindee enjoyed excellent health. Ferozepore and Sirsa in the south were beyond its limits. In the reports of the year we read:—

Sirsa.

"Sirsa in the desert has been extremely healthy, even more so than last year."

Ferozepore.

"No epidemic has prevailed during the year; the prisoners appear to be as healthy as the inhabitants of Ferozepore. The sickness and mortality have not been greater than usual, and the fevers have been slight."

Passing to the east of this limit the epidemic is at once met with.

Loodianah. "Fever was of the intermittent type, and the disease prevailed as an epidemic in and around Loodianah, as well as over all the upper provinces of India."

Khytul and Thanessur. "From the middle of October to the end of November, fevers prevailed to a frightful extent all over this part of the country."

Hissar. "Hissar suffered from the general sickness; 200 deaths were recorded in the town from diarrhœa following fever. There was a much larger amount of sickness from fever than there has been for many years."

Once more I would say, that these epidemics of malaria have an importance in connection with the study of the Natural History of disease in India which cannot be over-estimated; and I trust, that when parallel epidemics occur in the future, the aspect here shown, namely that of an actually invading miasm having a basis of departure, a limitation in space, and universality of distribution over the area affected, will not be overlooked.

I shall return to the subject of epidemic malaria in speaking of the conditions favoring the epidemic advance of the cholera of 1866-67.

The Meteorological Phenomena attending the Invasion of Natural Provinces by Cholera. Propositions F, G, and H.

G.—Cholera has no locomotive power in itself, and the geographical distribution of an advancing epidemic is essentially dependent upon the existence of *a vehicle*. A cholera which has no *vehicle* afforded to it is anchored, and is shown in localised outbreaks only. A cholera of a *dry and hot season*, wherever manifested, is a *reproduced* and not a *primarily invading* cholera. In connexion with the phenomena of reproduction and the conditions which retard or accelerate it, the epidemic distribution of cholera is effected, in the different regions of Hindostan, at the seasons when this vehicle is afforded. The vehicle required is in all cases, and wherever epidemic advance is in progress, a humid atmosphere.

H.—The prevailing wind is the agency which directs the course of an advancing epidemic, and determines its limitation in geographical distribution; the assertion that cholera may advance against a prevailing wind is contrary to fact, and the phenomena brought forward in support of it are, generally speaking, those of a cholera of reproduction, appearing over various and possibly widely separated portions of the same natural province, months or years subsequent to the original invasion, or they may be related even to the cholera of two natural and distinct provinces, each invaded from a separate base, and in a different direction, in which cholera may be in existence at the same time.

The following paragraphs treat of invasion in relation to the atmospheric conditions prevailing during epidemic advance at different seasons and in different localities; the seasons at which advance occurs have already been sufficiently indicated.

The region of endemic cholera is a region of perennial moisture, of moisture which is both air-conveyed and universally and permanently lodged on the surface or immediately beneath it. Here it is that in the dry months cholera is extricated, as soon as the breeding grounds appear above water in October, and it is here that it appears epidemic, when, in February and March, and April and May, the spring and summer of this region, the permanent moisture causes vegetation to sprout forth in luxuriant life. In early spring, the south-eastern breezes carry this cholera over the brim of the endemic basin; their steady continuance gives promise of an early season, and but too frequently of a cholera season also. These are the moist winds of the eastern division of the epidemic area, which are met and opposed by the dry or hot and healthy winds of the west and north. In the south, in the Central Provinces, the influence of these northern and western winds is tempered; and in proportion as their influence is diminished, the wider does the range of eastern influences extend across the continent on what I have designated an epidemic highway. A great portion of this tract is, in fact, in the spring months, assimilated in character to the region of endemic cholera. The general fall of the first rains of the monsoon over Upper India is followed by the submersion of the cholera breeding grounds of the endemic region, and by the comparative extinction of cholera; while in the Upper Provinces the miasm is roused into epidemic life, and becomes a moving epidemic, ready for the invasion of every province lying within the influence of the monsoon of July, August, and September. Wherever cholera is met with in Upper India in October or November as an evident epidemic, there must coexist a meteorology special to the locality, or generally diffused as an abnormal occurrence, in connexion with which the presence of cholera is manifested, and which causes the locality or the province, to approximate in character for the time being, to that of the lower provinces in the same months, or of that portion of the epidemic area in the extreme east, apt to be affected in the same months.

If this generalisation be correct, the conclusion is inevitable, that cholera, wherever met with, is entirely dependent on an atmosphere of moisture for epidemic invasion or progress.

I have already had occasion to show, that delay or acceleration, both of invasion and of reproduction subsequent to invasion, is regulated almost to a day by the meteorology of any geographical situation—that cholera almost never reappears in the west before 20th April; that the cholera of the 20th February in the east, or of the 12th May in the west, is one and the same; and that the cholera of the Terai below Nynee Tal of February 1867, is, in homology, the same with and the Calcutta cholera of February, and with the cholera of the Delhi District of May.

Again, I have shown, how, although revitalised over an area including many thousands of miles, it is on rare occasions only and with exceptional aerial phenomena, that a cholera of May and June in the western division of the epidemic area is endowed with the capability of invading any station; and that the mortality of July, August, and September was one hundred times as great as that of the months of April, May, and June, in the nine years from 1858 to 1866. I have shown, that this was due not to want of vitality, for the dormant cholera of 1861, for example, revived in almost every part of the province in the end of April and in the first week of May, and yet, no station affected in 1861 became reaffected in 1862 before the monsoon set in.

Illustrations of meteorology attending invasion.

I shall here illustrate the phenomena of invasion and of reproduction subsequent to invasion, in relation to the prevailing meteorology.

Jameson writes of the cholera of 1817* as follows—

"From knowing that during the existence of former pestilences the diffusion of the virus could be frequently traced to the motion of peculiar currents of air, it was natural to look for an explanation of this extraordinary regularity of progression in the prevailing course of the winds during that period. Accordingly upon reference to various reports of the rise of the disorder in different parts of the country, it was discovered that in a vast majority of instances the wind was blowing from the east or south-east quarter at the time of its breaking out. This may be stated to have been almost without exception the case in Bengal." * * "The same prevalence of easterly and southerly winds attended its progress through Tirhoot, Sarun, Behar, and Shahabad." * * "In the camp of the centre division of the Army (in Bundelcund) the wind which from the 21st of the preceding month had blown strongly from the west, suddenly changed round to the east quarter on the 7th November, and there are grounds for believing that from that day the disease raged in camp. With the Left Division (Jubbulpore, Nagpore, and Nerbudda Field Force) the wind ranged from east to south from the 1st to the 14th April. The epidemic was with them on the 9th, and abated as the winds came round to the west." * * "In Jeypore, Agra, and other stations of Central India, the winds were easterly during the prevalence of the disease." * * * "The apparent exceptions were not numerous, and when placed in contrast with the innumerable instances bearing towards the opposite point, are not of such magnitude as to overturn the general deduction which we now venture to draw; that the appearance of the epidemic in a particular place was usually accompanied or preceded by an easterly wind, and that there was apparently some connection between the dissemination of the pestilential virus, and the prevalence of currents from that quarter. Of the nature of that connection we cannot speak certainly, nor can we tell whether those currents acting as a vehicle of the poisonous matter carried it along with them from one infected spot to another previously healthy, or acted merely from their superior moisture in the light of a strong exciting cause, eliciting the disorder in places where the virus had previously existed, although it were not yet brought into action."

Jameson goes on to say, that the facts of the distribution of cholera in the west of the Presidency, will leave the reader almost satisfied, that there at least the virus must have been diffused and propelled by the winds, but that the distribution was not so readily to be distinguished in Lower Bengal, which we now recognise as the endemic seat of cholera, in consequence of cholera having become generally diffused and the whole air impregnated. He adds:—"In Upper India the air being less corrupt, required for the production of the epidemic an admixture of vitiated currents which were borne along by the winds. In this view of the case, the agency of the wind, setting aside the effect of its dampness, must be held to have been purely mechanical."

Writing in 1820, Jameson, recognising the retention of cholera by low and damp situations, says:—"In the low and stagnating climate of Bengal cholera having once gained ground has tarried for years; in the pure and elastic atmosphere of the Upper Provinces it was slowly received and quickly lost."

The effects of easterly winds in the early months, in spreading cholera over the eastern portion of the Presidency has constantly been recognized. Indeed, any one who has lived on the Ganges knows well, that cholera may be anticipated if east winds continue for any considerable time, and bring rain with them in March and April. Mackinnon, speaking of Cawnpore in 1845, writes:—"The hot season† was remarkable for repeated falls of rain during the latter part of March, in April, and in May while cholera raged very violently."

The meteorology attending the invasion of the Gangetic Provinces in the East.

I quote again the following passage:—"The hot winds of the Upper Provinces extend in some seasons over the whole of Behar; but in other years the south-east monsoon appears to set in earlier and stronger, and east winds will prevail for the whole of the hot season; the west wind is dry and parching; the east, damp and relaxing. Frequent falls of rain in the hot weather, especially with much easterly wind, observation has led me to think, are followed by disease, especially in the Upper Provinces, where they are least common."

Again, in 1848, Mackinnon, writing from Cawnpore, remarks:—"This station has for two years been perfectly exempt from cholera during the hot months, and no rain fell. This year I foretold its appearance when we had falls of rain and very changeable weather during these months." (p. 297).

In describing the great outbreak of 1848 in the 1st Fusiliers at Cawnpore, Dr. Bruce writes:—"In May easterly winds had prevailed from the 8th to the 22nd of the month, and between the 14th and 23rd there had been several very heavy falls of rain: on the 23rd the hot

* Pages 97 to 101.

† That is, the months of April, May, and June before the setting in of the monsoon.

westerly wind began again to blow, and continued during the remainder of the month, drying up rapidly the moisture that had fallen: the appearance of cholera was clearly to be ascribed to the above cause. The men had been healthy up to the time the rain fell; but before the end of the month thirty-one cases had been brought to hospital. Almost simultaneously, the epidemic made its appearance among the native inhabitants and the native regiments at the station."

The following is quoted from the report of the Deputy Inspector, Cawnpore Circle, regarding the character of the hot season of 1859 in Allahabad and Cawnpore:—"There was nothing remarkable in the season beyond a longer continuance of easterly winds than usual. It was remarked by all the Medical Officers that the disease appeared to ebb and flow as the wind was westerly or easterly. Cholera invariably increased with the return of the east wind." The regular rains commenced very early, on the 6th June.

We must, however, be prepared to meet statements the very reverse. In the case of the terrible outbreak in Her Majesty's 70th Regiment at Cawnpore in May, June, and July 1853, in which 183 men were lost, we read:*—"The predisposing cause of the cholera must be considered as due chiefly to atmospheric causes, on account of its having visited several other stations on the Ganges equally with Cawnpore, and from its existing only with a west and south-west wind, and dying away completely with an easterly wind."†

The meteorology of the two months preceding this outbreak I find recorded thus:—April. "Rain on the whole of the 13th. Rain and thunder on 14th, 22nd, and 23rd. The remainder of the month cloudy." May. "Rain and thunder on 27th; rain on 11th, 12th, and 13th. Remainder of the month cloudy by day and sultry by night." Such a meteorology exactly agrees with my conception of an epidemic season in the eastern province. Observers say that such a season is characterised by the absence of the hot dry and healthy west winds; I prefer to say, that it is characterised by cloudy weather with occasional rain and the continuous presence of damp and relaxing east winds at the season when the hot winds are due. The fact was, that the regiment suffered in both the first and second reproductions of the year, in May and in July. It was struck on the 20th May, and this cholera continued to the 11th of June. A very few cases occurred subsequent to this; but after the last of these, there was a clear break of three weeks from the 27th June to 19th July, when the epidemic recommenced. Exactly the same phenomenon occurred at Cawnpore in 1859. I quote from the report of Her Majesty's 80th Regiment for this year:—"Cholera made its appearance in the regiment on the 5th of May, and continued to prevail up to the 25th of the month; it then ceased, and did not recur until the 5th of August."

Illustrations of the fact of the occurrence of cholera in the Gangetic Provinces at two different seasons, in the spring and with the monsoon.

These are in fact, instances of what all dwellers on the Ganges so readily recognise as the two clearly separated cholera outbreaks of April and July, the first of which in Cawnpore is generally retarded into May. The first reproduction or invasion occurs with the moisture of the spring months; the second with that of the monsoon, subsequent to the middle of July.

I have placed here four examples to show this distinction between the spring and monsoon cholera in this situation. They are typical for this portion of the epidemic area, and occur with the meteorology indicated.

Outbreaks typical in season for the Allahabad and Cawnpore Districts, showing the distinction between spring and monsoon cholera.

Date of Admission of Fatal Cases of Cholera.

Her Majesty's 80th Regiment, Cawnpore, 1859.		Her Majesty's 54th Regiment, Cawnpore, 1861.		Her Majesty's 54th Regiment, Cawnpore, 1860.		Her Majesty's 90th Regiment, Allahabad, 1861.	
May 5	1	May 25	1	March 25	1	May 19	2
„ 7	1	„ 28	1	April 16	1	„ 26	2
„ 11	1	„ 30	2	„ 23	1	June 4	1
„ 12	1	June 1	2	„ 24	1	* * *	
„ 23	4	„ 10	1	* * *		July 21	1
„ 25	2	„ 11	2	August 12	1	„ 24	2
* * *		„ 15	1	„ 14	1	„ 25	1
August 5	1	* * *		„ 22	1	„ 28	1
„ 9	1	July 16	1	„ 23	1	„ 29	1
„ 12	1	„ 29	1	„ 24	1	„ 30	2
„ 13	1	„ 30	1	„ 26	2	„ 31	1
„ 14	1	August 1	1	„ 27	1	August 1	1
„ 15	1	„ 2	1	„ 28	1	„ 2	1
„ 20	1	„ 3	2	„ 29	1	„ 3	1
„ 22	2	„ 6	1	* * *		„ 5	1
„ 23	1	„ 10	1				
„ 25	1	„ 12	1				
„ 26	1	„ 13	1				
„ 27	1	„ 14	1				
„ 28	1						

* The Surgeon in charge at the time of the outbreak died of heat apoplexy, induced by over-fatigue, and it is evident that the Medical Officer who wrote this report was not acquainted with the facts. The meteorology was the reverse of what is stated. It was on the 23rd May that the outbreak commenced, and for six weeks previous the Cawnpore District had been under influences from the east. This cholera of 1853 was a cholera of a perfectly normal provincial distribution, absolutely confined to and universal over the eastern province. This cholera swept up the Ganges Valley, striking Dinapore on the 6th May and Cawnpore on the 23rd.

† Report of H. M.'s 70th Regiment for 1853.

Another parallel example showing the distinction between the May and monsoon cholera in this geographical situation, is thus described in the report of Her Majesty's 97th Regiment, stationed at Banda in 1859:—"Towards the end of May, cholera which had been committing great ravages at Allahabad and in the intermediate districts, made its appearance at Banda. During the first week of June, the disease became exceedingly virulent and deadly amongst the Natives, and although at this time only five cases occurred among the men of the regiment, they all proved fatal."

"The periodical rains set in earlier than usual, and cholera for a time entirely disappeared. The immunity, however, did not last long. The monsoon had not fairly commenced. The rains entirely disappeared towards the end of June, and for a period of three weeks the weather again became intensely hot. Cholera reappeared in the regiment on the 10th July and continued until the 23rd."

The prevalence of east wind was noted in every station of Oude previous to the outbreak of the spring of 1860; it is noted that the weather was foggy and sultry with occasional falls of rain. Dr. Hilson, with reference to the cholera of Gonda in March 1860, writes thus:—

"One of the meteorological conditions which is known to favour the development and transmission of the cause of cholera is a moist state of the atmosphere, and it is worthy of note that the advent of the disease in Gonda and the surrounding country, was immediately preceded, or at any rate accompanied, by a heavy fall of rain with thunder and lightning. Locality appeared to exercise little influence on the extension or virulence of the epidemic. No village escaped, whether it was situated on high ground or low ground. I was unable to find one village which had not been attacked, while in some the population had been literally decimated. This cholera finally disappeared from the district on 17th April."

The meteorology attending the invasion of the Nagpore territories in spring. Significance of the phenomena observed in this situation.

In the south and south-east where the climatology closely approaches to that of the region of endemic cholera, cholera may be distributed in seasons which for such a locality have an exceptionally small rainfall. This is a geographical continuation, in fact, of the phenomenon observed in the case of endemic cholera, namely, of prevalence in the hottest and driest season, from March to May; and the explanation of this is, that in such a situation, moisture is perennial, and there is no equivalent of the conditions under which, in Northern India, a moving epidemic is brought to a standstill or to an untimely end. In the report of the Raepore District for 1860, it is stated, that for the month of April, the thermometer stood 10° above the average, and that the tanks and wells in the station dried considerably more than in previous years. I have noted previously also, that throughout the Nagpore Circle the cholera of March and April disappeared throughout the month of May, and was renewed only with the monsoon, by which it was conveyed as far to the north-west as Agra. But the cholera of Nagpore of this year was not distributed, as the above report would suggest, in April, but immediately after the revitalisation of 20th February, and the meteorological report of Nagpore mentions that in February rain fell on 1st, 7th, 14th, 19th, and 23rd, while the weather was cloudy and sultry. Cholera broke out in Nagpore city on 1st March. Again at Chanda, at the same time, the early and abundant blossoming of the mango trees was held as indicative of a cholera season. The Medical Officer says:—"I would here note a curious belief which prevails among the Natives respecting the appearance or absence of cholera after the close of the cold season. They are able to foretell its coming by the abundant flowering of the mango trees, a phenomenon which they maintain to be always the harbinger of the disease. This statement has been verified in my experience in 1856 and in the present year. In this year, the mango harvest has been abundant, and in the intervening period between 1856 and 1860, when we enjoyed exemption from cholera, the harvest was almost a total failure."

The meteorological phenomena attending the invasion of this portion of India I have alluded to in many parts of this paper in connexion with my description of it as an epidemic highway, and in describing the invading epidemics of Nagpore and Saugor, and the method in which cholera is carried from the east to the west of India.

Following invading cholera towards the north-west, we find Dr. Murray describing the atmospheric conditions prevailing at Agra in the months previous to the coming of the great cholera of 20th May 1856, thus:—"During April and May, the atmosphere was hazy with easterly winds, and with little of the usual hot westerly wind. The regular rainy season commenced with a heavy fall of rain on the 30th May. The quantity that fell during the season was 37·85 inches —14 inches more than the average fall at Agra for the year. During the month of June, the air felt oppressively hot, close, and damp."

The meteorology attending the invasion of the western division of the epidemic area in spring and in the monsoon season.

Dr. Crozier evidently reckons the setting in of the regular rains from a different date, but his testimony entirely confirms that of Dr. Murray. He writes*:—

"The hot westerly breezes of the months of May and June were entirely absent, a deprivation much felt, as the tatties would not work and were rendered useless. Easterly winds, however, prevailed to a great extent, and many ascribe the unhealthiness of the season to their occurrence."

"The regular rainy season did not set in until a later period than usual, but when the rain did fall, it continued almost unremittingly for a whole month. It lasted also for a longer time, and advanced somewhat into the cold weather."

* Report, 3rd European Regiment, for 1856.

The cholera of 1860 did not reach Agra with the spring rains, but in the regular monsoon season. I have above noted how in Nagpore and the extreme south-east, the spring rains failed in April and May, and therefore no material was left for the formation of rain clouds in the north-west, and cholera having no vehicle, remained where it was in spring until the setting in of the monsoon rains. Dr. Murray describes the season, and the stoppage of the advance of cholera in the north-west with the failure of the monsoon, thus :—

"The season has been irregular. There was scarcely any rain during the cold weather. There was a heavy shower on the 9th or 10th of June, after which the hot winds returned; and the rains did not appear until the 18th July, and there was little rain after the 20th August in the country north of Agra.*"

"Cholera reached Gwalior on 22nd July, some days after the first fall of rain. It appeared at Agra in the beginning of August, and a few days later at Muttra, beyond which it has not extended to the north."

Dr. W. Walker notices the phenomena immediately attending the appearance of this cholera at Agra in the following sentence :—"During the prevalence, or more correctly at the first onset of the disease, the atmosphere remained for days clouded and murky to a degree; not much rain fell, but a thick drizzling mist continued during the greater part of a day."

Meteorology in 1860 of the famine tract of 1861, an exempted cholera area.

The meteorology of the exempted cholera area of 1859 and 1860, within which our European Soldiers enjoyed so high a standard of health, is described in the following quotation. In the eastern half of the Doab, included in the eastern division of the epidemic area, which suffered so severely from cholera both in 1859 and 1860, Colonel Baird Smith describes the harvests as magnificent. The failure of the crops within the famine tract he ascribes to the following causes. He writes :—

"It is well known that 1858, 1859, and 1860 were very dry and unfavorable. The nature of the drought was in each case the same. An almost entire failure of the rains required for the autumn crop, and the consequent destruction of that crop, was followed by a total failure of the spring rains, so that no land could be cultivated but with the aid of artificial irrigation. When no autumn rains fall after August, it matters very little, as far as agriculture is concerned, what the previous falls may have been, and as it was the case that both in 1837-38 and 1860-61, not a shower fell from September till March within the bad parts of either famine tract, the conclusion that the physical intensity of the drought was practically the same in both is a safe and reasonable one, and the broad fact of this identity makes the absence of detailed registers in the earlier period a matter of no serious practical importance."

The commencement of the movement of the cholera of 1860 on the exempted tract of that year in the end of May 1861, was coincident with the reappearance of the normal rains. In his report to the Punjab Government, Dr. D. B. Smith, then Civil Surgeon of Delhi, mentions, that the first heavy fall of rain at Delhi in 1861, occurred on the 31st May; and it was on the 11th June, that the first case of cholera was noticed at Delhi. As I have stated, the cholera of 1860 had been generally revitalised in the districts immediately to the south and south-west of Delhi for six weeks previous to the date of this invasion.

Parallel of the exemption of the Meerut District in 1850.

The cholera which was universal between the Jumna and Nagpore in 1850, and which became the cholera of 1851 and 1852 of Meerut and the Punjab, was excluded, as in 1860, from these provinces by an adverse meteorology. I find in the report of the 18th Royal Irish, stationed at Meerut in 1850, the following :—

"The weather was exceedingly backward and unseasonable, the hot winds blowing fiercely until the end of July without the temporary alleviation incident on the storms usual at that period of the year. Even when the rains set in they were scanty, and the hot winds prevailed to a greater or less extent up to the end of September."

The table which follows, shows very well the distinction, even in ordinary years, between the meteorology of the eastern and western half of the Doab. It is compiled from the data given in the Famine Map of 1861.

Rains of the Doab, (Baird Smith).

RAIN-FALL OF AN AVERAGE YEAR.

Eastern Half.			Western Half.		
Districts.	Spring Rains.	Autumn Rains.	Districts.	Spring Rains.	Autumn Rains.
Allahabad	6·23	36·40	Mynpoorie	3·06	21·60
Cawnpore	2·41	21·72†	Allyghur	?	20·93
Shahjehanpore ...	5·90	24·96	Muttra	1·83	16·45
Bareilly	5·21	32·73	Agra	1·70	17·88
Moradabad	6·31	23·79	Bolundshuhur ...	4·08	16·83
Humeerpore ...	2·82	28·00	Meerut	4·67	17·30
Etawah	2·67	25·99	Mozuffernuggur ...	9·56	24·82†
			Seharunpore ...	14·21	33·00†
			Bijnore	8·42	32·74†

* *Vide* Mactier's Report for Meerut regarding the rains of 1860, page 68.
† This average is understated. For 1866-67 a fair average year, the rain fall was 28·60.
‡ Rain-fall increased by proximity to the hills.

1860, A YEAR OF MINIMUM RAIN-FALL.

Eastern Half.			Western Half.		
Districts.	Spring Rains.	Autumn Rains.	Districts.	Spring Rains.	Autumn Rains.
Allahabad	·90	32·90	Mynpoorie	·90	11·08
Cawnpore	1·60	Erroneously stated.	Allyghur	1·20	14·20
			Muttra	1·50	11·00
Shahjehanpore ...	3·00	27·21	Agra	·40	9·55
Bareilly	·90	18·70	Bolundshuhur ...	·72	8·13
Moradabad	·90	22·81	Meerut	1·40	6·60
Humeerpore ...	2·30	20·00	Mozuffernuggur ...	1·00	8·97*
Etawah	·00	27·22	Seharunpore ...	2·21	11·55*

Extension to the west of the exempted area of 1860.

I find that in the west as well as in the north, monsoon influences and cholera were both absent in 1860. Ajmere, which usually suffers along with Agra, was not reached in 1860. The report of the year states:—"The rains set in a month later than usual, and were very scanty; about three inches only fell in July. We had two showers in August, and also a slight shower on 27th September. Altogether, we had not above six inches of rain during the whole year."

But Ajmere may be reached with the very same eastern influences under which Agra is attacked in May. The meteorology of this part of India is thus described by Irvine:—

Meteorology of Ajmere and the neighbourhood in relation to invasion.

"If the hot winds commence early in April and blow steadily, with only one or two heavy squalls in May, the rains may be confidently expected about the 10th or 15th of June, and will set in heavily and continue at intervals till early in October, at which time there will be an abundant supply of water all over the country, and a very cold season will follow till the middle of December, about which time, if one or two heavy showers fall, and then the clouds disperse, the cold season will be diminished greatly in temperature, and prolonged in duration, the crops will be splendid, and again a regular hot wind will succeed.

"On the other hand, if a considerable period of cloudy weather occurs in December, with light partial showers, the cold season will be much cut short and become less healthy; the clouds will clear up, and after an interval of fifteen or twenty days again appear and light showers fall; the season will be altogether hotter, and the crops will be inferior. *In March, April, and May clouds will continue to gather, and in May generally heavy rain will fall*; the hot wind will not blow freely. The season will be oppressive comparatively; the rains will not set in till the end of June, or early in July, will be light, and end about the middle of September. The following cold season will probably again be of shorter duration than usual, and hotter."† This is another illustration of the results of the antagonism of eastern and western influences.

At the opposite margin of the western province of invasion, the influences from the south-east, which bring cholera with them, remain the same.

The meteorology attending invasion at the north-western limit of the western division of the epidemic area. Epidemic of 1856.

At Agra, in 1856, the rainfall was reckoned by Dr. Murray, at 37·85 inches. Dr. Paton states that at Meean Meer, the limit of the invasion of the monsoon cholera of 1856, the fall was 38·62, although the climate of Meean Meer is naturally dry. The prevailing winds here also were from the east and south-east.

He gives the following history of the condition of the air at the onset and during the prevalence of the great outbaeak:—

"The weather in July, especially its latter half, was hot, sultry, and oppressive, reminding one of that still, heavy state of the atmosphere observed before an earthquake. What wind there was during the day came faintly, generally speaking, from the east and south-east, but about 9 P. M. it usually came steadily from the latter direction. Lightning was also observed low down in the horizon in the same direction, and not unfrequently in the east and north, for many days before the rains actually commenced. The average of the thermometer in the air for the latter half of the month of July was 95° at 4 P. M., and at 10 P. M. 79°. Heavy rain fell on the 7th, 25th, and 26th, and the total fall for the whole month, indeed I may say for the three days, was 8 inches and 39 cents.

"During the month of August the rains were, for Meean Meer, abundant, measuring for that period 14 inches 30 cents, the south-east wind almost invariably prevailing. The average of the thermometer in the air at 4 P. M. was 96°, and at 10 P. M. 85°. The atmosphere had frequently that heavy, leaden, dull appearance which gives a sickly hue to both mind and matter; the very clouds seemed fixed and immovable. On the 7th of this month, cholera attacked the Europeans of the Artillery.

"For the first fifteen days of September, only 2 inches 40 cents of rain fell; the wind, too, which had been also constantly south-east, began to change towards the latter half of the month to the south, south-west, and west, and the weather immediately cleared up, and the epidemic subsided and gradually disappeared at the same time."

* Rainfall increased by proximity to the hills.

† Topography of Ajmere. Irvine. 1841, page 67.

He adds:—"Cholera I believe firmly to be a poisoned and altered state of the atmosphere carried steadily in one direction; this atmosphere appears to have travelled almost in a direct line from south-east to north-west."

Epidemic of 1861.

The author of the Cholera Report of 1861 admits the fact that east winds and rains in the North-West usually accompany the appearance of cholera; that cholera has been chiefly prevalent during seasons when the amount of rain has been greater than usual, as in 1845, 1852, 1856, and 1861; and that easterly winds in Northern India are favorable to the diffusion of cholera. He says:—"Easterly winds always prevail during the periodical rains of Northern India; when the rains are especially heavy, the wind will be especially constant; if, as we believe to be undoubtedly the case, seasons of heavy rain are favorable to the diffusion of cholera, it necessarily follows that seasons of cholera will ordinarily be seasons when easterly winds are especially prevalent." He speaks here of invading not of reproduced cholera. His conclusion, which is the same as that of all other observers, is thus stated (para. 348):—

"Cholera has not its origin in atmospheric causes. The facts have an entirely different bearing. They show that while the relation to atmospheric conditions is evidently real, the original causes of cholera are perfectly distinct, and that the poison, whatever it may be, has a separate existence which certain conditions of climate may aggravate or repress."

Countries beyond monsoon influence in which invading cholera terminates. The North-Western Desert.

The nature of the country in which the monsoon comes to its end, and in which invading cholera stops, I find well described in the following, from a report on the topography of Upper Scinde by Mr. Sutherland. He writes:—

"The influence of the periodical rains is lost soon after entering the territories of Bhawul Khan. Bhawulpore, Beekaneer, Jessulmeer, and Upper Scinde have none. When rain does fall, it is uncertain both in time and quantity, and more likely to occur at the cold season than at any other."

"After leaving Ferozepore, the nature of the country for the first five marches differs in no material degree from that in its immediate neighbourhood. Here commences the Bhawulpore country, and six marches beyond, the sandy plains of the Beekaneer desert are found to approach the great road. The whole country up to this point is covered with jungle, consisting of acacia trees, which affords admirable grazing for camels, which advantage, as well as the nature of the ground, renders this country well adapted for the rearing and keeping in health that most useful animal. Immediately on leaving the Seikh states, the influence which the proximity of the Beekaneer desert exerts on the Bhawulpore country is apparent; the very aspect of the soil, without enquiry, tells the observer that rain is there unknown."*

Trans-Indus Districts.

On the frontier beyond the monsoon, although the rainfall is larger, it is not necessarily coincident with the rains of the east, and the advance of cholera at this season is utterly cut off from the Trans-Indus stations. We read:—"At Kohat there is no fixed period of rain. It is pretty equally distributed over the year, and the average fall is only 12 inches." Again,—"At Bunnoo the seasons may be divided into two, the hot and cold. The hot lasts from 1st May to 15th October; the cold from 15th October to 1st May. The falls of rain do not preserve any regularity, sometimes occurring in spring, sometimes in autumn, but, generally speaking, at uncertain intervals during the cold season. Heavy falls rarely occur in autumn, but when they do, sickness is greatly increased."

Rainfall of the Punjab in epidemic and non-epidemic years.

The table below shows the spring rains of the Punjab contrasted in an epidemic and non-epidemic year:—

Spring rains of an epidemic and non-epidemic year in the Punjab.

Stations.	May 1866.	May 1867.
Delhi	·9	1·4
Goorgaon	·0	2·3
Hissar	·0	·5
Rhotuck	·0	2·8
Jhung	·0	1·8
Mooltan	·7	1·8
Kurnaul	·0	1·5
Umballa	·0	·9
Jullundur	·0	7·2
Sealkote	4·2	6·2
Kangra	·6	12·3
Dhurmsalla	·5	13·0

In an epidemic year (not necessarily a cholera year), the rainfall of Meean Meer may be as high as that of Agra.

* Observations on the route from the N. W. Provinces to Scinde, 1844, p. 29.

But in a non-epidemic year the falling off of the monsoon towards the North-West is beautifully shown. The figures for 1866, for the months from May to September, when Mooltan and Peshawur were among the healthiest stations of Bengal, were as shown in the following table :—

Tailing off of the monsoon in the North-West indicated by the gradual diminution of the rainfall.

Stations.	1865, an average year.	1866, a non-epidemic year.	1867, an epidemic year.
Delhi	24·3	32·3	32·6
Kurnaul	20·9	15·0	27·7
Hissar	16·8	10·2	19·5
Rohtuck	13·7	11·8	21·4
Sirsa	15·5	13·7	13·9
Jhung	6·0	4·1	11·2
Mooltan	1·9	2·1	5·0
Dera Ismail Khan	·8	·7	4·5
Frontier Stations.			
Bunnoo	3·9	7·5	13·6
Kohat	5·1	12·3	5·8
Peshawur	3·6	3·2	4·6

The rainfall of stations of the Punjab lying towards the hills, in which the fall is larger and more uniform.

Stations.	1865.	1866.	1867.
Umballa	25·8	22·2	36·0
Hoshiarpore	27·6	29·0	28·2
Jullundur	15·2	23·9	31·2
Umritsur	22·2	22·6	24·5
Sealkote	17·4	29·8	41·1
Lahore	16·9	18·5	18·1
Rawulpindee	18·7	14·4	13·1
Hill Stations.			
Simla	38·0	58·2	47·8
Dhurmsalla	117·0	82·8	113·6
Kangra	49·8	53·4	68·9
Murree	26·0	28·3	28·4

In the report of Her Majesty's 51st Regiment for 1860, I find what appears to be the truth, very briefly summarised, thus :—

"The south-east monsoon is supposed to be felt as far (one year with another) as Lahore, coming over Bengal.* * This is the same as the south-west monsoon which strikes the western coast of India, but would appear to be felt but a short way into the interior, its force being expended almost entirely upon the ghâts and first table-lands on that side of Hindostan. What portion of the monsoon advances so far, reaches the Punjab in the form of a south-east wind."

Mooltan District.

It has been affirmed that Mooltan is not reached by the epidemic cholera of the Punjab. This idea I consider to have arisen without reason. Whether Mooltan is reached or exempted, depends upon the amount of its rainfall in the monsoon months. In 1856, out of seventy-seven men of the Battery stationed at Mooltan, eight were attacked and three died. In 1856, Mooltan had an exceptional rain-fall. "The amount of rain in August and September," writes Dr. Macintyre, "was not so much, in my opinion, the cause of sickness, as its being unseasonable and unnatural to the place; the amount which fell would be trivial in most parts of Hindostan."

The distribution of epidemic cholera a provincial, not a local, phenomenon.

In these paragraphs I have spoken of an invading cholera as making its invasions in the east, in the south, and in the west from out of the endemic region. I have not alluded to a cholera reproduced after invasion, to the secondary advances of a cholera which has occupied a province, or to the phenomena which are alleged to occur in any single station of an occupied area in connection with the appearance of cholera. It is not the phenomena

attending the immediate outbreak of cholera at Allahabad, Nagpore, Agra, or Lahore that I have here related. I am convinced that the most accurate register of aerial phenomena in any station will help little towards determining with precision the circumstances which precede great cholera outbursts. Invading cholera I believe to be generally rained down upon, or shot over a province, with one series of prevailing meteorological conditions, and to be locally manifested on many occasions with a series of phenomena which are different. A station may be struck by a cholera rolling along and passing over it like a wave, and will continue to show the effects of this wave for a certain limited number of days; while, if a cholera be portion of a body which has settled and comes forward in a stagnant atmosphere, a city may remain affected for a much longer period, and even during the prevalence of winds from a direction contrary to that from which invasion took place originally. But I would not be misunderstood in making this statement. If the wind be unfavorable to the propagation of cholera it dies. Thus, at Lucknow, in September 1867, a few days of steady westerly wind caused the disappearance of the great cholera of August from the city. This subject will again be referred to in studying aerial phenomena in connection with the *Outbreak*. Strachey alludes to the reports of different Medical Officers who recorded their observations during the outbreak of 1861, only to show how little reliance can be placed on locally recorded meteorological details.

The object of meteorological records is well stated by Hennen in the following sentence:—"Nothing can be more jejune and uninteresting than a protracted enumeration of the daily variations of the atmospheric temperature, weight, and moisture, or of the different shiftings of the winds, if the person who describes such occurrences does not deduce from them some practical information, by marking the effects which they produce upon the health of man and upon the face of nature. But if to the changes of the state of the atmosphere is added an account of the manifest influence which they have exerted on the health of those who were previously well, or on the diseases of the sick and convalescent, then an otherwise trivial piece of information is converted into an interesting and an instructive fact. In like manner, if any particular state of the weather has a marked effect upon vegetation, it may consecutively produce a very powerful influence upon the health of the inhabitants of the district where it has prevailed. While the medical topographer should by no means neglect minute and regular observations upon the changes of the weather, he should consider them not as a primary object of research, but should view them as merely subservient to the great purpose of explaining the origin and progress of disease; and it is by comparing the cause and the effect together, and repeating the comparisons faithfully and frequently, that registers of the weather can ever be made available to useful purposes."

The meteorology attending reproduction in an already invaded area, to be carefully considered apart from that attending invasion.

In the case of the occupation of a province, considered as a fact apart from all minor details, there is no ambiguity. But to one who does not appreciate the fact of the reproduction of an invading cholera months after the invasion has taken place, the apparent course of cholera is irreconcileable with any idea of its subordination to natural agencies; and hence, theories are constantly invented to explain what in reality requires no explanation beyond this, that the cholera which springs up on a certain date within a province which has been occupied, is a re-development, from a state of dormancy, of the same cholera which disappeared after showing its presence for so many weeks, perhaps in the year before. This is in fact a minor manifestation of what is constant in the endemic area. I quoted Jameson's remark that the direction of invasion in the endemic region of cholera was not perceptible because of the general distemperature of the air; so in the eastern province, for example, the distempered air—the cholera-bearing atmosphere—reappears in any spot already covered at a season determined by its geographical situation, provided the conditions for revitalisation are afforded. A cholera of Banda or Cawnpore of the previous year will reappear in the following May; a cholera invading Oude or the stations of the Ganges in one year, is due in March or April in the next year.

Illustration of a revitalisation in the year following invasion in the eastern province.

I cannot better illustrate the revitalisation of an invading cholera in a natural province than by placing here the contents of a paper by Dr. W. Walker, published some years since in the records of the North-Western Provinces, regarding the simultaneous appearance of choleraic influence throughout the eastern province in the week from 8th to 15th June 1864. This affords also an instance, additional to the many which I have already quoted, of the true provincial distinction between east and west in the North-Western Provinces. It shows how this powerful cholera, which had advanced up to the margin of the eastern province as far as to Banda and Humeerpore, was unable to travel in the course of the Jumna, even to Calpee or to Etawah.* The few cases exceptionally noticed at Muttra belonged probably to the cholera which became the cholera of the Ferozepore District in 1865. The cholera which Dr. Walker describes, I regard as the reproduction of the invading epidemic of 1863, which covered the exempted area of 1862 in the months between April and July. Its distribution is *an absolute parallel* with that of the eastern cholera of 1860 following the invasion of 1859.

Dr. Walker writes:—"I have taken advantage of my position (as Inspector of Jails) to ascertain how far the choleraic influence in the atmosphere was felt among the population of the North-Western Provinces during the week 7th to 15th June, when cholera so heavily visited the jail of Allahabad."

* For the parallel fact in 1818, see quotation from Jameson, p. 58.

Exempted area.

Dr. Walker finds no case in the Dehra, Seharunpore, Meerut, Bolundshuhur, Allyghur, Bijnour, Moradabad, Bareilly, Budaon, Shahjehanpore, Futtehghur, Etah, Mynpoorie, Etawah, Agra, Jhansie, Lullutpore, and Ajmere Districts. Some cases are said to have occurred in a village of the Mozuffernuggur District, and seven cases are reported from Muttra; and he adds, "strange to say, at Bareilly, a man of the 107th was attacked on 18th June."*

Occupied area.

In the Humeerpore District cholera prevailed extensively. In the Banda District the disease was very prevalent, and also in the south of the Mirzapore District. Although prevalent in the Allahabad District, its intensity was not so great as might have been expected from the sharpness of the attack in the jail. In Benares the disease was prevalent, but not to a marked extent. In the district of Azimghur the population suffered considerably. In the Goruckpore District also the disease was generally prevalent. The Civil Surgeon of Oraie states that reports of the appearance of cholera in some parts of the district had been made to him.

Dr. Walker concludes:—"The choleraic influence was confined to a continuous tract of country. The Humeerpore, Banda, Allahabad, Mirzapore, Benares, Azimghur, and Goruckpore Districts suffered most. The sudden appearance of the disease put it out of the question that the affection moved with slow tread along human highways. Simultaneously, at Goruckpore, Allahabad, and Banda, on the 8th of June, the affection showed itself, indicating beyond a question that it had its origin in wide spread atmospherical conditions."

Had Oude been under Dr. Walker's jurisdiction, he would have found this cholera general throughout this province at the same time.

The phenomenon above described was a redistribution within the provincial limits, of a vitalised cholera of May, by a generally prevailing atmospheric condition favorable for epidemic manifestation. The usual difficulty occurs in determining what this actually was. Dr. Walker says that he has not succeeded in tracing any extraordinary condition that would justify him in recording it as a concomitant of this cholera. He adds,—"Dr. Hooper remarked at Allahabad that during the five days—8th to 13th June—the wind veered about several times in the twenty-four hours, and from the 13th, the wind began to blow steadily from the east." The conclusion I feel inclined to draw is, that the epidemic manifestation of this invading cholera of 1863, revitalised in May 1864, was repressed so long as the hot west winds blew steadily; but that as soon as eastern influences commenced to dominate on 8th June, the conditions became those suited for general manifestation, and that this was distinctly confined to the natural province within which revitalisation occurred.

In the chapter treating of aerial influences as affecting the attack of communities by epidemic cholera, I have given a precise illustration of the converse of this case, occurring in the same area; namely, of the sudden cessation of the cholera of April 1860 from the opposite combination of meteorological conditions.

Rain-fall of an epidemic and a non-epidemic year in the Eastern Division.

The small number of outbreaks of cholera over the east in 1864, and the fact that with a single exception (Her Majesty's 36th at Lucknow), these were attended with trifling mortality, was due in all probability to the special character of the season. The rains were a month behind the usual time in setting in, and by the middle of September they had ceased. The rain-fall was in some stations but 12 inches; and the result was, the maximum of health in acclimatised troops, and the maximum of sickness in the non-acclimatised, true typhoid fevers with ulceration of Peyer's glands taking the place of paroxysmal fevers. The cholera distributed in 1863 did not show itself in epidemic force, as it would have done in a year of a different constitution; and even the outbreak at Lucknow commenced after the medical officers were congratulating themselves in the termination of the cholera season without any general manifestation. The smallness of the mortality in the European Regiments at Allahabad and Cawnpore, and in Her Majesty's 107th at Lucknow, may, in a great measure, be attributed to the character of the season.

Monsoon rains of Oude, 1863 *and* 1864.

	1863, AN EPIDEMIC YEAR.		1864, A YEAR OF REPRESSED CHOLERA.				
Months.	Lucknow.	Fyzabad.	Lucknow.	Roy Bareilly.	Baraitch.	Gonda.	Seetapore.
May	1·4 in.	·7 in.	7 in.	2·0 in.	9·1 in.	1·9 in.	2·3 in.
June	10·5 „	10·7 „	·5 „	3·0 „	·7 „	·2 „	·0 „
July	26·3 „	15·1 „	6·9 „	1·8 „	6·5 „	7·5 „	9·4 „
August	22·4 „	16·8 „	3·9 „	3·8 „	3·1 „	5·6 „	3·7 „
September	13·3 „	18·5 „	2·7 „	2·0 „	2·9 „	3·9 „	2·6 „
TOTAL ...	73·9 in.	61·8 in.	14·7 in.	12·6 in.	22·3 in.	19·1 in.	18·0 in.

* The third occasion on which during these fifteen years the last European soldier died from cholera, at Bareilly, reckoning our stations from east to west. The two previous occasions were in 1859 and 1860.

1865 and 1866 were also in Oude non-epidemic years, with a rain-fall below the average; and in 1867, when cholera again covered Oude to its furthest limits, the rain-fall was far in excess of the average. Dr. Cannon, in his report on the cholera of Lucknow of 1867, gives the rain-fall of the five years in inches as under:—

1863.	1864.	1865.	1866.	1867.
61·4	20·0	27·3	25·2	66·1

Such a fact might very readily tend to the suggestion of the theory, that a certain amount of rain occurring at a certain season, causes the springing up of the cholera germs latent in the epidemic provinces, while these are not evolved by the minor degree of humidity, and that an epidemic of cholera means merely the manifestation of local cholera in relation to a certain meteorology; or again, that the extreme humidity necessarily provides a vehicle for the importation of the cholera miasm from without.

A year of excessive rain-fall is not necessarily a cholera year, as shown by the exemption of the Central Provinces in 1867.

The provincial distribution of cholera in 1867 disproves both suggestions. In Nagpore and Central India, the rain-fall was the heaviest that had occurred for years, and yet not a case of cholera occurred from Raepore in the east to Erinpoorah in the west. Even as far to the north as Jhansi and Etawah, no cholera occurred along with the excessive rain-fall of 1867, although the limiting line of the epidemic of the year was but a few miles distant. The report from Jhansi is,—"No epidemic has occurred during the year. In September, October, and November, however, there was much fever, due, apparently, to the excessive rain-fall of the year, which exceeded the average by at least a third." From Etawah, the Civil Surgeon writes:—"We have been, I may say, quite free from cholera and other epidemic diseases." From Jubbulpore, Dr. Rice writes:—"Rain fell in each of the first five months of the year, and this tended much to temper the heat in April and May. The rains set in with their usual regularity on the 7th of June, and from that day till the day of cessation—the 19th September—it rained on seventy-three out of the 104 days. The total rain-fall has been unusually heavy; it has been the greatest but one, of the last eighteen years, during which a record has been kept." In the report from Nagpore, it is stated:—"The rain-fall far exceeded the average, amounting to 59·18 inches." Bandhara gives a rain-fall of 57·9 inches. Every one of these districts reports that no epidemic has shown itself throughout the year.

It requires to be taken into account, in considering the invasion of Central India lying above the Vindhya, and yet in the southern epidemic highway across the continent, that the physical aspect of the country is very different from that of the rest of the epidemic tract with which it is associated. The districts through which this tract runs in the south are known receptacles of epidemic cholera. The plains of Berar or of Khandeish (a jungly swamp between the Sathpoora and Chandore Hills), or the valley of the Nerbudda, afford facilities for the crossing of cholera from sea to sea, which are not afforded by the plateau of nearly 2,000 feet of elevation. The climatology is in all respects different; and hence it is, that cholera passes far to the west in the epidemic tract south of the Vindhya before Saugor or Bhopal is reached; that Guzerat and Western Malwa often suffer earlier than Saugor or Bhopal, and that invasion is generally delayed until May, while in the east, south, and west, cholera is frequently epidemic in March. For this part of India, May seems to be naturally the month of the appearance of cholera, as it is for the Cawnpore and Banda Districts. No parallel can be drawn for this plateau and that of Hazareebaugh, which is of a similar elevation. The geographical situation and its proximity to the base of eastern influences, determine for Hazareebaugh an aspect totally distinct.

Contrast between the aspect of the plains of Berar and Khandeish and the plateau of Central India, essential to be recognised.

The following quotations very well illustrate the conditions under which a body of cholera, whether dormant or invading, becomes epidemic over these provinces.

The meteorology attending the occupation of the southern epidemic highway.

The weather by which the epidemic of 1864-65 was ushered in in Nagpore in the early months of 1864, I find from the Nagpore registers to be of this character:—

"*April.*—Stormy on the nights of 11th and 13th, with thunder and lightning on former date. Slight rain on 3rd, 12th, 18th, and 19th. Cloudy on 6th and 7th; weather hot and sultry during the day.

"*May.*—More or less rain fell on twenty-five days, and on eight of these it was accompanied by violent storms of wind, lightning, and thunder. In the day, atmosphere close and sultry."

On the 2nd May, the Civil Surgeon writes, reporting that cholera is prevailing throughout the whole of Nimar. On the 4th May, cholera appeared in many parts of the Bhopal territory, and between the 12th and 15th May, cholera was distributed over the Saugor District. It was on the 11th July that the monsoon cholera of the year made its appearance at Saugor.* It was with a humid atmosphere that this cholera of Saugor of May was introduced, the result of the twenty-five days of a moist atmosphere to the south. Dr. Rice writes:—"Rain fell here in May in sufficient quantity to take the great dryness out of the air, and until the rains set in on the 5th July, the atmosphere was hazy and the sun a good deal obscured."

All of these examples illustrate what I believe to be an universal truth, that it is with an atmosphere essentially humid that epidemic cholera is distributed. It would serve no purpose, and it would be only to go over the same ground again, to show, that those observers who

General deduction from the facts of the seasons and circumstances of invasion.

* Compare table at p. 78, showing Cawnpore cholera of May and July.

have not comprehended the phenomena of distribution over definite areas, the share which moisture and the prevailing winds have in distributing epidemic cholera, and the phenomena of vital reproduction subsequent to invasion, have had no basis for their assertions. Let me say merely, that the term radiation, so frequently used in speaking of the epidemic spread of cholera, is a wrong term, inasmuch as it is not the fact that cholera does radiate from any focus. I make this generalisation subject to reservation, in anticipation of the study of the period during which a moving body, affected on a known day, may carry cholera from the point of affection as a centre. To distribution in such a case the term radiation is applicable, but the aerial diffusion of epidemic cholera is from one point to another, in the direction of the progress of natural agencies, and solely in subordination to the fact of these agencies being provided. Cholera has no motion due to its inherent vitality. This is an inference from negative facts rather than from positive data; that is to say, it is to be inferred from the fact that cholera is not found to move without a vehicle, and without the influence of a directing agent, that the vehicle and the directing agency are essential to its epidemic progress.

May epidemic distribution take place while the cholera miasm is in a state of dormancy?

For epidemic manifestation to be obvious to us, it is necessary that it should take place coincidently with the vitalisation of cholera, and therefore at the seasons when cholera naturally revives. But I see nothing improbable in the suggestion, that cholera may be distributed in its dormant state as well as in its vital condition. I do not make the remark for the purpose of making this possibility the explanation of phenomena of distribution which I cannot explain, for I believe the facts of our period to require no such assistance. I observe, that in England weight has been laid upon the aerial spread of a minor form of choleraic influence some months before invasion occurs, as premonitory of a coming invasion; and my own observation of the forerunners of a cholera approaching, although several hundred miles in the rear, leads me to conclude that a diffuse choleraic influence is not unfrequently spread abroad without its diffusion being suspected. I allude to such cases as those occurring in 1861, when, far ahead of the moving cholera, a patient in hospital in the Huzara Hills or at Kohat is fatally struck with cholera, evidently from a far-flying offshoot from the cholera-bearing atmosphere in the east of the epidemic province.

The presence of an aborted as well as of a diffuse cholera, may possibly be shown by an epidemic diarrhœa. Dr. Rice describes a diarrhœa for which he could not account, as epidemic in the Saugor District in the cold season of 1863, and this may have been the precursor, and premonitory of the invading epidemic of May 1864.

The aura of an epidemic.

That there is such a thing as the aura of an epidemic, a manifestation of the presence of cholera in an innocuous shape, the index and precursor of a great and fatal cholera following, such instances as the following seem to show:—

In March and April 1853, fifteen jails of the eastern division of the epidemic area, affected by the spring cholera of the year, gave seventy-eight admissions and only six deaths; as soon as the monsoon of the year set in, this cholera became a deadly epidemic, in which upwards of 300 prisoners died in the jails of the same province.

In 1855, the most westerly district affected from the east by the cholera the precursor of the great invasion of 1856, was Cawnpore. In this jail, in August and September, seventy-two cases of cholera occurred with only three deaths. Dr. Tresidder asserts that this was a true choleraic affection.

In 1863, the most westerly jail affected in the invasion from the east was Etah; in July, twenty-eight out of 200 prisoners were seized with cholera, but all recovered.

This is what seems to have occurred in the Saugor District towards the close of 1863, probably in connexion with the onward movement—the succeeding epidemic leap—of the cholera which invaded Jubbulpore, Mundla, and Seonee in June, which appears to have reached Bombay in December 1863.

The essentials for epidemic manifestation.

The essentials for manifest epidemic progress are three—(1), the presence of the cholera miasm; (2), the humid atmosphere, which is in every case its vehicle; and (3), the prevailing wind to give direction and limitation to this humid atmosphere.

I hold as a scientific truth, that with these three conditions cholera shall be distributed universally over a natural area, those portions of the natural area only being exempted in which these conditions are not fulfilled. I have shown what localisation means when applied to epidemic malaria, and it will be understood, that the degree of liability of any portion of an area will vary with the varying degrees of the facilities afforded or the obstacles offered to advance or localisation. But when we know that a province is invaded, then cholera has not necessarily any limit but that of the boundaries of the natural area, and the facts of distribution within this province give a positive proof that the dissemination is as wide and as general as are the invading meteorological influences. It is no more true that epidemic cholera moves along highways of communication than it is that it radiates from a focus. To take, as a single example, the Grand Trunk Road of our Presidency. I have shown, that cholera is never conveyed along it from the eastern half of the Doab to the western, or in the contrary direction; that when the western half of the epidemic area is invaded, Lahore is reached from the south-east as soon as Umballa, or even, as in 1856, a month before Umballa is affected; and that cholera had no power in 1856 or 1861, to pass beyond the Jhelum on its way towards Peshawur and Cabul. Some have endeavoured to advance

the hypothesis, that because it will generally be found that the first cases of cholera which occur come from an affected district, the fact is sufficient proof of the introduction of foci of contagion. It has no such significance; it must follow almost as a matter of course, that the first cases occurring in any province shall be imported cases. When, as in 1856 or 1861, epidemic cholera continued chained down in the Agra District and in the districts south and west of the Jumna from May to July, it cannot be imagined that six weeks elapsed without some passenger on the great highways carrying cholera with him in the latent stage into the Meerut District or the Punjab. I do not know that such cases did occur; but it suffices to me to know, that within three weeks from the date of the epidemic commencing to move with the setting in of the monsoon, the entire province was covered and its population destroyed by tens of thousands; and I infer, that the same distribution would have occurred had there been no human being existing within the invaded area.

General deductions regarding the relation of epidemic cholera to humidity.

I have no hesitation in stating it to be a law, that in this Presidency, epidemic cholera is never distributed with a dry atmosphere, and that, therefore, cholera moves only at those seasons in which the atmosphere is humid, whether the direction of invasion be from east to west, from south-east to north-west, or from south-west to north-east; that the retention of cholera in any tract, in any year, is proportioned in time to the natural degree of humidity which it possesses (in subordination to the vital existence of cholera as an object); and that repression of a cholera which we know to exist, also occurs in a degree proportionate to the prevalence of influences which determine a dry atmosphere.

Jameson's generalisation.

Jameson drew the very same conclusion as the result of his researches, although from failing to recognise the sub-division of the epidemic area into natural provinces, he was puzzled by what appeared to him to be exceptions to the generalisation. He recognises the effects of the moist easterly winds; but, forgetting that over the eastern division of the epidemic area, these winds brought the cholera of the spring of 1818, he concludes, that it was during the dry months of the hot weather that cholera prevailed here, while the moisture of the monsoon carried on the same cholera across the Doab into Meerut and Rohilcund. This was in fact part merely of the phenomenon which did not escape his notice, namely, the abhorrence of the cholera of the spring for the Bareilly District; the truth being, that the spring cholera was confined to the area of spring influences from the east. His general deduction (p. 100 of his report) has been already quoted in the introduction to this chapter.

In the following sentence Jameson expresses what I conclude to be the truth, that the agency of the winds directs and limits the invasion of cholera:—

"In Upper India the air, being less corrupt than that of the Lower Provinces, which were unquestionably the primary seat and seminary of the disease, required for the production of the epidemic an admixture of the more vitiated currents which were borne along by the winds. In this view of the case, the agency of the wind, setting aside the effect of its dampness, must be held to have been purely mechanical."*

Mackinnon's generalisations.

Throughout Mackinnon's treatise we find him constantly recurring to his experience of the effects of east winds in the dry season as influencing epidemic disease. His experience is of the Gangetic Provinces and Cawnpore. He thus characterises an epidemic season:—"Frequent falls of rain in the hot weather, especially with much easterly wind, observation has led me to think are followed by disease in the Upper Provinces."†

He indicates very clearly the three seasons of the prevalence of cholera; the third is evidently noted from his long experience of the Behar Provinces, where cholera may be found in any year in November, as in 1856 and 1857. "Cholera is most prevalent (in the spring months) in years when the weather is unseasonable by frequent and cooling showers followed by intense heat (indicating east wind). In the rains, again, I have seen it when there has been a long interval without good soaking falls. A third period when I have occasionally, but more rarely, seen outbreaks, is after the rains are over, and when the cool nights and heavy dews denote the approach of the cold season."

He suggests the geographical and aerial diffusion of epidemic cholera, taking as his example the converse of the phenomenon which fixed Jameson's attention, namely, the inability of cholera to pass in the Doab from west to east; Jameson noting its inability to pass from east to west.

Mackinnon recognises the truth thus:—

"There will be some to say that to Delhi (in 1856) cholera has been conveyed from Agra by human intercourse, and no doubt the believers in this manner of diffusion will find what they consider proof in the undoubted fact that travellers arrive daily at Delhi from Agra. But so they do at Cawnpore and other places lying east of Agra. Then why does not the disease travel as commonly in that direction also?"‡

Strachey's remarks.

All writers on the cholera of this Presidency have been similarly impressed with the essential connexion between aerial influences and the phenomena of cholera. Strachey writes:—"Observers in the North-Western Provinces and Punjab noting the similarity, we might almost say identity, of the

* Report p. 101.
† Already quoted at p. 77.
‡ Indian Annals, 1856, p. 133.

curves representing cholera, the tension of vapour, and rain-fall through a vast extent of country, might easily be led to the conclusion that the disease was necessarily dependent upon these special atmospheric conditions. Such a conclusion would have been evidently based not upon knowledge of the facts, but upon ignorance."

The meaning of this is simply, that over and above the prevalence of all meteorological conditions, the presence of the cholera miasm is an essential to the prevalence of cholera, and that the possible allegation of the perennial presence of cholera, and its manifestation or repression merely in relation to prevailing meteorology, is untenable.

But, again, I repeat, that the manifest epidemic existence of cholera in any locality is subordinate to the vitality which cholera possesses as an organised object, and the phenomena due to meteorological agencies must be studied, keeping this clearly before the mind. This was evidently present to Baly when he wrote the following sentences :—

Baly's unknown cause of the fluctuations of epidemic manifestation.

"No known influence effecting alterations in the purity or impurity of the air will explain the occasional rapid subsidence of the epidemic while the external temperature is high ; and it is therefore necessary to admit the agency of an unknown cause capable of producing even more remarkable variations in the intensity of the epidemic than those caused by fluctuations of temperature." And, again,—

"The cessation of the epidemic cannot be referred to any known external agency."*

Presence of cholera in different months demonstrative of the effects of aerial influences.

No illustration can be more striking than that afforded by the distribution of cholera in months in relation to the prevailing meteorology. An exceptional meteorology will bring with it results which affect the aim of an illustration, such as the following, which is meant to show how, in the first six months of the year, the divisions of the Presidency under eastern and western influences are respectively affected by cholera whether invading or reproduced ; it will be observed that the statement is for the nine years included between 1857 and 1867, in both of which years the mortality was heavy in the western division in these same months. Not losing sight of this, the case, as I put it, stands thus :—

With a larger strength, in the area under western influences, no cholera death occurred in the European Army in these nine years in January, February, or March ; one man died in April, eight in May, and five in June—in all fourteen men, in the first six months of these nine years.

In the division under eastern influences, with a smaller strength, 1,556 admissions occurred during the same six months of these nine years.

European Troops in Lower Bengal, Behar, Benares, Oude, and the Eastern portion of the Doab.

Months January to June.	Cholera Admissions of each year in the first six months.									Total.
	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	
January	13	8	...	6	2	4	...	5	3	41
February	47	4	57	4	2	1	5	1	1	122
March	59	28	158	22	7	3	15	4	7	303
April	91	66	271	27	10	17	22	28	2	534
May	34	202	52	23	7	3	4	15	2	342
June	89	53	47	18	1	1	2	3	...	214
Total for six months ...	333	361	585	100	29	29	48	56	15	1,556

Some have sought to prove, that the prevalence of cholera bears no specific relation to the moisture of the atmosphere, because it prevails and is epidemically spread with very different degrees of saturation. As I have shown from the phenomena of diffusion over the eastern area in the spring, it is the absence of the dry heat of the west winds that makes an epidemic season ; and a few inches of rain in May will determine an almost universal distribution of cholera over Rohilcund, Meerut, and the Punjab, as in 1862, 1865, and 1867. In the height of the monsoon season, cholera dies out nowhere ; and that its manifestation as an air-borne epidemic in the endemic area, is, as the rule, repressed, is unquestionably due to the fact of the submergence of the entire breeding grounds, as soon as Lower Bengal receives the floods of the monsoon. It is in Calcutta, as in the valley of the Ganges, when the rivers are at their lowest, and when in March and April the south-east breezes steadily prevail, that cholera comes as an air-borne epidemic. But it is a mistake to suppose, that an air-borne cholera is never distributed within the endemic area during the monsoon ; for the facts of 1859 (when Barrackpore and Dum-Dum were heavily struck in August) show the contrary. Before the floods have taken place, the extrication of cholera with the first rains is always a likely event ; and this is the great June cholera of the margins of the endemic basin, the representative in this situation of the monsoon cholera. I have already noted the statement of the Rev. Mr. Buckley, that when a heavy fall of rain occurs, either at Pooree or on the return journey from Juggurnath, disease and death may be confidently expected among the pilgrims.

I need not further insist, that cholera moves with monsoon influences, and that a cholera anchored by a dry atmosphere takes on locomotion as soon as the vehicle for its conveyance is afforded.

* Report of the College of Physicians, pp. 43 and 49.

Testimony to the necessity of a moist vehicle beyond the range of direct monsoon influences is not wanting. In the year 1862, when cholera attacked the 93rd Regiment in the Peshawur valley on four separate occasions, between July and October, Dr. Munro writes,—"In July and August the weather was hot and oppressive with occasional heavy showers of rain, and the first and second outbreaks took place after the rain." And again, before the great outbreak of October,—" Rain fell on the 5th, and on that day and on the following the air was cold and damp, and the hills were enveloped in a dense fog." Dr. John Brown has stated it as his opinion that Nepaul was invaded in 1856 from the plains by a succession of dense fogs acting as a vehicle to the cholera miasm ; these he describes as clinging to the mountain sides.

The vehicle of moisture in districts beyond the primary range of monsoon agencies.

The Dhurmsalla cholera of April and May 1862, is described as having been ushered in by a violent storm of rain, thunder, and lightning, and a dense yellow fog that was as dark as night.

Granting that a vehicle of moisture acted on by steadily prevailing winds is the agency which distributes cholera over a provincial area, the phenomena attending distribution may be of two kinds,—the cholera may be viewed as showered down over a province, or as moving with a broad front steadily in the course of the prevailing influences; in either case, the distribution will be equal to the area covered by these influences. This is my conception of the covering of a natural area by an air-borne cholera. I believe the eastern division to be frequently covered by cholera in a single week, just as we found that it was overspread with epidemic malaria in the first week of October in 1859. I have called attention to the remarkable cholera of the fortnight from 15th to 30th May 1865, striking the country west of Delhi, Meerut, the Umballa District, Deyrah, Kussowlie, and Dugshaie, with a rain-fall of 3 inches.* In speaking of the cholera of 1867, I shall have occasion to describe the distribution of the cholera of May, from the Jumna to the frontier, as occupying probably not more than eight days.

Even in the case of invading cholera, it is quite impossible to say with precision how long such a cholera occupied in its progress from one place to another. We find the Agra cholera of May 1856 and 1861, appearing at Lahore on the 6th and 7th August in the same years; it is useless, however, to draw a straight line through Agra and Lahore, to measure it off in miles, and dividing by the number of days, to say, that cholera has advanced towards the north-west at the rate of so many miles a day. A more approximate estimate would be made by calculating progress in such a year from the date at which the monsoon influences set in, and cholera began visibly to move. But even this estimate would be subject to many corrections. In 1856, the cholera of May was followed by a clear interval before invasion commenced. The dates of invasion in 1856 are given by Dr. Murray as under :—

Rate at which cholera travels to be calculated only in relation to provincial manifestation.

3rd and 4th weeks of May	...	... Agra.
1st week of June	...	... Muttra.
3rd week of June	...	... Bhurtpore, Allyghur.

Here there is an interval of a month preceding the monsoon advance.

3rd week of July	...	... Delhi, Bareilly, Dholepore.
1st week of August	...	... Meerut, Deyrah, Lahore.
2nd week of August	...	... Gwalior, Nynee Tal, Seharunpore.
3rd week of August	...	... Ferozepore.
1st week of September	...	... Umballa.

In the endemic area, and in a very large portion of the eastern division of the epidemic area, it is often found impossible to note any sequence of attack such as that here noted, from the universality and suddenness of the general affection of the province, whether by invading or revitalised cholera.

In all cases, epidemic cholera advances in a series of rapid strides, alternated with intervals in which no apparent progress is manifest; moving, as it does, in obedience to meteorological agencies and to these alone, the natural barrier cannot be overstepped, and the epidemic may cover in one week the same geographical area as in a year, provided the conditions for immediate diffusion be at hand—the vehicle and the directing agency.

The very fact of the extreme subordination of epidemic cholera to meteorological influences has, I believe, created many of the difficulties which have obstructed the study of the laws of distribution and reproduction. When the beautiful parallels of such epidemics as those of 1855-58 and 1859-62 are brought to notice, those who have not made the phenomena their special study are apt to demand, that all parallels shall be as perfect and as obvious to their intelligence as those upon which the generalisations have been based; and when these parallels are imperfectly represented, they are apt to conclude that the generalisation is wrong and unworthy of their further consideration. They forget, that parallels are but so many manifestations directly subordinate to natural agencies, and that these too must be taken into account as well as the mere fact of the visible presence or absence of cholera. And they will find, that what seems to them a contradiction, will in itself prove a parallel as valuable in the future as that

Parallel occurrences result from subordination to a definite meteorology.

* The meteorology during the epidemic invasion of May 1865 is thus noticed in the Weekly Returns of the Kussowlie Depôt :—

May 12th.—" During the last week we have had a great change in the weather, preceded by heavy falls of rain."

May 21st.—" Owing to the unsettled state of the weather, white clothing has been discontinued."

June 9th.—" We have had a considerable increase in the sick list, consisting chiefly of fever and rheumatism, due to the unfavorable condition of the weather. A case of spasmodic cholera has occurred and has proved fatal."

which they have lost. Had the cholera history of this Presidency been simple and without complication, the arrangement of the exact data at our disposal, would, during the past fifty years, have led to the recognition of some substantial truths; it is when facts which he cannot reconcile, meet him, that the observer loses faith in himself, and nothing but steadily to keep in view as a truth and as a fundamental principle, that every manifestation is subordinate to agencies which are natural, and whose operation is therefore unalterable, will carry him over the difficulty and into the smooth harmony which really lies beyond.

The reproduction of the cholera distributed over Northern India, is a truth which some are unwilling to accept, because it is not on every occasion so obvious as they would like to see it. They forget that a provincial re-manifestation must take place with a certain meteorology, and without it, may never occur at all; or that it may be repressed for an indefinite period. Let the one essential for epidemic manifestation be carefully sought for, and it will be found, that when cholera does not re-appear when it is due to re-appear, this essential is wanting, namely, the vehicle of moisture. We are not to expect an epidemic diffusion of a revitalised cholera while the hot west winds blow; and failure of the monsoon may, as in 1860, 1864, and 1868, determine a minimum of cholera, where a rain-fall twice or three times as great, would have been attended with the general movement and the obvious epidemic presence of cholera within the covered provinces.

The vehicle for the cholera of May is not wanting in the west; it was found in 1862, in 1865, and in 1867, and on each occasion carried cholera with it. The spring rains in the western division of the epidemic area represent the moist east winds which distribute cholera over, or re-awaken cholera in, the eastern division in March, April, and May. I have already said, that this cholera is due to appear about the same time that it appears normally in Banda or Cawnpore; that is as a May cholera. But the record is not wanting of the epidemic presence of cholera in the western area at an earlier period; for I find that, in reporting the prevalence of cholera at Muttra in 1838, the Superintending Surgeon says, that although he writes in April, the weather entirely resembles that of the rains. This illustration proves how true it is that an exceptional meteorology alone is wanting to determine exceptions to the period of normal manifestation.

In speaking of the cholera history of 1867, I shall have occasion to speak of the meteorology attending the invading cholera in the eastern and western divisions; and in the section on the affection of communities, I shall have to illustrate the fact, that many of the phenomena which occur during the course of a reproduction and even of an outbreak, are due to the aerial transmission of a moving cholera. I need not, therefore, enter into further explanations in the present chapter.

Importance to the meteorological observer of the recognition of Natural Provinces.

After viewing these great questions as I have done in relation to so vast an area as that of the Bengal Presidency, and illustrating them by the facts which I hold to be universally true for the area and for each of its provinces, it cannot be expected that I should supplement the generalisations by the details of stational meteorology. All local meteorology is subordinate to that which is provincial, and details for any locality are only so many items contributed to a general result. It is better, in studying epidemiology on a large scale, and in a country where the annual repetitions of the phenomena are so perfect, to grasp the result and to view details in the light which it affords.

Holding that the aim of the meteorological reporter is frustrated when he is compelled to deal with meteorological systems of which he sees only the terminations, I would recommend that the stations of observation be redistributed, so that each reporter may have a system under his notice which possesses both a base and a limiting line, that he may trace natural influences from their commencement to their normal termination.

PROPOSITION F. THE PROVINCIAL LIMITATION OF EPIDEMIC CHOLERA NEGATIVES THE THEORY THAT ITS PRIMARY DISTRIBUTION IS DUE TO HUMAN AGENCY.

A sequel to what has been advanced in the two previous chapters is the proposition which follows:—

F.—The geographical distribution of an invading cholera is purely a phenomenon of *meteorological significance*. Therefore, epidemic cholera is never in any case spread *over a definite geographical area by human intercourse alone*; nor can human agency cause the boundaries of a natural province, which has been occupied by cholera, to be transgressed, so that a *cholera epidemic from this source* shall appear in the province immediately adjoining, and become generally diffused among its inhabitants.

The positive aspect of this question does not fall to be treated in this section. I shall not here attempt to show that cholera has not been spread over a definite area by human intercourse in cases in which epidemic distribution has been attributed to such a vehicle. The negative aspect of the case is this, that the universal experience of these fifteen years has demonstrated, that human intercourse cannot carry cholera as an epidemic over the boundary line of any area which is, for the time, a natural province; be it a province of spring cholera, or of monsoon cholera. This is a proposition of fundamental importance, in considering the share which human intercourse has in the propagation of cholera geographically. I do not require to explain, that I am not referring to the question of individuals carrying cholera with them from an

affected into an unaffected area, or denying the possibility of cholera so imported being secondarily passed off to other individuals by those who have imported this cholera; but I leave such cases at a point where others take them up and found their theory upon the alleged facts in connexion with them. It is alleged that these are the foci whence springs the epidemic which follows at an interval of weeks or months; for invasion is always imminent when the heralds of its approach have made their appearance. The history of these fifteen years gives no encouragement to the theory of epidemic spread from such human centres. It teaches clearly, that cholera carried beyond the bounds of a natural province by human agency, is dead as an epidemic agent. The areas of exemption which I have noted in every year, have been truly exempted areas, and the most virulent epidemics have been repelled from their margins, although human intercourse, both by river and high road, has been uninterrupted. Whether invasion has been threatened from the east, south, or west, the result has been in every case the same. To repeat the illustrations would be only to rewrite the whole history of cholera as an epidemic, as I have already stated it; and to argue against these facts, it is necessary to deny that the natural provinces are such as I have described them to be.

The highways by which epidemic cholera travels are, in this country, aerial highways, and not routes of human communication. If the doctrine of the aerial distribution of cholera be true at all, I insist that it is proper that the fact be made the starting point in all enquiries relating to the geography of any epidemic. The fact is, no doubt, perfectly true, that the cholera of 1865 first appeared in the ports of the Mediterranean holding communication with Alexandria, and that the Hurdwar pilgrims of 1867 were, in very many cases, the first victims in the different districts to which the cholera-stricken crowd returned; but that the geographical diffusion of the epidemic of 1865 or of 1867 was influenced as to its direction or limit by these secondary manifestations, I do not admit.

CHAPTER VI.

THE PHENOMENA OF REPRODUCTION IN EACH YEAR OF AN EPIDEMIC, AND THE DURATION OF THE EPIDEMIC IN YEARS.

The previous chapter related to the mechanical phenomena of transmission and diffusion by winds and a moist atmosphere; the present would have been the proper place to treat of the vital phenomena manifested within an invaded area subsequent to invasion; but of these I have been compelled to speak throughout in noticing the reappearances of cholera at certain dates which are normal for definite localities.

I have placed the conclusions thus:—

Summary of generalisations regarding the Reproduction.

(1). It is not to be denied that a dormant but vital cholera does reappear within the province over which it has been disseminated; and so entirely is the phenomenon of reappearance under the control of the normal meteorology of any district, that, according to the geographical situation of an invading cholera, the date of its reappearance may be anticipated. That, in short, the phenomenon of reawaking into life at a certain date is as true for cholera as it is for vegetation.

(2). That the obvious seasons of reproduction are three—The first, coincident in its appearance with the disappearance of the monsoon floods, extending into November and December, confined as an epidemic to regions of perennial moisture, and hence nearly unrepresented on the plains of Northern India, when the dry west winds of the cold season blow; a great cholera of the true endemic region, and liable to appear in any locality allied to it in character, as for example, in the low lying districts of Western India. The second, the spring cholera, which reappears, according to locality, between the 20th February and the first week of May, the further to the east and south, the earlier being the date of reappearance; a cholera not due to appear in the western division of the epidemic area as an epidemic before the last week of April or the first week of May, since the normal meteorological conditions retard earlier manifestation. The third, the cholera of the monsoon, appearing about the 20th June and dead in the last week of September, universal within the range of monsoon limits, but at a minimum where the region of perennial moisture has, in a great measure, become for the time submerged. While some might urge that the monsoon cholera is but the summer manifestation of the spring cholera with vigorous locomotion imparted to it, it is at least convenient to recognise, that, viewed as mere manifestations, the two appearances are distinct phenomena. To observers in the western division, the spring cholera of February, March, and of the first half of April has no existence; and seeing that their cholera persists from the first week of May into the monsoon season, they naturally generalise from their observations, which are true only for their own portion of the epidemic area.

(3). That subordinate to repression by an exceptional meteorology, these reproductions are due at the date normal for revitalization in whatever province the invading cholera finds itself.

I wish it to be noted, that this remark has reference to a provincial and not to a local cholera. For it is certainly true, as the rule, that locally studied, cholera is not reproduced in consequence of the fact of its having been locally manifested even to the most virulent degree; while it is no less certainly true that a provincial distribution of cholera is followed by provincial revitalization. The conclusion from this statement is, that the breeding grounds in which the vitality of a dormant cholera are retained, are local tracts within the province, and that from these epidemic cholera emanates, when in a second or third year of epidemic life it is still playing its part as an earth-born and air-conveyed miasm.

Duration of Epidemics.

I have said that in any province an epidemic is made up of the reproductions of a certain period, and that observation leads me to conclude that the epidemic extends over a series of years, reckoning from the date of invasion to the date of final disappearance.

Normal duration of cholera in the epidemic area.

The statistical facts of the past fifteen years are before us. It is upon these facts alone that I form any generalisation. I have no theory that, in the fourth year after the invasion of a province, the invading cholera shall have died out, or shall have become reduced to a minimum, unless reinforced by invasion from an endemic source. I state simply as a truth, that the epidemic which we know to have made its exit from the endemic province in 1855, and which entered the western division of the epidemic area on the 20th May 1856, died finally in the first week of November 1858; that the fresh epidemic of 1859, which entered the western division of the epidemic area with the monsoon of 1860, also died in the first week of November 1862; and that the new cholera of 1863, which became in March 1864 the great invading epidemic of Nagpore and the south of our Presidency, was dead before the beginning of 1867. Were the same parallels to hold true, then the invading cholera of 1866 (the fourth

invasion of the fifteen-year period) should have had its existence prolonged up to 1869. Up to the date at which I write,* the cholera of 1868 has been repressed in a wonderful manner, coincidently, I believe, with the entire failure of the monsoon over Upper India, and the continued prevalence, as in 1860, of hot westerly winds; and subsequent events and the history of epidemic cholera in the spving of 1869, have shown, that I was in error in suggesting that the cholera which was in 1868 in vitality and epidemic vigour on the southern epidemic highway, and which invaded Nagpore in April 1868, struck Bombay in October, and in December was epidemic from Bombay to Malwa, was possibly derived from the materies of the epidemic of 1866.†

It will, I think, be found, that the duration in time, normal for an epidemic invading Upper India, is four years. The epidemic of 1817, invading from the south of the Jumna in May 1818, survived until 1820, with a continuous history of reproduction in each year up to the date of extinction; this was a four-year epidemic, a parallel to the epidemics of 1856-58 and 1860-62. The probability is, that if we could trace them with accuracy, very many of the intervening epidemics would be found to have the same range in time. And this must not be forgotten, that it is not necessarily the year of invasion that is the visible year of maximum. Distribution in force may occur under conditions so unfavorable that the presence of the invading cholera may scarcely call for remark at the time; the invasion of the western division of the epidemic area of November 1866, was an example of this. The maximum of manifestation of the cholera of 1855-58 was in 1856; the maximum of the epidemic of 1859-62 was in 1861; the maximum of the epidemic of 1863-66 was in 1864 and 1865 in the province of chief distribution; and the maximum of the epidemic of 1866-68 was in 1867. The great Umballa cholera of September 1852, occurred in the third year of the manifestation of the invading epidemic of 1850.

Circumstances which tend to obscure the phenomena of reinvasion.

In the absence of very precise and complete data, I prefer to adhere to the events of recent years. It is not unlikely that difficulty may arise in tracing even the current events in the future as in the past, for it is probable, that in very favorable cholera seasons, during the life-period of an epidemic, the cholera of one natural province may be reinforced through the legitimate channel from another province, and the phenomenon of reinvasion exhibited, while the cholera invading on the separate occasions, is truly only a portion of the materies of one epidemic. Another circumstance which I regard as also likely to occasion obscurity in studying the regularity of the succession of epidemics is, that invading cholera may be thrown off from different areas of the endemic field, and that hence intercurrent invasions may show themselves, and the phenomenon of an invasion occurring regularly every fourth or fifth year may be obscured by the mixing of separately invading epidemics. The great Gangetic cholera of 1853, lost to us in the North-West, was, I think, an epidemic of the class to which I refer; could its course be traced, I believe it would be found to be the origin of the invading epidemic of Western India of 1854, which I have traced invading from the south-west as far as to the north-western limit of the province of the south-west monsoon proper, and which struck Bombay Island in October 1853.

It is upon the tracts which I have called epidemic highways, lying the one to the south of the north-western desert, the other, to the south of the Vindhya, that I should regard it as most easy to trace the recurrence of invasion, as being less liable to the vicissitudes of monsoon agencies than the regions in which these influences terminate. The monsoon of 1860 reached exactly to the Jumna, and this fact constituted the districts lying to the south and to the north, for the season, two truly distinct natural provinces—the southerly marked by the presence of cholera, the northerly by its absence. From the southerly, the cholera of 1860 advanced westwards into Scinde in the same season. And this is only one illustration out of many, which shows, that it is not through the Punjab that influences travelling to the west proceed as the rule, but along the northern highway; and hence I should trust to tracing back invasion from India not through the Punjab so much as through Scinde and Rajpootana.

The value of indices towards completing epidemic history.

It is remarkable how from a few disjointed facts, apparently relating to events having no natural sequence, the history of an invading epidemic of cholera in the last century can be shown to have been the same as in the present day.

In 1781, cholera was epidemic over the entire south-east of the Presidency, and is said to have cut off 700 men of a force marching towards the East Coast in March of that year. That it was widely extended we know from the quotation which follows. It is from a letter from the Government of India to the Board of Directors concerning the unfortunate event, dated 27th April 1781:—"The disease has not been confined to the country near Ganjam. It afterwards found its way to Calcutta, and after affecting the inhabitants so as to occasion a great mortality during the period of a fortnight, it is now generally abated, and is pursuing its course to the northward."

* Written in September 1868.

† In writing of the history of this cholera of 1868 in the chapter which follows, I have not adopted the opinion expressed in a previous chapter of this report, namely, that the cholera of the Central Provinces of 1868 was derived from the materies of the epidemic of 1866-67. I have tried to show, that there is reason to fear that this is a cholera of a new emanation, appearing on the southern highway, because repelled by the meteorology of 1868 from the provinces of Upper India.

The next we hear of it is in April of 1783, decimating the pilgrims at Hurdwar. It is easy to fill up the blank although the facts are unrecorded. Upper India was covered in 1782, and the western province was invaded in the monsoon or the cold season by the cholera which was revitalized in April of the year following.

Epidemic of 1817-20.

The epidemic of 1817-20 may be taken as the type of all epidemics, and its stages of invasion and the dates of the successive movements, as typical for the experience of the past fifty years. I have rearranged below, according to my reading of the sequence of the occurrences, the events of these years as far as recorded by Jameson, and this will serve as a tabular index in endeavouring to link on the history of the successive epidemics which have appeared between 1817 and our time. Let it be remembered that all advance is *per saltum*, and that all the phenomena of progress arrange themselves accordingly. The beautifully detailed facts of Jameson's narrative are not capable of being perverted. They stand with the stamp of truth upon them, and its impress is rendered every day clearer as experience widens and facts accumulate.

I have indicated in the margin the position which the facts comprised in the quotations seem to me to occupy in the history of this Epidemic. The references are to the pages of the only edition ever published of this valuable report.

Universal cholera of the endemic province, May to July 1817.

"The disease was perhaps more common in the first six months of 1817 than in former years. In May and June it would seem to have occurred in an unusual degree in some parts of Nuddea and other districts; but as its attacks were as yet restricted to particular places, it does not appear to have excited much attention until the middle of August, when the rapidity of its progress and its general extension began to create universal alarm." (p. 3).

1817. Epidemic advance with, or immediately subsequent to the monsoon of the year.

"Facts prove, without the possibility of dispute, that it broke out at very remote places at one and the same time, or at the distance of such short intervals as to establish the impossibility of the pestilential virus being, in this stage of its progress, propagated by contagion or any of the other known modes of successive production. * * * The statements of the Medical Staff, written separately and without interchange of knowledge or communication, render it quite clear that more than a month previously to Jessore's becoming affected, the disease had begun to prevail epidemically in the distant provinces of Behar and Dacca. On the 23rd August we find it raging at Chittagong; at the same moment in Rajshahye; and not a week afterwards in the high and distant tracts of Bhaugulpore and Monghyr. * * * It is distinctly stated to have broken out in the city of Patna on the 11th July. * * * The only spots on the eastern side of the Ganges beyond the precincts of Bengal attacked by the epidemic in the autumn of 1817 were Mozufferpore and Chuprah and the Cantonment of Ghazeepore."*

Limitation of the monsoon cholera of 1817, the first step of epidemic progress.

"The disease, now strictly epidemical, extended from the most easterly parts of Purnea, Dinagepore, and Sylhet to the extreme borders of Balasore and Cuttack; and reached from the mouths of the Ganges nearly as high as its junction with the Jumna." (p. 8).

Offshoot of November into the districts south of the Jumna. Forerunners in Oude. Dormancy of the cold season of 1817-18.

The Mirzapore and Bundelcund cholera of November is described in the pages from 12 to 19, and ends with the outbreak of 7th November in the army of the Marquis of Hastings. "A few cases of cholera did certainly appear at Lucknow in December and January, but these were probably merely sporadic and an exception to the general rule, that from the beginning of November until the end of March 1818, when cholera broke out in Allahabad, no spot of the immense tract stretching to the east of the Ganges and Jumna from the northern point of Seharunpore to the southern boundary of Tirhoot was visited by the disease. The cholera, instead of shooting up from Mozufferpore, Chupra, and Ghazeepore through the contiguous districts to the provinces of Oude and Rohilcund, wholly left that part of the country, and for many months confined itself to the tracts lying west of the Ganges and Jumna." (p. 11).

Revitalization and epidemic advance in the spring of 1818. Universal from Oude to Nagpore between March and May.

In the spring of 1818, cholera became universal throughout the eastern division of the epidemic area. "Cholera visited the city of Lucknow with great violence in April and May, when it was prevailing epidemically in the neighbouring country" (p.12). "It broke out suddenly in the town and district of Allahabad in the end of March, and prevailed for several months with great malignancy, sweeping off nearly 10,000 of the inhabitants. The troops were not affected until the middle of July,† although holding daily and unrestrained intercourse with the people of the town. The epidemic entered Cawnpore on the 8th April, and remained in full force during fifteen or twenty days" (p. 25). In Bundelcund, "cholera reached Banda in the end of March. There and in the dependent district it is reported to have destroyed 10,000 of the inhabitants." In the Jubbulpore District, "the troops under Major-General Marshall, during their march from Saugor to Mundla, fell in with the disease on the

* South of the Ganges, Buxar was attacked on 17th September.

† In the monsoon revitalization.

9th April at Jubbulpore, and suffered severely from it during the remainder of the month. Before the arrival of this force cholera had been raging in Jubbulpore for several weeks" (p. 90).

This affords proof of the advance of this revitalized cholera, with a front of at least 300 miles, from north to south, within the ten days preceding the last mentioned outbreak. Within a month, the entire epidemic belt across the continent was occupied.

Jameson's curved line of the spring cholera of 1818.

(P. 19). "It is quite certain that, after appearing in this quarter (Bundelcund) in November 1817, the epidemic now took a decidedly south-westerly direction, and after being propagated along the beds of the principal rivers and great roads* to almost every town and village of Bundelcund and Saugor, was successively communicated to the provinces of Berar, Malwa, and Khandeish, and finally to almost every portion of the Deccan. * * * It reached Banda in the end of March (1818). * * * We now find it proceeding in a westerly direction to Lohargaon, Hatta and Saugor, in which neighbourhood it remained with great virulence from the beginning of April till the middle of May. * * * From Saugor the virus diverged in two directions—one stream took a southerly course to Nagpore, the other went south-west through Bhelsa and Bhopal to Oujein. * * * It was at Oujein on the 9th May, and at Mehidpore on the 12th." Thence Jameson continues to trace the southerly stream through Jubbulpore and the plains of Nagpore towards Bombay.

Looking back now, we do not associate the Jubbulpore cholera of 9th April 1818 with the March cholera of Banda, and we do not see it as a sequence, because cholera appeared in Bundelcund in March, Jubbulpore in April, and in Saugor in May, that the cholera of Bundelcund became the cholera of Saugor. The facts are precisely the same as in modern times, but we trace the cholera moving in the spring from east to west, and not from north-east to south-west. The appearance of the curve is, no doubt, often a true phenomenon; but it is due to the fact of the climatology of the extreme south, differing very widely from that of Central India Proper.

The Spring Cholera of 1818 reached the southern and extreme south-western limits of the Bengal Presidency.

In Western Malwa, we find that Mhow was reached on the 4th May, Oujein on the 9th May, and Mehidpore on the 12th (p. 20). These stations lie within 200 miles of the western coast, and are the last stations of our Presidency which are under observation. By the end of May, Berar was covered, and the Hoshungabad District, in the valley of the Nerbudda, had been occupied some weeks previously. This carries us up to the limits of our Presidency. What is chiefly to be noted, is, the enormous area covered in these six weeks, extending from the Himalayas to Guzerat, and stretching, as well, uninterruptedly from the north to the south of the Presidency. The facts of this spring advance of the cholera of 1818 effectually push aside the constantly reiterated error that the advance from east to west was in the teeth of the monsoon. The epidemic leap occurred nearly two months before the setting in of the monsoon, and the same cholera when revitalised or reinvigorated in the monsoon season, was mistaken for a cholera of invasion. Jameson, speaking of the meteorology of May 1818, says, that from the 8th to the 27th the winds were hot and westerly. It may be inferred that previous to the 8th, they were from the opposite direction; and speaking of the re-attack at Oujein on 22nd March 1819, he says (p. 136) that the appearance of sickness was here preceded by exactly the same atmospherical phenomena as in almost every part of India, namely, *easterly winds*, very hot days, and great variations of temperature between day and night.

Revitalization in the Gangetic Provinces in the Spring of 1818.

From Oude eastward, the Ganges Valley had also been filled with revitalised cholera (p. 32) :—"Cholera reappeared in May, and spread with extreme virulence over the whole district of Tirhoot." * * "Jounpore, Sultanpore, Goruckpore, Oude, Fyzabad, and Lucknow were successively attacked in April and May. In the end of April, the inhabitants of Goruckpore suffered so greatly that they quitted the city and sought for safety in the adjoining villages and groves."

Western limit in the Doab of the spring cholera of 1818, the same as that of recent epidemics.

While cholera was thus epidemic from Bundelcund to Western Malwa, there was no extension of cholera from Oude, Cawnpore, and Banda into Agra, Meerut, or Rohilcund, lying immediately to the west. It was late in May when Etawah was reached (p. 26). Etawah, Futtehghur, and Muttra seem, in the first week of June, to have first felt the influence of the monsoon cholera which was destined to invade the western division of the epidemic area in the first week of July.

In three different places Jameson notices this disinclination of the spring cholera of 1818 to cross the Doab (p. 91) :—"In Upper India did it not in Benares, Bundelcund, Oude, and the southern districts of the Doab rage virulently, whilst it appeared not in Delhi, nor in Meerut, nor in Jeypore, and the tracts in their vicinity until the rains had set in and the air was loaded with moisture." Again, (p. 25) :—"On the 8th April cholera attacked the city of Cawnpore, the Cantonments, the Civil Station of Bithoor, and the adjoining villages, and remained in full force during fifteen or twenty days. But it appeared little disposed to spread far in that

* This must be regarded as a statement only, not as a fact; this is the theory of the writer.

direction: Bareilly, Moradabad, and almost every other town in the same line enjoying their wonted health." And yet again (p. 97);—"When the cholera reached Cawnpore in the following spring, it showed a marked aversion for Bareilly and the other tracts east of the Ganges."

Monsoon advance of 1818 into the western division of the epidemic area.

While, as in 1856 and 1863, Agra and Muttra were invaded in advance of the true monsoon leap, the date of general advance was *to a week* the same in 1818 as in 1856 or 1861. "On the 11th July cholera entered the town of Coel. We next find the disease on the 20th at Delhi. Meerut and the Cantonments attached to it suffered under it from the 28th July to the 20th of August." The force collecting at Hansi for service in the Bikaneer and Sirsa countries got cholera in the first week of August, and although marching daily, falling back upon Hissar, carried cholera up to the 12th; 250 men were attacked. A detachment of the same force which passed through Delhi on the 29th July, was attacked on the 31st (p. 29);—"Several places intermediate between Delhi and Hansi, and between Delhi and Kurnaul, particularly Paniput, were affected previously to Hansi being brought within the pestilential influence." Jameson adds, that the epidemic in this direction appears to have been limited by the Sutledge. This was the limit to which authentic information extended; but it is not to be inferred that this was the actual limit in the North-West.

With the advance from the Agra District towards the north-west, the cholera of the monsoon of 1818 invaded also westwards into Rajpootana. "Cholera reached Jeypore in the latter end of August; the whole mortality, however, scarcely exceeded a thousand men. On the 12th September it began to abate in the city." The Rajpootana Field Force encamped twenty-five miles south-west of Jeypore, 4,200 strong, had among the fighting men, 292 cases and 122 deaths, between the 14th and 28th September (p. 31).

Monsoon cholera of 1818 of the eastern division of the epidemic area.

In the east, simultaneously with the Allahabad outbreak, appeared that of the Shahjehanpore District of July, in which 5,000 of the inhabitants are reported to have died; and the great outbreak of Nepaul was also with the monsoon of 1818 (p. 33), and while the same cholera was prevailing in the Gangetic Provinces.

Revitalisation of cholera in 1818 in Eastern Bengal.

"In Noacolly and the tracts near the mouth of the Ganges it began in February and terminated in June 1818." Note the months as precisely the same as those of the epidemics of modern times. "In Tipperah it returned in March 1818. In Sylhet, after retiring in October 1817, and being for several months dormant, it returned in the end of March, and subsisted until the setting in of the rains; but about the middle of October it suddenly increased all over the district to as great a degree and with greater fatality than on its first appearance. It again withdrew in the end of the year." The third reproduction was in this case typically displayed.

Persistence throughout 1819.

Writing on the 31st December 1819, Jameson says (p. 299).—"There seemed grounds for hoping that the dreadful mortality was on the decrease, and that we should soon be wholly released from a pestilence which had ravaged India during a period of more than two years and had spread dismay and destruction into every portion of its provinces. But the six months that have since elapsed have unhappily disappointed these expectations. During no part of the time can the country be said to have been wholly free from the disorder; and at several distinct periods and in distant quarters it has again shown itself in such an appalling and widely epidemical form as to leave no doubt that the distemperature of the air in which it originated yet subsists and is ever ready to be brought into action by external agents."

1819. Spring cholera of Lower Bengal.

Jameson (p. 156) mentions February 1818 and April 1819 as "the two most marked periods of the aggravation of the epidemic" in Lower Bengal.

Cholera of the eastern division of the epidemic area in its third year, 1819, of no great virulence, probably owing to the exceptional character of the season. Parallels 1861 and 1868.

"The rains did not regularly set in for many weeks after their customary time; and as the hot winds continued to blow without interruption during June and July and part of August, the whole face of the country was entirely parched up. The epidemical disposition of the air had certainly abated; since from Cawnpore downwards the disorder can scarcely be affirmed to have prevailed generally subsequently to the conclusion of the period included in this report; for, although a few cases now and then appeared at Dinapore, Chunar, and places in their vicinity, the aggregate amount of these was very inconsiderable, and only went to show how greatly the sickness was on the decrease." p. 305.

Cholera of Agra of the last ten days of May, parallel of 1856 and 1863.

"The epidemic made its second appearance at Agra on the 27th of May, was very destructive during the first week of June, and wholly withdrew on the 15th."

May cholera of Meerut, the forerunner of the cholera of August.

"Sporadic cases had been frequent among the Europeans, especially the drunkards, at Meerut for several months; but it was not until August that the disease recurred in an epidemical shape."

Rajpootana Field Force and Nusseerabad affected along with Agra, not with Malwa.

(P. 301). "The disease next appeared in the Rajpootana Force; it first showed itself mildly on the 8th June." (p. 304). Cholera appeared in Nusseerabad on 12th June."

"In the spring of the present year the epidemic raged extensively in Nagpore and Malwa, and largely affected the Nerbudda Field Force and the detachments serving in the vicinity of Neemuch in April and May. On the 8th of the latter month it reached the Saugor Division of the Army."

Reproduced spring cholera of Nagpore, Saugor, and Malwa.

(P. 304). "In July some corps of the Nerbudda Force suffered considerably. * * * From this month the disease ceased to be epidemic equally in the Nerbudda, Saugor, and Rajpootana Divisions."

Monsoon cholera of same province.

The great Meerut outbreak began on 8th August (pp. 309 to 318). (P. 318): "Nearly at the same time when it broke out in Meerut the epidemic displayed itself in Kumaon, at Bareilly, and at Moradabad to the east, and at Kurnaul to the west. It visited Almorah on the 10th August. * * The disorder showed itself at Kurnaul on the 10th August, and wholly disappeared in September. * * * From Kurnaul the disease spread in the direction of Loodianah, but as in the former year died away before reaching that station." The direction of this cholera was probably towards Ferozepore and Lahore, leaving, as usual, the Jullundur Doab and its vicinity unoccupied. At the very close of the reproduction, on the 2nd October, Deyrah Dhoon was entered: "Although it remained only three days in the valley it worked fearful desolation during its stay." It is stated that the Sirmoor Goorkha Battalion lost seventy-four men, and seventy-three women and children.

Monsoon cholera of western division of the epidemic area of 1819.

The last authentic information we have of the cholera of 1817-20 is regarding the May cholera of 1820. Jameson's narrative ends with December 1819, and we know only in a general way that 1820 was a year recognised by tradition as a great cholera year in the extreme north of India. In the records of the Medical Department we find mention made of the outbreak of Hurdwar, and among the escort on duty at Hurdwar, of the cholera of Kurnaul City and Cantonment (5th to 28th May), and of the Goorkhas at Subathoo (3rd May 1820). This was, no doubt, a cholera answering with great precision to our cholera of 1858 and 1862, marking the winding up of the epidemics of 1855 and 1859; in both years aggravated and universal in the area affected, and dead in the year following.

Spring revitalisation of 1820, parallel of 1857, 1862, and 1867.

I need not repeat that I maintain the parallel of the epidemics of 1855-58 and 1859-62 with that of the epidemic of 1817-20 to be perfect, and those of 1863 and 1866 to make up between them a geography and history also identical, although necessarily distributed over the life period of two epidemics.

Conclusion, that the identity of the epidemic of 1817-20 with the epidemics of recent times is perfect.

The general identity of the events of the intervening epidemics may in most cases be satisfactorily read, allowing due weight for the preponderance to the south, or to the north and north-west, of different epidemics not having the general or double distribution of the universal and typical epidemic. We must not expect now, however, to go back and read with perfect accuracy a history in which accurate statistical data are wanting; and the difficulty is the greater since the written record is a mere casual notice of local experience. The wonder is to how great an extent these isolated narratives fall in and take their place, and prove to be the indices of general facts from which we can generalize on the homologies of epidemics which have almost been forgotten.

Epidemics intervening between those of 1817-20 and 1855-58.

It is from the want of the record of facts that the chief difficulty arises in trying to elucidate the history of successive epidemics. Had the history of each been written even in a cursory manner, we could now have placed the facts in position, as we have done those of this perfect record of the events of 1817-20. As matters stand, we are compelled to grasp the outlines only, and we are fortunate in having even these to fall back upon. From 1826 onwards, the statistical data have been kept in such a form and so perfectly, that I have been able to construct the tables which follow;* and these are most valuable, not only as connecting into a chain the cholera history of 1826-68, but also as showing the aspects of cholera in relation to the soldier in former years in contrast to those of modern times.

I have tried to trace the periodicity of the recurring epidemics, and the chain can, I think, be constructed from the different links which I have been able to bring together. There is one epidemic missing, between the epidemic of 1817-20 and that which commenced in 1826. That this was typically represented is certain, but of its history in Upper India nothing can now be traced. The statistical tables of the Madras Army do not assist in making its history clearer. Many will say, that the cholera of 1821, which followed the route of the Persian Gulf into Syria and Asia Minor, leaving Egypt untouched, was the cholera of 1817-19. I do not think so. The reinvasion of Nagpore by a cholera of great power in 1821 (Corbyn on Cholera, p. p. 90 to 93), indicates to me a fresh epidemic on the southern highway, and in the far off cholera of 1823 of Laodicea and Antioch and the shores of the Mediterranean, I see the termination of the epidemic journey on this highway, begun in 1821; while in the cholera of the same year progressing through Upper Scinde into Persia and the provinces of the Caspian, I see the termination of the northern limb of the same epidemic.

Unrecorded Epidemic of 1821-23.

* These appear as an Appendix.

I read the sequence of the different epidemics between 1826 and the present time, as follows:—1. 1826-29.—2. 1830-33.—3. 1836-39.—4 and 5. 1841-46.—6 and 7. 1849-54.—8. 1856-58.—9. 1859-62.—10. 1863-66.—11. 1866-68.—12. 1868-69.

Clear intervals are provincial; exemption extends to certain of the natural areas only in any year. A new epidemic is constantly following up that which is dying out, appearing often almost before its predecessor has departed. Sometimes the exempted area is very wide, and the interval long; at others, the interval may be so short as to induce some to believe that the new cholera is a revitalisation of the old, and not the cholera of a new invasion. One of the most perfect intervals was the period 1834-35-36, in Madras and Bombay, during which only one cholera death was recorded in the Nagpore and Hyderabad Forces, and among the Madras troops occupying the Ceded Districts. In the European Army of the Madras Presidency, 4,600 strong, there were but four deaths in these three years;* and in the same years in the European Army of Bombay, only three deaths.†

All of these epidemics have at one stage or another of their lifetime broken through the boundaries of Hindostan. The epidemic of 1829, invading Persia and Russia through the regions of the Caspian, was the offspring of our cholera of Northern India of 1827-28; the cholera of Mecca, Egypt, and Southern Europe of 1831-33 was, as I reckon it, the extension of an Indian Epidemic, not of 1826, but of 1830-31; the great cholera of Southern Europe, Northern Africa, and Central America, of 1837-38, was, I believe, the produce of our epidemic of the same years; our epidemic of Western India of 1846 was followed up by the European cholera of 1848-49; and that of the province of the south-west monsoon proper of 1854, by the cholera of Arabia, of the Danubian Provinces, and of Europe generally of the same year. The cholera of 1856 died apparently in the end of 1858, after showing itself all along the shores of the Red Sea, in the very month in which it died on our north-west frontier; and, finally, I have shown how our epidemic of 1864 was distributed over Arabia, Eastern Africa, and Europe, even before it had the opportunity of throwing itself into the Meerut District or into the East of the Punjab.

It is very difficult to know with what epidemic to associate the Gibraltar cholera of 1860; the association can scarcely be with the cholera of Eastern Africa of 1858; and yet, it is little consistent with modern ideas of epidemic spread, to find a cholera which swept the southern epidemic highway of India in March, striking the west of the Mediterranean on 14th August of the same year. I incline, however, to the latter alternative.

1. Epidemic of 1826-28.

I call attention to the invasion of 1826 as an exact counterpart of that of 1866. The districts south and west of the Jumna, as in November 1866, were invaded in the same month of 1826; and the history of the year following shows me, that, as in 1866, the epidemic extension in the western division had been carried as far as to the hills, and much beyond the apparent limits of invasion. The advance of November was from a great body of cholera thrown into the eastern division of the epidemic area between April and August. The history of this great cholera of the Gangetic Provinces is recorded by the Superintending Surgeons of this province, of Dinapore, Benares, and Cawnpore.‡ The invasion of the spring and monsoon of 1826 was confined to the eastern division of the epidemic area.

Cholera of the Western Division of May 1827.

As in May 1819, 1856, and 1863 cholera reappeared at Agra in May 1827. It was reproduced, as in May 1867, over Rajpootana. On the 5th May the same cholera struck Nusseerabad and was dead on the 23rd; between these dates 157 cases occurred among the troops; and at Beaur, six men of the Mhairwarrah Battalion were attacked. I look upon the following remark made by the Superintending Surgeon of Meerut as of value in showing the parallel with 1867. In describing the outbreak of the monsoon of 1827, he adds:—"The Board is aware that cholera morbus had prevailed epidemically in this district from so far back as May last." In Delhi and the districts to the west, it reappeared even earlier than at Meerut; for I find the same Superintending Surgeon, writing in May, reporting the outbreak in these countries, while, as he states, Meerut yet remained free from cholera. This May cholera prevailed also in the lower hill stations, at Nahun and Subathoo; and also at Deyrah and Hurdwar.

This is the centre point of the epidemic. We require nothing more to tell us that we have substantially grasped the epidemic history of these two years. The revitalisations of the monsoon of 1827 and the history of 1828, are secondary to the facts of invasion in 1826 and renewal in the spring of 1827.

As far as we can gather, the body of this epidemic was diverted out of the southern epidemic highway. If this was the case, the history of 1867 exactly repeats the history of 1827, when cholera was dead throughout the Central Provinces and Central India, apparently as a consequence of the diversion of November 1866, and universal in the same area to the north of the exempted tract. The weakness of the southern offshoot was probably compensated for by the strength of the northern limb, and hence, as in 1867, resulted its ability to pass as an invading cholera into Cabul and Persia. This weak body of cholera in the south could have

* Nineteen, including King's Troops.

† Thirteen, including King's Troops.

‡ The quotations from the Proceedings of the Medical Board have been extracted by Mr. C. Macnamara, and printed in the *Indian Medical Gazette* for September 1868 and following months; therefore, I shall not reproduce them here.

afforded no starting base for the cholera of Scinde and Arabia of 1831; and, therefore, we look to the succeeding epidemic for evidence in this situation of power and substance sufficient for the materies of the cholera of a wide epidemic career.

2. Epidemic of 1830-33.

Taking the statistics of the Madras Troops stationed in the northern divisions, and of the Madras Armies generally, as the index of the presence or absence of epidemic cholera, we have evidence of an epidemic interposed between those of 1827-28 and 1837, thus:—

Deaths from Cholera in the Armies of the Madras Presidency 1830-36.

Year.	Madras Army of the Ceded Districts.	Nagpore Force.	Native Army of Madras as a Body.	European Army of Madras as a Body.
1830	1	None.	125	45
1831	23	14	271	91
1832	48	16	332	223
1833	103	32	580	233
1834	None.	None.	57	14
1835	None.	1	2	2
1836	None.	None.	11	3

In the "Madras Topography," I find the following remarks on this epidemic of the northern division (p. 88):—

"Cholera appeared in an epidemic form in 1830, 1831, 1832, and 1833. In April and May 1830, while the Left Wing of the 1st Madras European Regiment was marching from Kamptee to Masulipatam, twenty men were buried out of forty attacked; in August 1831, in the same Wing, while stationed at Masulipatam, 40 cases of cholera occurred with six deaths. Again, in November 1832, Her Majesty's 46th Regiment, while marching from Secundrabad to Masulipatam, lost fifteen men out of thirty-four attacked; and lastly, as has already been detailed in a former part of this report, Her Majesty's 62nd Regiment suffered severely from cholera in 1833 on its march to Masulipatam from Bangalore."*

I find the fact of this invasion in the south confirmed on referring to the epidemic history of the cholera of 1831 in our Presidency. The Surgeon of Ramghur, in describing the great cholera which came down over the Hazareebaugh plateau upon his district in the spring of 1831, calls attention to the remarkable circumstance that his district should have had no cholera in 1830, while the country immediately adjoining it to the south was nearly depopulated. He writes:—"1830 passed over without a single case, though the district of Palamow, a short distance to the south-west, was reported to have been nearly depopulated by it." In 1831, it was on the 10th April that the epidemic invasion occurred. Fifty-eight prisoners died in the Sherghotty Jail, besides 11 out of a gang of 100 prisoners detached to a sub-divisional jail. "The mortality," he adds, "among the inhabitants here and in the neighbourhood has been infinitely greater than on any former occasion; in a village, seven miles from this, about 350 deaths are reported; three of the runners employed in carrying the mails have died, and most of those remaining have had the disease; from the ghâts to the Soane every dâk post has been visited, and has lost part of its establishment." These are precisely the terms in which the Civil Surgeon of Behar writes in describing the invasion of 1863, preceding the epidemic of 1864-65 on the Central Provinces.

In forwarding this report the Superintending Surgeon of Dinapore writes:—"Cholera has within several of the districts of this circle committed deplorable havoc amongst the native population." In a later report, dated 18th June, he says:—"Cholera prevailed on both banks of the Ganges between Monghyr and Patna in the month of April, and to a still greater degree in the Purneah District. Amongst the troops at Dinapore it first appeared in the Barracks of Her Majesty's 13th Foot on the 6th May† and disappeared on the 25th, and it confined its ravages almost exclusively to that regiment. Sixty-four cases occurred, out of which, owing to the early and efficacious measures adopted on the first symptoms appearing, only nine deaths resulted."

Again he reports to the Medical Board, that in June the cholera prevailed epidemically amongst the native inhabitants of Tirhoot, Bhaugulpore, and other districts of his circle.

Simultaneously, cholera was prevailing all over the south and south-west of the Presidency on the southern epidemic highway. We read in various reports that during June cholera was epidemic throughout the valley of the Nerbudda. At Hoshungabad out of seven sepoys attacked not one survived; but the disease is stated to have been of a milder type among the general population. On the 9th June, the Superintending Surgeon of Neemuch reports the appearance of cholera at Mhow and in Nimar; and the report for July shows that the whole south-western

* This Regiment had 118 admissions.

† It was on the 6th May 1853 that Her Majesty's 29th Regiment was struck at Dinapore by a cholera wave which I believe to have been the same that struck the Danubian Provinces in July 1854.

province had been occupied, as Neemuch and Bhopawur both had suffered. There were fifty-five cases among the European Artillery at Mhow* "with the melancholy result of nine deaths." We find cholera still prevailing over this province in August and September.

It was in June 1831 that the shores of the Persian Gulf suffered, and that cholera became universal over Turkey and the Danubian Provinces.

Are we to connect on the May cholera of Mecca and the August cholera of Egypt of 1831 with the Indian epidemic of 1826-29 or with that of 1830-33? Was the May cholera of Arabia one and the same with the cholera of Archangel of the same month? I think not. That the cholera of 1829 became the cholera of Northern Europe is not doubtful, but the cholera of Southern Europe of 1831 I regard as a fresh invasion, and a cholera of a different provincial distribution; an example of what I have drawn attention to as a fresh body of cholera opening its career before that of the previous epidemic has wholly withdrawn. That this was the case is, I think, proved by the history of all succeeding European epidemics. That the outbreak of Mecca should have occurred in May, a month before we have a definite history of the occupation of the southern epidemic tract in India, must not be accepted as a final argument against this conclusion. I know nothing of the history of this cholera in Western India in April 1831. It does not, however, follow that there was not, as in 1864, a great cholera spread over Guzerat, Cutch, and Scinde, in that month; and, in fact, the actual invasion of Arabia may have occurred, as in 1864, towards the close of 1830.†

This cholera which we trace continuously from the Bay of Bengal to the Persian Gulf, I take to be the parent of the Mediterranean cholera of 1831, invading between July and September, and covering Greece and Corfu towards the end of the year.

It was in the revitalisation of the spring of 1832 that France, England, and Ireland suffered, the dates of invasion being, in Paris, March 24th, in London, February 10th, and in Dublin, March 22nd. With all its halts by the way, the Indian cholera of 1831 seems to have taken but one year to reach the shores of the Atlantic; and in July and August it was prevalent far and wide in North America, the first case in New York occurring on the 24th June. New Orleans was reached in November. Thus, the Indian cholera of 1830 appears to have extended from the Ganges to the Mississippi in less than two years. It probably was nearly extinct in 1833. Wood writes,—"In North America and in the greater part of Europe it disappeared entirely in somewhat more than two years from its first visitation."‡

There is a great tendency in recent times to deny to cholera extreme rapidity of epidemic advance or dissemination; and yet some of the minor facts of this very epidemic are as striking as any that have ever been produced. Thus this cholera was universal over Lower Egypt within five days after its appearance at Cairo; and in five days the great cholera of Paris was spread over four-fifths of the city.

Epidemic of 1833-34 in Upper India.

We have now to trace the progress of this epidemic in Northern India. As far as I can ascertain, the cholera of 1831 was, like the cholera of 1863, a diverted cholera of which no portion reached Upper India in 1831 or 1832, and it is not until 1833 that I find it in Upper India, south of the Jumna, while still in epidemic vigour on the southern highway; this epidemic of 1833 appears to have been a parallel with the epidemic of 1865, of which I have so often spoken as first entering the western division of the epidemic area in the *third* year after its original exit from the endemic province.§

As cholera appeared at Cawnpore in 1864 and 1865, so we find it in 1833 with the setting in of the monsoon. On 9th July it broke out, and a second great outbreak followed on 8th August; and at this time it was committing great ravages at Allahabad and in the surrounding districts. The 16th Lancers lost forty men, and the 44th Regiment twenty-five men, seven women, and eleven children. No prisoners seem to have been lost at Cawnpore in this outbreak; for I find no death recorded out of a strength of 780. All the other jails of the east, however, give indication of the epidemic. Allahabad gives five deaths, Futtehpore seven, and Shahjehanpore ten; and, south of the Jumna, the Banda Jail shows thirteen deaths‖ and the Humeerpore Jail four deaths among the prison population. Allyghur gives three deaths out of a strength of 2,237, and this is the furthest limit to the west of which the statistics of the prison population of the north-west give evidence. But there was probably a reason for the failure of the type to afford an adequate index of the extent of the spread of cholera in this year; and cholera may have been widely spread, although repressed. I find the following in the annual report of Her Majesty's 31st Regiment of Foot, stationed at Kurnaul during the year 1833:—

"The last hot season was the most extraordinary that has been observed in this country for a great many years, inasmuch as the hot winds continued nearly two months longer than usual, and the quantity of rain that fell late in the season was trifling in the extreme compared to former years. The baneful effect of this was felt to an intense degree, as the

* Out of a strength of 196. In the monsoon cholera of August, there were eight admissions and one death in the same body.

† "An official report by the British Consul at Jeddah stated that cholera existed in many places in the interior of Yemen towards the end of the year 1864." Report Constantinople Conference, p. 356.

‡ Practice of Medicine, Vol. I, p. 715.

§ Balfour notes from Sir R. Temple's Punjab Report of 1854 the following, as years remembered in that province, as having been characterised by epidemic invasions of cholera, namely, 1803, 1820, 1827, 1833, and 1845; in these years cholera appears to have pervailed universally in the Punjab.

‖ The representative of a great cholera among the population; compare table showing the enormous mortality in the same districts in 1865, the parallel year, p. 48.

different crops were thereby nearly destroyed, and the price of grain exceeded anything in the memory of any person living. This was succeeded by starvation among the lower order of natives, particularly in those districts bordering on the desert, where hundreds are reported to have died of want, others to have sold their children, while some are stated to have devoured their own offspring. Thirteen cases of cholera have been admitted in the hospital of Her Majesty's 31st Regiment, of which two proved fatal. These were generally very severe cases, and almost all were incorrigible drunkards."

In the note placed below, 1833 is noted as a great cholera year in the Punjab.

In 1834, cholera was renewed generally over the west; for we find cholera deaths in the Jail Table of 1834 noted at Banda, Humeerpore, Mynpoorie, Agra, Delhi, Goorgaon, and Bolundshuhur, a tract from which cholera disappears in 1835. This cholera seems to have been more severely felt at Muttra than elsewhere. The Superintending Surgeon writes :— "About the middle of July cholera made its appearance in the city of Muttra and carried off great numbers; at one time twenty and thirty were reported to have died daily." *** "From the 14th to the 22nd August it prevailed among the Europeans of the Artillery, and eight of the worst cases terminated fatally."

Not a single cholera death is found among the prisoners of the Central Provinces during the year 1835. Scarcely any jail, however, escaped in the two previous years, although no jail suffered severely."

Cholera Deaths of the Prison Population of the Central Provinces, 1833 *and* 1834.

			1833.	1834.
Jubbulpore	...	...	1	4
Nursingpore	...	...	3	...
Hoshungabad	...	...	2	...
Mundlaisir	...	...	...	4
Baitool	...	...	1	...
Seonee	...	...	5	...
Saugor	...	...	...	6

These figures are truly representative of cholera in the Nerbudda Valley and Saugor District in these years. In the report of the Superintending Surgeon for 1833 we read :— "Cholera raged epidemically at Hoshungabad after having appeared some time previously in the neighbouring villages. Of fifty-one cases treated forty-one recovered, and seventy or eighty deaths were returned by the Kotwal of people who had not undergone treatment." He adds, "South of Hoshungabad the village inhabitants avoid communicating with each other when the disease is present; and few attended the late fair at Hoshungabad for fear of contracting the disease by association with those who had come from diseased towns."

In the spring of 1834 cholera was extensively reproduced all through these provinces. The Superintending Surgeon of Saugor writes, dating 9th June :—"Eleven fatal cases occurred among the troops during the month of May from cholera. The disease during this period has been raging throughout this high table land with greater severity than it has been known to do for many years past; and not less than two hundred have died in and around the town of Saugor. The Medical Officer of Seonee states, that one thousand have died of it at Mundla on the banks of the Nerbudda. In the neighbourhood of Bhilsa, reports state that the roads have been nearly impassable from the putridity of the numerous bodies. Some of the deaths have been very sudden, as only two or three hours elapsed from the first attack when the death took place. The whole country is in such dreadful state of aridity that it is impossible any marsh miasma can be produced." I should doubt the correctness of an observation made in this report, that the winds were steadily from the north-west; we know the history of the invasion of the Saugor District in May in many succeeding epidemics, and it is opposed to the statement here made. The report from the adjoining Circle of the same month, tells us, that the winds were from the west or south-west.

The following is an extract of a letter from the Superintending Surgeon, Neemuch Division, dated 14th June 1834 :—

"Throughout the month of May cholera prevailed extensively over the country and caused great mortality. At Neemuch the wind blew strongly from the west or south-west, and from the 12th it became humid, as if rain had fallen in the vicinity. On the 5th May five persons were seized with the disease and died in the bazar of the 3rd Local Horse. On the 21st, the day following the Mohurrum, it attacked about sixty people in the Sudder Bazar of this station; the Mussulman population chiefly suffered, perhaps from the previous exposure to the weather during the Mohurrum. On the 23rd, some severe cases occurred at Neemuch in the men of the 2nd Cavalry on the right of the lines, and those of the Foot Artillery on the left, whilst the 51st and 61st Regiments occupying the intermediate lines were unmolested by it. About that date it attacked also the grass-cutters of the 2nd Cavalry at Barowh, fifteen miles distant; three were brought into hospital and recovered; medical assistance was sent to the others; of fifteen who had been attacked four died. Up to the 1st of June twelve sepoys of regular corps have been admitted into hospital, of whom six died. Of the inhabitants of the Sudder and Regimental Bazars with other camp followers, the number of deaths from this disease amounts to seventy-two. Since the 1st instant none have occurred; only two or three very mild cases were brought to hospital ten days ago, and now I indulge the hope that the disease has left this cantonment. I regret to notice that some cases of cholera have occurred at Mhow, five having been among the European Artillery, up to the 3rd instant."

The facts of this period as here placed, afford a history of a distinct epidemic, with a geographical distribution and a limit in time consistent with the history of typical epidemics. These facts carry us back not to the epidemic of 1826-29, but to another and succeeding invasion. This epidemic commenced its invasion into the east of the Madras Presidency in 1830, and was extinct, or nearly extinct, after 1833; and I regard the great cholera of Northern and Central India of 1833 and 1834 to have been the same which I have shown as an invading cholera in the spring of 1831, descending into the plains of Behar from the high lands closing in the endemic basin.

Some would see more in these two years of cholera in Western India (1833 and 1834) than merely the winding up of the epidemic of 1831, and might consider the strength of the body of this cholera proof of its being a new and fresh material. It is, as I estimate it, perfectly true that the cholera covering in 1833 the districts south of the Jumna and simultaneously occupying the Saugor District and the Nerbudda Valley, was a newly invading cholera, but I see no actual necessity for coming to the conclusion that it was a cholera freshly emanating from within the endemic area, or other than the materies which first appeared in 1831. I have remarked in the beginning of this chapter, that any year of the lifetime of an epidemic may be its year of maximum manifestation, and that the aspects of an epidemic must be looked at in relation to its provincial localisation and the circumstances attending the occupation of provinces. While this aspect of this cholera of Western India of 1833 and 1834, and thefact of the appearance in 1835 among the Mecca pilgrims of a cholera which we must reckon to have been an offshoot from this same western cholera, would suggest that the cholera of these years was a new epidemic following up the epidemic of 1831, we cannot but recall the parallel fact of the persistence on the same tract of the cholera of 1863, through 1864, and 1865, up to 1866. At the same time, the possibility of the connection between this cholera and the epidemic of 1837 of Europe and Central America, which I have spoken of in connection with the Indian epidemic of 1837-38, must not be overlooked.

3. Epidemic of 1836-39.

Graves tells us that between 1838 and 1847 cholera disappeared from Europe. There is no difficulty in recognising the fact that the epidemics of the Mediterranean and the cholera general throughout Europe and Central America of the years previous to 1838, was connected with the cholera epidemic in India; the difficulty lies in establishing the different links in the connexion. I have now to speak of a new epidemic, that of 1836-39; and while it is difficult to believe that the cholera which we find filling the Ganges Valley in 1836, and fully displayed only in the beginning of 1837, was the same cholera which covered the continent of Europe in the autumn of 1837, and Northern Africa in September and October, and which at the same time devastated Central America,* and appeared in England and Ireland,† still we are forced to conclude, either that the cholera of Western India of 1833 and 1834 was thrown in epidemic strength into Europe, and, in contradiction of all parallel history, maintained its vigour throughout successive revitalisations up to 1838, or that the new cholera of India of 1836-38 supplemented this cholera in Europe before it finally died out; and that thus the cholera of two separate invading epidemics became blended, as I assume to have occurred also in the case of the European invasions of 1829 and 1831.

The Indian cholera of 1837-38 has a very plain history. Early in the spring of 1837 it is found in the lower section of the Grand Trunk Road; next brimming over the Hazareebaugh plateau; then universal in the Ganges Valley and over the entire eastern epidemic province. The next stage finds it, as in 1860, attacking Agra in September; and we trace its usual career in the western division of the epidemic area in 1838, precisely as in every other epidemic.

The first we hear of the invading cholera of 1837 is in the extreme east. A party of volunteers for the European Regiment at Hazareebaugh lost three men and a woman on the road; and it is mentioned that at the time cholera raged in the villages on the Calcutta Road between Bancoorah and Hazareebaugh. This detachment left Fort William on 20th February.

On the 26th March cholera appeared at Hazareebaugh. From the 26th March to the 9th April twenty-nine soldiers and twenty-six women and children were attacked; twenty-three of the former and eleven of the latter died. From the 9th of April to the 15th, there were only five admissions among the men and two among the women and children, with one death in the former and one death in the latter.

The outbreak at Dinapore immediately follows. The Superintending Surgeon reports:—"Not a case had been admitted at the station during the period of its prevalence at Hazareebaugh, before the 14th of the month, when it broke out among the European Soldiers at Dinapore." No fatal cases were admitted after the 23rd; but between the 14th and 23rd forty-five admissions occurred, with eight deaths.

The annual reports of the Superintending Surgeons of the two remaining circles of the eastern epidemic province also notice the prevalence of this cholera as an epidemic, as follows:—

* "At no time has the destruction of the human race been greater in a given time by cholera than at present, in those countries through which this modern pestilence is travelling. In Central America the destruction of life has been melancholy in the extreme, and whole districts are represented to have been depopulated. An impression that the rivers were poisoned seems to be universally diffused, which has led to several barbarous outbreaks against the Government hardly less fearful than the cholera itself."—*Boston Medical Journal, quoted in Indian Journal of* 1*st May* 1838.

† Algiers, 14th October; "Dreadnought," 8th to 28th October; Marylebone, in same weeks; Limehouse, 26th October; Ireland, November.

"At Benares three per cent. of the Artillery died from cholera. Cholera broke out in the Invalid Garrison at Chunar early in March and carried off in the course of that month and the following, 11 men, being six per cent. of the whole strength. In July cholera broke out at Cawnpore, and prevailed to an alarming extent during that and the succeeding month; of the ten deaths which occurred in the Artillery, seven were from cholera morbus."

But this cholera had made its appearance in the Valley of the Ganges in 1836, and the fact that we can trace it in 1837 into the most northerly station occupied, shows this to have been the second year of the epidemic, invading the western division probably in November 1836, as in the same months in 1826 and 1866. The following is a report from Kurnaul:—"Cholera likewise appeared at this station in August, and prevailed during that and the three following months. Three per cent. of the mortality is attributed to that disease."

The appearance of cholera at Kurnaul in 1837 shows, that the whole western province was affected. The affection was, however, probably little felt at the time in consequence of the peculiar meteorology of the year. The famine tract of 1837 was, in fact, like the famine tract of 1860, an area comparatively exempted, while to the south and east cholera was universally in full epidemic vigour.

Baird Smith, writing of the famine of 1860, says:—"As regards the comparative intensity of the drought (of 1837-38 and 1860-61), I think it may with confidence be taken as virtually the same. * * As it was the case that both in 1837-38 and 1860-61, not a shower fell from September until March within the bad parts of the famine tract, the conclusion that the physical intensity of the drought was practically the same in both is a safe and reasonable one." This parallel very beautifully corroborates what I have written regarding repression of manifestation due to the failure of monsoon agencies.

The epidemic of 1837 seems to have come upon Agra quite at the close of the monsoon, as in 1860, having been delayed by the peculiar meteorology of the year. The battery at Agra was attacked on 24th September, and simultaneously the jail and general population. The Superintending Surgeon writes:—"Many of the famishing poor who have resorted to Agra for relief, as well as some of the distressed inhabitants of the city, have fallen victims to the disease; but still I am happy to conclude that cholera is not very prevalent, and as the wind has set in again from the west, I am in hopes that it will soon disappear altogether."

As in November 1826 and 1866, cholera reappeared at Agra in November 1837,* and also in Rajpootana. Thus we read:—"At Kotah between the 12th and 31st October, 400 people are reported to have died in the town. A range of from twenty to thirty deaths daily at Kotah and its immediate vicinity, continued up to the 14th November 1837."

In accordance with parallel history, this cholera was due to reappear on 20th April in 1838.

While covering Agra and Rajpootana, the cholera of 1837 made its way all down the Nerbudda Valley and over the plateau above the Vindhya, and every station further south on the epidemic highway suffered.

The general facts of this invasion are contained in the following extract from the report of the Superintending Surgeon, Saugor Division, for the year 1837:—

"Cholera reached the station of Saugor on the 9th of July 1837, having first made its appearance at Rewah and Jubbulpore,† on its transit from Mirzapore on the banks of the Ganges.

"At first it was confined to the town of Saugor. Out of an approximate estimate of the population put at 30,000 inhabitants, 1,632 cases of cholera occurred between 9th of July and 9th August, of whom 945 died. In the neighbouring villages 126 deaths occurred. Accounts have been received of its appearance at Dumoh and other neighbouring towns, and it is known to have committed great ravages at Hutta. So far back as two months ago, cholera has been at Jubbulpore, Nursingpore, and Hoshungabad. It has also made an extraordinary mortality among the cattle."

"In the month of July twenty-three cases occurred among the Native Troops at the station of Saugor; of these only three died. The disease increased somewhat in the following month; seven died during that period, and only one European of the Artillery Company."

"At Nursingpore, distant about 110 miles to the eastward of Hoshungabad, and fifty-five miles to the westward of Jubbulpore, not less than 2,645 fatal cases of cholera occurred, in that locality, and in about 150 villages surrounding the town. At Seonee 137, and at Jubbulpore 153 died from cholera."

Here, too, the monsoon rains were very deficient, and the weather is described as cloudy and threatening only, while rain should have been falling. The first fall was but small, and was followed at irregular periods of from seven to ten days by partial showers, so slight in their effects that after a month the soil was not found to be penetrated for more than five or six inches. The total rain-fall of the year was twenty-five inches in place of forty-six; I have noticed that the comparative deficiency of the rain-fall in 1860 and 1868 did not prevent the spread of the cholera of these years along the same tract.

A non-epidemic season has on the southern highway features very different from a non-epidemic season in our North-Western Provinces. The spread of cholera in the hot season

* Two cases, one fatal, occurred in the Battery of Artillery at Muttra in November 1836; these were, I think, indicative of *the original invasion* of this epidemic into the Western Division.

† The date given for the Jubbulpore District is 20th May; it was on the 23rd May 1868 that the Jubbulpore Cantonment became affected.

‡ Already quoted at p. 84.

with a limited rain-fall is exactly what takes place in the endemic area; and it is the absence of the normal south-west monsoon and the substitution of eastern influences for it that determines the phenomena of a year such as 1837. When the Superintending Surgeon of Saugor or Dinapore writes that the season is one of the hottest he has known, the statement is apt to mislead any one unacquainted with the meteorology of these districts, into the belief that the long continued prevalence of the hot, dry, and westerly wind is implied, whereas it is the very contrary. It is the continuance of moist and relaxing east winds that brings a hot, oppressive, and unhealthy season. This is in fact an extension of what is natural for the endemic area. It is precisely what we observe in regard to the cholera of Calcutta, for example; it is the hot season of Lower Bengal (April to June), which develops the maximum of cholera. But it is not heat alone, but heat with moisture, that causes the cholera to prevail.

Cholera of 1838.

It was owing to this deficiency of the rain-fall in the south that Agra escaped until September, as in 1860, and that Meerut, Rohilcund, and the Punjab remained comparatively untouched in 1837.

There was a true interval between the cholera of September 1837 and March 1838. The Superintending Surgeon of Agra writes:—"We escaped the disease altogether in the cold season."

I have said that the cholera distributed over the western division was due to reappear, with a normal meteorology, about the 20th April in 1838. But on 29th March 1838, the Superintending Surgeon writes to inform the Medical Board that cholera has reappeared among troops, prisoners, and the general population at Agra. But the following sentence explains the cause of the early reappearance. Speaking of the cholera which had broken out among the troops at Muttra, he writes (20th April):—"The seasons appear to be out of joint, and we have now occasional rain with a warmth and mugginess of the atmosphere like that felt in the beginning of the rains." From the 20th April to the 11th of May, sixty-seven prisoners died at Etawah, and the epidemic raged in the town. In Banda, as usual, cholera reappeared in May, and the sepoys of the Native Regiment lost seventeen men from cholera, through being compelled to go into camp in consequence of their lines having been burnt. The Superintending Surgeon of Cawnpore writes:—"The weather has deviated considerably from its usual state at this season of the year; there is an easterly wind and a murky sky." On the 14th May cholera reappeared at Hoshungabad.

It was not until the rains set in that the cholera of 1838 became universal over the North-West. In the return for July twenty-three cases of cholera and ten deaths appear among the European Troops at Meerut. In the movement of the cholera of July all the country up to the hills was covered. From the report of the Superintending Surgeon for July we learn that cholera prevailed greatly in the town at the time when it attacked the European cantonment; and that cholera had appeared also at Seharunpore and Deyrah,* and that many had fallen victims to it. In August, while cholera was still prevailing at Meerut, it was committing great ravages in the Mozuffernuggur District (Report, 18th August). Kurnaul was affected at the same time, and within a month the whole western area appears to have been covered.

In the Report of the 13th Light Infantry stationed at Kurnaul in 1838, we read:—"Cholera of a most malignant and fatal character prevailed for a period of more than six weeks, between the middle of July and the end of August. The disease first appeared in the station at the latter end of June, and committed great havoc until the middle of August." In the 13th Regiment forty-nine men were attacked, of whom nineteen died; and of twenty-seven children attacked twenty-one died.

The statistics of the invasion of the western division are as under:—

A.—Jails.

JAILS.	1st Quarter, January to March.		2nd Quarter, April to June.		3rd Quarter, July to September.		4th Quarter, October to December.	
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Banda	...	...	9	4	...	...	...	...
Humeerpore	...	...	2	2	...	...	...	...
Etawah	...	...	230	84 (c)	...	...	...	...
Mynpoorie	...	...	25	11	1	1	...	...
Allyghur (a)	16	None	163	32	62	4	7	...
Bolundshuhur	5	,,	150	43	11	6	3	...
Agra	68	28	53	41	3	2	1	...
Muttra	1	1	54	18	...	...	...	...
Delhi	...	...	3	2	...	...	19	10
Goorgaon	...	...	7	5	2	1	...	...
Rohtuk	...	...	10	7	10	2	1	...
Hissar	...	...	9	3	2	...	...	...
Sirsa (b)	*	*	*	*	*	*	*	*
Paniput	...	...	1	...	6	...	1	1
Meerut	...	...	2	2	2	..	4	1
Moradabad	...	...	1	...	8	2	1	...
Bijnore	...	...	...	...	8	1	...	...
Mozuffernuggur	1	...	1	...	1	...	...	...

* Cholera commenced on 4th July. Forty-four deaths occurred in the Goorkha lines, besides thirteen cases which were admitted into hospital.

(a) Thus in original return.

(b) For this jail there is no return, but it is stated that forty-one prisoners died from cholera.

(c) The mortality among the famine stricken inhabitants at the same time was reckoned at 150 a day.

B.—European Troops.

STATION.	Strength.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Agra ...	...	...	...	...	...	4	2	2	1	3	2	...	...	2	1	...	...	...	...	...	...	...	...	...	...
Muttra ...	...	...	...	...	...	...	...	15	4	...	...	...	...	...	...	1	1	...	...	...	...	1	...	...	...
Meerut ...	...	...	...	...	...	...	...	...	...	...	...	2	1	20	9	10	4	2	1	...	...	...	...	...	...
Landour ...	...	...	...	...	...	...	...	1	...	...	...	...	...	2	...	3	2	...	...	...	...	...	...	...	...
Kurnaul ...	...	...	...	...	...	1	...	...	...	1	...	...	...	30	14	40	17	3	1	2	1	...	...	1	1

At Cawnpore in the reproduced cholera of 1838, the European Troops, 1840 strong, lost 43 out of 152 attacked.

C.—Native Troops.

STATION.	JAN.		FEB.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.	
	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Muttra	...	...	...	...	...	...	1	...	...	...	10	5	...	...	2	1	...	...	...	...	...	...	...	...
Agra	2	...	...	...	25	9	39	17	13	9	23	6	2	...	1	...	6	3	1	1	...	...	...	...
Delhi	1	1	2	...	1	1	...	...	11	4	6	1	3	1	5	4	...	...	...	...	...	...	...	...
Meerut	...	...	...	...	1	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	(a)	(a)	...	...
Kurnaul	...	...	...	...	1	1	1	...	1	...	...	...	...	...	1	1	2	2	1	...	4	2	...	...
Subathoo	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	1	1	...	...	...	...	...	...
Deyrah	...	...	...	...	...	...	...	...	...	...	...	...	18	7	2	2	...	...	...	...	...	...	...	...
Almorah	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...

(a) Eight admissions and two deaths are recorded in November, but these appear to have occurred on the march in a newly arrived Regiment.

Cholera had not disappeared in the year following. In the rains of 1839, I find its reappearance noticed. The Superintending Surgeon reports from Meerut, that on the 4th of August, three cases occurred in the Buffs and one in the Dragoons; the 44th Regiment stationed at Kurnaul, had five cases, all of which were fatal; and another fatal case occurred in the Artillery at Muttra. The Native Regiments at Kurnaul had fifteen cases and seven deaths. These illustrations suffice to prove that in this the third year of invasion, this cholera was not dead in the western division of the epidemic area.

On the great southern epidemic highway these three years were as much an epidemic period as in the northern provinces.

Cholera Deaths of the Armies of Madras, of the entire Presidency, 1831 *to* 1838.

YEAR.	EUROPEAN ARMY.		NATIVE ARMY.	
1831	91		271	
1832	223	Epidemic.	332	Epidemic.
1833	233		580	
1834	14		57	
1835	2	Interval.	2	Interval.
1836	3		11	
1837	72	Epidemic.	351	Epidemic.
1838	52		480	

This cholera thrown into the province of the south-west monsoon, was fostered, and when so little redeveloped in the North-Western Provinces in 1839, became a powerful body of invading

cholera occupying the south-western natural province from Nusseerabad and Jodhpore southwards and westwards. Among the Native Troops I find the invasion thus represented:—

NUSSEERABAD CIRCLE, 1839.

Admissions and Deaths from Cholera.

STATION.	Strength.	MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Bhopawur ...	393	9	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Neemuch ...	5,309	3	...	8	6	6	2	19	9	22	...	39	17	...	...	...	...
Nusseerabad ...	4,472	...	2	...	...	28	7	14	4	3	1	106	33	...	...	...	...
Beaur ..	675	...	...	...	...	...	...	...	...	...	...	7	4	...	...	...	...
Ajmere ...	451	...	...	5	3	3	1	...	...	...	...	...	...	...	...	...	...
Jodhpore ..	1,027	...	...	...	...	...	...	...	...	...	...	59	18	4	...	1	...

It is evident that this cholera distributed with the south-west monsoon, put on fresh epidemic vigour in its third reproduction. It was in epidemic force at Candahar at the same time, evidently as a portion of the same provincial distribution, for the Army of Cabul was free from cholera, and the two Native Regiments at Quettah alone suffered, losing thirty-nine men in the end of August and first four days of September.

It is curious to observe the apparent decay of the cholera of September, when twenty-five admissions gave one death only. I think it has this significance, that the miasm was incapable for the time of exercising its highest manifestation in the human economy. It was during the prevalence of this cholera that the phase appeared, which was described by Dr. Murray, now Inspector General of the Bengal Medical Department, as the Malwa Sweating Sickness. The Superintending Surgeon writes:—"In July, soon after the commencement of the rains, and again after its termination in September, a disease appeared amongst the European Troops which Dr. J. Murray considered very analogous to the sweating sickness of Europe; the same prevailed in the lines of the Native Troops. It resembled cholera in having copious watery stools and vomiting, occasional cramps, oppression at the pericardium, with feeble action of the heart and collapse. It resembled remittent fever in being periodical, generally commencing with headache, and in having a slight hot stage which was followed by excessively profuse perspiration of a peculiar odour. The water ran off the bodies of the men, soaking their clothes and bedding, and leaving them in a state of great prostration. The blood was very liquid, the red particles mixed with the serum, and the leech bites oozed much. The disease was considered as owing to some deleterious addition to the blood, which rendered it less stimulant to the heart and blood vessels than usual, causing a suppression or vitiation of the secretions, which induced the other symptoms."

Sweating sickness of 1839.

The same phenomena described by Dr. Murray were observed in the course of the great outbreak of remittent fever following the cholera outbreak of the 3rd Europeans at Agra in 1856. I place below this parallel case, to show that the sweating sickness of 1839 does not stand alone as a solitary instance. It was shortly after the disappearance of the cholera epidemic that choleroid fever broke out in the Regiment. Nine cases occurred, all of which terminated fatally. Many of the cases of remittent fever which were treated about the same time resembled the choleroid cases, except that the symptoms were less severe. Dr. Crozier describes the choleroid fever of his Regiment as follows:—"The most marked cases only are entered as choleroid or sweating fever. The nine cases ended fatally in a short time* with all the symptoms of the collapse of cholera. Rigors, prostration, blueness of the nails, feeling of pain in the pit of the stomach, were the first symptoms of this formidable disease. These were followed by heat of skin, profuse and excessive perspirations, the smell of which was most disagreeable, and lasted in most cases until death took place. There was great restlessness, thirst, oppression of the chest; the pulse was quick and barely perceptible; and the mental faculties remained unimpaired until coma came on. Some had vomiting and purging; others had slight cramps, without vomiting and purging. No urine was secreted."

* 1.	Admitted	August	3rd,	Died	16th,	Duration 14 days.
2.	"	"	4th,	"	26th,	" 23 "
3.	"	"	9th,	"	16th,	" 8 "
4.	"	"	10th,	"	18th,	" 9 "
5.	"	"	10th,	"	14th,	" 5 "
6.	"	"	11th,	"	17th,	" 7 "
7.	"	"	12th,	"	17th,	" 6 "
8.	"	"	16th,	"	18th,	" 3 "
9.	"	"	17th,	"	19th,	" 3 "

It is possible that a few of these cases may have been for some time in hospital, admitted on account of another disease, when attacked.

In the months from July to October there were in this Regiment 1,120 admissions from fever, of which 520 are recorded as remittent in type. During the period of the occurrence of these nine cases, one case of true cholera was also admitted, the last of the terrible outbreak of June.

These cases should afford grounds for further investigation of the epidemic of the south of France of 1821, described by Rayer, as possibly the representative in Europe of our great cholera epidemic of 1817-20.

Kaye (Caius) described the sweating sickness of the fifteenth and sixteenth centuries as "a contagious pestilential fever of one day," from its progress to death being so rapid. The periodicity of this epidemic is strongly suggestive of the intervals between cholera epidemics.

The following dates of the prevalence of this epidemic in Europe are noted in Webb's Pathologia, p. XLVIII, as given by the Editor of the Madras Journal—1480, 1485, 1506, 1517, 1528, 1551, 1652, 1660, 1666, 1675, 1740, 1750, 1755, 1768, 1781.

We have evidence of the fact of a disease singularly resembling cholera having been epidemic in Scotland forty years before the earliest of the dates quoted. In *Chambers' Domestic Annals*, there is the following notice, taken from an early chronicle, regarding the sickness of 1439.—"The *wame-ill* was so violent, that there died mae that year than ever there died, owther in pestilence, or yet in any other sickness in Scotland. That samen year the pestilence came in Scotland, and began at Dumfries, and it was callit the *Pestilence bot Mercy*, for there took it nane that ever recoverit, but they died within twenty-four hours."

4 and 5. Cholera of 1840-47.

The year 1846 winds up a series of cholera years during which two epidemics seem to have played out their parts in this Presidency. The first was the cholera of the endemic province of 1840, invading in the spring of 1841, and last heard of in the high Punjab and Cabul as the great cholera of 1844; but that this cholera was reinforced from behind, or rather succeeded by, a fresh invasion of enormous power, which became the epidemic of 1845-46, is not doubtful, and we should reason on a fallacy were we to attempt to recognise in the cholera of this period the cholera of a single invasion.

I shall best follow out the history of these two distinct epidemics by going at once to the gate of exit from our Presidency, and showing the fact of the exit of the first, before the second epidemic had mingled with that preceding it. It is very essential that there should be no misunderstanding of the epidemics of these years. They present a very difficult problem, and one which only the most intimate acquaintance with the epidemiology of cholera can solve. Being liable to misinterpretation, the facts have been over and over again misinterpreted. Those who trace cholera as an object wandering about, not knowing how to shape its course unless guided by the selection of the human pabulum, have traced the cholera of these years from place to place, and so tracing it in what they imagine to be a sequence, have superimposed upon the alleged facts theories contrary to all preceding and to all subsequent experience. The theories are wrong, and as I read them, the facts do not adapt themselves to the theories.

I take Ajmere as the index station, knowing that every epidemic that has ever touched the North-Western Provinces has found its way along the northern epidemic highway on its road to Central Asia, to this point. Dr. Ewart tells us, that in May 1843, the Meywar Bheel Corps at Kherwarrah was struck for the first time, and that 112 men were affected with cholera, of whom twenty-nine died. He quotes from Dr. Bowhill's report the following:—"In this year the mortality was so fearfully high among the surrounding population, that on the fifth day after the appearance of the cholera, so horror struck were the inhabitants at its fearful increase, that they, deserting alike the dying and the dead, fled to the jungles. The same cholera had been committing fearful ravages in the country lying north-west of this at least a month before it showed itself in our neighbourhood. On the day of its appearance in cantonments the wind suddenly changed from south-west to an easterly direction, accompanied by a very dense mist, and before evening seven men had been attacked, who all died. It continued to prevail, though not so virulently, till the 25th, when it disappeared as suddenly as it came among us."

This cholera of the districts north-west of Ajmere of April, following all modern parallels, must have been distributed between September and November of 1842. It is the representative of the same cholera which I have traced revitalised in April 1857, April 1861, and April 1867 in Bhurtpore and Jeypore, and the same as the May cholera of Umballa, Meerut, and the districts west of Delhi. And here is the continuation of the parallel, as furnished by our jail population, which shows that the revitalisation was universal over the western province, and was not confined to the western extension into Rajpootana only:—

INVADING CHOLERA OF 1843.

Jails of Agra, Meerut, and Sirhind.

Station.	Admissions from Cholera in each month.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Ajmere	...	...	...	...	*	*	...	...	...	...	...	...
Muttra	...	...	...	...	...	...	1	1	9	...	...	...
Agra	...	...	...	...	1	1	2	60	3	...	2	...
Etawah	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur	...	...	...	...	2	2	1	9	5	...	1	2
Bolundshuhur	...	...	...	...	...	...	...	2	1	...	...	1
Budaon	...	...	...	...	2	1	1	...	...	...	...	...
Meerut	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad	...	...	...	...	1	1	...	...	...	3	...	...
Mozuffernuggur	...	...	...	...	...	...	...	...	...	...	...	...
Seharunpore	...	...	...	...	...	...	...	...	...	...	...	...
Bijnore	...	...	...	...	...	...	1	...	...	1	...	...
Deyrah	...	...	...	...	...	1	...	...	...	...	...	...
Delhi	...	...	...	...	...	...	...	...	...	...	...	...
Hissar	...	...	...	...	...	...	...	...	...	1	...	...
Sirsa	...	...	...	...	...	...	1	...	...	...	...	...
Umballa	...	...	...	...	6	1	3	...	...	...	...	...

* Ten cases and five deaths in this jail in these months.

In the May cholera of Rajpootana, epidemic with the spring rains of 1843, I see the body of the cholera of Central Asia so destructive in 1844, the same which it is alleged descended upon Peshawur in November 1844, and which was revitalised on the frontier in April 1845. Let me follow out the parallel of 1860-62 in illustration, to show how little necessity there is for the assumption that this cholera must have descended from Central Asia upon the Punjab and Rohilcund.

Frontier invasion of 1844-45 parallel with the Frontier invasion of 1862.

In September 1860, the cholera of a new epidemic re-entered Scinde which had enjoyed almost complete immunity from cholera since the epidemic of 1853.* I quote from Strachey's Report (p. 143), the parallel in this province of the April and May cholera of 1843 :— "In April 1861, cholera again appeared, and soon spread with great violence through the province. During April and May the mortality was very large. In June the disease became much less prevalent, but it did not disappear until a month or two later." Immediately afterwards we find this cholera in Cabul, before a single case of cholera had appeared in the north of the Punjab (p. 4) :—"Cholera did not spread epidemically through any of the districts of the Punjab north of Lahore. It was, however, virulent at Cabul in October." In November 1860 the same cholera entered Persia. But it was not until April 1862 that the cholera of 1860 appeared on the Peshawur Frontier.

The same occurred in the previous epidemic ; it was not until November 1858 that the cholera of 1856 crossed from the Jhelum to beyond the Indus, although the same cholera had raged in Persia in the year before.

As the cholera of 1860, when revitalised in 1861 invaded Cabul in the same year, and did not appear at Peshawur until 1862, so did the cholera of 1843, when revitalised in 1844, invade Cabul, and it appeared at Peshawur only in the last months of 1844, and again in the spring of 1845.

We trace the frontier cholera of 1858 through Huzara in May and in July, until it descends into the Peshawur Valley in November ; we note the coincident appearance in April 1862 of the same cholera on the frontier that we traced general over the east of the Punjab. But we do not for a moment think of seeking beyond the mountains the source of the cholera of the high Punjab of these years, since we know it to be in the countries lying to the east and to the south of the newly invaded tract.

Persia is but a province of Hindostan as regards the invasion of an epidemic cholera. The Scinde cholera of 1860 entered Persia in the beginning of November (Report, Constantinople Conference, p. 319), and the same cholera did not move upon Meerut or the Punjab until the first week of July in the year following, an illustration of the truth that epidemic cholera has no locomotion due to human agency. Again, we read, that there have been no epidemics in Persia from 1861 to 1865 ; and the reason is, that the epidemic of 1863-64 moved along the southern highway through Nagpore, Lower Scinde, Arabia, and Egypt, leaving the northern highway unoccupied. The epidemic of Northern India of 1867 reached Teheran on 28th August in the same year. Persia suffered greatly in our epidemic of 1856-57, and it died out apparently in the month of its final disappearance throughout our Presidency, namely, November 1858 ; and to this succeeded the September cholera of 1860, our great September cholera of Agra, Jhansi, and Morar of the same year.

Persia a portion of a cholera province of Hindostan.

I go back to the epidemic of 1843, to show the connection of the Rajpootana invasion with the cholera of the east and south. The July outbreak of Agra was a great cholera, and all the adjoining districts were covered. The figures which I have given from the Jail Returns show that this cholera was lightly spread even as high as Umballa, but they serve also to show, how trifling was the cholera of 1843 in this extension. The force of the wave evidently passed south of the Punjab. The returns of 1844 show only fourteen deaths in the jails of the same provinces, and these I regard as indicating the termination of the epidemic.

The great cholera of Agra of 1843 was distinctly traced as the successor of that of 1837 ; and we are told that for many years Agra had been exempted from any epidemic visitation. In the report of the 39th Regiment, it is stated that the hot winds blew with less intensity and less constancy in their direction, and that the rainy season was protracted, and the fall above the average. In this Regiment the first case occurred on 8th August and the last on 22nd September. The Surgeon remarks, however, that for upwards of a month before the Regiment was affected, the disease had been raging with fearful malignity in the city and in the neighbouring villages.

I have said that the fact of the appearance of the cholera of 1843 over the western area in April and May, induces me to believe that the invasion must have occurred in 1842. I find in the Meywar Bheel Corps four deaths in 1842, in the Mhairwarra Battalion one, and altogether thirteen deaths among the troops of the Nusseerabad Circle (see table of 1842). These cases are to me perfect evidence of the fact of invasion having occurred. Again, among Native Troops, the Nusseeree Battalion at Subathoo gives one death, and the Sirmoor Battalion at Deyrah also one death. I find also one death at Meerut, Delhi, Allyghur, Bareilly, and Ferozepore, and this is the total for the

Cholera of 1842 in the west.

* Grierson's Report quoted by Strachey.

western province. The European Regiments at Kurnaul lost eight men between June and September.

Cholera of 1842 in the east.

In the east, every station suffered in 1842. Among the Native Troops, Banda shows thirteen deaths; Cawnpore eight, in five different corps; Lucknow five; Allahabad five; Mirzapore six; Benares thirty-five; and Dinapore forty-five.

From March until July, the report of the Superintending Surgeon of Dinapore is one deplorable record of cholera and its malignancy, as the following table shows:—

Admissions and Deaths from Cholera, Dinapore Circle, March to July 1842.

1842.	Native Troops.	European Troops.	Prisoners.
March	Admitted 14, died 5	.....	Admitted 63, died 11
April	Admitted 16, died 8	Admitted 10, died 3	Admitted 120, died 38
May	Admitted ? died 4	Admitted 2, died 0	Admitted 245, died 86
June	Admitted 20, died 16	Admitted 5, died 4	Admitted ? died 44
July	Admitted 6, died 3	Admitted 7, died 6	Admitted 140, died 57

Following this cholera up the valley of the Ganges, we find that the Chunar Garrison had thirty cases, of which twenty-one were fatal, between 4th April and 7th May. During the monsoon reproduction, the Superintending Surgeon writes from Cawnpore, that between the 1st and 13th August, thirty-nine European soldiers had died, besides women and children; and writing again on 2nd September, he reports twenty-seven deaths out of forty-five admissions.

Cholera of 1842 in the south.

In the south, from May to September, this same cholera prevailed. In May, cholera is reported from Jubbulpore, Hoshungabad, and Baitool, and in June, from Jubbulpore and Seonee. In July, cholera again appeared at Saugor; ninety-two cases and forty-one deaths were reported among the inhabitants. In August and in the beginning of September, the troops at Saugor were attacked; the Battery (European) lost five men, the Native Regiments eight men, and the jail ten prisoners.

But this cholera, both in the east and south, was a second-year cholera. It was in 1841 that the actual exit of the epidemic occurred, and finding, as I do, the minimum or extinction of this cholera in the south and west of our Presidency in 1844, I can without hesitation refer the epidemic of 1845 and 1846, dead in 1848, to a fresh source, and not to the endemic cholera of 1840 or to the invading cholera of 1841.

Cholera of 1841.

The invasion of 1841 was well marked. Terrible boat outbreaks among the Native Regiments moving on the Ganges between Dacca and Dinapore occurred in March. The 32nd Native Infantry was struck on the 3rd March, and at the time the Medical Officer wrote, between 150 and 170 men of the fleet had died. The 15th Native Infantry had forty-three deaths in the end of March and the beginning of April, on the river near Rampore Beauleah. Next, as usual, we find the cholera brimming over the Hazareebaugh plateau. Her Majesty's 62nd Regiment had nine admissions and three deaths after 19th March. Dinapore Cantonment is next attacked; in March and April, the 21st Fusiliers had twenty-three cases and ten deaths, and in May, twenty-nine cases and twenty-one deaths. Up to June, cholera was general both in jails and cantonments. Cases are noted up to June in Hazareebaugh; and at the same time cholera disappeared in the 21st Regiment. In the Tirhoot Jail alone, there were in April ninety-five admissions and fifty-one deaths; and in May, eighty-nine admissions and forty-nine deaths. No jail of the Ganges Valley escaped in 1841. From Cawnpore eastwards, every jail had cholera, although in no great severity; the weight of the epidemic fell further to the east.

From Behar south as far as the Bay of Bengal the country was covered by a sheet of cholera, as is indicated in the Jail Tables. Hazareebaugh Jail gave seven deaths, and Ranchee Jail six; at Chyebassa, the detachment of the Ramghur Battalion lost eight men between the 5th and 21st June; and the jails of Cuttack, Balasore, and Pooree give respectively sixty-two, twenty-four, and twenty-three fatal cases among their prisoners.

Cholera of 1841 on the southern epidemic highway.

Simultaneously, occurs the march along the southern highway, through Jubbulpore and Saugor, and through the Nagpore Province to Madras and Bombay. At Saugor, as at Agra, the succession of this epidemic to that of 1837 is distinctly recognized. The Superintending Surgeon writes:—"At the close of the month of June the epidemic cholera invaded the Saugor District. The total of cases treated during the month of July did not exceed 402, of which 289 were cured and 102 died. * * * The epidemic of the present year has thus been particularly mild as compared with that of 1837, in which so many as sixty-eight died in one day in the town of Saugor alone, and in the single month of July 812. * * * Cholera is said to be declining at Jubbulpore since the close of the last month." It is not until 1844 that this cholera entirely disappears, taking the jail population as the index.

The same phenomenon of repression of the monsoon, that is, the abnormal prevalence of easterly over south-westerly influences, to which I have called attention in speaking of the previous epidemic of Saugor of 1837, was seen in 1841. The Superintending Surgeon writes:—"The season of hot weather was much protracted. The clouds collected but slowly, and the greater part of the month of June was cloudy, threatening, and very close; but the fall of rain, which is usually rather abundant from the 12th June to the end of July, did not, up to the 21st July, give more than 8¾ inches, and up to the close of July less than one-third of the amount of rain due in an ordinary season fell."

In the Native Army of Madras the interval between the epidemics of 1837-38 and 1845-46 is thus marked; in 1847, cholera had disappeared from nearly every station of the Presidency. As in our provinces, it was not until 1842 and 1843 that the cholera invading in 1841 was exhibited in power.

Cholera Deaths of the Native Army of Madras, 1839 *to* 1847.

	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.
Strength	66,514	71,188	72,232	74,618	73,763	73,577	74,861	74,682	...
Died	249	122	241	741	905	521*	708	1,208	78
	Interval.			Invasion.		Decline.	Re-invasion.		Decline.

It seems to have been in the marching season of 1844-45 that Madras was re-invaded by the fresh cholera, which I regard as the parent of the cholera of 1845-46. The great calamities on the march roused the Madras Government to an enquiry, of which the results were thrown together by Lorimer. Of twenty-three marches undertaken in 1844, twelve only were completed without the appearance of cholera, and the deaths of four corps alone made up an aggregate of 290. In the spring of 1845 we find the same recurring. During 1845 and 1846 Madras suffered nearly as much as our North-West Provinces and Western Division of the Army; 708 Sepoys were lost in 1845, and 1,208 in 1846. The cholera of Madras and of our Presidency was one and the same cholera; the cholera of 1844-45 was our cholera of these years, and our great cholera of 1846 was geographically added on to that of the Madras and Bombay Presidencies. In 1847, cholera was dead as an epidemic in Madras; dead in the province of the south-west monsoon proper; dead in our North-West Provinces and in the Punjab; a sufficient indication that the cholera, wherever we may have met with it, was the cholera of the same epidemic.

Interval succeeding the cholera of 1846.

In April and May 1846, we find, as in all other years following epidemic invasion, cholera re-appearing at Umballa; there were, however, only fourteen cases and five deaths among the Europeans. The Native portion of the Punjab Field Force suffered at the same time, between March and June. The European Regiments at Ferozepore also lost a few men; one man died in May, and five in August and September. Cholera still appears in the Jail Returns of this province, although evidently nearly at its end. The European Army of the North-Western Provinces gives but a single death; and the troops in the stations of the Ganges Valley three. Among the Native Troops of the same provinces, 37,500 strong, seven deaths only were recorded. Mackinnon, writing from Cawnpore regarding the outbreak of September 1847, says:—"During the two past years I do not think there was a case of cholera even among the Natives, until the disease appeared a few days ago." (Op. cit., p. 81). This statement clearly defines the interval between the epidemics of 1845 and of 1847.

Even in Central India cholera was little felt in 1846. I find the Superintending Surgeon of Saugor congratulating himself on the fact that the terrible cholera of Malwa and Guzerat had scarcely reached so far to the east. The jails of his circle show six deaths only during the year, three at Saugor, and three at Hoshungabad, which suffered greatly in the provincial invasion.

Cholera of the province of the south-west monsoon proper of 1846.

In the extreme north of the south-western province, cholera coming up from the south-west appeared on 15th June, after ravaging all the country to the south in April and May. This extension seems to have coincided to a day with the invasion of Scinde; it was on the evening of the 14th June that Kurrachee was struck, and Nusseerabad became affected on the 15th. The extension, reaching as far to the north-west as Ajmere, was due to the peculiar meteorology of the year which I have noticed further on.

The provincial range of this cholera of 1846 is beautifully defined. Every Regiment marching westward from the east came within its influence as soon as a certain line was passed; and within the provincial limit cholera was absolutely universal and extended westward to the sea.

In connexion with the origin of the great Kurrachee outbreak, I have placed here extracts from Regimental Reports, which show the bounds and extent of the choleraic influence of April

* Of these 290 occurred in four Regiments on the march.

and May, and carry up its history and geography until the occurrence of the Kurrachee outbreak of June.

4th Company, 1st Battalion Artillery.—"During the march from Saugor to Mhow, between the 20th March and 14th April, the men continued healthy and escaped cholera, which was then raging in the country and broke out very severely in the 58th Native Infantry which travelled over the same route only ten days later."

10th Light Cavalry.—"The Regiment was at Nowgong in Bundelcund until the 28th April, when it marched for Mhow; with the exception of cholera which occurred in camp during the march to Mhow, little sickness has occurred. Thirty-nine cases of cholera were treated between the 27th May and the 9th June, of which twelve died. On the latter day the disease suddenly disappeared. Some days before cholera appeared, I had been told at various places that cholera had raged to a great extent, and had carried off many of the inhabitants ten days or a fortnight before we marched through."

58th Native Infantry.—"On 19th March, the Regiment commenced its march from Jubbulpore to Mhow. The Regiment continued very healthy until it arrived within one march of Indore when it was attacked with cholera. Cholera commenced on 21st April and continued to rage for sixteen days. The village at which it was picked up had lost many of its inhabitants, but this information was not given until afterwards. Cholera had not appeared at Mhow to any extent for five years previously. This was told me by Dr. Arnott, who, with about 200 men of his Regiment, fell victims to this dreadful malady a few days after leaving Mhow."* There were fifty-two cases and twenty-two deaths in the 58th.

74th Native Infantry.—"This Regiment marched from Hoshungabad on 2nd June and reached Mhow on the 20th. Four cases of cholera occurred at Mhow, but not of a severe character. Cholera, however, prevailed at Hoshungabad in May last. The disease soon spread to every part of cantonments. There were seventy-five cases of cholera admitted, and twenty-eight deaths. The disease was of a most severe character, some of the cases terminating in from seven to twelve hours."

Nimar.—"Cholera occurred during the hot season; but the district of Nimar seldom escapes an entire twelve months without cholera making its appearance."

5th Irregular Cavalry, Bhopawar.—"Cholera was epidemic throughout Malwa in April and May. It carried off eleven men of the Regiment detached on out-post duties at Jowrah, out of twenty-three cases."

22nd Bombay Native Infantry.—"On the 1st May the 58th Native Infantry encamped at Bhopawar, about two miles from cantonments. Cholera first made its appearance among them at Dhar, and increased so rapidly that in eight days upwards of 100 fatal cases occurred. On resuming their march on the 4th, towards Baroda, they left forty sepoys and numerous camp followers behind, many of them in a hopeless state. The type of the disease was deadly; in many instances collapse was concomitant with the commencement of the attack. * * The Regiment continued to suffer until within a few marches of Baroda, when the disease subsided as suddenly as it had made its appearance." From a letter dated 11th May, I find that cholera had been prevailing east and south-east of Bhopawar for some time previous, and that forty to fifty deaths were daily reported in the town of Dhar.

1st Irregular Cavalry, Neemuch.—"The Regiment continued remarkably healthy until the month of May, when two cases of cholera came under treatment. In June three further cases occurred, all of which were fatal."

2nd Company, 1st Battalion, Bengal Artillery, Nusseerabad, 1846.—"Cholera appeared at Nusseerabad about the 15th June with the setting in of the rains, which proved unusually heavy." Eleven men of the Battery died. There was the usual phenomenon of the exemption of the Natives. "The gun lascars were untouched; the 37th Native Infantry had but one sepoy affected, and the 18th Native Infantry was totally unharmed."

Mhairwarra Local Battalion, Beaur.—"Spasmodic cholera of an epidemic character appeared during the months of June and July. It does not appear that many deaths occurred in the district."

Every report mentions the great rain-fall of the year, which was far above the average. The extension of cholera so far to the north as to Nusseerabad, Beaur, and Ajmere, shows that this was the limit of the province of the monsoon in this year. The report for the year of the Nusseerabad Circle states:—"The periodical rain set in on the 25th June; a heavy shower or two fell on the 18th. The rains were heavier this year and more lasting than the oldest inhabitant can ever recollect before to have witnessed."

The report from Ajmere is as follows:—

"Heavy rain fell on 12th June, and up to the close of the month there was almost a daily fall. The month of July was cloudy and rainy throughout, and the general character of the weather was of the gloomiest kind, the sky being overcast with heavy masses of cloud. It was at this time that the cholera made its appearance at Nusseerabad. Early in July it also broke out in the city of Ajmere, and for a fortnight six or eight was about the daily average of deaths. Beyond this period the disease did not last in a severe form, and it disappeared about the end of August."

* This Regiment was attacked at Bhopawar; it was relieved by the 58th.

The cholera record of this province is of extreme interest, showing, as it does, the source of the great Kurrachee outbreak of 14th June.

Cholera of 1846 beyond the limits of Hindostan.

The natural inference from finding so enormous a body of cholera on the western confines of India is to connect on with this the succeeding epidemic of Europe—the Egyptian epidemic of July, August, and September 1848, the cholera invading Prussia in August, England in October of the same year, and New Orleans in December, and to reckon it as the parent of the cholera surviving up to the end of 1849. My impression is different. Notwithstanding the violence of this invasion, I consider that the cholera of the epidemic of 1844-46 died, and did not prolong its epidemic existence except in its extension below indicated, and in the Caspian Provinces; and I am inclined to believe that it was another body of cholera which two years later passed into Egypt. The history of cholera in Persia confirms this view. There is said to have been a clear interval of thirteen years previous to the invasion of 1845; and this cholera was dead in 1846, and Persia was free again from cholera until a fresh invasion occurred in 1848.

This cholera of 1846 was prevailing in Persia while the same cholera was raging at Kurrachee; and at Aden we find it even earlier, as usual, in the month of May, after a violent and unusual fall of rain.*

The next epidemic advance occurred in October 1846, when this cholera reached Aleppo and Damascus; and in January 1847, the Mecca pilgrims suffered, probably from the same cholera still retained in Arabia.

As the cholera of 1829 became unquestionably the Russian cholera of the years following, so there can be as little doubt that our cholera of 1845-46 found for itself a habitat far more suitable than any offered to it in India, and prolonged its existence until Northern Europe was covered. As with the epidemic of 1831, the difficulty lies in bridging over the interval between May 1846 and July 1848, the dates of its appearance in Arabia and in Egypt, and in determining whether the Egyptian cholera of 1848 was a new invasion from India derived from the invading cholera of 1847 noticed in the previous page, or an invasion from the north. It is to be noted that it was in July of 1831 and 1848 that Egypt was entered.

Great Indian cholera of 1845.

This western cholera of 1846 was but the extension of a cholera invading in 1845. This cholera of 1845 was a great cholera as well in the south as in the north of our Presidency. It was a great cholera in Cawnpore and Bundelcund, as well as in Meerut and the Punjab. In 1844, Cawnpore did not suffer. No cholera death took place out of a strength of 2,300 European Troops. Oudh also appears to have had no cholera in 1844. In the report of the King's Hospital for 1844, I find this statement:—"We have not seen nor heard of a single case of cholera since the year 1843." This exemption of Oude and Cawnpore I consider to mark distinctly the interval between the epidemics of 1841-44 and 1844-46. To the east, however, the cholera which I reckon to have been the cholera of the new invasion, was abundant in 1844. The Regiment at Allahabad had sixty-one cases and thirty deaths, and the Regiment at Ghazeepore seventy-one cases and twenty-seven deaths. Cholera appears to have been epidemic in Chota Nagpore also, as 109 deaths are returned among the prisoners of the Ranchee Jail.†

The spring of 1845 was peculiarly favorable for the extension westward of cholera. Mackinnon particularly remarks upon the meteorology of the early months of 1845 as favorable for bringing up from the east the great cholera of May and June upon Cawnpore. He writes (op. cit., p. 80):—"The hot season of 1845 was remarkable for repeated falls of rain during the latter part of March and in April and May." It was in March and April that cholera began to appear at Cawnpore and over the east generally. The Native Regiments at Benares had twenty-one cases and fourteen deaths in March, and those of Dinapore twenty-two cases and nine deaths in the same month and in April. At Cawnpore there were in March and April thirteen cases and three deaths, and cholera appeared at the same time at Lucknow. What is remarkable is, that Agra should have had cholera in March and April. Of the fact I believe there can be no doubt, for I find a death in the European Battery as well. Among the Native Troops I find sixteen cases and five deaths. And what, it will be asked, is the value of this, if it be a fact. I have said before that I reckon the importance of a cholera by the evidence of its epidemic spread rather than by local indications of malignancy. We know that the cholera of Cawnpore of June, in which sixty-eight European Soldiers were lost, was this same cholera, and I think it very probable that the cholera which swept over Agra in these early months was the very same body which when revitalised in the end of June, became the cholera covering the provincial area from Meerut to the Indus. That a wide spread body of cholera had been disseminated I have no doubt, and the forerunners of which I have elsewhere spoken as of so much importance to be watched and noted, were not wanting. At Meerut a single death in May gives intimation of the great monsoon outbreak of September, in which ninety-one men were lost. In reporting on the Meerut cholera of 1861, Dr. Wilkie traces these indications, noting that Private

* Sutherland's Report on the European Cholera of 1848, p. 4.

† It is possible that there may be some error in connexion with this; in the Jail Return these 109 deaths are entered, but I can find no record of the circumstances under which they occurred.

Jones, Her Majesty's 29th Regiment, died on 27th May 1845, and Private Lockwood, of the 10th Regiment, on 19th July, in anticipation of the outbreak. At the very same date in May, I find the Superintending Surgeon of the Saugor Division reporting the death from cholera of the Adjutant of the Bundelcund Legion at Jhansie on 22nd May. The very lightness of the visitation of Agra is, to my mind, a proof of the fact of its occurrence; had it occurred as usual about the 20th May in place of in March and April, we know what the result would have been. Scarcely a trace of cholera would have reached the Punjab or Meerut before the first week of July, but in the intervening six weeks cholera would have seated itself in the Agra District, and would have raged with a virulence equal to that of 1856 of the same six weeks. The passing on of this spring cholera without localisation, was followed by the ordinary results, namely, sparse distribution of cholera in May, and powerful revitalisation coincident with the setting in of the rains. The phase of distribution at the two seasons is different. The distribution of the spring in the western division, as for example that of May 1865, is not traceable, except when carefully and statistically surveyed; but it is true nevertheless, as is evinced by the fact that it is provincially reproduced when the moist vehicle is given to it with the setting in of the monsoon. The other phase, that of the monsoon, as of 1856 and 1861, shows epidemic advance in the same vehicle which would revitalise a spring distributed cholera. In either case the province is covered as a province, and we do not say that cholera has travelled here or has travelled there within the province, because we know that to say so is to make use of an expression which is essentially incorrect. When, in 1867, for example, we find cholera at Mooltan in May and at Meerut in September, we know both to be one and the same cholera, but we do not say that cholera travelled from Mooltan to Meerut. And yet this is exactly what has been done with regard to the cholera of 1845; and the cholera of Sukkur and Ferozepore is asserted to have marched against the monsoon until it reached successively Umballa and Meerut.

The fact of cholera having in November 1866 passed over Agra almost as an aura, and occupied the province over which it was so powerfully redeveloped in the spring and monsoon of 1867, and of Agra having been nearly exempted in 1867, when every station and district to the north and north-west was covered, is quite an illustration in point. It is this limitation in distribution, due to the absence of influences which carry on an invading cholera, which I have spoken of as an ideal wall against which cholera is thrown, and behind which it falls thick in consequence of repression in space; when the wall is absent the chances of localisation are comparatively small, for the miasm becomes diffusely spread in place of being precipitated in volume.

Why did cholera appear first at Sukkur before appearing in Rohilcund and the east of the Punjab? Note, that it was on the 15th June in 1845 that this Scinde cholera broke out, and that it was on the evening of the 14th June in 1846 that the Scinde cholera of Kurrachee made its outburst, and the reason becomes apparent. It was because this station lay within the province of the south-west monsoon proper, under monsoon influences which do not reach to the Punjab stations; it was, as usual, in the first week of July, and under monsoon influences from the east, that the general provincial manifestation in Meerut, Rohilcund, and the Punjab began to show itself.

This is the explanation which I give of this great cholera, and I believe it to be the correct one, namely, that the history of this period comprehends the facts of two distinct epidemics—the one, invading in 1841 and dead in 1844, having its maximum in the epidemic area in 1843; the other, commencing its invasion in 1844 and dying out in 1847, known generally as the great cholera of the years 1845 and 1846. Granting that the explanation is incorrect, the alternative does not lie in accepting as a fact the march of this cholera from Cabul to Meerut; no one holding generalisations founded on the history of cholera as an epidemic in India can subscribe to such a theory, and generalisations based on the assumption of this as a fact must of necessity be valueless. The alternative lies in conceiving the invading cholera of 1843 to have been repressed from powerful manifestation during 1844, and to have revived in force with the altered meteorology of 1845; to have been, in fact, a powerful third year cholera, such as the history of our time shows 1858 and 1862 to have been in the same province; and as following the Agra epidemic of 1843, as the cholera of these years followed the Agra cholera of 1856 and 1860. It is also right that I should remark that there is a great want of systematised information regarding the medical history of these years, and beyond the mere statistical data no explanations are given in the returns.

6 and 7. Cholera of 1848-54.

The period between the death of the epidemic of 1846 and the appearance of the great epidemic of 1856 had also apparently two epidemics included within it.

The end of the epidemic period was in 1854, when the province of the south-west monsoon proper was covered, exactly as in 1846. In 1853 we find a powerful body of cholera over the east, and invading also in the south. But this was supplementary to a previous epidemic which appeared on the southern epidemic highway in 1849 and 1850, was distributed over Northern India in 1851, and died off in 1852. The last notable outbreak in connexion with the epidemic invasion was the great Umballa outbreak of September 1852, and after this date the provincial area comprehending Central India Proper, Agra, Meerut, Rohilcund, and the Punjab, was free from cholera up to the invasion of May and July 1856.

The table which follows gives us the clue to these distinctions. It shows how a record even for one locality may coincide with the facts true for a continent :—

Cholera Deaths registered in the Island of Bombay, 1848-65.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Remarks.
1848	...	11	7	17	10	9	6	2	2	...	5	...	69	
1849	...	...	1	4	1	...	...	121	690	369	260	682	2,128	Invading epidemic of 1849.
1850	141	53	209	607	296	230	324	348	143	51	53	453	2,997	
1851	1,873	905	1,013	601	373	339	73	37	25	19	20	207	5,485	
1852	408	91	160	271	149	151	165	66	19	10	6	24	1,520	
1853	23	3	13	5	16	9	6	6	6	250	571	240	1,148	Invading epidemic of 1853.
1854	214	299	372	724	520	930	317	68	14	11	9	9	3,507	
1855	60	22	22	302	585	273	167	52	75	46	21	20	1,645	
1856	154	266	241	358	280	197	89	22	19	38	40	142	1,846	Invading epidemic of 1856-57.
1857	459	165	306	363	249	302	157	86	32	31	18	13	2,181	
1858	19	9	8	15	11	9	5	8	11	6	7	7	115	
1859	9	10	9	7	69	843	329	170	41	85	131	282	1,985	Invading epidemic of 1859.
1860	289	332	396	321	163	107	89	128	51	47	29	9	1,961	
1861	15	18	5	4	12	18	13	10	11	34	35	466	641	
1862	625	249	339	260	367	218	117	95	161	272	201	269	3,164	
1863	189	50	89	161	153	161	412	240	178	181	176	319	2,309	Invading epidemic of 1863-64.
1864	622	401	302	680	837	395	371	351	232	88	137	431	4,847	
1865	363	540	522	356	624	206	116	62	31	32	22	13	2,887	

This table shows that only once in these eighteen years has invading cholera struck Bombay in the monsoon season. It is in the spring months, or after the close of the monsoon, that our epidemics from the east appear, and it is possible that the invasion of 1849 may have been no exception. The fact of the constant sequence of these epidemics to invasions from the east forbids us to attribute their appearance to the local growth under favoring conditions of a cholera endemic in Bombay. Such increase and decrease does occur, but only as a phenomenon secondary to that of invasion.

Cholera of the province of the south-west monsoon proper of 1854.

The invading epidemic of May and June 1854, like that of May 1846, is illustrative of the distribution of a cholera confined within the limits of the south-western province. Neither at the time of invasion nor afterwards did this cholera pass into the Gwalior territories in its advance from the south-west. While Bhopal, Western Malwa, Nimar, and other districts bordering on the Nerbudda were covered within a few weeks, no advance was made beyond the epidemic line towards the north-west. To illustrate this, I show here the distribution of the 10,000 men composing the corps of Central India in June 1854, geographically divided, noting the stations affected and those which remained unaffected in this advance :—

Native Corps of Central India, June 1854.

Stations unaffected.		Stations affected.	
Gwalior, strength	3,570	Boorhanpore, strength	238
Augur	983	Mundlaisir	527
Seepree	901	Bhopal	1,050
Goonah	100	Sirdarpore	383
Lullutpore	670	Mehidpore	1,568

The Cholera Table for the jail population for the same year shows that Neemuch Jail suffered in common with the jails of Mundlaisir and Hoshungabad.

Epidemic of 1853 of the Gangetic Provinces.

The universality of this cholera is what is chiefly worthy of notice, and also its connexion with the cholera of the preceding year. I think that there can be no doubt of the fact, that a great body of cholera followed up the cholera of 1848-49 in 1853. In May, it swept up the valley of the Ganges, and struck Cawnpore on the 20th. This invasion initiated the terrible cholera of the 70th Regiment, of June, July, and August, in which 183 men were lost; but in May the premonitory cholera lasted four days only and cut off only four men. The same cholera had attacked the 29th Regiment at Dinapore on 6th May; but here also this May outbreak was of secondary importance to the monsoon manifestation of this cholera wave.

Few bodies of cholera have given greater evidence of universality and power than this Gangetic cholera of July and August 1853. I find it noted, that in Chunar twenty to

thirty deaths occurred daily; and it is supposed that 1,000 persons died out of a population of 12,000. The invasion and revitalisation of July is beautifully shown in the statistics of the jail population. What is well worthy of notice is, the apparent aura of March and April, universally displayed without the occurrence of almost a single death, and the deadly revitalisation of July, which did not spare a single jail between Hazareebaugh and Cawnpore.

Admissions and Deaths from Cholera in each month of 1853.

Jail Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Ranchee ...	...	...	...	...	...	...	3-0	...	...	...	1-0	...
Hazareebaugh ...	1-1	...	...	...	...	2-0	28-13	0-1	...	...	...	...
Monghyr ...	...	1-0	2-0	...	10-1	1-0	1-0	...	...	...	...	...
Bhaugulpore ...	...	2-0	1-0	8-2	20-13	...	52-19	1-2	...	...	...	...
Purneah ...	...	...	3-0	3-1	1-0	...	...	1-1	...	...	...	...
Gyah ...	...	1-0	5-1	2-0	1-0	3-1	47-16	18-11	2-3	...	...	...
Patna ...	...	...	5-1	2-0	5-3	...	1-0	3-0	...	...	...	1-0
Deegah ...	...	2-1	6-0	4-1	6-2	5-1	131-42	4-5	4-3	6-5	...	...
Arrah ...	...	...	2-0	8-0	...	2-1	84-24	...	...	...	...	...
Chumparun ...	...	...	...	2-0	10-2	18-14	2-0	0-1	3-0	...	...	...
Mozufferpore ...	...	...	1-0	4-0	1-0	6-1	26-6	12-1	0-1	...	...	...
Chuprah ...	...	...	2-0	3-0	10-2	10-1	73-24	27-13	...	...	...	...
Ghazeepore ...	...	1-0	5-0	4-0	...	2-0	18-2	1-1	...	...	...	...
Benares ...	...	...	...	2-0	1-0	38-13	2-1	4-5	1-0	...	...	...
Mirzapore ...	...	...	...	1-0	...	2-2	...	2-0	1-0	2-1	...	...
Azimghur ...	...	...	...	...	...	...	2-0	3-1	...	...	3-1	2-1
Jounpore ...	...	...	...	1-0	...	1-1	6-2	22-9	...	...	...	...
Goruckpore ...	...	...	...	2-0	2-0	0-0	18-10	46-19	1-3	2-1	2-1	1-0
Allahabad ...	...	...	..	...	3-1	2-0	3-0	33-13	2-0	...	...	1-0
Futtehpore ...	...	...	...	...	...	...	...	5-1	...	...	...	...
Cawnpore ...	...	...	...	...	...	5-0	1-0	16-3	2-0	1-0	...	1-0
Futtehghur ...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	...	...	...	...	...	3-0	...	...	...	...	...	...
Oraie ...	...	...	...	...	...	...	...	...	...	...	...	...
Humeerpore ...	...	...	...	...	...	...	...	1-0	...	...	...	...
Etawah ...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	...	...	...	...	...	...	...	...	...	...	1-1	1-0
Dumoh ...	...	...	...	...	...	...	...	...	2-1	...	...	...
Nursingpore ...	...	...	...	...	...	...	...	...	1-1	...	...	...
Hoshungabad ...	...	...	...	...	...	...	...	...	...	...	...	...
Baitool ...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore ...	...	...	...	...	...	...	...	1-0	...	...	...	...

No sooner is the monsoon at an end than we find this same cholera on its journey on the southern highway. The cases of Dumoh and Nursingpore of September give evidence of the passing on towards Bombay of the cholera which reached the city of Bombay in October. Thus in one year we connect on the cholera of Bombay with the endemic cholera of Bengal.* It was this cholera which in the spring of 1854 became the cholera of Malwa, of which I have indicated the epidemic spread, just as at present, while this paper is passing through the press, the invading Bombay cholera of October 1868 has shown itself epidemically throughout the same province.

Nothing of this epidemic is found in the western division of the epidemic area of our Presidency either in 1853 or in 1854. It was powerfully reproduced in the Gangetic Provinces in 1854, but the invading materies was lost, diverted as in the case of the epidemic of 1863-65, to constitute the very body of the cholera which we trace going to the south and west, and which we shall further trace as the European cholera of 1854-55.

Epidemic of 1849-52.

We have now to look to the epidemic which immediately preceded this. This cholera invaded Bombay apparently in the end of August 1849, and became in the same year an epidemic of minor intensity in Madras.

This epidemic I regard as the cholera of the invasion of 1848, from which the 1st Fusiliers suffered so severely at Cawnpore. On the 12th May 1849 (the identical day on which the cholera of 1866 reappeared in 1867), a great outbreak commenced in the Banda Jail, in which forty-two prisoners were lost. Next, this cholera appears universal on the southern highway in

* The invading October cholera of Bombay of 1868 I have traced commencing its march early in 1868, through Mundla, Seonee, and Jubbulpore, halting until the end of the monsoon, and then resuming its course westward and reaching Bombay on 15th October.

June and July, ready for the next epidemic leap, in which Bombay was reached. The fact and date of invasion is thus shown in the case of the jail population of these provinces:—

Admissions and Deaths of the Jails of Cawnpore and Saugor, 1849.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Allahabad	...	...	...	...	...	31-7	60-19	13-10	5-1	1-0	...	...
Futtehpore	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore	...	...	...	1-0	...	6-2	8-4	5-4	...	...	...	...
Futtehghur	...	...	...	...	...	...	...	...	...	...	...	...
Banda	...	...	...	...	12th to 31st 23-12	63-26	4-2	1-1	1-1	...	...	...
Humeerpore	...	...	...	...	...	1-0	1-0	...	1-0	...	...	...
Etawah	...	...	...	...	...	...	...	...	...	1-0	...	...
Jubbulpore	...	...	...	...	...	1-0	26-13	30-16	...	...	...	...
Saugor	...	...	...	...	...	7-4	16-11	2-2	...	...	...	...
Nursingpore	...	...	...	...	...	...	53-38	...	...	...	...	...
Mundlaisir	...	...	...	...	...	...	...	...	...	1-1	...	...

Another reason that induces me to consider this a cholera reproduced from the invasion of 1848 is, that 1849 in the valley of the Ganges below Allahabad, was a year in which very little cholera appeared. In fact, of the whole of the jails of Benares and Behar, Bhaugulpore and Tirhoot alone suffered, and scarcely a single death is reported out of the remaining sixteen jails.

Cholera of 1850 on the northern epidemic route.

In 1850 this cholera is found in full epidemic force in the south. But on the northern epidemic route this was but a feeble although a distinctly epidemic cholera. The cholera of 1849 was, in fact, as in 1837 and 1860, repressed from the northern provinces during 1850. In the report of the year from the Meerut Division we read:—"No particular epidemics are reported in any of the civil districts of the Meerut Circle." As in 1860 (mark the parallel), Goorgaon is the last station at which cholera invading from the east or south-east is met with. The Jail Return of 1850 gives seven cases and two deaths. Next it is found at Muttra:—"Cholera made its appearance at Muttra about the middle of August, but was confined principally to the city and sudder bazaar; in both places the mortality was considerable. The disease began to decline in October and disappeared entirely in November." Dr. Murray, in his report on the Agra epidemic of 1851, states that cholera was very general towards the end of the hot season of 1850 in Gwalior, and that it extended during the rains as far as to the banks of the Chumbul.

At the same time, this cholera appears as far west as Ajmere, our index station, on the same route. In the jail twelve cases and four deaths occurred. In the report it is stated that these occurred in September towards the close of the monsoon. This cholera hung about the Agra District also up to the close of the year. The Death Rolls of the Agra Jail show a death on each of the following days,—2nd, 4th, and 30th October, 13th November, and 9th and 11th December. Dr. Murray says that the cold season of 1850-51 was cloudy and wet, with very little truly cold weather.

But this, although a true and typically marked invasion, was not a great cholera in the North-West; and the meteorology of the year, as in 1837 and 1860, was sufficient to account for the phenomenon of limitation in geographical distribution and of repression in intensity of manifestation. Writing from Meerut, the Surgeon of H. M.'s 18th Regiment states in his Annual Report:—"The year was exceedingly unseasonable. The hot winds blew fiercely until the end of July without the temporary alleviation incident on the storms usual at that period of the year; and even when the rains set in they were scanty, the hot winds prevailing to a greater or less extent up to the end of September."

On the southern epidemic route the cholera of 1850 was powerfully revived. The following quotations from jail reports illustrate this:—

Cholera of 1850 on the southern epidemic route.

1850, *Baitool.*—"Throughout almost the whole of the hot and rainy seasons cholera prevailed in the district; it did not, however, attack the jail until July, when seven cases occurred."

Seonee.—"The jail mortality has been principally occasioned by cholera, by which twenty-two men were attacked. The cholera has not appeared, I am given to understand, in this district for five or six years, till it in this last year devastated the villages in the surrounding country. It

seemed to appear at the same time in all parts of the district, and subsided as suddenly without any particular progress."

Jubbulpore.—"Cholera first appeared on the 7th June in the gang of prisoners at work at Moorwarrah, fifty-seven miles east of Jubbulpore. Thirty-two cases and seventeen deaths occurred. In June two cases occurred in the jail hospital, and in July seven. In August it raged with the greatest violence." Thirty cases and twenty deaths occurred in the Jubbulpore Jail.

In the same year this cholera covered the west of India; it is found invading Malwa, and as far west as Surat, Baroda, Deesa, and Kurrachee. It reappeared here again in 1851, 1852, and 1853.

The following paragraph from a report by the Civil Surgeon of Nimar, dated 1st September 1851, shows the provincial distribution in the south-west with the monsoon of that year. He writes:—"Cholera first broke out in the southern part of the province bordering on Khandeish, where is situated the large city of Boorhanpore. Then it continued extending in the direction of the Nerbudda, and spreading forth east and west. It has not concentrated its virulence within a limit. Villages in the interior as well as those on each bank of the river have been equally attacked; nor has the Vindhya range proved a barrier to the progress of the disease, as the cantonment of Mhow and the city of Indore have not escaped."

This is the parent of the cholera of Persia and Europe of 1851-54. It was in July 1851 that cholera began to spread along the Persian Gulf, and within three months the whole of the south of Persia was occupied. This was the Persian cholera of 1851 and 1852. But again, cholera appeared in the very month in which I have shown Bombay to have become reaffected by our Gangetic cholera of the same year, namely, October 1853. In the report of the Constantinople Conference we read (Indian edition, p. 318):—"On the 19th October 1853, the Inspector announced that cholera had reached Bassorah, imported *viâ* Mohammerah. The troops of the Shah ravaged by cholera spread themselves, and disseminated the disease throughout Persia.* On the 18th November it passed from Persia *viâ* Bassorah to Bagdad." This, our Gangetic cholera of 1853, is, as I reckon it, the cholera which appeared in the Black Sea on 16th July 1854, and on the 21st July at Varna.

Cholera of these epidemics beyond the limits of Hindostan.

The cholera of 1851, derived from our epidemic of Northern India of 1850, had appeared at Warsaw in July 1852, and in St. Petersburg in October. Mr. Grainger's report gives the career in Eastern Europe, up to September 1852, of this cholera, regarding it, and with truth, as the same which in the summer of 1853 made its appearance in England. I regard the Crimean cholera of 1854-55 as a cholera different from this, and belonging to the epidemic succeeding that of Northern Europe of 1852-53. This was the great cholera of Arabia, which Palgrave mentions as traditionally remembered, and the same from which Persia became affected in October 1853.

In May 1851, as on the occasion of all former and subsequent epidemics, we find the cholera of 1850 revitalized west of Agra and south of the Jumna. Dr. Murray notices its prevalence at Banda, Hattras, and Allyghur. But it was not until the monsoon of 1851 that this same cholera entered Meerut, Rohilcund, and the Punjab. It was on the 25th July that the great cholera of the Agra Jail appeared, in which 254 prisoners were attacked, of whom seventy-three died. In August, Lahore is reported to be suffering from fever and cholera, the deaths being estimated at from forty to fifty a day, and in the end of the year we find it raging in the Terai. The Sub-Assistant Surgeon, who was deputed to Kaladoongee to look after those attacked, reports that between 25th December and 21st January he treated 128 cases, of which seventy-one were fatal. This was followed, as usual, in April and May of the year following, 1852, by a general outbreak over Kumaon, when Deyrah and Almorah also suffered; and the last we hear of the epidemic is the great outbreak of 5th September 1852 at Umballa, in which seventy-three European soldiers were carried off out of 147 affected by the cholera. At the same time the Goorkha Regiment at Deyrah suffered severely. But in no other station of Meerut or the Punjab except in Umballa and Deyrah was this cholera of 1850-52 felt; individual cases of cholera only appear in the returns. I believe that the strength of the epidemic in these provinces was broken by the repression of 1850.

Cholera of 1851-52 in Northern India.

For four years after 1852, Northern India remained free from cholera, until the invasion of the epidemic of 1856. This, probably the greatest of all our Indian epidemics, owed its greatness perhaps to its geographical repression. Although a true invading epidemic in the south, this limb was weak in comparison to that invading to the north, and it was not until 1858 that it reached Aden. In October 1858, and for some months afterwards, cholera committed great ravages amongst the population on both shores of the Red Sea.† It prevailed in the same month in the Persian Gulf. In 1857, this cholera was general from Jubbulpore to Bombay, as well as throughout our North-Western Provinces.

8. Interval preceding the epidemic of 1856 in Northern India.

The following extracts from Annual Stational Reports relate to the new epidemic of 1860, traversing the southern epidemic route:—

Raepore.—"Epidemic cholera visited the station after a lapse of four years. The first admission of this station was on the 22nd March, a sepoy who was on guard; the next a prisoner. After this, cholera spread simultaneously both in the town and regiment, and twenty to

9. Cholera of the early months of 1860. Invasion on the southern epidemic route.

* This is the theory of the writer.

† Report on the Army of India, Station Aden, Vol. II, p. 851.

thirty died daily, while it was at its worst in April and May. The last admission was in the city hospital on the 18th August. The disease appears to have travelled to us from Nagpore, as it occurred there some time previous."

Chanda.—The date of the appearance of cholera at this station is not given. "Cholera prevailed in the jail from 5th to 17th May, when the disease was committing great ravages in the city. It continued to prevail in the city for months after its disappearance from the jail."

Nagpore.—"Cholera prevailed epidemically first in the city, and afterwards, it attacked the prisoners. The first case was admitted on the 1st March, and the last on the 25th July, but no cases were admitted in May."

Chindwarra.—"On the 28th February I saw the first case of cholera."

Hoshungabad.—"Epidemic cholera made its appearance in the district in March, but only two cases occurred in the jail."

Nursingpore.—"The Nursingpore Jail was exempted from any epidemic during the year, but cholera was rife in the district during April, May, and June."

Baitool.—"The district of Baitool is said to have suffered severely from cholera during the months of May, June, and July."

Nimar.—"Cholera made its appearance in the month of March (6th March). After this month there were only two cases of cholera in the jail, although it still existed in the district."

Above the Vindhya—Sehore.—"Cholera prevailed in Sehore, although the prisoners enjoyed complete immunity from the disease. It commenced about the 15th June and continued until September. Cholera is stated to appear here generally about the end of March or in April; the recent attack was therefore at an unusual season."

Saugor.—"Cholera made its appearance among the people soon after the first fall of rain, from the 6th to the 9th June, and lasted during the monsoon, gradually disappearing towards the end of August."

Mundla.—"Cholera appeared in the city of Mundla in May last, and continued until the end of July." If this district was crossed by epidemic cholera in 1859, when our eastern epidemic province was covered, our returns give no clue to the invasion. It may have occurred nevertheless, for it is remarkable to note the great outbreak in Bombay city coincident with the invasion of the Gangetic Provinces.

This was the cholera that reached Persia in the beginning of November, which is thus noticed in the report of the Constantinople Conference (p. 313):—"Towards the termination of the year 1860 cholera came into the country with the Persian troops returning from Turkistan, and in its rapid march it invaded Turkey."

I need not trace again this epidemic in the successive stages of its career up to its death in November 1862. I have already shown that this epidemic and its predecessor of 1856-58, were strictly moulded upon the type of the cholera of 1817-20, and were strictly parallel one with the other.

10. Epidemic of 1863-65.

The epidemic of 1863-65 claims greater attention, as having illustrated to us in our time the method and course of invasion from the Bay of Bengal to Eastern Africa.

We can trace it back to the week of its exit from the endemic province. The Jail Table for 1863 tells the whole story of invasion with absolute precision. It shows cholera swarming up the Ganges Valley in the east, and covering the Behar Provinces, in which we are told not a village of any note escaped. It is in March that invasion commences; the spring cholera struck Agra on 20th May, and the entire eastern province was covered within those months. Next mark the revitalisation of July, and the east of our Presidency covered by an enormous body of cholera, universal from Agra to Hazareebaugh, not sparing one station of the natural province. Oude also is occupied throughout. Agra was the station furthest to the west which was touched; not a case of cholera is seen in Rohilcund, Meerut, or the Punjab in 1863.

The commencement of the epidemic journey to Africa and Europe also appears in this table. It took place along the southern epidemic highway. Mark carefully the geography of the jails affected in June in the Central Provinces, and it will be seen that those alone were affected which are apt to come within the influence of our monsoon from the Bay of Bengal,—Raepore, Bandhara, Seonee, Jubbulpore, and Mundla, the cluster of five jails occupying the east and north-east of the Nagpore Province and immediately adjoining to Chota Nagpore and our endemic province.* It was in September, October, and November that the Nagpore Jail suffered, and this cholera marched onwards to the west after waiting for the conclusion of the monsoon. This I regard as the cholera which reached the city of Bombay in December 1863, and which cut off upwards of 3,000 persons between this month and May following.

The history of the same cholera revitalised in 1864 is also perfectly marked. Powerful and universal over the area in the east invaded in 1863, it was at the same time as powerfully repressed by the meteorology of this non-epidemic season, the character of which I have sketched in the previous chapter. Cholera struggled to attack the Europeans in Lucknow, Cawnpore, Allahabad, and Benares, and happily succeeded to but a small extent; and it obtained a footing in six jails only of the province. Its epidemic advance in 1864 was not promoted by

* This was a true invasion, for not a case of cholera appears in these jails until the common outburst with the monsoon, which sets in earlier in the south, and which is the equivalent of the same meteorology which revitalised in July the great body of cholera spread between Nagpore and Oude.

a mile, for cholera was dead, as in 1863, over the western division of the epidemic area in our Presidency. Throughout the Punjab, Western Rohilcund, Meerut, Agra, and Central India, to a clear bounding limit of the natural cholera province of the south-west monsoon proper, cholera had no existence in 1864, unless the three cases below referred to be regarded as true forerunners of the cholera invading in May 1865.*

Before tracing the cholera of 1864 and 1865 in the south, I shall finish what I have to say of the cholera of 1865 in the North-Western Provinces.

In the eastern area the fact of the continued prevalence of the cholera is clear enough from the figures shown in the tables of the year.

Finding the persistence of cholera in the south-east also, I feared that the western division of the epidemic area would not escape invasion in 1865. In anticipation of this, I addressed the Sanitary Commissioner, not knowing at the time that what I anticipated had actually occurred, and that the persistence of the cholera in the south-east in 1865, had been followed by the invasion of the Northern Provinces. Speaking of the cholera of the early months of 1865, I wrote:—"Cholera has reappeared also in the jail of Nagpore (where it has been present from March to June), in Chanda, Belaspore, Bandhara, and Seonee. Jubbulpore Jail has also been threatened, and to-day the death of a woman of Her Majesty's 91st is reported. I am inclined to regard the fact of the appearance of cholera in so many jails with great suspicion, for I have held, and feel inclined to hold, that, under the circumstances, we may look for its progress north and west. Happily this is a cholera in its third year of invasion, and, should we suffer, next year should see the end of the invasion, unless it be supplemented anew. There is another circumstance favourable to us, *viz.*, that however powerful the epidemic may be when pursuing a normal progress to the west, as this cholera has done and is doing, the offshoot which may have come into the highway leading to our Presidency may be but a feeble one, and may possibly be dissipated before reaching so far on its journey northward. However, I give you my impressions and I do not hesitate to do so; and I make my assertions without insisting upon their truth dogmatically."

The anticipations contained in this letter were precisely realised. Between the 12th May and the end of the month a sparse body of cholera was thrown over the western area, even into the hills, striking Kussowlie, Dugshaie, and Deyrah. Writing of these sparse cases, I addressed the Sanitary Commissioner thus:—"In regard to the renewal of cholera subsequent to invasion, I have stated that I consider universality of distribution rather than the strength of individual outbreaks a criterion of the seriousness of an invading cholera. But the cases I wrote about yesterday seem of so thoroughly sporadic a nature that I doubt the power of the cholera which has already invaded to do much mischief; at the same time if cases do occur shortly, in which we cannot trace distinct continuity with the cholera of the Agra and Morar Districts now in progress, we shall at least recognise their origin, and regard their occurrence as no mystery." The more powerful body of the same invasion came only as far north as to Etawah, Jhansi, Agra, and Morar, where it became the cholera of June, July, and August 1865. This cholera was, as I reckoned it would be, dead in 1866.

This May cholera of 1865, for the first time since the exit of the epidemic from within the endemic area invading our Northern Provinces, was the very cholera which was at the same time cutting off the Mhow Artillery Detachment below the Simrole Ghât in Khandeish and the pilgrims at Mecca, and which was ravaging the highlands of Abyssinia.

I have traced it beginning its journey on the southern epidemic highway in June 1863; the journey was continued in the following stages:—

The revitalisation in the spring of 1864 showed the epidemic belt covered with cholera from sea to sea.

The *Bombay Gazette*, in its overland summary of the 28th March 1864, states:—

"The provinces of Central and Western India are suffering from the effects of an outbreak of cholera almost as deadly and widespread as that which, three years ago, ravaged Hindostan. Letters from most parts of the Bombay Presidency and adjacent territories give sickening accounts of the desolation which this fearful pestilence has made in the land. In Berar and Khandeish the people are dying by the hundreds every day. From Surat we hear hardly less sad a tale; and although Bombay itself is still comparatively free from cholera, the districts of the Southern Concan have been stricken as heavily as Guzerat."

The monsoon manifestation of this cholera was worse than that of the spring; and before the end of the year this same cholera was prevailing in Arabia.

We know the exact limits of this cholera of 1864; it was the curved line which bounds the cholera province of the south-west. As I have shown, we had not a trace of this cholera in Northern India in 1864.

The limit was reached about twenty miles north and east of Saugor, and this limit was not overstepped by human intercourse. And from this point westward to the sea and southward to Berar and Khandeish no spot escaped; Nursingpore, Nimar, Saugor to the west, Bhopal, Malwa, and Guzerat, suffered equally.

* In our printed returns three deaths, attributed to cholera, are shown over this area in 1864. A prisoner died in Umballa Jail with symptoms much resembling those of cholera; a Sergeant of an European Regiment died at Mecan Meer in collapse after attending an entertainment; and a death of a sepoy is noted at Umritsur in December, an unusual month for the occurrence of cholera in the Punjab. It may be doubted whether any of these three cases was a case of true cholera.

This universally distributed cholera was ready for reproduction in the spring of 1865, in the more favourable localities in February, March, and April, and in the later localities in April and May; and it came forward throughout the entire area covered in 1864 as an epidemic within the area. It became the cholera of the early months of 1865 of Kattywar, Scinde, Arabia, and Eastern Africa. In Guzerat, in the beginning of 1865, it was exceedingly virulent; in Broach so much so that the Courts were closed for the time. Colonel Keatinge writes to me from Kattywar in June 1865:—"There is much cholera in the south-east of the province. There was a fearful outbreak at the close of a great concourse of pilgrims at the Palectana Hill in the cold weather, and it has lingered ever since." Our invalids and time-expired men from the Punjab who went down the Indus, met this cholera as soon as they arrived at Kurrachee in the early months of 1865. It was by this cholera that in May 1865, the Mhow Artillery Detachment was cut off in Khandeish. In the introduction to the "Deaths of Madras" for 1864, it is mentioned, that in these months of 1865 the high road leading from Nagpore to the terminus of the Bombay Railway had been literally a valley of death.

The following are extracts from this report:—

"During the past year (1864) and the present (1865), two fearful epidemics have taken their origin from the same spot.* The troops in Nagpore have suffered on both occasions, and the highroad between the terminus of the Railway and Nagpore has been literally a valley of death for months together. Officers, their families, and Native travellers innumerable have fallen victims in attempting to pass it."

"In another direction, cholera has passed down the valleys of the rivers leading into the Godavery. It attacked the coolies employed in the works in connexion with that river, so that the whole camp became for a time demoralised. At one station the deaths had numbered 328, and many coolies had deserted and returned to their homes."

That this was truly a reproduced cholera is shown by the account which Dr. Thompson, of Bhopal, gives of its reappearance in the spring of 1865. As in our Northern Provinces, the date of the first reproduction here of a cholera which has made its invasion in the previous year, is about the 20th April. It is quite evident that, throughout the Bhopal territories, this cholera was generally reproduced at this date because it was lying latent from the cholera of 1864, and came forward when the climatic conditions suited its revival. He writes:—"The disease did not seem, as in former outbreaks, to pursue a particular direction, or to be confined to towns situated near the high road. In former outbreaks, occurring during the past ten years, the disease has always pursued the same course. It has been heard of in Khandeish and Nimar, gradually travelling along from Boorhanpore, Burwai, and Simrole to Indore; it then shows itself at Sehore, and pursues its course in an easterly direction.† But this year only two cases entered the station from that direction, and they came in August after the disease had been prevailing for months in Sehore."

He adds, that the Natives all agree that the cholera of 1865 was the most severe and the longest continued ever known.

The Native Regiments of the Central India Force attached to this Presidency, lost thirty-nine men. This force is distributed in many out-posts, and very few escaped a visitation of cholera in 1865. All of these facts are shown in the tables for these years; they give a true indication of the distribution of this great southern epidemic.

We are told that Persia preserved herself in 1865 against this cholera by closing her chief ports against arrivals from the Arabian Coast. Had the cholera of 1863-64 occupied the northern in place of the southern highway, we know how futile any measures of quarantine would have proved. It is probable that the body of the cholera of 1864-65 passed altogether to the south of Persia, as it reached very far to the south on the east coast of Africa.

There was no escape for Persia in 1867-68 when our northern provinces suffered. By the 28th August 1867 our Indian cholera of May was raging in Teheran.‡

In the next chapter I shall show the relations of the epidemic of 1866-68 (No. 11). The one feature of this epidemic is the exemption of the southern epidemic highway in 1867, apparently consequent on the transfer in October 1866 into Northern India of the cholera which would normally have commenced to enter it in March 1867, and its re-occupation in the spring of 1868, by a body of cholera which reached Bombay in October after the close of the monsoon, and in November and December has given evidence of having extended into Khandeish and Malwa.

Even in this rapid sketch, touching merely the more readily tangible features of so many different epidemics, the grand truths parallel throughout these fifty years force themselves into notice. Sometimes they are easily read; sometimes the parallels are read with difficulty; but that the harmony is perfect is not to be doubted. It is our misinterpretation or ignorance of the facts which alone introduces discord. The laws of control and repression are but part of the harmony; and when we cannot follow out what we imagine to be the natural course of events, we may be sure that there is a good reason for what is obscure to us.

That the present method of investigating the means and routes by which Europe is invaded from India is erroneous, we, studying cholera in India as an air-conveyed miasm, cannot but

* The temple of Mahadeo. This is a theory of the writer.

† Covering the natural province from the south and south-west.

‡ The *Bombay Gazette* states, that cholera of the most virulent type, is reported to have broken out at Teheran In three days 150 deaths took place, and the cases averaged 80 per diem. This intelligence came in a telegram viâ Bagdad, dated from Teheran, August 28th.

conclude. The different routes—through Central Africa, through Arabia and Egypt, through Syria and Asia Minor, and through the provinces of Russia, seem each to be specially selected by different epidemics, and as long as the theory is held to, as conveying the whole truth, that cholera is continuously spread to Europe by transmission from man to man, so long will the grand and fundamental laws of diffusion and control be overlooked and unappreciated, and disappointment result when epidemics advance unchecked and unmitigated.

Since the progress of the cholera of Hindostan is now carefully watched and recorded, there need be no difficulty in tracing to their base of departure the epidemics which shall in future years leave this country. We shall watch for them on both the northern and southern highways, and especially at their gates of exit; and we shall note the age of the cholera at its date of departure, in order to ascertain whether the delay of a year or of two years, determines the earlier death of the epidemic invading beyond Hindostan. To those watching for the arrival of the invading cholera in countries foreign to it, I would recommend that less attention be paid to the observation of isolated cases thrown forward in anticipation of the coming cholera; or, at least, that the occurrence of these shall not be allowed to divert the observer from the true object of his research,—the actual date of the coming of the air-conveyed epidemic which is to be studied, the meteorology attending its advent, the interval between successive epidemic leaps, and the natural phenomena of dormancy and revitalisation normal for natural provinces which, although less marked than with us, no doubt exist as well in the West as in the East.

It is evident that on every occasion of renewed epidemic exit from the endemic area the invasion of countries beyond India is to be looked for. If it does not occur, this is the exception and not the rule. The causes which extend the distribution of cholera in space extend it, apparently, in time also. For I think it is certain that once the epidemic barrier caused by the African, Arabian, and Syrian deserts is passed, Eastern Europe affords facilities for the extensive revitalisation of cholera quite as great as those of the provinces of Upper India. A definite record is required, to show with what meteorology and at what seasons, Eastern Africa, Arabia, and Persia are covered; the dates normal for invasion, as fixed by the parallels of different epidemics; and the limits of distribution, especially whether the meteorology attending invasion is capable of carrying and does carry the miasm over the desert tracts into the well watered countries of Eastern and Southern Europe. I cannot conceive that a cholera, such as that of 1866-68, destined to die in 1869 in Upper India, should, from the mere fact of its exit from Hindostan on the southern epidemic highway, renew its vitality in countries beyond. The opportunity was lost to it, when, in October 1866, it was turned aside from the southern into the northern epidemic highway. This northern limb has played its part in Cabul in 1867, and in Persia in 1867 and 1868, and if this epidemic is to reach Europe at all it must be through Northern Persia. The body of this cholera covered in its exit the whole of the Behar Provinces in the first week of July 1866; it was in the week ending the 15th October 1868 that cholera struck Bombay on the occasion of its reentering and reoccupying the province of the south-western monsoon proper. If this invading cholera belonged to the epidemic emanation of 1866, then two years and four months were occupied in crossing from the brim of our endemic basin to the western coast; and I can scarcely think, favourable although the track traversed in 1868 by this cholera certainly is, not only for the passage, but also for the propagation of the cholera miasm, that its vitality shall be so renewed and its volume increased, as to adapt it to become the pabulum of an epidemic invading Arabia and Egypt. It is possible that it may be heard of, like the cholera of 1858, the fourth-year cholera of the epidemic of 1855, as a cholera confined to, and ending in, Southern Arabia and Eastern Africa.*

The very fact of the constant mixing up one with the other of the different epidemics of India and Europe shows how rapidly the succeeding epidemic follows up its predecessor beyond as well as in Hindostan; but I think there will in future be no insuperable difficulty in fixing the base whence a body of invading cholera originating in India has departed.

* After a review of further facts observed since this was written, I now recognise that the cholera reoccupying the southern epidemic belt, which reached Bombay in October, was not a portion of the epidemic invading in 1866, but the cholera of a fresh emanation from the endemic area in the spring of 1868.

CHAPTER VII.

THE CHOLERA OF THE EPIDEMIC AREA OF 1866-69.

It was evident that with the monsoon of 1866, a new invading epidemic, in succession to that of 1863, had made its exit from the endemic area and was threatening to cover the epidemic area in the east.

Minimum of manifestation preceding the invasion of the new epidemic of 1866.

The year 1866 was the fourth year following 1863; and, therefore, in accordance with the parallels of 1858-59 and 1862-63, a minimum or the extinction of cholera over Upper India was to be anticipated. Putting aside the part played by the newly invading cholera of the year, this minimum was thus represented in our types in 1866:—

A. Prisoners.—A daily average of 13,529 prisoners in the jails of Benares, Oude, and Cawnpore gave during the year five admissions and one death.

A daily average of 9,695 prisoners in the jails of Central India,* Agra, Meerut, and Rohilcund gave two admissions and one death.

A daily average of 10,697 prisoners in the jails of the Punjab gave no admissions and no deaths.

A daily average of 33,921 prisoners in the Upper Provinces gave seven admissions and two deaths from cholera during 1866.

B. Native Army.—There was a local outbreak at Benares in April and May, in which five men died out of eight admitted; and one man died at Lucknow in June, whose death was attributed to cholera. With these exceptions, the Army of Upper India had no admission nor death from cholera, until the end of October, when it became affected by the new epidemic.

C. European Army.—The stations of the Ganges were slightly affected in the monsoon advance of the epidemic. It is perfectly well known that an offshoot of the advancing cholera was thrown over the valley of the Ganges simultaneously with its advance over the Hazareebaugh plateau and the entire occupation of the Behar Provinces. The effects of this offshoot were thus represented among the European Troops:—

Cholera admissions of the European Army of the Eastern Division 1866.

Stations.	Strength.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admissions.	Total Deaths.
Hazareebaugh ...	806	...	...	5	12	2	...	...	...	19	13
Dinapore	892	...	...	...	1	...	...	...	...	1	...
Benares	645	...	...	3	6	...	1	...	...	10	6
Azimghur	146	...	...	...	...	...	...	...	...	...	...
Rae Bareilly ...	401	...	...	...	1	...	...	...	...	1	...
Lucknow	2,241	...	...	...	1	...	...	...	...	1	...
Fyzabad	921	...	...	...	...	...	...	...	...	...	...
Seetapore	566	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	235	...	...	...	1	...	...	...	...	1	1
Cawnpore	813	...	...	...	...	...	...	...	...	...	...
Allahabad	1,020	...	...	3	4	1	...	...	...	8	4

There can be no doubt that it was the same invading wave which struck Hazareebaugh, Benares, and Allahabad in July. The Chunar Invalid Garrison was affected at the very same time, and the Civil Surgeons of Buxar and Mirzapore also recognised the advance of this cholera from the east. Into the western division of the epidemic area this cholera did not penetrate before November; and among the European Troops throughout Rohilcund, Meerut, Agra, Central India, and the Punjab no admission from cholera took place up to November out of a daily average strength of 22,403.

* Not the Central Provinces. The jails of Nagpore suffered slightly from a cholera which was probably the remains of the great epidemic of 1864-65.

D. General Population.—The cholera deaths of the North-Western Provinces were returned as 75,338 in 1865; in 1866, the total is 8,167, thus distributed:—

Eastern Division of the Epidemic Area.		Districts South of the Jumna, (Area of minimum).		Western Division of the Epidemic Area.	
Ghazeepore ...	1,144*	Banda ...	58	Agra	105
Benares ...	1,534*	Humeerpore ...	3	Muttra ...	82
Azimghur ...	342	Jaloun ...	66	Mynpoorie ...	116
Jounpore ...	289	Jhansi ...	1	Etawah ...	62
Bustee and Goruckpore ...	344	Lullutpore ...	23	Etah	86
Shahjehanpore ...	133			Budaon ...	127
Bareilly	369	This minimum followed the very great epidemic over these districts of 1865, in which 35,968 deaths were recorded.		Allyghur ...	74
Mirzapore	661*			Bolundshuhur ...	144
Allahabad	325			Moradabad ...	252
Futtehpore	189			Meerut ...	719
Cawnpore	235			Mozuffernuggur ...	191
Futtehghur	247			Seharunpore ...	126
				Bijnore ...	87
				Dehra Dhoon ...	None.
				Terai... ...	33

This total of the deaths of the North-Western Provinces includes the deaths of the Gangetic Stations due to the fresh invasion of the year.

From these statements it is obvious that the epidemic of 1863 was extinct, or nearly so, throughout Upper India. The field was clear over which the progress of a new epidemic was to be watched; and when the cholera of the monsoon of 1866 had in its advance covered Behar and all districts from the Himalayas to the Bay of Bengal, it was a certainty that Upper India could not escape invasion.

The epidemic of 1866 in its endemic home previous to its appearance in the epidemic area.

It is not difficult to trace back this epidemic to its home in the endemic area. Before its exit, its presence as an epidemic within endemic limits was exhibited in the most exaggerated form. The population affected was that of famine-stricken Orissa and Chota Nagpore; and in these districts, for months before epidemic advance commenced, every district between Chyebassa and Pooree had been ravaged. In our dispensaries alone in South-Western Bengal 2,080 cases of cholera were treated; and this affords a mere indication of the fact of the prevalence of cholera as an epidemic. The Police Report from Balasore for March states:—"Cholera is doing its work in a terrific way. Were it not for the frightful havoc made by cholera, the sufferings from starvation would have been greatly increased, since many have been carried off by cholera instead of being left to combat with want and hunger." †

As early as February 1866, the prevalence of cholera and the debilitated state of the inhabitants of Pooree led to the anticipation, that as the season advanced, the epidemic would show itself in an aggravated form; and on the 21st February, we find the Lieutenant Governor of Bengal calling for a special report on the subject. Even in January, the Collector of Cuttack reported cholera to be unusually prevalent. The view taken by the Commissioners of the relation of this epidemic to the population affected, is not, in my opinion, altogether correct. They write (p. 24 of Famine Report):—"We believe we are correct in saying, that even where there is no epidemic cholera very generally spread, it has constantly happened that the famine-stricken have been carried off by that disease or by something presenting similar appearances. *** In the early part of the famine, it was undoubtedly difficult to distinguish between the two causes of death, cholera and starvation, which in fact we find in the early reports to be generally coupled together. The truth we take to be simply this, that the ordinary outbursts of cholera were aggravated and extended by want and bad food. *** Cholera constantly accompanied want. We have it first in the districts of Southern Pooree, where excessive want first appeared; then about Pooree itself; and later, in the eastern portions of Cuttack. At Balasore also it appeared at the same time as starvation. It depended very much on the idiosyncrasy of the narrator whether the mortality was ascribed to cholera, or to want, or to both. *** The presence of cholera seems at any rate to have had a material effect in rendering less palpable the whole effect of want in the early stage of the famine, and it was certainly to a great degree the result of want." What the Commissioners describe is, as I estimate it, increase in the manifestation of cholera in proportion to the susceptibility of the people to succumb to disease. The progress of events showed, however, that the estimate formed of the value of the prevailing cholera, which recognised it only as an aggravation, by the conditions existing in 1865-66, of the cholera which prevails in Orissa in the early part of almost every year, was inadequate. This was, in short, not the cholera of an average annual reproduction, and the aggravation in manifestation was due to the presence of the material of a periodic epidemic—of a cholera destined for epidemic life beyond endemic limits.

* The stations reached by the fresh invasion of August 1866.

† Report of the famine in Bengal and Orissa, Vol. I, p. 73.

The epidemic prevalence of cholera in the south-western districts of Bengal Proper was indicated by the admissions and deaths of the jail population, as follows :—

Statement showing the epidemic prevalence of cholera in South-Western Bengal in 1866 *among the Jail population.*

Jail Station.	Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Admitted.	Total Died.
Midnapore	814	...	21	6	...	...	13	2	...	...	...	...	...	42	23
Balasore	564	...	...	22	23	1	33	3	5	2	...	...	...	89	37
Cuttack	856	...	...	8	6	3	66	36	42	31	4	3	17	216	113
Pooree	394	...	...	14	...	3	3	1	1	2	2	...	...	26	12

These districts suffered twice; first, from the spring reproduction in February and March, and, again, in the monsoon reproduction in June and July. Dr. Bensley, of Midnapore, in the report already quoted, recognises these two distinct outbreaks (See p. 57). The minimum of May is also evident in the above statement.

Chyebassa suffered in common with the famine districts of South-Western Bengal. This district was covered in March, and cholera continued throughout the year.

Advance from out of the endemic area towards the north and north-west, with the monsoon of 1866.

It was in the monsoon reproduction that the epidemic invasion of this body of cholera was made apparent. In the jails lying north of the Chyebassa District, between it and the Himalayas, the evidence of advance was thus shown :—

Jail Population of the Behar Provinces. Cholera Admissions, June to December 1866.

Jail Station.	June.	July.	August.	September.	October.	November	December.
Hazareebaugh	.....	130	22	1	.....	.....	.....
Gyah	.....	16	3	2	.....	.....	.....
Patna and Deegah	.....	13	81	8	.....	.....	.....
Arrah	1	29	36	...	7	15	.....
Chumparun	.....	.....	17	2	.....	.....	.....
Mozufferpore	.....	72	.....	...	.....	.....	.....
Chuprah	27	47	2	...	.....	.....	.....

Within a month, the Behar Provinces were covered by this invasion, and the districts between the sea and the Himalayas were universally occupied. In a provincial distribution of epidemic cholera manifested throughout the whole duration of a reproduction, I have said that it is useless to look for direct geographical sequence in the several outbreaks. In the above circle of jails the dates of outbreak were as follows: Chuprah, 24th June; Gyah, 30th June; Hazareebaugh, 9th July; Mozufferpore, 10th July; Arrah, 19th July; Deegah, 20th July; Chumparun, 6th August. It was not until the 29th July that the cholera of Hazareebaugh appeared in the Regiment stationed there.

I have already quoted from the report of 1817, the passages which prove that this was precisely the limit of the monsoon cholera of that year as regards general distribution, and that in that year, as in 1866, an offshoot was at the same time thrown to the westward up the valley of the Ganges, which affected Ghazeepore, Buxar, and the Mirzapore District (See p. 29).

Effects of the meteorology of 1866 in retarding and accelerating the movement of the epidemic.

Had 1866 been a year of average or excessive rain-fall, it is probable that in the monsoon of 1866 the entire eastern division of the epidemic area would have been covered. It is evident from the following statements, that epidemic influence tailed off in this eastern province in a very remarkable manner in this year; and in connection with the distribution of the cholera of October and November, it is of great interest to note the area over which in these months epidemic influence prevailed, in distinction to that over which it was at an end. The circumstance which I have stated to be the best test of an epidemic or non-epidemic season is the steady decline of fevers from July to the close of the year, or their rise through the monsoon months to a maximum in September and October; a sudden rise in October (as in October 1859), is probably indicative of something more than the normal average of an epidemic year. Such a rise took place in October 1866, and coincidently with it, cholera was epidemically distributed over a great portion of the tract in which the increase occurred. The meteorological phenomena preceding the great cholera of Bundelcund of November 1817 appear to have very closely resembled those preceding the cholera of the districts south and west of the Jumna of November 1866: Jameson writes:—"In the middle provinces there was nothing very peculiar in the progress of the rains; but in the districts of Cawnpore and Bundelcund and generally throughout Upper India the rains were observed to be remarkably scanty. Of October the first eight days had been cloudy, with easterly wind and occasional falls of rain."

The scanty rain-fall of the monsoon accounts for the geographical limitation of cholera in the eastern division of the epidemic area in 1817. I have shown the effect of eight days of rain in these very same first eight days of October, to have been the epidemic distribution of the great fever of 1859 (p. 74).

In 1866, the tailing off of fevers from east to west during the monsoon season with the diminution of the rain-fall, was thus shown, in the case of the European Troops, in the eastern province :—The admissions per cent. of strength were in Hazareebaugh, 48·39; in Dinapore, 38·68; in Benares, 32·71; in Lucknow, 19·81; in Fyzabad, 19·00; in Rae Bareilly, 11·22; and in Seetapore, 10·25.

The truly non-epidemic character of the monsoon season of 1866 in Oude and Rohilcund is shown in the following statement. In the stations noted, there was no cholera at the time when the wave which I have referred to, affected Benares, Allahabad, and Futtehpore :—

OUDE, MEERUT, AND ROHILCUND.

Fever Admissions, European Troops, June to December 1866.

STATION.	Strength.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
Lucknow	2,288	47	56	55	60	38	24	13	293
Fyzabad	920	18	30	11	28	14	16	6	123
Seetapore	550	6	2	3	7	3	3	4	28
Rae Bareilly	400	4	2	4	3	5	7	4	29
Shahjehanpore	500	8	25	10	21	9	4	5	82
Bareilly	840	12	11	7	15	7	1	14	67
Moradabad	294	5	6	10	6	5	1	...	33
Meerut	1,720	62	59	24	62	28	20	15	270
TOTAL ...	7,512	162	191	124	202	109	76	61	925

These stations gave a fever rate of 12·31 per cent. for the last six months of 1866; the stations of the tract lying on and south of the Ganges and Jumna gave a ratio of 55·38 per cent. In this latter group the characteristic feature is the universal rise of fevers in October, which in the former were rapidly dying out in this month.

The geography of fevers in October 1866, illustrating the effects of a meteorology favourable to the epidemic advance of cholera in the same month.

GANGETIC VALLEY, BUNDELCUND, AND CENTRAL INDIA.

Fever Admissions, European Troops, June to December 1866.

STATION.	Strength.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
Dinapore	920	17	12	16	10	63	79	22	219
Benares	550	12	15	15	12	42	29	29	154
Allahabad	1,020	10	25	41	81	194	83	28	462
Nagode	203	1	4	11	31	61	25	3	136
Nowgong	190	17	7	6	8	15	26	17	96
Jhansi	520	41	55	71	91	83	30	12	383
Morar	1,000	45	42	37	57	52	89	77	399
Saugor	560	13	23	79	101	113	122	75	526
Jubbulpore	660	20	35	73	202	337	231	128	1,026
Agra	1,000	44	31	29	38	44	41	40	267
TOTAL ...	6,623	220	249	378	631	1,004	755	431	3,668

N. B.—Native Troops show similar ratios.

The inference which I wish to draw is, that the meteorology which determined this distribution of fever, provided the vehicle for the conveyance of the October Reproduction of the great cholera of the spring and monsoon, from the eastern into the western division of the epidemic area; and in the usual channel, not across the Doab, but through the districts south of the Jumna.

In continuation of the remarks which I have made on the distribution of the miasm of malarious fever as an epidemic, it is interesting to be able to show as a parallel fact, that this fever of October 1866 was not a mere climatic fever or a fever of trifling significance, but a provincially distributed epidemic of the widest range. In the east and south where it was most virulent, it was a malarious fever of the worst type. The Regiment at Jubbulpore lost ten men from it; and the symptoms were so aggravated that some medical officers who saw the fever were of opinion that it might be a typhus.

Character of the fever of the east and south-east, of October 1866.

I find it thus described by the Surgeon of the 105th Regiment, who met with it at Dinapore in a somewhat milder form, although still as a very severe fever:

105th Regiment, Dinapore, 1866.—"In October, November, and December there was a regular epidemic of fever. It appeared to attack old and young soldiers indiscriminately, neither sparing the acclimatised nor the fresh arrival; no preference was shown for locality, and the numbers from each Company were nearly similar. The symptoms were in all cases alike, namely, great muscular pain, entire loss of appetite, constipation, tongue dry, hard, and covered with a brown almost black sordes, face flushed, temporal arteries throbbing, conjunctiva injected, pulse full and hard, in nearly all cases vomiting of bile, and great thirst. The type of the fever was asthenic, and differed from the ordinary remittent fever, inasmuch as that there was no marked period of remission. Remission was followed by convalescence. Some of the worst cases lasted without remission for three and four days and nights. The symptoms were similar to those in jungle fevers, and were doubtless caused by malaria arising from the alluvial soil. No steps short of evacuating the station could have promised any good results."

This fever has an interest in relation to other stations also. Hazareebaugh suffered from this epidemic fever as well as from cholera in 1866; and I regard it as essential that the epidemic aspect of this fever should be kept in view in estimating the character of Hazareebaugh as a station and the Hazareebaugh District as a locality. The proposal for the abandonment of Hazareebaugh as a military cantonment in consequence of the experience of Her Majesty's 27th Regiment in 1866, on the plea of the liability of the station to fever and cholera, was considered in this light; and while the liability to cholera in every epidemic, and almost in every year, was admitted, the statistical facts clearly proved, that no endemic source of malaria existed of sufficient importance to justify the abandonment of Hazareebaugh on such a plea, and that there was nothing to warrant the suggestion that a better site could be selected within the same area.

Chota Nagpore suffered very severely at the same time with Jubbulpore, Hazareebaugh, and Dinapore.

The specific fever by which the 79th Regiment was prostrated, acquired on the march from Rawulpindee to Roorkee and Delhi, was probably an offshoot of this same epidemic; and the endemic of Mozuffernuggur which became so aggravated in 1867, may have acquired its character from having been supplemented by this epidemic miasm.

This fever I shall notice again in speaking of the geographical localisation of the cholera of 1867 in the western division of the epidemic area.

To return to the circumstances attending the appearance of the eastern cholera in the western division. Agra had been free from cholera since 1863. As far as the presence of cholera is exhibited in our types, no case of cholera had occurred in this district during 1864 or 1865. In August 1866, however, a single fatal case of cholera appeared in the Agra Jail, and the significance which I attach to this case as a true forerunner of the epidemic, depends on the fact that it appeared while the offshoot of which I have spoken was affecting the stations of the Ganges and the Futtehpore District. This I believe to have been one of those cases which give warning of the advance of an epidemic upon a definite tract, and which ought not to be overlooked or passed over as sporadic cases of cholera.

When I say that the western division of the epidemic area was free from cholera, it is necessary to exclude the province of the south-west monsoon, in which cholera was not extinct in 1866. The remains of the great epidemic of 1864-65 still existed, and cholera was found all through the Central Provinces from east to west. Of the jails Raepore alone suffered severely, but the marginal statement shows that the presence of cholera was general. The absolute disappearance of cholera over this province in 1867 is sufficient to prove that this was the cholera of the termination of the previous epidemic and not the cholera of a fresh invasion. As far to the west as Erinpoorah cholera was still present. Erinpoorah was for the first time since the formation of the cantonment in 1836, attacked in 1866.* Cholera prevailed also at Palee, in Jodhpore, in September.† Cholera is reported to have appeared at Tonk also towards the close of the rains in 1866.

The monsoon cholera of the Central Provinces, of 1866, was not a portion of the new and invading epidemic of 1866-67.

	Admitted.	*Died.*
Raepore ...	75	44
Bandhara ...	4	2
Chanda ...	5	2
Nagpore ...	7	2
Sironcha ...	5	4
Mundla ...	1	1
Jubbulpore ...	2	2

I trace no connection, however, between this monsoon cholera of the south-western province and that which I have to describe as the parent of the cholera of the North-Western Provinces and Punjab of 1867. The western limit of this cholera was much further to the east; and it was on the 27th October that attention was first called to the fact of its prevalence. On this day the camp of the Agent of the Governor General for Rajpootana which had left Mount Aboo about the middle of September, had reached the Bhurtpore state, on its way to join the Durbar camp of the Governor General at Agra. On this day the Political Agent of Bhurtpore visited the camp, and gave information that cholera was present in and around Bhurtpore. Subsequent enquiry showed, that in the village of Halena where the camp then was, several cases had already occurred. On the night of the 28th two cases occurred in camp which proved

First indications of advance into the western division of the epidemic area of the new invading cholera of 1866.

* Report by Mr. Eddowes.

† Report by Dr. Lownds.

rapidly fatal. The establishments and escort were separated, and both parties suffered subsequently; the establishments had fourteen cases between the 4th and 12th November, the escort forty cases between the 5th and 9th. The cholera of the escort was believed to have been acquired at the camping ground at Baroda. Dr. Lownds writes:—"We were told on the 2nd that cholera had been present at Baroda some little time before; I heard on good authority that it was present about the 26th October at Biana; and it has since been reported to me as having been present at Futtehpore Sikree about a fortnight before the camp came." * * "Subsequent to the arrival of our camp at Agra, we heard that cholera commenced in Jeypore early in November, and only ceased about the 8th December." It was evident towards the end of October that cholera had covered the districts along the northern epidemic highway far to the west of Agra. Dr. Lownds concludes thus:—"I propose further enquiries about the existence of cholera in detached places, and though but little precision may be expected in the replies, still some trace of the scourge may be elicited, and it will be at least interesting to watch for its reappearance, should such take place in the ensuing hot season (1867)."

November is not a season normal for a widespread provincial manifestation of invading cholera in these districts. Even the great outbreak on the Sind river in November 1817, did not occur as a portion of a powerful epidemic among the general population. This was, however, a true parallel for the November cholera of 1866; and a similar one we found in November 1826 preceding the epidemic of May 1827, when a slightly marked invasion occurred affecting the troops in the stations on the right bank of the Jumna at Agra, Muttra, and Delhi.

When in connection with the appearance of the invading epidemic of the east of July and August, my opinion was asked as to whether the extension of this cholera was likely to affect the troops ordered to assemble at Agra in the end of October, I was ignorant of this parallel of 1826, and I was inclined to believe that it was unlikely that the parallel of November 1817 would hold good, and my reply was, that taking the parallels 1855-56 and 1859-60, invasion of the western area was not to be anticipated before 1867, and that there was nothing to show that invasion into the western division was imminent. The event showed that the parallels of 1817 and 1826 held good, and although the invasion was marked by no violent outbursts, it became evident that before the end of November cholera had been generally distributed over the unoccupied western area, although its manifestation was repressed by its distribution at an abnormal season.

In the encampments of the native chiefs and in the city of Agra, sixty-four deaths from cholera were reported between the 11th and 26th November; the European Troops assembled at the Durbar lost twelve men; and nineteen men of the Native Regiments died at Agra and on the march after the Durbar was broken up.

About the same time cases of cholera were noticed in all districts lying to the north of Agra—in Delhi, Meerut, Moradabad, Rampore, Roorkee, and Umballa. This universality of distribution led me to infer, that an extension of a powerful body of cholera into the western area had occurred, and that in accordance with parallel history its revitalisation from the state of dormancy was to be anticipated about the 20th April.

Meteorology attending the appearance of the invading cholera of Agra and Rajpootana of October and November.

The month of October 1866 was almost rainless. Rain fell pretty generally on the 11th and 12th, but the fall was trifling. It is remarkable, however, that without any conception of its bearings, Dr. Murray Thomson should in his report of the meteorology of the North-Western Provinces for 1867, have drawn attention to the fact as remarkable that, although, at Agra, October was an almost rainless month, ·08 of an inch only having been registered, yet that in this month the highest mean humidity of the five years 1863-67, was found. I have before said, that the epidemic distribution of cholera is not necessarily coincident with rain-fall, and that a humid atmosphere is a sufficient vehicle. It was, I believe, with this humid atmosphere of October that the spread of this cholera occurred, the same atmosphere which I have showed causing the general provincial rise of the fever rate in the east and south-east in the same month. I have above quoted Jameson, who says that in October 1817 the first eight days of the month were cloudy, with easterly winds and occasional falls of rain.

Reviewing the spread of cholera in 1866, the anticipation to be formed in regard to its reappearance in 1867, in conformity with the parallels of previous epidemics was, that the eastern division of the epidemic area should be covered either in the spring reproduction or in that of the rains, or in both, and that the western division of the area should be occupied, as in 1857 and 1862, by a cholera of a like distribution. Recognising this, I addressed the Secretary to the Sanitary Commissioner in February 1867 in the letter already quoted at page 30.

In one respect only did the parallel vary, namely, in this, that there was no invasion of Nagpore as in the spring of 1818, 1856, 1860 or 1864. It would appear that some essential was wanting in 1867; the material itself had been diverted into our North-Western Provinces, the vehicle was wanting, or the directing agency was not forthcoming. The fostering conditions were not absent, for the Central Provinces had a steady rain-fall far above the average, which would have given epidemic vigour to any body of cholera once introduced within the boundary line of the influences of the south-west monsoon.

As I have already remarked (see p. 48 and diagram), the epidemic history of 1867 presents a geographical contrast directly opposite to that of 1864; and it takes the combined geography

of the two years to make up an epidemic such as that of 1856 or 1860. While the violence of the epidemic of 1864 was expended on the Central Provinces and Western India, the provinces of Northern India received only the shadow of the epidemic; the cholera of 1867, utterly leaving the Central Provinces, concentrated its force on the provinces of Upper India. This distribution, and the possibility of diversion, must in the future be carefully watched by any one who may undertake to define the geography of epidemic cholera in our Presidency.

Geography of the dormant cholera of the cold season of 1866-67, and the anticipations regarding its distribution after revitalisation.

The case stood thus then in the beginning of 1867: The east of the eastern division of the epidemic area, that is to say, the Behar Provinces and Chota Nagpore, had been covered, and the stations of the valley of the Ganges had given evidence that a new advance had occurred from east to west. Further to the south, the western extension had been carried out as far as to Jeypore, and from this western extension a distribution of invading cholera had taken place over the eastern half of the western division of the epidemic area.

From a consideration of this geographical distribution, there was to be anticipated, on the occasion of the revitalisation of this dormant cholera, the general appearance of cholera over the east in the spring and monsoon of 1867; and in the west, as in 1857 and 1862, the early appearance of this cholera in the Terai districts, its general appearance subsequent to 20th April throughout the western area, and its chief manifestation during the monsoon months. It is evident that to the casual observer the range of such a cholera would be apparently continuous from the Behar Provinces to Peshawur; and that, as in 1857 and 1861, the line of demarcation between the cholera of the eastern and western areas would be obscured, or appreciable only when carefully looked for. It is essential that we should review the events of 1867 in the light of previous epidemics; and it will be found that in so doing much that is perplexing becomes simple and is readily comprehended.

Earliest indications of revitalisation, in the Terai districts of the western area.

It is in the Terai districts north of Moradabad and Rampore that the earliest record of the revitalisation of the cholera of 1866 is found. Our indices pointed to the fact that the cholera of November had passed over this tract. It is a remarkable coincidence, and one which shows how rigidly true are the parallels of epidemic cholera in our Presidency, that it is in the very same tract and in the very same villages that the earliest indication of revitalisation is found in 1852, 1857, and 1867; namely, in the Terai districts lying west of 80° east longitude, and west of where the Gogra comes through the outer Himalaya.* In the beginning of the year, cholera had shown itself here at Ramnuggur, Kaladoongee, Huldwanee, and Birmdeo;† and anxiety was felt lest this cholera should be communicated to the camp of Jung Bahadur, who was advancing up to the Nepaul Frontier from the east with a camp of 5,000 men, coming to marry his daughter to the Rajah of Kasheepore, whose territories lay in the affected tract of country. As soon as the camp reached Birmdeo cholera made its appearance, and the homeward march was commenced as soon as the fact was evident. The camp carried cholera in its retreat for eleven days, and 600 men are stated to have died. Jung Bahadur's camp had skirted the Terai from Segowlee on the march westward, and not a trace of cholera was met with before its advance up to the affected tract, which corresponds exactly to the eastern limit of our western division of the epidemic area. It was at Birmdeo in March 1857, that cholera appeared in the one Wing of the 66th Goorkhas and among their camp followers, and at Kaladoongee, seventy miles to the west, that the Head Quarter Wing was simultaneously attacked. On the 18th February 1867, it was still reported that cholera was prevailing along the foot of the hills below Nynee Tal.

I trace no connection between this cholera of the Terai west of 80° and that of Northern Oude which showed itself in the first week of April. The reproduction followed by epidemic advance from the east was due in March and April, and it is with this that I connect on the cholera of Oude of the end of March and the beginning of April; this is the cholera to which the last paragraph of my letter (p. 30) had reference. The revival of the cholera of the east is proved by the following notices extracted from the Sanitary Reports of the jails for the months of March and April:—

Hazareebaugh, April.—"Several cases of cholera have occurred outside the jail."

Monghyr, April.—Cholera is described as epidemic in the district.

Purneah.—The jail gave 65 admissions and 43 deaths from cholera in April and May.

Gyah, April.—Cholera is represented to be epidemic in Behar.

Patna, April.—Cholera epidemic—fourteen cases and seven deaths in the jail.

Ghazeepore.—Cholera is noticed as prevalent in the city in April.

Benares.—Much cholera in the city in April.

Mirzapore, April.—"Cholera has shown itself in the town and district."

All the jails of the Behar Provinces, except those of Chumparun and Deegah, furnished cases of cholera in March and April.

The epidemic advance of this revived body of cholera appears to have taken place about the 20th March. On the 22nd March, a sudden outbreak occurred in the Allahabad Jail, in

* McClelland describes this locality thus: "The malaria of the place is such that this pass (Birmdeo) is only available from November to March. Vegetation is so dense and of such rapid growth that it would be very difficult where there is so little traffic, to preserve an open communication." Topography of Bengal, p. 2.

† Report from the Conservator of Forests in Oude to the Secretary, Chief Commissioner, dated 9th February 1851.

which twenty-seven prisoners were attacked, with a mortality of fourteen. On the 23rd, the Civil Surgeon of Benares reports the outbreak of cholera in the city. On the 27th, cholera was first reported in the Central Jail at Lucknow, and simultaneously in the Lunatic Asylum; and on the 29th March, the appearance of cholera in several towns to the north-west of Lucknow was announced.

The revitalisation of the cholera of the Behar Provinces, and epidemic advance from the east into Oude in March and April, and into Cawnpore and the districts south of the Jumna in May.

We saw how the advance of 1866 was from south to north, until it was stopped by the hills. The great body of this cholera appears in its advance westward to have clung to the Terai districts at the foot of the hills, and to have been but little diverted towards the south. This is of importance in connection with the distribution of the monsoon cholera of the eastern province in 1867, and it must not be lost sight of. In March cholera was reported prevalent all along the Terai skirting the northern districts of Goruckpore, Gondah, Baraitch, and Luckeempore.* In the first week of April, this cholera broke out at a native fair in the Toolseepore District, and in this district and in that of Bulrampore adjoining, 1,474 deaths were reported. On the 27th April, the cantonment of Fyzabad was invaded; and by this time Northern Oude was universally affected. In the Seetapore District the appearance of cholera also dates from the last week of April.

Going back to the east, we find that it was on the 20th April that the invasion of Nepaul occurred, introducing the cholera which eventually burst forth in the second week of June into an epidemic which destroyed between 2,500 and 3,000 of the inhabitants of the valley.

The cholera which appeared in the last week of March at Allahabad was, as I have said, probably an invading cholera. The first week of May is the date of appearance normal for the Doab west of Allahabad, for Cawnpore and for Banda. The Commissioner of the Allahabad Division has traced the cholera of 1867 in the May appearance with great care.† Its appearance was first noticed at Lucheeghur, a village on the Ganges a few miles below Allahabad. Between the 3rd and 16th May it had extended over the Allahabad District south of the Jumna, and had entered the Banda District; at Kirwee it appeared on the 12th May. Cawnpore was threatened at the same time, and three cases occurred among the troops. The Civil Surgeon of Cawnpore writes:—"Cholera is prevailing in the city, and many deaths have occurred; the deaths in proportion to the attacks have, however, been few."

The line by which the main body of the epidemic travelled, the Commissioner of Allahabad considers to have been south of the Jumna, through Lucheeghur, Arail, Bara, and Khyragurh into the Banda District, leaving the Doab comparatively uninvaded. "Not a single case," he writes, "can be traced to pilgrims returning from Hurdwar. As I believe to be universally the case, the disease first appeared in the east. It came from the east and moved west."

This is the consistent history of the spring cholera of the eastern province. It became epidemic from Behar to Banda between the 20th March and 12th May; and it was universally manifested over this area, in the Behar Provinces, in the valley of the Ganges, and in the Doab, dying away at Cawnpore. It was a great cholera south of the Jumna; a powerful invading cholera in Nepaul; a great epidemic all along the Terai from Segowlie to Northern Oude; and it had a general distribution over Oude, but was concentrated chiefly in its northern districts. This cholera had in truth a geographical distribution of its own as far extended as was possible, when the northern and western limits of the eastern area are considered. This was a cholera of a geography corresponding in every detail with that of any other epidemic of eastern origin. This was the distribution which I predicted in August 1866, basing my anticipations upon the facts of the distribution of the invading epidemic in that month. (See the jail table of 1866 in Appendix).

Spring revitalisation in the states of Rajpootana affected in the end of 1866. The minimum of prevalence towards the southern margin of the area affected in 1867, and the geographical continuity of this with the exempted area of the year.

When we come to study the history of the spring reproduction of the cholera of 1866 in the western division of the epidemic area, we find it complicated by a question with which I believe it to have no immediate concern—that of the degree to which the geography of the cholera of the year may have been influenced by the spread of cholera from pilgrims attacked at Hurdwar on the 12th April. What we have in reality to study is, how far the geography of the reproduced cholera of 1867 corresponds to that of other years following the invasion of the area, such as 1857-58 and 1862.

In the south of the western division, in the states of Rajpootana affected in November 1866, as in 1861 following the invasion of 1860, we look for the reappearance of the cholera anticipated by Dr. Lownds, in April. And we find it. Dr. Harvey, of Bhurtpore, states that cholera first showed itself on 6th April, and that in the beginning of May it was prevalent in every pergunnah; and Dr. Burr, of Jeypore, reports that it reappeared on the 15th April. In the Agra District, although cholera was present both in the spring and rains, its prevalence was not remarkable; the chief incident brought to notice in the spring cholera was the attack in which the orphans at Secundra suffered, when thirteen died out of forty-six attacked. Agra and Gwalior clearly shared to a great extent the absolute exemption which the country lying to the south enjoyed; for in the Jhansi and Lullutpore Districts not a case of cholera was reported in 1867, and these districts are continuous with the exempted tract of the year in the Central Provinces.

* Report on the cholera of Oude by Inspector General Innes, Her Majesty's Service, *Oude Gazette*, April 4th, 1868.
† Report to Government, dated July 13th, 1867.

Few cases occurred in Gwalior, although cholera persisted from 22nd May to 15th September. The first European soldier was struck down on 31st May, the day after the sudden attack of the Secundra orphans.

In the Muttra District cholera appeared at the same time. In the report for the week ending 15th May mention is made of the occurrence of a few cases of cholera; on 31st it is reported that cholera still exists in the district; and in June the occurrence of a few cases at Mahabun is noticed.

Revitalisation and invasion within the radius alleged to have become affected in consequence of the spread of cholera by Hurdwar pilgrims.

In considering the reproduction of the spring cholera of 1867 within the radius which may possibly have been affected by the infected streams of Hurdwar pilgrims, it will be more satisfactory to study the parallel events of 1862 in connection with those of 1867, seeing that the significance attached to the two parallel occurrences by the same observers has been so very differently estimated in the two years.

The universal testimony borne by the Medical Officers in charge of the districts included in this radius is to this effect:—"The cholera was introduced by Hurdwar pilgrims, and there was no cholera in the district before the arrival of these pilgrims; therefore, I conclude that its introduction and subsequent spread was due to this source." Nothing can be more plausible than such an argument; and the more so that it rests on what is a fact, that the Hurdwar pilgrims were the first to carry cholera into nearly all of these districts.

They introduced this cholera at a date prior to that at which it was due naturally to appear.

When I fixed the 20th April as the probable date of reappearance, I meant that this was the date upon which the first appearance was due; the general appearance of cholera I have stated to occur nearly at the date normal for Banda and Cawnpore in the eastern province. The Commissioner of Allahabad fixes the date for 1867 between the 3rd and 16th May; it was on the 11th or 12th that the Banda District became affected. In 1857 it was on the 15th and 16th May that the Fusiliers and 75th began to suffer, as soon as they descended from Kussowlie and Dugshaie into the plains. Scriven gives the date May 12th, 1862, for the general affection of the villages of Rohtuk and Hissar, and May 17th for the villages of the Kurnaul District.* That cholera should have broken out at Hurdwar on 12th April is no exception to the truth that the general diffusion of this provincial cholera was not due for a month later; and the sequel will show that the actual rise of cholera among the population generally, did not occur before the date at which it was due in accordance with the parallel history of previous epidemics.

The Hurdwar gathering occupies the valley of the Ganges for a space of nine miles in the course of the river, with an extension right and left of from two to six miles. The distance of this vast encampment from where the Ganges issues from the Himalayas is but thirteen miles. Hurdwar itself is situated in a gorge of the Sewalik Range, which runs parallel with the Himalayas. The country intervening is a Dhoon, which Dr. Cutcliffe describes as occupied by dense uncleared tree-forests, with heavy brush-wood and rank grass, with large and deep swamps at intervals, and so teeming with malaria that even the natives can reside in it with impunity only from December to the commencement of the rainy season. The winds of this tract Dr. Cutcliffe thus describes:—†"Through this funnel-like gorge of the Sewaliks leading from the swampy and malarious Terai, in which Hurdwar lies, the cold wind locally known as the Dadoo blows from the snowy regions down to the heated plains below. It blows at night, and its direction is steadily from north-east to south-west. In April it commenced to blow about 9 P. M., and it ceased at about 10 A. M. By day the current of air is chiefly upwards towards the hills." The meteorology of the days immediately preceding the outbreak he gives in the following sentences:—"The 11th April was a cloudy close day with the usual wind blowing upwards to the hills. In the afternoon a heavy storm of thunder and very vivid lightning coming from the west broke over Hurdwar, when two men were killed and four others severely burnt by the electric fluid. Heavy rain fell and continued all night. The 12th was the great day for bathing, and the pilgrims, who had been wet for twelve hours, began before the dawn of day to stream off in thousands to the sacred ghât. The rain still continued to fall, though now only lightly; nor did it cease until the evening, when, just before sunset, the clouds broke and the sun for a short time came out. * * A vast number must have waited in a state of fatigue for twenty-four hours till the sun came out ere they could have got any dry clothes on their bodies. On the following day, April 13th, eight cases of cholera were sent to hospital."

We have the same evidence that cholera had passed over Roorkee into the Terai beyond Hurdwar in the last months of 1866 that we have of its having swept over Moradabad and Rampore into the Terai west of the Gogra at the same time. Everything required for epidemic manifestation among a population assembled at Hurdwar was present. The cholera had been introduced into a breeding ground well adapted for revitalisation, and known from past experience to be a certain breeding field. The vehicle of moisture and the wind to bring it down on the assembled mass were opportunely provided, and previous fatigue and exposure rendered the body of pilgrims eminently fitted for the reception of the miasm; and when it did come, the assemblage succumbed to cholera as a body, just as it would have been prostrated

* Report to Punjab Government on the cholera of 1862, dated 1st June 1863.
† Cutcliffe's Report.

as a body by the malaria poison had it spent the same number of days in the same locality at the season when malarious influences are there predominant.

When the topography and the meteorology of this locality is considered, we are prepared to recognise the reappearance of its cholera a month in advance of that of the plain districts, as a normal occurrence; and antecedent history warns us not to mix up and confuse together the cholera due to appear over Northern India in May with that which radiated in the stream of pilgrims setting out from Hurdwar on 13th April. A clear understanding on this subject is of vital importance to the correct comprehension of the epidemic history of the year. If we leave the argument taken up by every Medical Officer and in every report to Government unanswered, it will be handed down as an indisputable fact, that the sequence of events and their significance was such as has been stated, and an obstacle will be thrown in the way of the study of cholera as an epidemic which twenty years of further experience may do little to remove. What is required to be proved is, that the outbreak at Hurdwar, great as it was, was but one outbreak of a reproduction which was certain to have occurred, the geography of which would have been identically the same had no gathering at Hurdwar taken place; and which would have given warning of reappearance about the 20th April, and would have been generally in manifest vitality before the 15th May over the whole area alleged to have been infected by Hurdwar pilgrims in 1867.

In the face of parallel epidemic history, the fact that cholera came into the districts of Shahjehanpore, Bareilly, Budaon, Meerut, Moradabad, Bijnore, Seharunpore, Mozuffernuggur, Delhi, Rohtuk, Kurnaul, Umballa, Loodianah, and Jullundur, first with the pilgrims of Hurdwar, has not the weight that the individual observers have sought to attach to it. In the east, we have found a consistent history for 1867, in which pilgrimage plays no part. And once before I have shown how, on occasions when the pilgrim theory was introduced to prove that such streams polluted certain localities, the local narrator urged his views in ignorance of the fact that what to his observation seemed of so much importance, was but a trifling item in the grand generalisation that cholera was universal from the Bhurmpooter to Bundelcund (1863), from Assam to Guzerat (1860), and from the shores of the Bay of Bengal to those of the Atlantic (1864-65).

The antagonistic facts have not yet been satisfactorily explained, why, when the cholera of Hurdwar was at an end among the pilgrims who passed through the districts to the east and south of Hurdwar, it ceased among the general population until the setting in of the monsoon, and why to the west and south-west this cholera acquired its epidemic strength only when it was almost at an end among the pilgrims.

Two phases of the May cholera of 1867,—decay and disappearance in the eastern districts of the western division and growth and epidemic spread in the western districts. The significance of the phenomenon.

In the Bareilly District up to the 27th May when the cholera ceased, there had been only sixty-three fatal cases of cholera, including the pilgrims from Hurdwar. In Budaon up to the 11th May, fourteen deaths only had been reported, including pilgrims. In the Shahjehanpore District only three cases of cholera were reported among the population, and nine deaths among pilgrims up to the 30th April; and nothing more is noticed until the 20th May, when cholera was introduced evidently from the east. The deaths of Shahjehanpore for May amounted to seventy-two; of June to forty-one; and of July to fifty-three, after which the monsoon cholera dreadfully ravaged this district. After the 11th May no case was reported from the Moradabad District. In Bolundshuhur thirty-nine deaths of pilgrims and of residents were reported in April, and sixty-nine in all in May. In the Allyghur District we find fourteen deaths in April, 109 in May (seventy-nine being in the towns Khyr and Hattras), and twenty-nine in June confined to two villages. So, too, in Meerut; from April up to the 15th June forty-four deaths in all were reported in Pergunnah Meerut, and nineteen only in the city.

This is one phase of the spring cholera of 1867 of the western division of the epidemic area, shown over the districts of the North-Western Provinces lying to the east of the Jumna and south of the Terai. We pass to the westward, to the districts lying between the Hindun River, the Doab Canal, and the Jumna, and instantly the phase is changed. In the single town of Chuprolee we find 445 deaths; in Barote 1,187 deaths; in Benowlie 109 deaths; in Baghput sixty-nine deaths; and in Khikrah sixty-six deaths. It is along this tract lying between Meerut and the Jumna that we find the northward progress of the great cholera of 1861 traced; in other words, it was in this tract that the advancing epidemic was most conspicuously manifested. The Superintending Surgeon of the Meerut Division, in his report on the cholera of 1861, traces the advance as usual from the south and not from the east. He writes:—"That the epidemic should have pursued this course by which it travelled from south to north, is attributed to the low and undrained lands lying in the hollow. The locality is invariably subject to malaria, and has on previous occasions been visited by severe epidemics." This is the most easterly indication of a virulent and localised cholera among the population apart from what degree of prevalence may have been due to the transmission of cholera from Hurdwar as a centre.

Breeding grounds of the cholera distributed in the invasion of November 1866.

This tract is continued north along the Jumna, through the Mozuffernuggur District, with exactly the same characteristics. And here the facts are the same as in the south. While in the Mozuffernuggur Tehseel, out of 134 deaths up to the 30th April, 119 were among pilgrims, in the Shamlee Tehseel of the same district lying along the Jumna, during the same

period out of 290 deaths ninety-seven only were deaths of pilgrims. The mortality of May of the Mozuffernuggur District appears to have been almost entirely confined to the towns and villages of this tract.

Turning to the north of Hurdwar, we find the same thing, namely, the spread of cholera, in connexion with the topographical peculiarity of the situation, in the towns bordering on the Terai, and lying in the tract connecting the Terai above Hurdwar with that in which cholera appeared early in the year. The towns of Bijnore in which cholera continued to prevail throughout May all lie in this tract, Nujeebabad, Nuggena, Burrapoorah, Afzulghur, and Shercote. The Superintendent of the Terai Pergunnahs reports, that out of 130 deaths from cholera in the month of April not more than ten were pilgrims from Hurdwar; cholera appeared in fact in these parts before and simultaneously with the appearance of cholera of Hurdwar. To the west of Hurdwar in the Dehra Dhoon the same tendency to persistence is noted. The report of 15th May is:—"The disease which before existed in a sporadic form has assumed a more fully developed character, and the number of cases is greater."

Parallel History of May 1862, explanatory of the geographical distribution of the May cholera of 1867.

It is unfortunate that for the North-Western Provinces we have no record of the cholera of 1862, as it is to this cholera that we look for the explanation of many of the events of 1867. We know the general fact that Hurdwar pilgrims did die on their way home; that cholera prevailed at Deyrah from the 20th April onwards; and that in May Kumaon and Ghurwal were affected. The history of the cholera of 1862 west of the Jumna is well known, and the parallel history of the cholera of 1862 and 1867 from the Jumna westward, calls for special attention. For the occurrences of 1867 the one explanation has been, that cholera was introduced by pilgrims, and that its spread and propagation were due to intercourse with those affected; in 1857-58 and in 1862, the introduction and spread were not thus explained.

It is useless to study the cholera of 1867 assuming as a groundwork the theory, that the subsequent propagation took place from these Hurdwar pilgrims. The history of this outbreak is the history of any other typical outbreak as I have defined it in the second section of this report; we have the facts of absolute freedom from cholera up to a certain date, prevalence for a certain number of days, and inevitable disappearance at the end of a normal period of prevalence. Whatever is superadded to this, comes within the scope of theory, not of fact, and it is here that parallels drawn from the Natural History of cholera come in to supplement fact, and to supply whatever else is wanting to give consistency to the history of the epidemic.

The Government of the Punjab has caused a report to be drawn up to show the progress of cholera among the pilgrims returning from Hurdwar to that province, and in this report the following generalisations are founded on the history of this May cholera of 1867: 1. That cholera is conveyed, in the first instance, by human agency alone. 2. That cholera can be conveyed and disseminated by persons not themselves suffering from it. 3. That the history of the present epidemic confirms the opinion that the transmission of the disease by the atmosphere alone is limited to a very short distance from the focus of emission. 4. That quarantine, if effectively established and maintained long enough, appears to be the only and best protection at our disposal against the dissemination of cholera.

In the Punjab, as in the North-Western Provinces, there was no cholera before the stream of pilgrims from the east entered the province. But the fact, in my opinion, goes for nothing when we recall the parallels of 1857 and 1862, which show that the 11th May was the day on which general revitalisation was due. It follows almost as a matter of course, that no cholera could have appeared in 1867 except by importation, prior to that date; and hence it followed, that when between the 16th and 30th April the stream had spread over the province and twenty-two districts had reported the invasion, the first case of cholera occurred in every instance in a Hurdwar pilgrim. No conclusion is more natural than that this importation constituted the invading cholera of 1867. But in my estimation this was not the case. I reckon that the invasion of 1867 took place between the 10th and 20th May, the dates on which cholera appeared epidemically in the districts west of Delhi and on the frontier, and in which it was epidemic over the Banda District, and in every pergunnah of Bhurtpore. This was precisely the date, at which Rawulpindee and Huzara were invaded in 1858, and on which cholera reappeared in May 1862 west of Delhi, while it was at the same time an invading cholera beyond the Indus. It has never been alleged that the advance of the cholera of 1856 beyond the Jhelum in May 1858 was due to human intercourse; and those who saw the reappearance of cholera in Rohtuk and Sirsa in May 1862 had no difficulty in distinguishing it as a revitalisation of the epidemic cholera of 1861, and the opinions of these observers, Scriven, in his report to the Punjab Government upon the cholera of 1862, thoroughly endorses.

The aspect in which the question is viewed in this section, is not whether Hurdwar pilgrims introduced the cholera of 1867 into the Punjab, or whether they did not; but, apart from any such possibility, I shall try to show here that invasion was due, independent of human agency altogether, at the very time that it did take place. I have traced to the influence of locality the growth of the cholera of May along the Terai tracts and in the districts lying on the Jumna and immediately to the east of this river, while in Meerut and Rohilcund generally it was dying out or at an end. I have now to trace the growth of this cholera in the districts west of the Jumna through May, to sketch the topography of these districts, and show their meteorology during the weeks in which cholera was spread from the Jumna to Peshawur.

Speaking of the famine of 1861 as affecting the districts west of the Jumna, Baird Smith writes:—"The richly irrigated district of Paniput and the northern sub-division of the Delhi District have virtually escaped all injury, by reason,—firstly, of their being traversed by the Western Jumna Canal; next, of the continued drought having relieved them from the broad areas of swamp by which they are ordinarily infested, and having turned these useless lands into productive fields; and last, of the low damp valley lands bordering the Jumna having been also dried so as to become culturable, and to give an abundant produce. These resources over by far the largest part of the area indicated have guaranteed wealth and abundance." Speaking of the country south and west of Delhi, Bullubghur and Goorgaon, which suffered to an extreme degree in the famine of 1861, he writes:—"A considerable portion of the area is of bleak and barren rocks or deep ravines; the drainage is under indifferent control, and the rivers sometimes run as wild as those of the Pontine marshes or the Tuscan Maremma." Mr. Adam Taylor describes the part of the Rohtuk District chiefly affected by cholera in 1862, thus:—"A branch of Ferozeshah's Canal runs through the northern part of the district, terminating a short distance from Rohtuk itself. The country through which it passes is extensively irrigated to the distance of sometimes two miles from its banks. The effect produced on the land is very marked; the vegetation is rank and luxurious; and the air is charged with moisture, and it certainly contains malaria owing to the patches of swampy jungle formed by the oozing or overflowing of the water. It will be seen from the statistics that the cholera raged most violently in the Gohana Pergunnah, and that of the seventeen villages named, fourteen were on the canal, the other three losing but fourteen cases among them. This fatality must have been owing to the poisonous effects of the exhalations from the swamps or from the malaria engendered by the drying up of the irrigated soil."

I believe that the cholera of November 1866 found a location in the low lands lying on and west of the Jumna; and from the parallel of 1862, it was about the 12th May that its reappearance from its state of dormancy was due. Writing of the cholera of 1862, Mr. Taylor says:—"I am of opinion that the cholera poison, the cause of the cholera in this district in 1861, never really left, but that it was rendered dormant by some condition of the atmosphere during the cold weather from November to May, and was restored to activity and virulence by the heat of April." Again he writes:—"I think the suddenness (almost explosive) of its outbreak over so large an extent of country, embracing not only Rohtuk, but also Hissar and Sirsa, precludes the idea of its having travelled. In no instance was I able to trace the origin of the disease to the fact of its having been brought in by travellers. Generally some inhabitant, apparently not more exposed than his neighbours, was struck down, the first, but not originating victim of the pest; and although the villagers deserting their homes fleeing from the cholera, would die by the road or at the places where they sought refuge, in no case were they accused of bringing destruction on their asylum." Mr. Taylor, who was Civil Surgeon of the Delhi District in 1867, makes his statement of the parallel events in very different terms:—"I am of opinion," he writes, "that the disease was entirely the result of infection by the pilgrims. * * Cholera had certainly appeared in the Delhi District in November 1866 after the Agra Durbar, but if it had been dormant during the cold weather, it would have appeared earlier than the 19th April." As shown above, revitalisation was not due before the 11th or 12th May, the day on which it reappeared in these same districts in 1862.

It was on the occasion of the spread of the great epidemic of malaria over Upper India in 1843, the epidemic of malaria which preceded that of 1850 which I have elsewhere described, that the attention of Government was drawn to the fact, that certain localities seemed to have suffered excessively, and some were not slow to assert that this localisation of the general epidemic was due solely to canal irrigation. In 1845, Mr. Dempster, an officer of high repute, was ordered to report on this localised disease, and the answers which he gave to the questions proposed for investigation, prove, that independent of any effects which the canals may have, the whole of the districts lying east and west of the Jumna are eminently adapted for the propagation of miasmatic disease. His investigations extended over these very districts, in which I have shown that the May cholera of 1867 took its rise, while utterly dying out in all districts lying to the east. The general conclusion which Dempster came to was, that in the rains of the year 1843 there was a general epidemic influence in operation, widely diffused over the North-Western Provinces; that while the canal districts were severely affected, in situations neither irrigated by canals nor within reach of such influence, as at Kythul, in the vicinity of the Nujufghur Jheels, and in the low lying lands of the Jumna, fever prevailed to an extent and with an intensity as great as in the worst of the canal villages; and that the influence was a true malarious influence inducing typical malarious fever, such as I have described it prevalent over the same parts in 1850. Dempster writes:—"The season of the year at which the disease appeared, its symptoms, progress, and consequences, mark it to have been everywhere of the same type, *viz.*, the endemic (remittent and intermittent) of the rainy season, but everywhere, and especially in naturally malarious localities, greatly aggravated by the constitution or peculiarity of the season." The following answer is important in relation to the natural topography of the districts inspected:—"By far the greater part of the evils we have observed have not been the necessary and unavoidable results of canal irrigation. In all situations where mischief was prominently marked, the natural drainage of the country had been checked or interfered with, stiff or retentive soils saturated with water, and natural disadvantages of site enhanced by excess of moisture." The districts visited were those west and north of Delhi, and those immediately to

the east of the Jumna. "The Shamlee Pergunnah of Mozuffernuggur," Mr. Dempster writes, "had for years been notorious for its extreme unhealthiness; and as this obviously depended in a great measure on other causes besides canal irrigation, we agreed to exclude the results from our returns. (See page 132)." He continues:—"In point of fact we have just then entered upon an extensive unhealthy tract. A few miles further on and the whole aspect of the canal and country was suddenly and entirely changed." * * * "The swampy belt of reeds and high grass was here met with for the first time. Jheels and marsh swarming with aquatic fowls are seen on either side, and the villages are often surrounded with shallow stagnant pools. The soil, too, undergoes a decided change, being no longer light and friable, but generally stiff and clayey." * * * "The effect on the health of the inhabitants has been the same in kind and nearly in degree as in the objectionable portions of the Delhi canals, that is to say, in the worst villages, about 70 per cent. of the inhabitants suffer from decided spleen enlargement."

On the right bank of the Jumna and to the westward, the conditions are also at certain seasons and in certain years unfavourable to the population, which is apt to suffer from spleen enlargement. The districts inspected by Dempster were Kurnaul, Hissar, Rohtuk, and Delhi. He states it as a remarkable feature of the lands bordering on the right bank of the Jumna that the drainage flows from, instead of towards, that river, and that the fall is towards the south-west, amounting to a foot or a foot and half in the mile. It was this fact which was taken advantage of by the Mussulman Government of Delhi in the construction of the Western Jumna Canal which was re-opened under British rule. This water collects in jheels, as exemplified on a large scale in the Nujufghur District, and to a less degree in many other localities. Goorgaon was not included in Dempster's inspection; I have quoted Colonel Baird Smith's statement, that its waters run wild as those of the Pontine marshes or the Tuscan Maremma.

Epidemic malaria of 1867 in the tracts which chiefly suffered from the cholera epidemic of May.

The parallel of 1867 is as follows:—On the 12th December, we find the Lieutenant Governor of the North-Western Provinces appointing a special officer to investigate the topography of these very tracts and instructing him to proceed at once into the districts, "with the view more especially of tracing and studying the character of the fever which is said to be endemic in some of the districts, but which has apparently been more than usually virulent and fatal during the past season."*

The result of Mr. Cutcliffe's enquiry showed, that it was a true epidemic malaria which had affected the population of these tracts, varying locally in malignity according to the degree in which sanitary advantages were provided or were deficient. The special intensity of the fever of the year is assumed to have been due to the aggravation of an endemic malaria by local causes alone, or by these aided by a meteorology such as that of 1867, characterised by a rain-fall above the average.

It is natural that I should be inclined to associate the aggravation of malaria in these tracts of the western division in 1867 with its provincial manifestations in the south and east in 1866, in Chota Nagpore, Jubbulpore, and Behar, and that I should suggest, that in this fever of the banks of the Jumna, we have an instance of the epidemic distribution of an air-borne malarious miasm exactly corresponding to that of the cholera miasm which was manifested over Chota Nagpore and Behar in 1866, and in these same tracts on the Jumna in 1867.

As to the nature of the epidemic fever, no doubt can be suggested. The descriptions are identically the same with those given by the observers in the same districts in 1850, corresponding even to the detail of the comparative exemption of the jail population.

The following are extracts from Mr. Cutcliffe's report to the Government of the North-Western Provinces:—

"I have already described the fever-stricken tracts, and have shown that, though the disease prevailed in many parts both of the Seharunpore and Mozuffernuggur Districts, it was neither universally distributed throughout those districts, nor was it equally severe in those parts which were affected by it. I have shown that its ravages were chiefly marked along certain water-courses and low swampy vallies.

"Up and down the eastern Jumna Canal fever prevailed, and the native doctor proved to me that his cases were malarious fever. I have mentioned in my notes that the free population suffered generally from fever, while the prisoners of the jail escaped.

"The description of this fever given by the inhabitants of the towns which I visited may be summed up as follows: the fever commenced in all the affected places at nearly the same time, namely, in July or August, and ended generally about December.

"The evidence contained in the notes seems to me to be conclusive that the character of the fever which I have been directed to trace and study was malarious fever.

"It was most often intermittent, of which the most frequent type was the quotidian, though cases of the tertian type were not uncommon. Sometimes the fever was remittent, when it was always most severe, and was frequently attended by enlarged spleen and by hepatic affections manifested by jaundice, and sometimes leading to dropsy; and occasionally cases ending in general anasarca (dropsy of the whole body) were described. Diarrhœa, in some of the towns, was spoken of as not a very uncommon complication of the graver remittents, and when it came on it usually destroyed life. Where patients did not die from

* Instructions to Mr. Cutcliffe appointed special Sanitary Officer for the Meerut Division.

remittent fever, the disease usually became intermittent before it ceased, the most common type being the quotidian, and, at a later period of convalescence, not unfrequently tertian.

"In some of the towns rheumatic affections were much complained of as attending the later stages of the fever."

Epidemic malaria of the Punjab of 1867.

This last peculiarity recalls the fever of the 79th Highlanders, which the Regiment acquired on the march in the Punjab in the cold season of 1866-67. It was certainly derived from the same epidemic. In a note to the Regimental Tables of 1867, I have enumerated as sequelæ of the fever in the 79th, fourteen casualties by death and invaliding from phthisis, fifty-four admissions from orchitis, and 230 admissions from rheumatic affections. Nine deaths occurred immediately from the fever. It is well worth while to note, that but one section of the Regiment escaped this fever, namely, the women and children; that the only exception was the family of the Canteen Sergeant, who daily accompanied him when he went in advance of the Regiment to have coffee ready for the men on reaching the halting ground. The other families never moved until the sun was up, and they escaped; the Regiment as a body succumbed to the malaria of the early morning.*

The statement which follows shows the effects of what I imagine to be the same epidemic of malaria on the jail population. It is interesting to note exemption beyond the line limiting monsoon influences in the north-west, and even in those included portions of the geographical area which I have shown usually to escape in the primary invasion of cholera.

Fever Admissions of the jails of the Punjab of August and September 1867. *A Statement to show the provincial distribution of a fever which may have been connected with the fevers of the districts bordering on the Jumna, and with the fever of the south-east of the Presidency of* 1866.

Jails affected.			Jails not reached.		
	August.	September.		August.	September.
Delhi	32	122	Mooltan	13	14
Rhotuk	3	32	Montgomery		2
Sirsa	4	13	Shahpore		1
Umballa	18	58	Ferozepore	6	8
Loodianah	10	59	Jullundur†	7	5
Jhelum	10	29			
Goojranwalla	13	24			
Goordaspore	20	79			
Dhurmsalla	8	23			
Sealkote	7	17			
Lahore Female	13	66			
Lahore	135	656			
Umritsur	55	172			
Total of the above ...	328	1,350			

Meteorology of the season of epidemic advance from south-east to north-west from the Jumna to Peshawur.

It is certain, that with a meteorology of a definite character, cholera is due to spread over the Punjab from south-east to north-west in the month of May subsequent to its revitalisation. Speaking of the meteorology attending the spread of the May cholera of 1862 in the Sirsa District, Mr. Minas writes:—"During the prevalence of the hot west wind all moisture is absorbed and the season is salubrious. But when the wind veers to south or south-east, when the thermometer ranges high, when there is slight

* As a parallel to this case we have the great fever of the 1st Fusiliers, which suffered at Lahore in the epidemic of malaria of 1850 (see p. 75). The Regiment being in cantonments and unable to escape from the localised malaria, suffered far more heavily than the 79th, which in its Head Quarters' Station at least, had every opportunity for recovering from the effects of the miasm. Scriven tells us, that after the arrival of the 1st Fusiliers from Lahore at Meerut in March 1851, 194 enlarged spleens were found in the Regiment. Such results are not the effects of merely local conditions. There is the epidemic miasm superadded, and it is only at intervals of years, and when the history of epidemic invasion is also found, that such occurrences take place.

† The Jullundur Doab, as usual, was not affected.

moisture consequent on rain falling in very small quantity at a time, under such circumstances the appearance of cholera may be predicted. What has been stated, clearly exhibits the fact, that the disease in a great measure spreads in the direction of the wind from south-east to north-west. From the 4th May the direction of the wind changed to south-east. The mornings were cool and agreeable, imparting the sensation that there had been rain somewhere in the neighbourhood. During the night of the 5th rain fell, and this tended materially to cool the atmosphere. Intelligence was received of the first appearance of cholera on the 6th May, in Rundhawa, seven miles south-east of Sirsa. On the 15th, it appeared in the city of Sirsa and then it spread in every direction, not following the routes of traffic only, but irregularly visiting villages at a distance from them."

Mr. Minas, now in charge of the Hissar District, thus describes the weather prevailing in April and May 1867:—"In the month of April the weather was very uncertain; clouds gathered; rain fell in drops; a heavy shower fell on 20th, accompanied with a severe storm. Storms occurred at times during the month." May.—"There has been constant rain and continued sand storms. The total rain-fall was 6·9 inches. From the 20th, the heat became oppressive, and these vicissitudes caused fevers to rage violently." The Reporter for the Punjab, in his review of the meteorology of April, says:—"It is to be noted with respect to the spread of cholera, which began to appear during the latter part of this month, that the direction of the wind throughout the province generally was not unfavourable to the onward course of the disease northward; nor was the air deficient in moisture, the presence of which not a few maintain to be very favourable to the development of cholera." The meteorology of the month of May is very important. The Reporter writes:—"Up to the 6th of this month the wind blew principally from a westerly direction. It changed on this date to the south-east, and a fall of rain ensued in many places within a wide area.* Up to the 10th in fact, rain was very general throughout the whole province. From the 11th to the 13th, the barometer, after a slight rise, fell again, and another general rain-fall followed. From the 14th to the 18th the barometer again rose gradually, with a varying wind, but from the latter date it fell steadily to the minimum for the month, which was registered on the 26th. Rain again fell in various parts of the province on the 28th, 29th, and 30th. * * * Fevers and cholera prevailed in many parts of the Punjab during this month, and the considerable amount of moisture in the air, was by no means against the development and spread of either of these diseases." The rain continued even into June. "From the 7th to the 14th, rain fell in many places throughout the province, though to small amount. The wind up to the 6th blew from a westerly or north-westerly direction, but afterwards changed mostly to east and south-east. During the rain-fall from 22nd to 28th, southerly and easterly winds prevailed."

The actual date at which the Punjab was invaded in 1867, and the method in which the date of invasion is to be determined.

In all narratives which have been written on the May cholera of the Punjab of 1867, the attempt has been made so universally to connect on the presence of cholera with the arrival of Hurdwar pilgrims, and to associate its spread among the general population to infection from the contaminated stream, that it is almost impossible, with the data at our command, to say at what date invasion actually did take place. The idea of any method of introduction by other than human agency seems to have entered into the calculation of but very few. The palpable fact that the pilgrims were the first to bring the cholera from the east has been accepted as the whole truth, and the attempt has been made to show not only that pilgrims brought in the disease, but that each individual affected proved a focus of contagion. That the endeavour to show that, in nearly all districts from Umballa to Peshawur, a pilgrim was the first to suffer has been successful, is not to be denied; and that not a few who came in contact with the infected pilgrims, and possibly even with pilgrims apparently uninfected, cannot be questioned, because the alleged facts may be taken as incontestably true. It is when the conclusions from the two series of facts taken together are used as an incontrovertible argument for the full efficiency of human agency to introduce and propagate epidemic cholera, to the disparagement of the theory which maintains the aerial and provincial transmission of epidemic cholera, that it becomes essential to assert, that here as elsewhere secondary truths have been elevated into the position of primary truths, and that the minor has been taken for the major and indeed the entire truth.

In theory, men acknowledge readily enough the existence of a soil-generated cholera, but association is so strong that few in reasoning on the theory can forbear to think of cholera unless in connexion with the index of its presence, namely, affection of the human being; and they constantly overlook that no theory which does not recognise the reproduction of cholera as a vital phenomenon can possibly affect to deal with the facts of epidemic history. The fact is very simple of comprehension to any one acquainted with the history of epidemic cholera in India, that no combination of conditions (which is not natural) will expedite by three weeks the revitalisation or epidemic advance of cholera. We might as well look for the continuance by contingencies, up to the end of October, of the cholera due to die out on the 25th September.

It is certain that it was not until May that the districts of the Punjab generally began to suffer. The cholera of April was almost entirely Hurdwar cholera, the cholera of one outbreak.† This is evident from the tailing off of the mortality from the affected centre. The

* Mooltan, Dera Ismael Khan, Bunnoo, Shahpore, Rawulpindee, Huzara, Scalkote.

† The question of the normal duration of the Outbreak falls to be considered in the Second Section.

maximum of mortality among the pilgrims took place in the Umballa District, and to the south and west the mortality diminished thus in the different districts:—

Statement to show that the cholera of the Punjab of April 1867 *was chiefly Hurdwar cholera.*

Umballa and Kurnal Districts, Deaths of April	1,067	
Rohtuk	206	
Delhi	160	
Goorgaon	47	
Sirsa	32	
Loodianah	481	
Hoshiarpore	259	
Kangra	144	Total 2,777 deaths.
Jullundur	168	
Umritsur	169	
Ferozepore	19	
Sealkote	10	
Lahore	8	
Goojranwalla	5	
Jhelum	2	

Eleven districts are returned free from cholera in April—Goojrat, Shahpore, Huzara, Rawulpindee, Jhung, Mozufferghur, Moo ltan, Dera Ismael Khan, Dera Ghazee Khan, Bunnoo, and Kohat.

It was not among Hurdwar pilgrims but among the general population of the Punjab that the cholera of May spread. To give a single illustration, I take Goorgaon, the district lying conterminous with the Muttra and Bhurtpore Districts, into which it is certain that pilgrims did not introduce cholera. In this district, in accordance with the experience of outbreaks, and in accordance with the experience of this same cholera east of the Jumna, the disappearance of a cholera which might have been introduced by pilgrims was due at the end of April or on the first days of May. But in place of this, during May the mortality reached 1,335, and in June 1,280. The proportion of deaths in pilgrims in May was 41 to 1,294; for June, the proportion was so trifling that it is not recorded. The usual theory is thus stated:—"No doubt the chief reason that the disease prevailed to such an extent in the Goorgaon District is the fact, that the stream of pilgrims from Hurdwar was diverted at Delhi, causing vast numbers to enter the district by crossing the river near Furrucknuggur."

The vast majority of the deaths of April were deaths of pilgrims as the above statement showing the mortality on the three pilgrim routes proves; the total mortality for the Punjab for the month is given as 2,842. The deaths of May were 9,704; and the inference that has been made is, that while the influence of the pilgrims east of the Jumna on the general population in May was *nil*, these 10,000 deaths of the districts west of the Jumna were due solely to infection by the stream of pilgrims proceeding westward. I place the facts side by side, and it is for those who hold that all that is wanted is a germ and a human pabulum to explain the contradiction. It has been satisfactorily proved that in many cases individuals who were brought into contact with the pilgrims did get cholera; in other cases the evidence has not been conclusive; and in some districts the connection between human importation and the prevalence of the epidemic has been denied altogether.

The alternative between which we have to choose is the usual one—was this provincial cholera of the Punjab the result of transmission from man to man, or was it aerially transmitted; and we are called on to decide, laying aside minor considerations, which of the truths are of secondary and which of primary value.

May and June 1867 were from their meteorology, months much more favourable for the spread of an air-borne cholera than the corresponding months of 1862. But notwithstanding this, the limit of the distribution both in space and time was exactly the same in both cases. In 1862, we do not trace cholera beginning in the east and spreading gradually to the west; for the geography of the cholera of the year shows us that it was not along the course of lines of communication that the spring cholera of this year travelled. It is with the cholera of the districts lying to the south-east that we associate the frontier cholera, which was the first to show itself in 1862, with the cholera of Bikaneer and Bhawulpore, which prevailed up nearly to the close of 1861; and it is not to be overlooked that the cholera of 1861 had passed into Cabul, leaving the entire Upper Punjab between the Jhelum and the Frontier mountains an exempted area for the time, while cholera was present on its eastern, southern, and western sides. It was the Trans-Indus portion of this area that first showed the cholera of 1862; it was on the 20th April that cholera began to show itself in the Bunnoo District, and the Kohat District was invaded between the 18th and 21st May, the days in which cholera appeared at Teree and Hungoo. I have shown from the facts of three parallel years, that it is not necessarily the same part of the frontier range that is reached by cholera. In May 1858, it was Huzara that suffered, while the Peshawur Valley escaped; in May 1862, it was the Kohat Valley that was entered, while the cholera did not show itself at Peshawur before the 25th June; in May 1867, it was the Peshawur Valley which suffered, while the Kohat Valley escaped until the 26th July, with the exception of a single fatal case, which is said to

have happened on the 22nd May. With such parallels, while looking to the May cholera of Jeypore, Bhurtpore, and the districts west of the Jumna, as the source of the Peshawur cholera of 19th May 1867, I hold the manifestation to have been of provincial significance, and unassociated with any germ which pilgrims in passing through may possibly have introduced. I think it is very striking, that, after a clear interval of five years, the valley of Peshawur should have been entered on the very days on which the cholera began to prevail in the towns of the adjoining Kohat Valley.*

In the districts west of the Jumna, I have mentioned the earliest cases as occurring in the Sirsa District, on 6th May 1862. Scriven gives the date 12th May for Rohtuk and Hissar, and 17th May for the villages of the Kurnaul District. The same dates would probably apply more or less accurately to the same districts in 1867. The difficulty in the way of correctly determining the dates in 1867 I have explained to be, the mixing up of the results of the special outbreak at Hurdwar with those of the normal reproduction.

We have, however, Mr. Adam Taylor's map, showing the date at which 115 villages of the Delhi District became affected; and this seems to me to show, that the "explosiveness" which Mr. Taylor described in the affection of numerous villages on a given date in Rohtuk in 1862, held good in 1867; and not only so, but also that the explosion occurred to a day with that of Mr. Taylor's district of 1862. The 11th May is noted in Mr. Taylor's map as the day in which forty villages out of 115 became affected, the very day on which cholera attracted notice in the Banda District.†

In the Delhi District 115 villages were affected, and Mr. Taylor gives the following as the dates of first appearance:—

Cholera appeared in	1	village	on	20th April.
„	21	villages	from	1st to 5th May.
„	49	„	„	6th to 12th May.
„	34	„	„	13th to 31st May.
„	10	„	„	1st to 13th June.
„	115	„	„	20th April to 13th June.

Note again, that it was on the 6th that the wind began to blow from the south-east; and that rain fell during nearly a week over almost every district of the Punjab. It was on the evening of the 10th that the severe, though short-continued, attack at Mooltan commenced, supposed to have been connected with a funeral gathering of a rich man's wife who died on the 6th May after her return from Hurdwar. Dr. DeRenzy, speaking of the locality chiefly affected, says:—"The streets were unpaved and undrained, and they happened at the time to be very sloppy from a fall of six-tenths of an inch of rain that had fallen on the 8th May." The next general fall of rain was from the 11th to 13th, and this reached the high Punjab. The Deputy Quarter Master General at Peshawur writes:—"A week before the outbreak of the epidemic (on 20th May), there had been a violent storm of rain and great floods as a consequence." The outbreak at the Sohan River, five miles from Rawulpindee, began on the very same day as the outbreak at Peshawur, and Rawulpindee became affected on the 25th and 26th. Subsequent to the outbreak at Peshawur, "it was ascertained that cases of cholera had occurred amongst some workmen at the Sohan Bridge near Rawulpindee, and that a case or two had appeared at Hurreepore in Huzara on the same day in which the epidemic showed itself at Peshawur. A woman also belonging to the 42nd Highlanders *en route* to the family camp at Murree was seized at Tret."‡

A large village of the Rawulpindee District had become affected in the second week of May, and the origin of its cholera was, as usual, attributed to pilgrims.

The meteorology with which cholera was introduced into the Rawulpindee District is thus alluded to by Surgeon F. F. Allen:—

"The atmosphere was dense, loaded with dust, and so hazy as to obscure the view of the hills, only about twelve miles distant from the station. During this period the wind came chiefly from the east and south-east. I attribute the comparative mildness of the epidemic at Rawulpindee principally to the purer condition of the atmosphere as compared with Peshawur, which is situated in a low cup-shaped valley surrounded by hills, which materially interfere with the circulation of air, while Pindee is situated on a high ridge sloping on either side to the Jhelum and the Indus, and hence is exposed to every wind, and possesses good natural drainage."

That the vehicle, the directing agency, and the materies of the epidemic were all present, and in a position to spread cholera from the Jumna to Peshawur between the 6th and 20th May, has been clearly shown from the above quotations; and I know of nothing else necessary for a provincial dissemination and manifestation of cholera. I am not prepared to say why it was that the cholera of 1856, one of the greatest epidemics ever known, declined to cross the Jhelum in 1857, and until May 1858. The disturbed state of the country has caused a deficiency in our records for the period, and we can only conjecture that the vehicle was wanting. The reproduction in the east of the Natural Province was as true as in 1867. Several soldiers had died at

* Scriven gives the 30th April as the day of the infection of Teree, and Hungoo May 21st, 1862; I quote from the report of the Inspector General of the Peshawur Division.

† Note the parallel forty-eight years before. I quote from the Superintending Surgeon's Report for the month of May 1820. "Cholera appeared in the town of Kurnaul on the 5th May, and continued till the 28th. On the 11th May the epidemic first appeared in the cantonment."

‡ Report of the Assistant Quarter Master General, Peshawur Division.

Roorkee and Subathoo even in April; Dugshaie was invaded in May; and in the Umballa District (including Loodianah, Umballa, and Kurnaul), sixty-two European soldiers were lost in this May cholera of 1857, while moving towards Delhi, and from subsequent report we know also that this cholera was virulent at the same time in the districts to the west of Delhi.

We have the same circumstantial account in regard to Kangra and Sealkote and the territories of the Maharajah of Cashmere, how that cholera was spread through these districts in May 1867 by those who had gone to Hurdwar. In Kangra the epidemic began apparently in the first week of May; the police and jail were attacked on the 5th and 6th. A foot note of Mr. Scriven's report (p. 5) gives the parallel in 1862 :—"Since this report was written, I have learnt that a number of cases of cholera occurred in the Kangra District, some of them as early as April 26th; but I have not been able to trace any connection between these and the epidemic treated of in the text." Mr. Scriven means to imply that this cholera occurred as early as that of the frontier, and that of the districts west of the Jumna, and so he fails to trace the effect of human intercourse in causing the different epidemic manifestations and the geographical continuity of cholera throughout the Punjab.

In Cashmere upwards of 6,000 people are said to have died in 1867. The introduction of the cholera was attributed to the troops of the Maharajah, who accompanied him to Hurdwar. Cholera existed for three months in the city of Jummoo, and a daily average of sixty died when the cholera first broke out. Jummoo is but twenty-four miles from Sealkote, and a rigid quarantine was established and kept up by a double line of sentries. The Deputy Commissioner writes :—"So rigidly was this cordon kept up that I believe not a soul passed from the Jummoo territory into this district except by the Zufferwal road, and then under passes from myself." The Cantonment Magistrate of Sealkote states that the precautions taken were successful, and he is of opinion that had these measures not been taken, the results would have been most disastrous. This opinion it is as well that we should qualify by the parallel experience of 1862, as in almost every instance the Civil Authorities have subscribed to the theory of the introduction of this cholera by pilgrims, and, in consequence, to the efficiency of quarantine as a preventive measure. The then Deputy Commissioner (Mr. Macnabb) writes :—"In May and June (1862) cholera raged with such violence in Jummoo that the Maharajah delayed his departure for Cashmere till it abated; *while Sealkote and other neighbouring towns and villages were filled with people flying from the danger, they do not seem to have brought the disease with them, as only one isolated case of cholera occurred in the district.* A good month elapsed after the dying out of the cholera in Jummoo, when about the end of July, the season of the periodical rains, the disease, brought from a totally different direction, became epidemic." It is very significant to remark that the very same tracts localised cholera in the Sealkote District in 1862 and 1867. Duska and Pusroor hold the first place in Mr. Macnabb's enumeration;* and in 1867, these two Tehsils gave 334 deaths out of a total of 384 for the whole Sealkote District.

General conclusion regarding the cholera of the Punjab of May 1867, alleged to have been introduced into the province and spread by Hurdwar pilgrims.

I think it is clear from all this that the parallel of May 1862 for the Punjab holds most remarkably, whether we take it in the east, the west, or the north. Coincidence has no place in my estimation of this parallel. As I read it, the outbreak of Hurdwar, while affecting primarily those there assembled and secondarily those brought into contact with them, had no connexion whatever with the geography of this May cholera of 1867; and I believe that the geographical distribution would not have been different had no Hurdwar gathering taken place.

I have shown how in the first week of April the cholera of November 1866 began to revive in the Bhurtpore State; the date given for Jeypore is the 15th. We know nothing definite regarding the cholera of Bikaneer. We know the fact that in the marching season of 1866-67 the route of the camp of the Governor General's Agent was diverted from Bikaneer in consequence of the prevalence of this cholera, and in May 1867 we read in the narratives of the districts to the east of Bikaneer that the villages lying towards Bikaneer suffered more than others. The statement made in the report from the Rajpootana States, that cholera was not epidemic in 1867 in Bikaneer, cannot therefore be regarded as correct for the whole of the Bikaneer territory.

Exempted area of 1867.

I have said that the exempted area of 1867 was the province of the south-west monsoon proper. The report from the Administration of the Central Provinces states, that no case of cholera occurred among the prisoners or troops. "The Civil Surgeons of Hoshungabad, Baitool, Nursingpore, Raepore, Nimar, Seonee, Dumoh, and Nagpore, all report that the year was singularly free from epidemics, and that cholera in particular was almost entirely unknown." I have mentioned that in the Central Provinces its prevalence was confined to some villages of the Mundla District, the cholera of which is always an eastern cholera associated with that of Chota Nagpore.†

Following the northern line of the exempted area, the definition is found sharp and unmistakable. The cholera extending over months in the Banda District passed off no offshoot into the Jhansi District immediately adjoining. Lullutpore to the south continued absolutely free from cholera during the year.

* Scriven's Report, p. 27.

† Since this was written, another example of this same association has occurred. In the exit of the current epidemic from the endemic area in 1868, the cholera of Chota Nagpore and Mundla appeared as portion of the same invasion.

Saugor reports:—"This year was at Saugor a remarkably healthy one among European as well as among Native troops; and there was not a single case of cholera throughout it."

Nowgong reports:—"No epidemic visited Nowgong last year. The Natives in the cantonment and the adjacent villages were remarkably healthy. Cholera here is hardly known."

Bhopal reports:—"There has not been a single case of cholera." Augur.—"There has not been to my knowledge a case of cholera anywhere in the vicinity during the year." The same is the report up to Erinpoorah, the most westerly of our stations, which was also absolutely free from cholera in 1867.

The Madras Presidency shared in this immunity, and the European Army lost during 1867 but seven men from cholera. The explanation which I have given is, that 1867 was the fourth year following the invasion of June 1863, and that since this cholera was not supplemented, its decay in 1867 was certain; these provinces were reinvaded in 1868 by cholera commencing its invasion in the Jubbulpore and Mundla Districts in April. It was not deficiency of moisture which prevented the re-development of cholera in this great province, for the rain-fall was sixty inches, seasonably distributed, which is above the average for these provinces.

Definition of the northern margin of the Exempted Tract, and the occupation of the districts lying immediately within the area of invasion, in May 1867.

Skirting the north of the exempted tract, Gwalior, lying immediately to the north of Jhansi, reported invasion in May, the first case occurring among the population on the 22nd and among the Europeans on 31st. As already noted, it was on the 30th May that the orphans at Agra, the adjoining district, were attacked. The report of cholera from the state of Tonk lying west of Gwalior is of the same date, the 30th May. This cholera, showing itself so widely for the first time between the 20th and 31st May, I connect on not immediately with that of November 1866, nor with its reproduction as it occurred in Bhurtpore and Jeypore in April, but with the Banda cholera of the 12th May, reckoning this a fresh reinforcement from the east, showing itself on the very same date as in 1818, 1856, or 1863, *a cholera which would have provided the material for the invasion of the western division of the epidemic area of* 1867, *had its arrival not been anticipated in November* 1866. We have no evidence to show that this body of cholera following up the invasion of the end of 1866 was of great power. All along the line of demarcation between the exempted and occupied area of 1867, a minimum of intensity was shown, and this it is essential to keep in view in estimating the success alleged to have been attained in opposing this invasion; Gwalior, for example, was in 1856 or 1860 *centrally* situated in the affected area of these years; in 1867 it occupied *the very margin of the cholera tract.*

Precisely as in the epidemic of 1861, Deolee was the last station of our Presidency affected; in this district was the extreme south-western limit of the cholera of 1867. This station lies close on the borders of and indeed within the province of the south-west monsoon. At Erinpoorah, our last cantonment to the south-west beyond Deolee, the wind blows for ten months of the year from the south-west; this station has no association with the cholera of our Presidency, being entirely within the south-western province. The history of the progress of cholera from the east into this district is thus described by Surgeon Major J. D. Crawford:—"Deolee is situated in latitude 25° 50′ north, and longitude 75° 30′ east, at a point where the Jeypore, Boondee, Oodeypore, and Ajmere territories meet. It is about ninety-five miles distant south and by west from the city of Jeypore; thirty-six miles south-west from the city of Tonk; and about sixty miles south-east from the cantonment of Nusseerabad."

"A strong wind from the south-west prevails generally, and the climate is healthy."

"In the month of May 1867, reports reached us that cholera was prevalent in the Bhurtpore and Jeypore territories. A guard of five men of the Regiment left Deolee on the 30th May to escort regimental stores from the Jeypore road. On arrival at Tonk they were informed that cholera had broken out, and in consequence pitched outside the town. As they proceeded into the Jeypore District, they heard that the disease was very prevalent in many of the villages, and avoided entering them. As they were returning to Deolee, it was also prevalent along the line of road. A few days after this I heard that cholera had made its appearance at Punwar, a village four miles distant from Deolee, and on the 20th June the first case occurred in the station."

"Before the outbreak the weather had been from the 14th June close, hazy, and oppressive, *with an easterly wind*, when there was any. A camp follower was attacked on the 20th with cholera, but recovered."

Even in this remote corner of the epidemic area, with a knowledge of the fact of the general prevalence of cholera within less than 100 miles persisting up to the 15th of December in 1866, we find the observers not unwilling to adopt the theory that possibly Hurdwar pilgrims may have been the means of bringing cholera upon these districts. Dr. Murray, of Ajmere, is in fact the only officer in those parts who states simply that he can trace no connection between the advent of pilgrims and the breaking out of the cholera.

Dr. Burr, of Jeypore—a state in which the cholera of 1866 ceased in December—expresses his opinion, that the disease was "communicated by pilgrims from Hurdwar." Dr. Crawford, of Deolee, says:—"I have not been able to connect the outbreak of the disease here with the arrival of pilgrims from Hurdwar, but I believe they must have reached this part of the

country about a month before cholera made its appearance." His theory is, that as the stream of pilgrims became small, the disease died out from amongst the pilgrims, but progressed by slower steps from village to village till it reached Deolee. Dr. DeFabeck, of Deolee, thinks that there can be no doubt that this epidemic owes its origin to the transmission of the disease from Hurdwar; "but," he adds, "while this conviction forces itself strongly upon us, I must admit that the small amount of evidence which I have been able to collect is very inconclusive." Dr. Menzies, of Gwalior, thinks that we have direct evidence of a connecting link, although a weak one, between Gwalior and the Hurdwar Fair, in the fact that a Sirdar of the Maharajah did go to Hurdwar; and that although there is no evidence of importation of cholera, this link of connection ought not to be lost sight of.

This is exactly the same kind of evidence that we find adduced from the most easterly divisions of the epidemic tract alleged to have been infected by pilgrims, for example, in Shahjehanpore and Budaon. As soon as we pass from west to east into the eastern cholera province, the authorities deny any influence to pilgrim importation. But wherever there has been the shadow of a possibility that cholera may have propagated after its introduction by pilgrims, the introduction and propagation have been insisted on as facts, whereas if my estimate of the sequence of events be correct, whatever amount of truth may have been embraced in the allegations has been used to support a theory which is fundamentally erroneous. District authorities have been invited to take up this aspect of the question, and they have not been slow to generalise from their own limited basis of observation; and there is probably not a native medical subordinate in the Punjab who is not impressed with the conviction that at the present time he knows the whole truth regarding the propagation of epidemic cholera, a problem the solution of which has been the aspiration of the most able observers from the past fifty years. Much of what has been alleged regarding infection from pilgrims is no doubt true; much is as undoubtedly false or exaggerated, or the evidence has been strained so as to give an untrue colouring to the facts.* If the supposed influence of Hurdwar be struck out altogether, and I maintain that it ought to be struck out in studying the Natural History of this epidemic, the opinions so universally expressed are as universally fallacious as they are unanimous. They end in nothing, and a new theory is required to suit the altered circumstances. The one most likely to be formed, namely, that the epidemic travelled along the highways of communication would be as untrue as that abandoned. The theory is no more true—taken as theory and as representing the whole truth—than is the deduction from it, that quarantine is the universal panacea for epidemic cholera. That quarantine prevented the appearance of cholera in certain stations in May 1867, is probably true; and should similar circumstances recur in future, it is not doubtful that it will be the duty of the authorities to act as they acted in this year. But this it is necessary to add, that the true spread of the epidemic will not be limited by the application of these measures, and disappointment must not arise when this is found to be the case.

Monsoon reproduction of the cholera of 1867; its range and intensity.

The monsoon cholera of 1867 of the epidemic area had its range from Nepaul to Persia. The 18th of June is reckoned as the day on which cholera began generally to affect the population of the Nepaul Valley; intelligence from Teheran, dated August 28th, states that within three days, 150 deaths had occurred, and that on the average eighty cases of cholera were occurring daily. The prevalence of this cholera in Cabul was included between the 19th July and first week of September; it is stated that 8,000 persons died up to the 14th August.

Monsoon cholera of Nepaul.

Dr. Wright reports:—"From the 20th April to the middle of May a few cases occurred at Katmandoo. Towards the end of May rumours arose that cholera in a severe form was raging at Gorkha, sixty miles to the westward of the valley of Katmandoo. I heard no more of it until the second week in June, when it was reported that cases were occurring daily in Katmandoo and Patun, two miles distant. From the 18th June the epidemic fairly broke out, and continued to rage till the end of September."

"In the months of July and August, when the cholera was at the worst, the weather was remarkably pleasant. There were showers and breezes daily, but nothing approaching to a heavy downfall of rain or a strong wind. The greatest fall in one day in June was 1·2 inches, and in July 1·5 inches. There were eighteen rainy days in June, twenty-four in July, and twenty-five in August."

* In the Bareilly District the police reported between the 18th April and 27th May 1867, when the spring cholera ceased, 552 cases with sixty-three deaths; and in the Budaon District, 151 cases with fourteen deaths. The statement of deaths is probably nearly correct, but the gross exaggeration of the number of cases alleged to have been discovered is conspicuous. Budaon was actually invaded from the east, along with Shahjehanpore, in the monsoon reproduction; but upon the fact of the occurrence of these fourteen pilgrim deaths of April and May, the Medical Officer of the district constructs his theory thus:—

"The disease first appeared (at Budaon) with the Hurdwar pilgrims, in April 1867. For nearly two months the disease was scarcely felt, and then all of a sudden it broke out, assuming a virulent form, and caused dreadful havoc among the population. It appears to be very evident, that the cholera poison lay dormant for the period for want of some circumstance favourable for its growth, and that when this was supplied either by the changes of the atmosphere, or habits of the people (probably the former), the poison became fully developed, gained strength, and spread in different directions."

Monsoon cholera of Rajpootana.

In the extreme south-west of the affected area in our Presidency, the first case of cholera occurred at Deolee on 20th June, and the epidemic was included between this date and the 31st July.

Dr. J. Murray, of Ajmere, writes :—"Reports reached Ajmere of the prevalence of cholera in various parts of Marwar for more than a month before it made its appearance in Ajmere.* The first case occurred here on the 20th June. I made every enquiry with the view of tracing the first cases to stray pilgrims, but failed to do so. In the city, cholera lingered until the 30th September." * * "I observed on several occasions after a heavy fall of rain that there were a greater number of attacks. This was particularly noticeable after a fall of 3·1 inches during the night of 17th August. The detachment of Europeans in the fort was attacked on 20th."

Here we find to a day the rejuvenescence or revitalisation of cholera with the setting in of the monsoon at the two extremes of the epidemic area of 1867—at Nepaul, in the north-east and at Ajmere and Deolee in the south-west. Between these points, and indeed between Cabul and the Behar Provinces, renewed manifestation was nearly universal in July, August, and September. The monsoon cholera of Gwalior dates from the 10th July, with a fresh invasion or wave on 12th August. The 28th July was the day of the outbreak of the monsoon cholera among the European Troops at Allahabad.

Monsoon cholera of Oude, Shahjehanpore, and Bareilly.

In Dr. Cannon's Report we read :—"In the city of Lucknow there were eighty-nine cases and forty-two deaths in June; in July, the Police returns give 406 cholera deaths out of 859 cases recorded. Up to the 23rd August, when cholera as an epidemic ceased in the city, there were 1,455 cases, of which 781 were fatal."

"On the 23rd August, after nine days without rain, there was not a single fatal case reported. The maximum mortality of any day was on 3rd August, when ninety-two fatal cases were reported."

In the last week of July, the cholera reached Khyrabad, and by the 10th August, all the bazaars of Seetapore had become affected. Sundeela lost 220 inhabitants in an attack which commenced on 23rd July, and died out on 14th August.

Khyrabad lies exactly half way between Lucknow and Shahjehanpore. It was unquestionably from the east that the terrible monsoon cholera of Shahjehanpore came, although, as in the case of the Budaon District, it is insisted that the introduction of cholera by Hurdwar pilgrims must have been the origin of the catastrophe, since between the 24th and 30th April nine pilgrims died in two villages of the Shahjehanpore District. In May, June, and July only 166 deaths occurred in this wide district. I have elsewhere stated distinctly that Shahjehanpore is a portion of the eastern division of the epidemic area, instancing the events of 1818, 1859, and 1860 in proof of the fact. Notwithstanding his adoption of the pilgrim theory, we find the Magistrate writing :—"The east wind prevailed, as is usual, throughout the epidemic with only a few days' intermission. Whenever any other wind prevailed for a day, the mortality returns were lighter."† From a total of fifty-five deaths in July, the mortality rose in August to 1,147; in September 1,738 died; in October 729, in November 290, and in December 130. Along with this occurred the great Bareilly cholera of 1867, which seems to have reached its maximum in September and October, in which months 3,127 deaths were reported. Etah comes next, lying south and west of Shahjehanpore. In this district there were a few cases of cholera at the end of May when Cawnpore was affected. It was on the 6th August that the alarm was given that cholera had entered the district. This is a district bordering on epidemic limits, and little liable to visitations of cholera. The maximum of the epidemic in this district was in September, when 231 deaths occurred. It is mentioned that while the epidemic was raging in the town, the sky was cloudy and east wind was blowing; on 20th September, when cholera began to decline, we read that cholera had decreased since the setting in of the westerly wind. While cholera was attaining its maximum in the Bareilly District in October, the same cholera was violent in Budaon adjoining; the deaths rose from forty-one in September to 413 in October; in December only fourteen deaths were returned.

This appears to have been the cholera tract affected from the east in the monsoon of 1867.‡ The great force of eastern cholera was concentrated on Oude, Shahjehanpore, and Bareilly; Northern Oude suffered in the spring invasion, Western Oude, Shahjehanpore, and Bareilly in the monsoon revitalisation.

The districts of the Doab suffered little. Futtehgurh gave only 611 deaths for the year. Cawnpore gave 287 deaths in September; eighty-nine in October; eight in November; and four in December. Futtehgurh had had only sixty-four cholera deaths in September and October; and Allahabad eighty-six.

Comparative intensity of the epidemic of 1867 in different tracts of the eastern division of the epidemic area.

In relation to the geography of the cholera of 1867, the eastern division of the epidemic area may be divided into two tracts, one south of the Jumna, the second lying between the Jumna and the hills. The latter may again be sub-divided into three, in relation to the degree of intensity of prevalence.

* This statement is of importance, as opposed to that of the report furnished from the states of Rajpootana, in which it is alleged that cholera appeared neither in Marwar nor in Bikaneer. The statement appears to have been in both instances incorrect.

† This statement evidently requires qualification or explanation.

‡ It was to this cholera due in 1867 that I called attention in September 1866, when the limit of the invading cholera of 1866 in the east was apparent; it is also the cholera referred to in my letter of February 1867.

Cholera Deaths of the General Population in 1867—*Eastern Division.*

The districts are geographically continuous, and are arranged from east to west.

A. South of the Jumna.		B. Between the Jumna and the Hills.					
Showing the dying out of the epidemic from East to West and South-West.		1. Tract of Maximum.		2. Tract of Medium.		3. Tract of Minimum.	
Banda	2,534	Gorackpore and Bustee	9,221	Ghazeepore	1,389	Benares	502
Humeerpore	223	Gonda and Baraitch ...	5,896	Azimghur	872	Jounpore	262
Oraie	20	Kheree	4,764	Fyzabad	2,339	Sultanpore	76
Jhansi	None.	Shahjehanpore ...	7,781	Lucknow	2,468	Pertabghur	42
Lullutpore	None.	Bareilly	7,821	Cawnpore	1,816	Mirzapore	365
The southern margin was conterminous with the exempted tract of the year.		Budaon	796	Seetapore	683	Allahabad	492
		Etah	1,402	Futtehghur	611	Futtehpore	712*

Had we not the events of every year from 1858 to 1866 to tell us that there is a true line of distinction between eastern and western cholera, we might without hesitation have added on to the cholera tract including Oude Shahjehanpore and Bareilly, the Moradabad Meerut and Allyghur Districts, which suffered heavily in the monsoon of 1867. In such a year, as in 1856 and 1857, the most careful recorder could not draw the epidemic line. And, therefore, while I state it as a fact that on every occasion where the history of an epidemic has led us to expect it, this line has been found, I am willing to admit the possibility of the geographical continuity above referred to, provided always that a continuity of meteorological phenomena can be shown. East winds and rain sweeping the Gangetic Provinces we know to extend to Etah and Shahjehanpore, but it is not my experience that these same winds reach further to the west. But, as I have already said, abnormal intensity and continuance may in any year push back a true epidemic barrier. I do not think, however, that there is any occasion to have recourse to this explanation in regard to the monsoon cholera west of 80° in 1867. I have shown that any cholera which may appear in these districts in May is to be regarded as the shadow of what is to come in July, August, and September, and I have stated that this phenomenon is so constant as to have been recognised by the residents of these parts. In our statistics of European Troops the fact is thus represented in the years in which Meerut and Rohilcund were affected, namely, 1856-57-58-61-62 and 1867. What is shown for Meerut is true for the whole of the Meerut and Rohilcund Districts:—

Cholera Admissions of European Troops—Meerut, 1856-67.

YEAR.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1856	...	...	...	...	...	...	6	73	...	...	...	...	79
1857	...	...	...	...	...	...	...	1†	6†	...	...	...	7
1858	...	...	...	...	...	...	3	1	...	...	..	...	4
1861	...	...	...	1	1	...	88	27	..	1	...	...	118
1862	...	...	...	1	..	1	24	26	...	..	...	...	52
1867	...	...	...	...	...	...	...	16	106	1		..	123
TOTAL ...	...	...	...	2	1	1	121	144	112	2	...	...	383

This statement clearly shows that whether it be in the case of an invading or of a reproduced cholera, epidemic manifestation is not due in May, but is delayed until after the setting in of the rains.

Evidence of the invasion of the Punjab from south-east to north-west, and of the removal of the material of the epidemic out of the districts of the south-east.

The tables for the Punjab seem to show us that the very revitalised material which is reproduced in the south-east of the Punjab is carried onwards into the north-west, and that by its transference the district out of which it is transferred becomes comparatively free from cholera, just as the endemic area seems relieved after invading cholera has made its exit, and has begun its progress through the epidemic area. The continuity of the wave over the frontier into Cabul and Persia also indicates that no epidemic wall intervened to oppose the progress of the material. This fact probably contributed to cause the weakness of the Punjab cholera of 1868; for had the epidemic barrier existed, the invading cholera would have fallen thick behind it, as in 1856 and 1861, ready to manifest its presence at the close of the normal period of dormancy. In all the districts little affected by the monsoon, and in which the spring rains prevail, we do not find in the monsoon months of 1867 the extensive reinvigoration of cholera which is met with further to the east and south-east. Universality rather than vigour is the characteristic of the Punjab cholera of July, August, and September 1867; and the decline of the cholera of September, which is invariably a month of maximum when the invasion has occurred with the monsoon, as in 1856 and 1861, was unusually rapid.

* Some sub-divisions of Futtehpore suffered while Banda was being invaded. † Deaths.

Tract continuous from the Jumna to the Indus, S. E. to N. W.

AREA OF DECREASE FROM MAY.						AREA OF AUGMENTATION FROM MAY.					
AREA OF SPRING CHOLERA.						AREA OF MONSOON CHOLERA.					
DISTRICTS.	May.	June.	July.	August.	September.	DISTRICTS.	May.	June.	July.	August.	September.
Sirsa	423	435	152	21	5						
Hissar	1,870	683	104	6	...	Umritsur ...	257	601	941	1,143	400
Rohtuk	524	252	63	...	...	Lahore ...	120	421	1,031	368	124
Goorgaon ...	1,068	1,435	330	40	35	Goojranwalla ...	60	50	616	673	270
Delhi	931	338	50	5	4	Goojrat ...	9	14	...	82	248
Kurnaul ...	743	341	125	93	51	Sealcote ...	2	52	146	132	258
Umballa ...	1,044	358	152	46	58	Jhelum ...	4	80	152	303	198
Hoshiarpore ...	484	57	29	35	61	Shahpore ...	...	2	17	231	189
Loodianah ...	352	236	253	112	68	Rawulpindee ...	57	360	...	956	200
Kangra	675	459	213	78	127	Huzara ...	3	96	254	715	515
Goordaspore ...	60	9	25	31	61						
TOTAL ...	8,174	4,603	1,496	467	470	TOTAL ...	537	1,676	3,157	4,603	2,402

This table I consider to show the transfer of the cholera of the south-east of the Punjab into the tract immediately continuous on the north and west, a transfer effected most probably with the spring rains in the second or third week of May, when the seed was sown, which came forward only as the monsoon reached the different districts.

It is scarcely necessary to remark that the pilgrim theory explains nothing in regard to the geography of the cholera of the year, and where such explanation is attempted it fails at every point.

We have some difficulty in comparing this Punjab cholera of 1867 with that of any other year, inasmuch as no year of our period has supplied an exact parallel. The cholera of November 1866 had as much a limit in the western division of the epidemic area as the Behar cholera of July had in the eastern. Consequently we have not to deal with the reproduction of such a cholera as that of 1856 which had covered the Punjab up to the Jhelum, or that of 1861, which had a like distribution. We had to look for invasion of the north of the Punjab from the east and south-east in spring over a country actually unoccupied, and we had in addition to look for the monsoon manifestation of the same cholera within the whole provincial area. These two distinct phenomena are what is shown in the above table; and, therefore, it was that there was no limitation in space of the Punjab cholera of 1867, no stoppage either by the Jhelum or Indus, as in previous invasions.

It is clear that this May cholera did not come out of the Agra, Allyghur, or Meerut Districts unless the tracts of these districts lying along the Jumna may have furnished a contingent. The May cholera began on and west of the Jumna, and with no small beginnings. Nothing but a knowledge of the fact that these districts were the breeding grounds of the cholera of 1862 could have induced me to regard them as the breeding grounds of the cholera of 1867.

In relation to meteorology, the distribution of 1867 means, that between the rains of the spring and of the monsoon every part of the Punjab Province was covered, and that the same phenomena and distribution occurred in a single year which we generally find included in two, the invasion occurring in the rains of the one year, the reproduction and further extension in the spring of the year following invasion.

The Bunnoo District was reinvaded in October, the first case occurring in the city on the 4th. About the 20th it began to abate, but as late as the 15th November, this cholera continued to prevail in the villages of the Bunnoo District. This was a cholera parallel with the Peshawur and Kohat cholera of October 1858, and with the last outbreak of the Peshawur Valley of 1862, which died in the first week of November.

General conclusions regarding the epidemic relations of the cholera of Northern India of 1867.

Thus the history of the year stands complete in its parallels, and every occurrence presents itself in an aspect consistent with past history, in meteorology, in season, and in geography. The estimate which I have made will no doubt be called in question, and the sequence of the events as I have described it will no doubt be disputed. And yet I cannot but regard the basis of my estimate as a sound one; and indeed I know of no other from which I could have tried to show the significance and the relation of the phenomena which actually occurred.

Experience of the past entitles us to sketch what would in all probability have been the cholera history of the year had the phenomena of 1866 been different. While the Behar invasion of August 1866 was in progress, I showed that the material of this epidemic was due as a great cholera over the eastern division of the epidemic area in the spring and monsoon seasons of 1867, and was due to invade the western division through the

districts south of the Jumna, commencing western invasion about the 20th May, if following parallel history. At this time it was no part of my calculation that the parallel of 1817 and 1826 should be repeated, and that the October cholera of the far east should at this season cover the country between Chota Nagpore and Rajpootana. Had the programme of 1855 and 1859 been followed, and had the meteorology of 1867 over the western area been normal, the sequel would have been as follows: The cholera which invaded Banda on 12th May would have been a body of great intensity, and not, as we actually found it, shorn of its strength. With easterly winds this cholera would have commenced to affect Agra as usual about the 20th May, but no progress would have been made before the first week of July, when with the vehicle afforded by the monsoon, Gwalior, Rajpootana, and Northern Scinde in the west, Meerut, Rohilcund, and possibly Umballa in the north, and all districts lying between the Jhelum and Agra would have been affected, the Jullundur Doab and the Sealcote District remaining most probably unaffected; this distribution would have been completed by the first week of August, and between the 25th September and the first week of October the invading cholera would have been dormant all over the area, unless, perhaps, in some few places where local conditions might have caused vitality to reappear for a few weeks in the end of October and beginning of November. This cholera distributed in the monsoon of 1867 would have begun to reappear from its dormancy on 20th April 1868; and about the 12th May would have been epidemic west of the Jumna, over Umballa and Kangra and the lower hill stations, Rawulpindee and Huzara, and also beyond the Indus on some part of the frontier.

In short, the history of the western cholera of 1866-67 in place of being comprehended in the three revitalisations of November 1866, May 1867, and July 1867 would have been extended over a further period of a year; for what was effected in May 1867 could not possibly have been effected before May 1868 had the invasion of the Agra District from the east been delayed until the end of May 1867. We have seen how little hold, even in 1867, this May cholera had of the Agra District, and eastern cholera could not have crossed this tract at such a season in such a shape as to be capable of forming the body of an epidemic suited for invasion further to the north and west, as we know from the history of the May cholera of 1856 and 1861.*

What actually happened was, that the great south-eastern body of the cholera of 1866 was diverted in October 1866 into the tract west of 80° east longitude, trifling as was the indication of the fact, taking the affection of the population as an index. Had I not noted universality of distribution to be a better gauge of the importance of a threatened epidemic than the severity of single outbreaks, especially when occurring at an abnormal season, the fact of general invasion might in the instance of this epidemic have escaped notice altogether, and the true clue to the epidemic history of 1867 would in this case have been lost. The fact of the October advance of 1866 enormously diminished the power of the invading cholera of May 1867, which followed in its track, and indeed it seems to have swept away entirely the material which, if present, would have been available for the invasion of Nagpore in March 1867. I believe that the course of the monsoon cholera of 1866 directly from south to north had also much to do with this diversion, and I see in the great cholera of Northern Oude and Goruckpore the compensation for the immunity of the Central Provinces.

Cholera of the epidemic area of 1868-69.

It seems to me, writing at the present time, April 1869, that the anticipations in regard to the epidemic which is to succeed that of 1866, should take the following direction :—

Cholera is now widely epidemic in Eastern Bengal; and when we review the facts of 1868, we cannot doubt that in the spring of this year also cholera was widely diffused as a moving epidemic within the endemic area. In the cholera seasons of 1868 the prevalence of cholera was far above the average in very many districts of Bengal Proper. The facts regarding cholera in the endemic province forbid us to conclude that even the indices given by our types were mere evidences of the local reproduction of cholera.

Cholera of the spring of 1868, epidemic within the Endemic Province.

In the last days of March 1868, the first wave of the year seems to have swept over a large and continuous tract of the endemic area, and the effects of this seem to have ceased about the 17th of April.

The following are the indices of this cholera wave shown in the Returns of 1868 :—

1.—Three men of the 2-60th Regiment were patients in the General Hospital at Calcutta in the upper ward. The first was admitted on the 20th March, suffering from simple hæmorrhoids; the second had been in hospital for two months, suffering from indolent bubo; and the third was admitted on the 8th April on account of dysentery. These three men were attacked and died, the first on 27th March, the second on 30th March, and the third on 16th April. There was no cholera in Fort William at the time, nor was there any other admission in the Regiment before December.

2.—The 2nd Native Infantry, stationed at Alipore, a mile in the rear of the General Hospital, had ten cases of cholera, of which five were fatal, between the 31st March and 10th April.

* In making this broad statement, it is right that I should qualify it with reference to my observations regarding the cholera of the spring of 1845, which I have described as passing over Agra in March and April, and as having had its full provincial distribution during the spring reproduction.

3.—The Chinsurah Depôt (European) was attacked on the 7th April, and the last case occurred on the 16th; four men were lost in this outbreak.

4.—The following is from the report of the jail at Burdwan for 1868: "A slight epidemic of cholera attacked the prisoners in April. On the 15th, five women were taken ill; on the 16th, another woman; and on the 17th, three more. None of the cases, however, proved fatal." In the same days, the general population around the jail were suffering.

5.—In the Rajshahye jail two great outbreaks occurred in the spring of 1868. The first commenced on 29th March and terminated on the 17th April; the second, which commenced after a clear interval of nine days, was included between the 26th April and 13th May. Mr. French is inclined to believe that the infection of his jail occurred through pilgrims, because the appearance of cholera in the jail and district was coincident with the infection of pilgrims; and yet he recognises the difficulties of the case. He writes:*—"I have not the slightest doubt but that the cholera brought by the pilgrims from Nattore, either through the air, or in some way or other, infected the jail. There was, however, no communication at all between the pilgrims and the prisoners, and I have shown that the cholera appeared on the same day among the prisoners in two distinct and separate parts of the jail, namely, in the quarantine ward and in the main jail. These men had no communication whatever with any one outside the jail walls." The question of the poisoning of a tank in proximity to the jail by cholera-infected pilgrims, is brought forward as affording a possible clue to the infection of the prisoners; but from the dates, taken in connection with the four instances quoted, this seems to have been an infection from one common source of the district population, pilgrims, and prisoners.

About the 20th of May, a second wave appears to have passed over a large portion of Lower Bengal. With this Chinsurah and Berhampore became affected on the 20th and 22nd, and in the Backergunge jail an outbreak commenced on the 18th. A third outbreak occurred in the Chinsurah Depôt between the 20th and 22nd June in which five men died; and the Berhampore detachment was attacked a second time on 25th July.

Such indications show the wide spread of cholera truly epidemic in this situation. On the higher lying districts bounding the endemic basin, epidemic cholera appears to have been very persistent. For example, in the report for Beerbhoom we read:—"Epidemic cholera of a malignant character prevailed in many parts of the district throughout the greater part of the year." The report for Hazareebaugh states that cholera prevailed from April to August.

Cholera of the spring of 1868, on the margins of the endemic basin.

I have on many occasions alluded to the significance of a cholera epidemic on the plateau of Hazareebaugh; and if we are to reckon this cholera of 1868 a true epidemic emanation immediately added on to the cholera epidemic within the endemic basin, I fear that we have no right to disregard the warning which similar emanations have given of epidemic advance beyond the boundaries of the endemic province.

In previous chapters of this report, written in 1868, I have mentioned, that it was my impression that the cholera re-occupying the southern epidemic highway (the exempted area of 1867), between March and December, was but a portion of the materies of the invading epidemic of 1866 repressed from invasion during 1867, and entering the Central Provinces with the favouring spring influences of 1868. Further reflection, and the most recent experience of the cholera of 1869, inclines me now to view the occurrence in a different light, and to regard the cholera of the Central Provinces repressed out of Upper India by the meteorology of 1868, as the body of a new epidemic commencing its career over the epidemic area.

Invading cholera of the Epidemic Area, and its probable alliances. Cholera of Chota Nagpore of 1868.

Throughout the Behar Provinces and the valley of the Ganges, and beyond, over Northern India generally, in 1868, the characteristics of a non-epidemic year were universally displayed; and hence probably it was that Bundlecund and the districts intervening gave no great manifestation of cholera in response to the appearance in the east, and that the southern epidemic highway was selected by the invading cholera of the year in preference to the northern.

We recall the invasion from the east of the epidemic of 1863, and the gate by which we traced it entering to become the great cholera of the Central Provinces of 1864 and 1865. It was the circle of jails of the north-east of the Central Provinces that afforded the indication of entrance—Mundla, Jubbulpore, and Seonee. The infection of these same districts early in 1868, added to the indications of the bursting forth of cholera from within the endemic area, leads me to believe, that in the phenomena we cannot but recognise the succession of a new invasion to that of 1863, and one not due to any portion of the cholera of 1866 and 1867. And in addition, we find the connecting link joining on the cholera of Jubbulpore and Mundla with that of Hazareebaugh and Beerbhoom, in the great cholera of Chota Nagpore of 1868, regarding which I hope to append a few details in a postscript to this chapter.

The line of repression and of extinction in the north is very beautifully defined in the mortality record of the general population. I append the table showing the mortality from cholera in the North-Western Provinces, which I have arranged geographically.

* Report published in the *Calcutta Gazette* of 1868, page 748.

Cholera Deaths of the North-Western Provinces, 1868.

(Estimated population, 29,588,653).

Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total for the year.
Ghazeepore	51	33	123	166	145	383	245	378	327	241	87	36	2,215
Benares	20	30	169	171	228	444	140	78	70	33	35	15	1,433
Mirzapore	27	17	601	342	675	434	123	19	29	4	16	3	2,290
Azimghur	48	27	23	55	188	102	258	248	264	219	46	76	1,554
Jounpore	5	7	41	169	195	111	120	336	77	35	6	2	1,104
Goruckpore	102	12	8	370	463	675	1,040	869	331	96	29	...	3,995
Bustee	73	16	27	29	129	87	125	68	9	1	...	...	564
Allahabad	24	7	12	56	119	55	204	58	28	9	14	36	622
Futtehpore	40	3	4	2	9	20	4	1	2	...	1	2	88
Banda	1	3	2	2	...	...	...	...	...	...	...	...	8
Humeerpore	1	...	...	...	1	2	1	...	...	...	...	...	5
Jaloun	...	...	...	...	...	1	1	...	...	...	8	1	11
Jhansi	...	...	...	...	...	...	...	...	...	...	...	...	...
Lullutpore	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore	...	1	11	5	4	9	10	6	5	8	4	4	67
Futtehpore	7	11	13	6	23	8	7	13	11	...	2	1	102
Etah	3	4	4	8	4	4	8	3	6	5	7	5	61
Mynpoorie	3	8	4	16	2	21	9	2	5	5	3	2	80
Etawah	1	...	4	...	2	1	3	...	1	...	...	...	12
Allyghur	9	14	5	8	6	4	11	11	16	12	7	3	106
Bolundshuhur	3	4	2	12	12	9	*	22	23	8	1	6	102*
Muttra	4	3	6	10	13	14	50	10	5	6	4	3	128
Agra	1	8	5	10	12	12	6	8	5	7	4	...	78
Meerut	8	8	9	12	13	40	33	18	153	7	8	9	318
Moradabad	13	12	10	10	20	20	7	5	10	12	8	10	137
Budaon	1	12	12	8	9	10	11	13	11	8	13	3	104
Bareilly	28	18	46	88	62	41	28	56	27	88	40	9	531
Shahjehanpore	5	8	...	1	1	2	5	5	6	8	2	.	43
Terai Pergunnahs ...	...	...	1	2	...	...	...	...	...	...	...	...	3
Kumaon	.	...	...	...	...	...	2	...	...	...	...	...	2
Ghurwal	11	6	...	2	1	...	...	...	...	...	...	...	20
Bijnour	1	1	2	2	.	8	4	5	3	3	5	4	38
Seharunpore	5	16	9	24	21	11	16	8	4	9	3	12	138
Mozuffernuggur ...	21	11	49	7	22	36	34	17	10	4	8	9	228
Dehra	...	...	...	...	2	1	2	...	...	...	...	...	5
North-Western Provinces	516	290	1,202	1,593	2,381	2,565	2,507	2,260	1,438	828	361	251	16,192

We have not yet a tabulated record for the Gangetic Districts extending over a period sufficient to show the normal average number of deaths in relation to comparative exemption, to the meteorology of any year, and to the age of epidemics, which would enable us to estimate whether or not the numbers shown in the above table indicate a prevalence of cholera much above what is normal for these and localities of a similar character; nor can we say with certainty from merely looking at the table, that the indication is here afforded of the invasion of a new epidemic. Allahabad and the seven districts lying to the east clearly form an area which is cut off from that lying to the west by the disparity of the ratio of prevalence; this area stands associated with the cholera of the east.

It is evident that as soon as we pass to the westward a tract of minimum is reached, which is continuous geographically with a great tract of absolute exemption lying south of the Jumna. The districts noted in the margin form the western division of the eastern province of the epidemic area, and constitute the tract in which influences immediately from the east die out. If the cholera of Allahabad and the east was an invading cholera, then it is evident that the western boundary of the eastern province, which normally is very nearly the line of 80°, was pushed much to the east in consequence of the predominance of western influences and the absence of influences which the monsoon would have brought with it had it reached so far. The cholera area of 1868 in this situation plainly represents the natural province in the east, whether we regard it as formed by local or invading agencies, or by both.

General Population.

Cholera deaths of the year.

Districts.	Deaths.	Districts.	Deaths.
Futtehpore ...	88	Jaloun ...	11
Cawnpore	67	Jhansi ...	None.
Futtehghur ...	102	Lullutpore...	None.
Shahjehanpore ...	43	Humeerpore ...	5
Etah	61	Banda	8
Etawah	12		

With the exception of the districts of Bareilly, Meerut, and Mozuffernuggur, which gave, respectively, 531, 318, and 228 deaths from cholera, the indications of prevalence afforded by the statistics of the general population are trifling, and they show how little the cholera so diffusely spread in 1866 and 1867 continued to affect the northern provinces.

* There is an evident error in the return from Bolundshuhur of July.

The cholera which passed the frontier and affected Cabul and Persia in 1867 still survived in the Caspian Provinces of Persia. On the 25th August 1868, the Medical Officer reports to Her Majesty's Minister at Teheran that cholera had reappeared. He writes:—"After the cessation of the epidemic in this neighbourhood last autumn, it seems to have moved on towards the Caspian Provinces, where it continued during the winter months, assuming a milder or rather the sporadic form.

"In the spring it gradually spread over the towns and villages on the road to Khorasan, and according to the latest accounts received from Meshed, the epidemic broke out in that town last month with great virulence."

He dates the arrival of cholera in Teheran from the 7th August, and considers its appearance to be consequent on the arrival of a caravan of pilgrims from Meshed, which reached Teheran on the 5th of the same month. As in Upper India, this cholera died in the end of September. After the 1st October only thirteen deaths were attributed to cholera. Between the 7th August and 11th October, 468 deaths were caused by this cholera in Teheran.

The dying away of the cholera of the North-West in the course of the dying monsoon is beautifully shown in the preceding table and in that which follows, which gives the cholera deaths of the Punjab for 1868, geographically arranged. Except in the districts lying along the base of the hills, the indications of prevalence are the most trifling, and the tract beyond primary monsoon influences is exhibited as an area of utter exemption. The Agra District gave but seventy-eight deaths in 1868, and the Muttra District 128; and immediately on entering the Punjab from the south-east, the numbers diminish in a still more wonderful degree. This table affords an illustration of what is meant in speaking of the minimum reached in Upper India; and I believe that in many years the deaths fall even much below what is now represented:—

CHOLERA DEATHS OF THE PUNJAB, 1868.

(Estimated population, 17,586,232).

DISTRICTS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Goorgaon	2	...	...	4	7	5	1	...	1	2	...	1
Delhi	...	1	1	...	2	1	3	1	...	*	2	...
Rhotuk	...	...	...	1	...	1	...	...	...	...	1	...
Hissar	1	...	...	...	...	...	...	2	1	...	...	...
Sirsa	...	...	1	1	1	...	1	1	...	...	...	...
Kurnaul	2	3	3	2	...	3	2	6	5	1	...	1
Umballa	6	1	5	4	7	5	3	1	...	3	...	...
Simla	...	...	...	...	...	...	...	...	...	1	...	...
Jullundur	5	...	1	...	1	3	1	...	...	...	1	2
Loodianah	...	2	...	1	...	2	...	...	...	...	...	...
Hoshiarpore	5	1	1	...	6	2	1	...	1	...	...	...
Kangra	3	6	1	2	3	5	5	3	14	65	8	4
Goordaspore	8	4	4	3	...	...	...	...	...	...	...	...
Sealcote	1	...	4		...	2	1	2	2	..	..	...
Umritsur	5	3	1	8	28	14	12	11	6	3	4	...
Goojrat	2	...	3	4	3	5	1	5	2	5	2	5
Goojranwalla	3	1	1	1	3	4	5	5	1	...	1	...
Lahore	...	...	...	1	2	1	1	...	1	4	1	...
Ferozepore	...	...	2	2	1	2	1	1	2	...	1	1
Montgomery	...	...	...	...	1	...	1	...	...	1	...	...
Mooltan	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferghur	...	...	...	...	...	...	...	...	1	...	...	...
Dera Ghazee Khan	...	...	...	...	...	...	...	...	...	...	...	...
Dera Ismael Khan	...	...	...	...	...	...	...	...	...	...	...	...
Jhung	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore	2	1	...	...	...	2	...	...	...	...	...	...
Jhelum	...	...	...	9	1	1	2	...	...	...	1	...
Huzara	...	1	1	...	2	2	...	3	..	...	1	...
Rawul Pindee	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur	3	2	2	1	3	3	2	...	...	...	1	2
Kohat	...	...	...	...	...	1	...	...	...	...	...	...
Bunnoo	...	...	...	...	...	...	...	...	...	...	...	1
Cholera deaths of the Punjab	48	26	31	44	71	64	43	41	37	85	24	17

I am not of opinion that this minimum was due solely to the natural decay of the invading cholera of 1866 and 1867, although the fact that the cholera of 1867 was diffusely spread far beyond the frontier might have caused the inference to be made, that revitalisation in epidemic vigour was scarcely to be expected, since there was not, as in the invasions of the Punjab of 1856 and 1861, a boundary line behind which cholera was precipitated and survived because of its precipitation. It is certain that the meteorology of the year in this situation had much

* No return.

to do with the repression of manifestation, and determined a ratio of prevalence very much smaller than would have resulted with a normal or excessive rain-fall.

The following table shows the meteorology with which the northern cholera was associated in 1868. Except in the stations which enjoy a higher rain-fall in consequence of their proximity to the hills, the minimum was universal :—

Rain-fall in inches of the Punjab, 1868, *a non-epidemic year.*

Districts.	Spring rains, 1st April to 14th June.	Monsoon rains, 15th June to 4th October.
Goorgaon	1·5	7·6
Delhi	1·5	17·4 *
Kurnaul	1·3	6·6
Rhotuk	·9	5·6
Hissar	·7	4·5
Sirsa	2·4	4·2
Ferozepore	2·1	9·9
Montgomery	·3	3·0
Mooltan	3·0	1·5
Mozufferghur	·7	·1
Dera Ghazee Khan	1·4	1·3
Dera Ismael Khan	3·1	1·7
Jhung	1·9	6·0
Shahpore	2·9	1·0
Umballa	9·1	6·8
Jullundur	1·4	9·8
Loodianah	1·3	12·6
Hoshiarpore	1·5	17·2
Kangra	6·6	26·6
Goordaspore	5·3	28·5
Sealcote	6·8	28·4
Umritsur	4·3	9·0
Lahore	3·5	5·7
Goojranwallah	3·4	15·1
Goojrat	6·2	16·6
Jhelum	1·9	11·0
Rawul Pindee	5·5	12·7
Abbottabad	9·1	12·9
Peshawur	4·0	1·5
Kohat	4·2	3·0
Bunnoo	5·4	3·5
Dhurmsalla	17·0	65·4
Simla	19·2	37·4
Dalhousie	11·3	31·2

In continuation of tables at pages 69 and 70, I note here the statistics of the province for 1868, to show the consistency of these with the figures of former years of a similar character. The maximum of sickness was attained not in the malarious months, reaching its culminating point in October and November, but in the hot months preceding the usual date of the setting in of the rains; there is no rise of the sick-rate in the autumn months, in which malarious influences normally prevail, and from September, there is a steady decline to the minimum of December.

European Army of the Punjab, 1868. *Average Strength*, 12,576.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Fever Admissions	364	192	250	367	934	1,357	723	795	763	693	694	605
Daily sick-rate per cent. of strength	4·19	4·04	3·95	3·93	4·52	5·51	5·10	5·11	5·16	4·85	4·20	3·72

The death-rate for the European Army was 15·50 per 1,000; but of this rate 5·50 was due to heat apoplexy and heat fevers, which, in a year constituted like 1868, I have shown to contribute in excess of the normal mean.

The three stations which I employed as indices, and of which I gave the death rates for 1859, 1860, and 1866, gave in 1868 a ratio entirely consistent with the rates of these years. (See page 70).

* 14·1 inches of this total fell between 21st and 25th July; 4 inches only fell after this date.

European Troops, 1868. *Died per* 1,000 *of Strength.*

Ferozepore. Strength 817		Mooltan. Strength 774		Peshawur. Strength 1,676	
All causes	9·79	All causes	14·21	All causes ...	14·32
Heat apoplexy ...	2·45	Heat apoplexy ...	5·17	Heat apoplexy ...	1·20
Deducting heat apoplexy	7·34	Deducting heat apoplexy	9·04	Deducting heat apoplexy	13·12

Her Majesty's 92nd Regiment.				
Age	15	Died	...	1
,,	18	,,	...	1
,,	19	,,	...	2
,,	20	,,	...	2
,,	21	,,	...	2
,,	23	,,	...	1
,,	24	,,	...	1
,,	25	,,	...	1

The characteristic which I noticed, as distinguishing the heat fevers of a non-epidemic year among unacclimatised British soldiers, was exhibited in the case of every Regiment in its first year in India, and many of the young lads succumbed to this typhoid fever, which, as usual, was in every case attended with the affection of Peyer's glands. The 92nd Regiment lost eleven young men, whose ages are noted in the margin, and the 85th and 1-6th Regiments also suffered from the same fever.*

The death-rate for the jail population sank to a minimum never yet attained in our experience—12·39 per 1,000, the equivalent of 137 deaths out of an average daily strength of 11,056 prisoners. No death from cholera occurred in the Punjab among troops or prisoners.

Over the northern epidemic highway also, a tract which gets its rain and its cholera in common with the north-western extension as far as the desert, monsoon influences utterly failed in 1868. On the 10th September, the Editor of the *Delhi Gazette* writes as follows regarding the state of Rajpootana:—

"Advices from Rajpootana, especially towards the south of that district, give melancholy accounts of the condition of the country from want of rain. While the northern parts of Guzerat have been flooded and devastated by a hurricane, a few miles further north the face of nature is brown and withered, as in the hot weather. The downpour of rain appears to have extended as far north as the military cantonment of Deesa, while further up the country all effects of the monsoon gradually disappear, until in Marwar, British Mhairwarrah, and Ajmere, there is scarcely the trace of a passing shower. In the first locality mentioned, houses and even villages have been washed away, crops destroyed, and men and cattle drowned. In the latter districts crops are dead, cattle are dying, and the inhabitants leaving their homes in search of water. In Marwar, on the verge of the desert, the rain-fall is generally very scanty, and a slight diminution of the usual amount is sufficient to create dire distress. In some parts of this unhappy country, it is stated that not one drop has yet fallen. The magicians have conjured, the rain-makers have been sent for far and wide, and offerings have covered the numerous shrines. These and many other contrivances have been resorted to, but the time has passed on, and the rain so ardently desired has not fallen. As yet perhaps some few of the crops might be partly saved by a timely downfall; but a longer period elapsing without rain, nothing can save the country north of Deesa, almost up to Agra, from famine."

In accordance with all that has been written regarding the circumstances attending the occupation of the northern highway, it is certain that, even had the material of an epidemic offered itself at the gate of entrance to this tract, it must, for want of a vehicle, have located itself, waiting for the opportunity of epidemic advance denied to it by the meteorology of 1868.

I have, in various epidemics, taken Ajmere as the index station, in estimating the fact of the occupation of the northern highway. The indication of a cholera in this situation is not one likely to mislead. And as I write (April 1869), the fact of the appearance of cholera has been reported.

A correspondent of the *Delhi Gazette*, writing from Nusseerabad on the 12th April, says:—"I have just heard that cholera of a virulent type broke out in Ajmere on Wednesday last, when four cases occurred with three deaths. On Friday there were six deaths, all natives. I have no later information about the spread of the disease. No Europeans had been attacked, but yesterday morning the Company of the Royals, stationed in the fort, was marched out and quartered in the residency bungalow at some distance from the town."

The occurrence of cholera in Ajmere might be considered by some only as caused by a northern extension of the cholera of Malwa of November and December; but I attach to it a significance beyond this. I think it not improbable that an offshoot of southern or south-eastern cholera was directed into this route in December, which is now becoming manifest. I have noticed the occurrence in December 1855, of a single fatal case in the Jhansi Jail as the outrunner of the epidemic of 1856; and exactly a parallel case occurred in the 103rd Regiment at Morar on the 27th December last. To this I called special attention at the time, as possibly giving forewarning of a cholera in motion; and I was struck by its occurrence all the more forcibly from finding at this most unusual season, a fatal case in the 5th Lancers at Lucknow, which occurred on the very same day. I looked at the latter case also in connection with the attack of the 4th Native Infantry at Allahabad in the end of

* The 85th Regiment lost eleven young men, and nine of the recruits for Bengal Regiments left for the hot season at the Kurrachee Depôt died from the same fever.

November and in the first days of December. A glance at the table for European Troops shows a wide-spread choleraic influence, of no strength, occurring in the month of August.* The present aspect of the cholera of our Presidency leads us back to enquire, whether or not this cholera of August 1868, like the monsoon cholera of 1865, epidemic over the same area and geographically added on to the cholera of the Central Provinces, was the aura of the same cholera which was universally epidemic to the south at the time; and whether the cholera of Agra, Morar, and Meerut, which occurred in all of these stations in the seven days between the 14th and 21st August, was not one and the same cholera of which Saugor affords us the index. The first case proved fatal at Saugor on the 21st August; the Meerut case became affected on the 20th; and the case at Morar during the week ending 21st August. We know that the case at Saugor was truly and unmistakably a portion of the invading wave in the south; and taking our parallel from the cholera of 1865, we shall not, I think, be wrong in regarding the cases occurring simultaneously further to the north as a part of the same moving cholera.

That this cholera of the south was again in motion in the last three months of the year, the invasion of Bombay and the occupation of Khandeish and Malwa distinctly points out; and the meteorology accompanying this movement determined over the area in these months a special manifestation of disease in the form of fever and dysentery.

In connexion with the case which occurred at Gwalior on the 27th December, and the possibility of its being an index of a moving cholera and of invasion, the following case, although standing apparently isolated, has for us a special interest. The Medical Officer of Bhopal, dating from Sehore on 7th January 1869, mentions, that, on the 20th December, a single case of true cholera had occurred in the city, which he had seen, and from which the boy had recovered. It is on the 20th April that revitalisation of such a cholera is to be looked for in the western area; and, as I write, a telegram from the General Commanding at Morar, dated the 20th April, announces that three cases have occurred between the 3rd and 19th, and that an outbreak is anticipated.

It is to be hoped that these warnings may be the prelude in the western division only to the invasion of a cholera of the strength of that of 1865; which, however, we must not forget, was a body of enormous power in every district south of the Jumna (see p. 45); and while the character of the cholera of 1868, as shown on the southern highway, would not indicate great epidemic strength, we must not overlook the unfavourable meteorology with which it occurred, the well known character of the tract occupied, and the possibility of reinforcement from behind.

I have shown how, in various epidemics occurring in the fifty years that are past, seasons exactly characterised in Northern India like that of 1868, afforded, in the Central Provinces, the opportunity for cholera of passing from sea to sea; and I have shown this to be the case even when the seasons in the Central Provinces were described as hot and deficient in rain-fall. The explanation which I have given is, that in the Central Provinces there is no such condition of dryness as prevails during the blowing of the hot winds over Northern India; that dryness is a comparative term, and that in this geographical situation, dryness means what it means in the endemic province—the normal climatology which exists between March and June, with which the cholera miasm flourishes in its greatest vigour. And I have remarked, that the vehicle for the westward extension of cholera on this southern highway is more readily available in such seasons, since the normal monsoon from the western coast is in abeyance, and since, therefore, eastern influences are predominant.

The meteorology of this non-epidemic year in the south, and the results in regard to disease, are well stated in the following extract from the medical history of the 12th Native Infantry for 1868. Mr. Caird writes:—"The experience of 1868 would give a very favourable idea of the climate of Jubbulpore; for the prolonged hot season before the rains, which were a month later than usual, was by no means beyond endurance, and the nights especially were not stifling as in many parts of India. The climate presented a marked contrast to the fierce heat of the North-West Provinces at the same time of the year. A fall of rain lasting for a month was followed by dry weather again, which has continued uninterruptedly till the present. This has been a season of health as well as of comfort, rarely experienced in the most favoured parts of India. Instead of a deluge of rain in August and September, only the first part of the former month had any rain-fall, and in the latter the heat was very bearable; and in the commencement of October the weather became perceptibly cooler, and in the middle of the month the cold season had set in. There being no swamps to dry up and no fierce heat in the day, the autumn was devoid of the usual malarious diseases, and there was scarcely more fever than is usual in May and June."

The limiting line of the monsoon and of the cholera of 1868, was not like the line of 1860, visibly found as far to the north-west as Agra, although it may have been indicated in shadow. As I have shown, there was no cholera south of the Jumna, and no cholera in Jhansi or Lullutpore. But this was the northern limit; for as soon as we pass south of this line the tract invaded during 1868 is entered, the same tract which was the exempted area of 1867.

The history of the invasion has been very clearly traced; and from the time of its entrance in the extreme north-east in April, until the occupation of Malwa in December

* No case out of the four which occurred at Morar, Agra, and Meerut, was fatal.

there is no difficulty in recognising that it is an invading cholera of which the career is being followed out.

As is shown in the Jail Table for 1863, it is through the Mundla, Jubbulpore, and Seonee Districts that cholera is found entering the Central Provinces. The forewarning of this cholera had been given as early as March, and the first outbreak that attracted special notice began on the 15th April among a gang of coolies employed on the Nagpore road in the Seonee District, fifty-five miles from Jubbulpore. It was on the 15th May that cholera was reported to have entered Jubbulpore, and the European Regiment became affected on the 23rd of May. I have repeatedly called attention to invasion from the east as occurring in many epidemics in this week, especially into the Agra District, the gate by which the cholera threatening to invade the northern provinces, enters; it is therefore no coincidence that, in the same week, with the meteorology of 1868, this cholera should have appeared in the districts to the south and east.

The police reported the appearance of cholera in the Mundla District in the same week, and on the 1st of June the first inhabitant of the town was attacked. As is usual for this situation, the vitality of this invading cholera ended in August. The Civil Surgeon writes:—"No death from cholera has occurred in the district since the 17th September; in fact, the disease died out in August, and it was only the old cases that were dropping off that were reported in the Mortuary Returns for September."

We find the valley of the Nerbudda occupied in June, and in August cholera is reported to be prevailing in Khandeish, at the same time that its presence was noticed in the Saugor District above the Vindhya. This would seem to have been the limit reached with the monsoon; for it was not until October that the body of the epidemic reached Bombay, and it was subsequent to this date that Western Malwa was occupied. As I have shown above, it was not until the 20th of December that the first case of cholera, an index case, appeared in the Bhopal territory.

The table which follows shows the results of the invasion of the Central Provinces, and the dates at which this invasion began and terminated:—

Cholera Deaths of the Central Provinces, 1868.

Divisions.	Districts.	Number of deaths from Cholera in each Month.												Total Deaths of the Year.
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
Nagpore.	Nagpore	...	...	...	4	3	92	120	50	14	8	...	...	291
	Bhundara	...	...	...	...	...	...	55	86	1	...	...	...	142
	Wurdah	...	...	...	2	8	12	73	172	74	23	6	...	370
	Chanda	...	...	...	...	...	...	30	19	...	...	...	...	49
	Balaghat	...	...	...	...	7	21	27	46	5	4	...	1	111
Jubbul-pore.	Jubbulpore	7	7	1	2	148	671	1,520	542	41	13	...	...	2,952
	Dumoh	2	1	...	3	3	5	5	1	1	9	...	4	34
	Saugor	...	3	1	...	2	3	22	68	128	23	6	...	256
	Seonee	2	2	5	4	150	414	742	291	17	5	5	1	1,638
	Mundla	...	1	...	...	9	263	567	209	21	4	...	...	1,074
Nerbudda.	Nursingpore ...	2	...	...	...	...	78	250	175	63	2	3	...	573
	Baitool	1	3	...	...	...	...	...	14	...	...	...	1	19
	Chindwarra ...	...	...	1	1	...	...	5	45	1	...	2	...	55
	Hoshungabad ...	...	...	...	1	...	...	1	...	...	...	...	...	2
	Nimar	...	...	1	...	2	...	1	...	...	8	...	1	13
Chuttees-ghur.	Raipore	...	...	1	...	...	...	...	...	...	2	...	...	3
	Belaspore	...	1	...	2	1	1	...	...	...	...	...	...	5
	Sumbulpore ...	...	...	...	...	...	...	...	...	...	...	...	...	None.
	Upper Godavery ...	...	...	1	1	...	...	...	...	3	...	...	...	5
	The Central Provinces ...	14	18	11	20	333	1,560	3,418	1,718	369	101	22	8	7,592

This table shows very perfectly the minimum preceding invasion, and the minimum marking the dormancy of the invading cholera; the minimum preceding invasion is indicated by the occurrence of eleven deaths from cholera in the Central Provinces in March, and the minimum due to dormancy by the occurrence of eight deaths within the same immense area in December. The repression of the manifestation of the invading cholera until the weak monsoon influences of the year made themselves generally felt, is shown by the occurrence of 333 deaths in May, while in July, when the maximum of the year was reached, 3,418 cholera deaths were registered. Of the 333 deaths of May, 298 were returned from the Jubbulpore and Seonee Districts.

Next, the geography of this invading cholera of the Central Provinces demands attention. The central focus is evidently the circle first invaded, Jubbulpore, Seonee, and Mundla.* Added on to this tract on the west is Nursingpore. The five districts of the Nagpore Division, lying immediately to the south, give together 963 deaths. The cholera of Nagpore and the Nerbudda Valley tails off as shown on the margin, and even the Nimar District gives but thirteen deaths as the index of the invasion from which this district has suffered so heavily in the spring of 1869. In the westward extension, above the Vindhya, the Saugor and Dumoh Districts show only 290 deaths; and we have seen how, immediately to the west, the Medical Officer of Bhopal makes mention of but one case of cholera as have occurred during the year, and that in December at the time when it would appear that Nimar and Malwa were occupied.

Jubbulpore, Seonee and Mundla	...	5,664 Deaths.
Nursingpore	...	573 „
Nagpore Division	...	963 „
Chindwarra	...	55 „
Baitool	...	19 „
Upper Godavery	...	5 „
Hoshungabad	...	2 „
Nimar	...	13 „
Saugor and Dumoh	...	290 „
Chutteesghur Division		8 „
Central Provinces		7,592 Deaths.

The enormous tract lying immediately to the east of Jubbulpore and Nagpore, comprehending the districts of the Chutteesghur Division, was an exempted tract, since eight deaths only were registered throughout it in 1868. This is another instance showing how little effect importation has upon the epidemic spread of cholera. And yet when cholera does break out here, evidence of importation is always sought after. Thus, when in 1860 cholera appeared in Nagpore before the Raipore District was invaded, the theory was advanced that cholera had entered it from Nagpore. When Raipore and Sumbulpore are invaded before Nagpore and along with Pooree and Cuttack, the spread of cholera is attributed to pilgrims travelling westwards from Juggernauth.

While this cholera was stretching towards the west, it was moving also towards the south. On the 15th November the city of Hyderabad became affected, and in forwarding an account of the outbreak, Dr. Wyndowe, Residency Surgeon of Hyderabad, gives the following details of the progress of this cholera from the north. Here also the invasion was recognised as a fresh one, since the last outbreak of cholera known to have occurred in Hyderabad was in 1865, from the 22nd February to the 7th July.

Dr. Wyndowe writes:—

"During the preceding months, *viz.*, August, September, and October, cholera prevailed in parts of Berar and the Nizam's dominions. Reports show that cholera prevailed in an epidemic form in Akote, Akolah, and Ellichpore on the 18th of August;† subsequently cases were reported at Oomraotee, Bassein, Mominabad, and Ballapore. In September, cholera still prevailed at Ellichpore and also at Jaulnah, but during this month it was reported to have ceased at the former place. At the commencement of October, epidemic cholera is reported to prevail at Chicklee, and at Hingolee, six miles from Mulkapore; on the 13th October, its prevalence in the Uron District was reported. On the 30th October, cholera is reported to have prevailed amongst a gang of work-people near Ballapore. On the 3rd and 4th November, six persons died of cholera in Mulkapore; on the 14th, four cases of cholera occurred in Secunderabad Bazaar, and on the 15th, the first two cases occurred at Hyderabad."

I have not the data which would enable me to judge of the conditions under which the cholera of the Central Provinces was spread, or was geographically repressed in 1868. That the history of epidemic advance is consistent with that of previous invasions in years of a similar constitution is obvious. We can recognise that certain of the advances occurred *per saltum*. The primary advance, and the advance in which Hyderabad on the south and Bombay in the south-west were invaded, after the setting in of the north-east monsoon, clearly indicate the leap of an air-borne cholera. In the absence of accurate data, we shall probably not be far wrong in conjecturing that it was the prevalence of monsoon influences from the south-west, even in diminished intensity, which repelled this cholera coming from the north-east from Hoshungabad, Baitool, and Nimar, and caused it scarcely to be shown in the northern districts of the Deccan, which were leaped over and probably sown with cholera towards the end of 1868. And, again, turning to the east, the fact that cholera did not progress into the Chutteesghur Division, should, consistently, be held to indicate the limitation of monsoon influences from the south-west, and the consequent predominance of influences from the east, from the Bay of Bengal, which, in such a year as 1868, take in this situation, the place of those having the Bombay Coast for their base.‡

The following short extracts from the Weekly District Returns show the dates of the appearance of the cholera of 1868 in the different districts, the fact of its general dormancy,

* Chota Nagpore suffered in common with these districts. The following extract from the Jail Report of Chyebassa for 1868 may possibly have reference to the aura of the epidemic which entered the Central Provinces in the spring of 1868, and may afford the connecting link between this and the cholera epidemic in the beginning of 1868 within the endemic area:—"In the month of January a sudden prevalence of diarrhœa, of a very mild type, occurred, and it was attributed to the use by the prisoners of a variety of arum. The further use of the vegetable was immediately stopped." In reading this sentence the diarrhœa of the Saugor District of the cold season of 1863, preceding the invasion of 1864, for which Dr. Rice could not account, is recalled.

† It was on the 14th August that cholera was reported to have made its appearance at Malligaum in Khandeish.

‡ Since this paragraph was written, I have had an opportunity of reading the Report of the Medical Officer of the Raipore District for 1868; his remarks confirm what I have here suggested as probable. He writes:—"The early cessation of the monsoon seems to have had a considerable influence for good on the health of the people. The wind blowing principally from the north-east, we have had none of the watery vapours generally brought up from the Western Coast during the autumn months. The atmosphere was, therefore, much drier than is usual at this time, and we had much less malarious influence at work than usual." (See page 72).

and its revitalisation in the spring of 1869. This general statement exhibits one phase, if not the only one, under which the southern epidemic highway is occupied :—

A.—THE INVASION.

April 18th, 1868.—SEONEE.—Cholera has made its appearance among coolies employed on the road near Guneshgunge.

May 16th.—JUBBULPORE.—Several cases of cholera have occurred on the Great Deccan Road beyond the Nerbudda.

May 30th.—NAGPORE.—Cholera is prevailing slightly in Tehseelee Ramtek.

May 30th.—MUNDLA.—Outbreak of cholera is reported toward Chokee Chittora on the Jubbulpore Road.

June 6th.—NAGPORE.—Cholera is prevailing slightly in Tehseelees Nagpore and Ramtek.

June 6th.—NURSINGPORE.—Cholera appeared on the 23rd May.

June 13th.—CHINDWARRA.—There have been some cases of cholera.

June 20th.—WURDAH.—Several cases of cholera reported on the road leading to Oomraotee.

June 27th.—WURDAH.—Cholera in three villages in the Arvee Tehseelee.

July 18th.—SAUGOR.—Four fatal cases of cholera in a village four miles from Saugor, and three cases in Saugor City. Rain has fallen in abundance.*

July 25th.—BAITOOL (ATNAIR).—Two or three deaths from cholera reported in this circle.

August 1st.—HOSHUNGABAD.—Some cases of cholera have occurred in the villages in the eastern part of the district.

August 1st.—WURDAH.—A few cases of cholera have appeared in the Hingunghat Circle. Cholera still continues to prevail in the Arvee Circle.

August 8th.—BAITOOL.—Cholera is reported on the Berar Frontier.

August 15th.—CHANDA.—Cholera has appeared in various pergunnahs.†

B.—THE DEATH OF THE REPRODUCTION.

October 10th.—NAGPORE.—Cholera has almost disappeared. CHANDA.—Cholera has disappeared. WURDAH.—No epidemic. JUBBULPORE.—No epidemic. SAUGOR.—In Saugor City, eight cases, three fatal. SEONEE.—No epidemic. MUNDLA.—No epidemic. CHINDWARRA.—No epidemic. NURSINGPORE.—No epidemic.

October 17th.—SAUGOR.—In one village, four cases of cholera, two fatal. In Saugor City, five cases of cholera, three fatal.

(No Cholera alluded to in any other District Report).

October 24th.—SAUGOR.—Three cases of cholera in the city, all fatal. In two villages six persons were attacked, of whom three died.

(No Cholera alluded to in any other District Report).

November 7th.—No mention of cholera in any district of the Central Provinces.

C.—THE REVITALISATION OF THE INVADING CHOLERA OF 1868.

January 2nd, 1869.—NIMAR.—Some cases of cholera have been reported.‡

January 30th.—HOSHUNGABAD.—A few cases of cholera reported in the vicinity of Hurda; but the outbreak has not assumed an epidemic character.

NIMAR.—Eighteen cases of cholera occurred in Khundwa during the week.

February 20th.—BAITOOL.—A few isolated cases of cholera have been reported.

February 27th.—SEONEE.—A few cases of cholera have appeared here and there on the Great Northern Road.

BAITOOL.—Cholera reported at Mooltye.

NIMAR.—Cholera is still prevalent in the district; 175 cases have been reported, of which eighty-nine were fatal.

March 13th.—BAITOOL.—Seventy-one cases of cholera reported up to date, of which thirty-eight have been fatal.

CHINDWARRA.—Cholera has shown itself to the north-west of the station.

March 20th.—NAGPORE.—Cholera slightly prevailing in Ramtek.

March 27th.—SEONEE.—Cholera prevalent, especially along the Northern Road.

BAITOOL.—Eighty-nine cases of cholera have occurred up to date, chiefly in the town of Mooltye.

NURSINGPORE.—There have been three or four cases of cholera along the railway line.

April 3rd.—JUBBULPORE.—Cholera has broken out in the district.

SAUGOR.—Six men reported to have died from cholera on the Saugor and Nursingpore Road.

* This rain-fall of Saugor was local and exceptional. The statement below given shows that the rain-fall of 1868 was very small throughout the Central Provinces, not amounting to one-third of the fall of an average year.

Rain-fall of the Central Provinces in inches, April to December 1868.

Nagpore.	Jubbulpore.	Dumoh.	Hoshungabad.	Baitool.	Bhopal.
18·00	24·08	21·00	26·60	15·88	25·00

† This invasion of the Chanda District, in the week ending the 15th August, probably occurred in the same leap in which the north of the Deccan and Khandeish were entered.

‡ In every week, up to April 3rd, the prevalence of epidemic cholera throughout Nimar is noted. When cholera, travelling on the epidemic highway, has reached so far to the west, it is entirely under western influences, and its behaviour is regulated according to these and to the physical aspect of this favourite resting place.

HOSHUNGABAD.—A few cases of cholera in Charwah Pergunnah.

NURSINGPORE.—Cholera has broken out along the line of railway.

I have in various places of this paper, indicated the date of revitalisation normal for Saugor. The reappearance of cholera has occurred in 1869, exactly at the date at which it was due. I append the latest accounts received from Saugor. A telegram, dated 16th May, announces, that two fatal cases of cholera occurred on the 15th and 16th in the 7th Fusiliers; and a second, dated the 19th, states that the Regiment is in camp, as eleven cases, of which six were fatal, have since become developed. Cholera is now, in the beginning of June, universal throughout the Central Provinces, from Raipore in the east to Deolee in the west.

It was after the cessation of the monsoon that Bombay was reached; and it was with the north-east monsoon that Madras, which was exempted along with the Central Provinces in 1867, was re-entered by invading cholera. Early in 1869, cholera was reported to be prevailing in the Madras Presidency along routes usually traversed by Regiments on the march, and the march of various Regiments was postponed in consequence. In the west, the same thing occurred, and the prevalence of cholera in Khandeish put a stop to the movement of troops towards Malwa from Bombay; even as early as November 1868, the 25th Bombay Native Infantry was attacked near Dhoolia. On the 30th of the same month, immediately after the 26th Bengal Native Infantry had begun to move eastward from Mehidpore and Augur, it met cholera on the road, showing that at this time Malwa was occupied; and the reappearance of this cholera has been shown within the past month (April 1869) by the affection of the Mhow cantonment. The city of Bombay, Poona, and other stations in the same locality, became affected in the second week of October, after the close of the monsoon. The following are the deaths from cholera registered in the city of Bombay from 1st January up to 17th December 1868:—

Cholera Deaths of Bombay, January to 17th December 1868.

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December, 1st to 17th.
1	.....	1	3	3	2	3	1	1	33	60	31

If the cholera thus distributed be the material of a new epidemic, and there are now unfortunately no reasonable grounds for doubting that such is the case, the probabilities in regard to its future career may be guessed from the abundant experience which has been afforded in the past of the behaviour of an invading epidemic occupying such a geographical area; and if the exempted tract south of the Jumna be re-occupied in 1869, we shall have evidence of the presence of a moving cholera which it will be well for us not to disregard, since the motion of cholera upon this tract has on every occasion been the forerunner of the invasion of Northern India.

POSTSCRIPT.

The cholera of Chota Nagpore of 1868, connecting on the cholera of the Central Provinces with the epidemic cholera of the endemic area.

Since this chapter was written, the documents relating to the cholera of Chota Nagpore of 1868 have been received from the Sanitary Commissioner for Bengal. I shall, therefore, note here the general facts contained in the reports of the District Officers. The Assistant Commissioner of Palamow remarks, that there is the greatest difficulty in getting correct information regarding the state of the villages affected, since as soon as the first man is attacked, the whole of the villagers, police included, disappear into the jungle.

It was the general prevalence of cholera during the monsoon season that chiefly attracted notice in Chota Nagpore; that primary invasion occurred earlier in the year we know from the observation of the Civil Surgeon of Hazareebaugh, who states, that cholera had been prevalent in his district from April. The monsoon manifestation in the Hazareebaugh District was first seen at Eechaak on 17th June; and on the 23rd, the Assistant Commissioner of Palamow reports the existence of cholera in twenty-nine villages of his Division. His reports extend up to the 17th September, when the cholera seems to have ceased, and they contain the record of 570 deaths.

Proceeding to the east, the geographical continuity of this cholera with that of the Raneegunge District is at once evident. The Assistant Magistrate of Raneegunge informs the Government of Bengal that cholera has been flying about his Sub-Division ever since the beginning of 1868; and writing on 22nd June, reporting the aggravation of cholera, the Civil Surgeon notices its presence in the district for the three months previous to the date of his letter. He writes:—"I have to report the occurrence, during the past week, of an outbreak of cholera in the station, or rather of a sudden exacerbation of that disease which has lingered here in a sporadic form since the beginning of March last."

His report is continued as follows:—"On the 7th instant, nearly seven inches of rain fell, and the rain continued subsequently to fall daily till the 18th, the total fall for the thirteen days

being 19·42 inches. The rain seemed at first to have caused the disease to abate and almost to disappear, but on the 12th an European Station Master was seized with cholera at Undal, six miles from Raneegunge, and died the same night. Several cases occurred on the same day (the 12th) in the Raneegunge Bazaar, and it spread on the 13th, 14th, and 15th, till on the last date there were no less than ten deaths. It spread at the same time at the Bengal Coal Company's mines. There was one death on the 16th, but from that date till to-day (22nd) there have been only seven seizures and two deaths in the station." The outbreak at Raneegunge appears to have been a typical outbreak according to the standard which I have laid down in the second section of this report.

Midway between Raneegunge and Chota Nagpore lies Purulea (Maunbhoom). The Civil Surgeon of Raneegunge mentions that in April and May cholera was very fatal in the villages of his Sub-Division bordering on Maunbhoom. On the 10th June, the reappearance of cholera at Purulea occurred; and from that date until the 11th July, eighty persons had been treated in the Charitable Dispensary alone.

I regard the cholera of Seonee of the 18th April and the Jubbulpore cholera of May 16th to be the same with this Maunbhoom cholera of the same months; and there is no difficulty in recognising that the monsoon cholera of the Central Provinces of June, July, and August was the same with that of Chota Nagpore and the margins of the endemic basin (See Table, page 153).

The cholera history of 1868 teaches us clearly what we have not been taught hitherto with sufficient precision, namely, the method in which the southern epidemic belt is crossed from sea to sea, and the time occupied in the journey. It teaches that in the year of its breaking forth, cholera may have extended indefinitely to the west in India, and without the affection of our Northern Provinces having taken place at all. This history of 1868 recalls the history of the invading cholera of 1830 and 1854, epidemics which reached Europe along the southern highway, and which, probably on this very account, were almost entirely diverted from Upper India. The great cholera now in progress in the Central Provinces, and which is epidemic also over Guzerat, is the exact counterpart of the cholera of 1864 following the invasion of 1863; and we shall wait to see whether or not it is destined at the close of this year or in the spring of 1870, to transgress the boundaries of Hindostan, and to make its appearance in Arabia or Syria, or in Eastern Africa. The occupation of the northern highway has occurred in the spring of 1869; the forerunners have been thrown forward into Northern India as far as to Jullundur, Sealkote, Lahore, and Mooltan; and even those who know the phenomena of invasion only from personal and local experience, recognise that the invasion of the Northern Provinces is imminent.

SECTION II.

THE NATURAL HISTORY OF THE OUTBREAK. EPIDEMIC CHOLERA IN ITS RELATIONS TO COMMUNITIES.

SECTION II.

INTRODUCTORY.

THE RELATIONS IN WHICH THE NATURAL HISTORY OF THE OUTBREAK IS TO BE STUDIED.

THERE is no such thing as an outbreak which has not a place in a reproduction. To whatever cause any special outbreak may have been attributed, he who has studied the history of the epidemic will have no difficulty in saying, that the outbreak in question occupied a definite place in season and geography, occurring in connection with and subordinate to the reproduction or invasion of cholera of a certain provincial distribution. To the epidemic the human race must of necessity submit; the reproduction is equally inevitable in natural provinces which furnish the physical conditions suited to propagation; outbreaks are as inevitable as is the reproduction or the epidemic. I do not mean to say that every outbreak which occurs, appears of necessity, seeing that the causes which produce the local manifestation are often evident and removeable; but it is a fact, that after every reproduction providing cholera over a provincial area, affection of the included population is a certainty. Such cholera is the source of all primary outbreaks; secondary outbreaks owe their occurrence to the distribution of such cholera by human agency or by fomites. But it will be more satisfactory to place the latter class of cases under another head as dependencies of outbreaks, and to study them as a separate group, and to reckon all outbreaks not traceable to human infection as due directly to the effects of aerially transmitted cholera. It is as impossible to trace back in every case the outbreak to the effects of human intercourse as it is to assign to the same cause the appearance and decay of the reproduction or of the epidemic. Epidemic cholera is as truly earth-born and air-conveyed when we come to study its relation to a town or a barrack, as it is when we think of the reproduction as general over a province, or of the epidemic as affecting a continent. The reproduction I have stated to be a vital manifestation of cholera, and not a contingency depending for its occurrence on meteorological phenomena, however rigidly such influences may keep it in control; and I have shown that nothing can prolong the reproduction indefinitely after the date at which it is due to die. Hence it follows, that the outbreak has its limit in time also. Theoretically, an outbreak might be prolonged throughout the vital period of a reproduction. We know, however, that while such prolongation of cholera is often, in fact, constantly, true for districts, the period is generally abbreviated even in the case of cities; and the outbreak becomes, as the rule, circumscribed to a period of days when an individual section of the community is concerned.*

Leaving then out of the question the class of outbreaks which comes under the designation "Dependencies of Outbreaks," I shall speak of the outbreak in its different aspects as I conceive these to be manifested when unaffected by secondary causes, and when the cholera prevailing is purely of aerial origin. We must not forget that the same general laws applicable to the reproduction are applicable also to the outbreak. Hence, when we find the entire series of the outbreaks of a provincial area simultaneously controlled by one prevailing cause, we have to decide whether the significance of the phenomenon is vital or meteorological, keeping in mind that the general termination at a certain season means decay of vitality, and that the general commencement of a reproduced cholera within an invaded area, also implies true revitalisation. The provincial reproduction of which I have spoken as a something entire, is a structure built up of the outbreaks of a natural area, and it is wonderful how often, throughout the constituent outbreaks, we can recognise, in the course of the life period of the reproduction, the general obedience paid to the controlling agency, and the parallelism over the area of phenomena caused by the existence of the universally present miasm. The outbreak must be studied as a portion of the reproduction, and, in fact, we shall find this study to be essential, when, after having determined what is the type of the outbreak, we seek to account for the many aberrations from the type.

But it is not alone as a portion of the reproduction that the outbreak is to be considered. The method and course of the infection of communities and the results which follow require to be studied; and here also we are called on to determine the normal duration of outbreaks, and the circumstances which tend to prolong or to cut short, to intensify or to diminish the virulence of the outbreak. From the systematic tabulation of a large series of outbreaks, we may in time be able to predict what sequence of events shall naturally follow subsequent to the infection of a body or community on a given date; and from the study of the facies of the outbreak a further insight into the natural history of the object cholera may be anticipated. If the meteorological and geographical aspects of the epidemic and the reproduction have

* From the very beginning of this section, it is necessary to keep before the mind the two-fold aspect of the outbreak: first, the aspect due to the simple fact of the affection of a certain body, such as the prisoners of a jail or the men of a Regiment struck upon a known day; and second, the aspect shown in relation to the population of a province. Under the first, the persistence is for a period of days, but it is capable of being prolonged, and in many cases is actually prolonged, up to the limit in time of the reproduction; under the second, the general disappearance throughout the natural area occurs only with the devitalisation of the cholera miasm on the close of the period of the reproduction.

taught us the part which cholera plays over provinces and in relation to season, the aspect of cholera when viewed locally and as localised by special conditions, and studied in the method of its infection of and decay in communities, should teach us what to expect, and what to avoid, and how the cholera of the outbreak is to be met.

The subjects to be treated of in this section, I shall consider in the following order :—

CHAPTER I.—The phenomena common to all outbreaks over a provincial area.

CHAPTER II.—Methods and course of infection, the duration of outbreaks, and the circumstances which tend to prolong or to cut short the outbreak.

CHAPTER III.—The circumstances which intensify or diminish the ratio of attacks during the outbreak. The direction in which the study of the natural history of the epidemic and the outbreak points in trying to determine the principles on which the outbreak should be met.

CHAPTER IV.—Dependencies of outbreaks. How far the natural and primary aspect of the epidemic, the reproduction, and the outbreak is affected by the secondary manifestations of cholera.

CHAPTER I.

THE PHENOMENA COMMON TO ALL OUTBREAKS OVER A PROVINCIAL AREA.

THE commencement of every outbreak of the epidemic area occurs subsequent to the invasion of the epidemic or to the revitalisation of the reproduction; outbreaks are at an end with the decay of the epidemic, and with the dormancy of the reproduction. Outbreaks which have been termed casual or sporadic have their true place in a system, as well as those occurring conspicuously in connexion with others.

These truths are readily acknowledged in a general way in this country, where the absolute subordination of the cholera of a province to the climatology of the months and to the phenomena of invasion, is manifested without variation year after year. When an epidemic has advanced with the monsoon, and when outbreak after outbreak has shown that a whole province is in a conflagration, every observer can state positively that this cholera came with the monsoon, and that no cholera already existed in a state of dormancy ready to awake when the climatic conditions were afforded; and he can readily prove by the geography of its advance, that the invading cholera did not advance along lines of communication. And yet, as a rule, no sooner have these admissions been made, than they seem to be forgotten, and we find the outbreak treated of as something distinct from the invasion, and as a thing secondary to human intercourse, which these same observers properly ignore as the originating cause of the invading cholera. This carelessness in expression must be carefully avoided in treating of the outbreak. In thinking of the miasm causing true malarious fever, no observer ever confuses in his mind the two things, the effect of the poison and the effect of human intercourse in spreading the fever. He accepts it as true that one generally prevailing cause, the presence of the miasm in an atmospheric medium, has sufficed to light up and to maintain for a certain time the specific fever over the provincial area. He does not say that this fever has radiated from a centre, or that it has travelled along highways of communication, for he knows that such is not the case. He tries to show that where local causes have been in operation to determine graver or minor degrees of prevalence there the general influence has affected the resident community with greater or less severity; in short, that the miasm has had a geography and a local prevalence which were not determined by the presence or absence of the human being. The very first and fundamental proposition in speaking of the cholera outbreak is, that the locality of its occurrence and its severity are determined by causes which have not necessarily any connection with human intercourse.

It is the powerful individuality of the cholera miasm which clearly cuts it off from all other miasmata, and denies to us the opportunity of ascribing the effects produced to any other cause than the presence of the cholera poison. From the observation of this powerful individuality has sprung the theory that cholera must be something over and above a malarious miasm, and that it is or may become a poison with alliances to typhus or smallpox; and the extreme view cuts it off altogether from the group of malarious poisons, and associates it entirely with poisons multiplied in the system, and passed on from man to man in virtue of being so multiplied.

It is from the events of the outbreak, to the neglect of the phenomena of the epidemic and of the reproduction, that the natural history of epidemic cholera has hitherto been studied; and hence has arisen the difficulty of equally apportioning the whole truth, which is, that epidemic cholera has secondary manifestations due to its individuality over and above those which it exhibits as an epidemic agent in subordination to the meteorological agencies which limit and control it. Baly has carefully discussed the different theories advanced, and his conclusion shows the difficulty he felt in determining how much was due to primary and how much to secondary causes. It is as follows:—"That theory alone is supported by a large amount of evidence which regards the cause of cholera as a matter increasing by some process in impure or damp air, and assumes that, although, of course, diffused with the air, it is also distributed and diffused by means of human intercourse. This theory explains much that would otherwise seem capricious in the course of cholera. It is not implied, however, that it is adopted to the exclusion of all others. For the possibility that cholera is occasionally communicated as a virus produced in and emanating from the sick has already been admitted; and other questions relative to the means by which the cause of the disease is disseminated and its introduction into this human body effected, have been left open for further inquiry."* It is impossible to get over these difficulties unless by drawing the distinction definitely between the truths which are primary and those which are secondary—the primary being those relating to cholera as earth-generated and air-conveyed, and affecting a population through infection of the atmosphere and soil; the secondary, those due to cholera considered as an individuality, as portable, as capable of attachment to and of multiplication in fomites, and, possibly, as capable of propagation in a community subsequent to increase in the *primæ viæ* of individuals who have been subjected to choleraic influence.

It is not a little remarkable that the nearer in our Presidency we approach to the endemic area, the less is the importance attached by observers to the secondary manifestations of cholera. The primary manifestations of cholera alone have been regarded by those who have had the widest opportunities of studying cholera as a disease in its endemic province. The most careful and skilled physicians have succeeded each other in the charge of

* Report of Royal College of Physicians, p. 224.

the great cholera hospitals of Calcutta for fifty years back, and not one of them has yet been able to make up his mind to the belief that cholera is a thing communicable to those around the suffering patients. The possibility that the establishment of quarantine might prevent the introduction of cholera into the jails of Lower Bengal is one which never was suggested, simply because of the universal belief in the primary truths regarding cholera, to the exclusion of all other considerations. The writers on the cholera of India before 1857 never dreamt of taking as their basis the view that the extension of epidemics was due to human intercourse. On the contrary, their facts went to show that cholera was not so diffused; and where individual cases of alleged transmission have been put upon record, it is evident that the recorder reasoned from the narrowest data, and did not comprehend the place which his facts actually did occupy in the history of the general epidemic. The reverse of all this has of late years been advanced as true, namely, that cholera is a disease and of all diseases the most subtilely contagious; that its growth takes place in the human system; that the sole method of its propagation is by the human race; that the cholera patient spreads cholera all around him; that the disease cholera has phases in which none of the usual symptoms are developed, and, as a sequence, that an individual who may never have suffered from cholera at all in a palpable shape may infect a whole community.

This diversity of opinion shows the want of fixed principles to guide our conceptions of the role of cholera, and inculcates the necessity for endeavouring to estimate at their true value the different causes which may give to the outbreak its origin and aspect.

Causes determining Special Aspects and Parallel Phenomena in the Outbreaks of a Provincial Area.

By trying to read the significance of the aspects of the outbreaks of a few epidemics we shall learn some general lessons as to the part which the outbreak plays in the reproduction; and invasion I shall reckon as a reproduction, since this is truly the value it holds in a system.

Occasional aspect of the outbreaks of a province due to compression.

I believe that the intensity of the outbreaks of defined portions of provinces is often due to the limitation or cutting short of an advancing epidemic. Hence we may find the phenomenon of great power exhibited over a very limited area, to be due, apparently, to the settlement within a limited space of a body of cholera sufficient to cover many times the extent of the area actually occupied. The cessation of the chief outbreaks manifested in connection with this great limited cholera is not with the end of the reproduction, but with the setting in of aerial agencies adapted to act as a vehicle, and which actually carry off the material and distribute it elsewhere, leaving the infected area comparatively free. The following case seems to illustrate this phase:—

Lessons to be deduced from the aspect of Outbreaks in the invading epidemic of 1856.

In 1856, the western division of the epidemic area began to be infected on 20th May, and the death of the cholera which invaded the area took place generally throughout the province in the third week of September. But in the Agra District, the district first invaded, the termination of outbreaks seems to have taken place as soon as the body of the cholera began to move to the west and north-west. Cholera was found after this date, as it will be found typically in every case after provincial distribution up to the end of the reproduction, but the outbreaks brought prominently to our notice died between the 7th and 9th July. In the jail the outbreak commenced in strength on 7th June, and terminated on 9th July; in the 3rd Europeans the commencement was on 10th June, and the termination on 9th July; and in the Artillery the commencement was on 23rd June, and the end of the outbreak on 7th July. In regard to this cholera of the Agra District, I have said that between the 20th May and the first week of July the vehicle required for epidemic advance was wanting; and I consider that from the 20th May to the first week of July, the whole body of the cholera which furnished the great epidemic of Meerut and the Punjab of July, August, and September, was lodged in the Agra District, and to the south and east of it.*

I believe it to be true from what I have noted, that when any circumstance checks epidemic advance short of the natural limits, the whole material is precipitated, and the result is enormous strength locally manifested, either at the time or in the revitalisation. On many occasions the natural limit of a province will act as an opposing barrier. If the propelling power from behind be strong and the resistance by the opposing influences be sufficient to prevent overstepping of the natural limits, compression and concentration is the result. Hence is occasioned the frequent severity of the cholera invading from the east, of the Cawnpore District, of Shahjehanpore, and of Western and Northern Oude; it is driven towards the natural barrier by eastern influences, and when it can get no further, it becomes localised in force along the line of the natural limit, and here it is often found much more severe than in the countries over which it has merely passed. So also is the case with the great invading western cholera. This seems to be the reason why Meean Meer has been so constantly and so dreadfully visited. It is the last station reached from the south-east by invading cholera; it lies, as it were, under the wall against which the advancing cholera strikes and terminates; it lies in the space within which compression and precipitation occurs, because the vehicle fails and further advance is prohibited on all occasions of invasion with the monsoon. I regard the Himalayas as a barrier so situated that the renewal of cholera in strength after invasion along the base is certain to take place at the proper season, independent of the physical

* A parallel case, showing the behaviour of the May cholera of 1867 west of the Jumna, is tabulated at page 145.

aspects of the country, which are also calculated to foster the miasm.* The natural barrier being formed by the famine tract in 1860 was the cause, as I imagine, of the extreme severity of the cholera of that year and of 1861; the cholera of 1860 which ought to have had the sweep of the entire province was concentrated into the area bounded by Jhansi, Morar, Agra, and Muttra, and was ready in renewed vigour for invasion with the monsoon of 1861. So with the cholera of May 1856. The entire body of cholera destined for the invasion of Meerut, Rohilcund, and the Punjab with the monsoon, was from the last week of May to the first week of July, packed into the small space within which the cholera of May and June was manifested, and this seems to have determined the duration of the individual outbreaks; they seem in fact to have lasted until the incubus of the cholera was removed by the advancing monsoon, and until the epidemic was thrown upon new tracts.

Outbreaks indicative of aerial progress. Method in which a natural area is occupied.

I have said that this was about the 7th or 9th of July; and as soon as this cholera ceased, Meerut and Rohilcund, hitherto free from cholera, were entered.

The invading epidemic struck the jail at Delhi on July 3rd, and disappeared on 7th August.

Cholera appeared in the jail at Bareilly on July 11th, and disappeared on 4th August.

Cholera appeared in the jail at Meerut on July 18th, and disappeared on 9th August.

Cholera appeared in the jail at Budaon on July 24th, and disappeared on 7th August.

Cholera appeared in the jail at Moradabad on July 31st, and disappeared on 10th Augt.

At the date at which the first burst of this invasion was ceasing in the east of the province, the extreme limit reached in 1856 was becoming affected. The cantonment of Meean Meer was struck on the evening of the 6th August. The Artillery became affected on 7th August; Her Majesty's 81st Regiment on 14th; the 26th Native Infantry on 16th August; the 8th Cavalry and 49th Native Infantry on 25th; and the 16th Native Infantry on 27th.

Her Majesty's 70th Regiment at Ferozepore had its first fatal case on the very same day as the Artillery at Meean Meer, the 7th August. During all this time the Jullundur Doab and the Umballa District remained unaffected by the invading epidemic.

This gives us an insight into what is meant by invasion or the occupation of a district by invading cholera. Invasion is clearly regulated, and there is nothing like caprice shown in the occupation of a province. Waves or stages there are or may be, as I shall show presently, but the phenomenon is that of a determinate purpose carried out until what is destined is accomplished.

In the area covered all outbreaks do not occur synchronously with the invasion. At any time from the date of invasion up to the date of the death of the reproduction outbreaks are to be expected within the occupied area; thus, while the jails of Meerut and Rohilcund generally were affected in the primary advance of July 1856, the jail of Mozuffernuggur was not affected before the 19th August.

Phenomenon of disappearance subsequent to invasion in a provincial area, as illustrated by the outbreaks of 1856.

The termination of the reproduction or invasion is, as I have often before said, truly a natural phenomenon. In the jail at Mozuffernuggur the last case occurred on the 14th September, almost simultaneously with the disappearance of the cholera of the Lahore Jail, which terminated on 16th September. Among the Native Troops of the Meerut Division the last case occurred on 19th September in Meerut, and on 8th September in Bareilly, although these stations were first struck early in July. In the 70th Regiment at Ferozepore the last cholera case occurred on 22nd September, in the Artillery on 17th September, and among the Native Troops on 18th September. The last case in Her Majesty's 81st Regiment at Meean Meer was on 23rd September; among Native Troops between the 14th and 21st (8th Cavalry, 21st; 16th Native Infantry, 14th; Police Battalion, 14th; 26th Native Infantry, 16th). This shows what is meant by the end of the reproduction. It is the date up to which outbreaks can occur in consequence of the presence of vitalized cholera over the area. A cholera thus decaying in September over the western epidemic area reappears with the spring rains of May, when these are present; and when they are not, with the monsoon rains of July and August in the year following.

Parallel in the outbreaks of the invasion of 1861.

The history of the same area in 1861 repeats that of 1856. There is no moving along ways of communication in the spread of this cholera. The track traversed is an aerial highway, leading the cholera to the same terminus in each epidemic with but one day of difference (the evening of the 6th of August 1856 and the 7th August 1861 at Meean Meer, the last station reached), and winding up on the very same day, the 28th September. The outbreak of Morar terminates on the 27th; cholera dies at the opposite extremity of the natural area at Meean Meer on the day following.

In relation to a special meteorology, to geographical site, or to comparative elevation, the outbreaks of an area may be represented, some in substance, some in shadow.

The aggregate of such outbreaks makes up the reproduction. In one portion of the provincial area the manifestation may be substantial, while in another it may be represented by a mere shadow. Thus the series of outbreaks at Umballa in September 1852, from the 5th onwards to the end of the month, in which 147 European soldiers were attacked, were represented at Ferozepore by a

* At the present date, July 1869, cholera is prevailing in the interior of the hills, in the districts of the Himalayas which rise above the valley of the Sutledge; here the cholera which passed as an aura over the Simla Hills in the first week of June appears to have found a locality for settlement and concentration.

single case, which is thus noticed by the Surgeon of Her Majesty's 87th Regiment :— "A man was admitted on the 6th September with symptoms of developed cholera, which came on after taking a purgative of compound jalap for a feverish attack. The symptoms were severe, but the man recovered. About the same time two or three premonitory cases occurred in the Regiment and a few natives died in the station." Two cases occurred at Meean Meer in the European Regiment at the same time, which the Medical Officer returned as cholera; but these, he says, may have been cases of the choleroid form of intermittent fever.*

Each of the hill stations adjoining to Umballa returned cases of choleraic affection while the cholera was prevailing at Umballa, but no fatal cases occurred.

In the case of Ferozepore and Meean Meer, the stations lay probably out of the line of the choleraic influence; for I have shown that the Umballa District and the Jullundur Doab are not necessarily visited in the same advance of cholera in which Meerut on the one hand or Ferozepore and Meean Meer on the other suffer, but seem often to be swept by a secondary wave later in the season. It is more than a coincidence that in the succeeding epidemic, it was on the 4th September 1856 that the invading cholera first appeared at Umballa.

The minor manifestation of choleraic influence at the high elevation exhibits the effects of height in preventing the localisation of the miasm; these stations were affected by a diffused, and not by a concentrated miasm.†

In the first section, I have in various places spoken of the aura preceding by some months the manifest invasion of the substance of the epidemic, and of the adaptation of different outbreaks in relation to the phenomenon. Thus, I have shown how during invasion from the east in March and April 1853, the jails of the Gangetic Provinces were universally affected by a cholera which was powerless to destroy; how in the invasion of 1855 seventy-two prisoners of the jail at Cawnpore, the last station affected in the west, were stricken down by the choleraic influence with the result that three only died; and how the same phenomenon was repeated at Etah, the last station affected during the epidemic advance of 1863, when twenty-four prisoners succumbed with the symptoms of cholera without a single death following. In the last chapter of the first section, I have mentioned the diarrhœa of the Chyebassa jail of January 1868 as due probably to the passing out from the endemic area of the body of the cholera destined to become a few months afterwards the great cholera of Chota Nagpore, with which the cholera of 1868 of the Central Provinces was geographically continuous.

The Outbreak in subordination to the meteorology of a province.

The appearance of the outbreak depends on the coincidence of the presence of the cholera miasm, its vehicle, and the agency which directs its progress; and the commencement and termination of the reproduction are subordinate to what cholera is as a vital object. The cessation of outbreaks may at any time during the life period of the reproduction be due to meteorological causes, and notably to the failure of the vehicle. I have shown how over the eastern area the prevalence of west wind was sufficient to retard the reappearance of the cholera of 1863 up to the first week of June in 1864 (See page 84). The case which follows illustrates the contrary; namely, that the setting in of steady west winds was sufficient to cut short the numerous outbreaks in which the great cholera of the spring of 1860 showed itself over the eastern area. This great cholera was ushered in by east winds and rain. (See page 79).

In the Bhaugulpore Jail cholera died out on 13th April.
In the Monghyr Jail cholera died out on 17th April.
In the Purneah Jail cholera died out on 15th April.
In Her Majesty's 37th Regiment at Ghazeepore cholera died out on 17th April.
In Her Majesty's 34th Regiment at Fyzabad cholera died out on 16th April.
In Her Majesty's 20th Regiment at Gondah cholera died out on 16th April.
In the 3rd Troop, 1st Brigade Horse Artillery at Gondah, cholera died out on 16th April.
In Her Majesty's 82nd Regiment at Shahjehanpore cholera died out on 15th April.
In Her Majesty's 13th Regiment at Goruckpore cholera died out on 17th April.
In the 1st Company, 1st Battalion Artillery at Nagode, cholera died out on 23rd April.
In Her Majesty's 54th Regiment at Cawnpore cholera died out on 24th April.
In Her Majesty's 70th Regiment at Allahabad cholera died out on 13th April.
In the 4th European Regiment at Lucknow cholera died out on 24th April.

The cholera wave. The significance of the phenomenon.

The following is an illustration, taken from the history of 1867, of a series of local outbreaks attributed to the influence of successive cholera waves. The first case of cholera occurred at Deolee on 20th June, and the appearance of the first wave was coincident with the rain of the 23rd. Surgeon-Major Crawford writes :—

"On the evening of the 23rd June a storm with rain passed over the station causing a pleasant change. On the 3rd July and morning of the 4th rain fell heavily, and by this

* "Of cholera three cases appear upon the return. Although the symptoms were most marked—the collapse, the cold clammy perspiration, the cramps in the extremities, and violent vomiting and purging—it was thought that they were the collapse of severe intermittent: in a few hours the patients slept, and the acute symptoms disappeared." *Report of H. M.'s 96th Regiment for* 1852.

† In the previous page I have mentioned the fact of the aura of an invading cholera having passed over Simla in June 1869; from this children were almost the only sufferers, and the same special liability to succumb in the case of children was noticed in the invasion of 1867. Dr. Cuningham writes :—"The total number of cases among European residents was sixteen, of which six were fatal. It is a curious fact that they were nearly all children." The adult constitution had on both occasions the strength to resist the effects of the diffused miasm.

time it was evident that cholera was epidemic throughout the station. On the 3rd there was a sudden increase in the number of cases in the station, and amongst the natives attached to the Harrowtie Agency there were eleven admissions on this day and nine on the 4th. On the 5th sixteen cases were admitted. From this date cases continued to occur; but except among the 2nd Cavalry there were no cases from the 14th to the 18th, and on the 19th there was no admission into any hospital. Rain fell on the 19th; and on the 20th the third wave of the epidemic occurred, with five fresh cases among the troops; on the 21st ten cases were admitted."

The phenomenon which has often been noticed, that the cholera invading an area seems to come in a succession of waves, admits of three explanations. We can conceive, (1), that each wave may represent a new body of invading cholera; or (2), that the reappearance may be due to the sprouting of the cholera seed sown during the invasion of the primary wave; or again (3), that the renewal of the vehicle may be the cause of manifest reinvigoration. Each and all of these should be kept in view in trying to determine the aspect of the outbreaks of a province.

The phenomena common to the whole invaded area shown in each of the local manifestations in the western invasion of 1860.

The invading cholera of the western provinces of July and August 1860 is a very satisfactory case in which to note the phenomena displayed by the outbreaks of the reproduction. The area invaded was absolutely free from cholera before the invasion; Morar was struck on July 22nd; Jhansi on August 2nd; Agra on August 10th; and Muttra on August 15th. The vitality of this reproduction ceased at Morar on 16th September; at Agra on 17th September; and at Muttra on 24th September.

In three stations out of the four a distinct break occurred as follows:—

In Her Majesty's 71st Regiment at Morar cholera ceased between 27th August and 6th September.

In the 3rd Battalion Rifle Brigade at Agra cholera ceased between the 31st August and 3rd September.

In the 2nd European Cavalry at Muttra cholera ceased between 30th August and 5th September.

In the 3rd Troop, 3rd Brigade Artillery at Muttra, cholera ceased for altogether on 25th August.

In Her Majesty's 89th Regiment at Jhansi cholera ceased for altogether on 18th August.

The effects of the first cholera wave were evidently over in the end of August. The renewal in these three cases out of the five, I believe to have been due to the revival of a precipitated cholera; the same cholera, in fact, which as an air-conveyed miasm struck the stations in its aerial progress. I have shown how this cholera fell thick behind this its limiting line of 1860—the famine tract line of 1861—for want of its vehicle, and how on its revival eight months afterwards, the same materies appeared as the great epidemic cholera of 1861. The renewal from September 6th to 16th at Morar, from September 3rd to 17th at Agra, and from September 5th to 24th at Muttra, is to me an evidence of the subsidence over these districts of the air-conveyed epidemic of July and August. It is from such an illustration as this that I shall try to explain what I understand by infection of a locality, by a body being struck by cholera, and by a cholera which has been precipitated budding forth after a certain number of days after precipitation. Here the stations were struck on July 22nd, August 2nd, August 10th, and August 15th, and as a consequence the bodies struck carried cholera during a certain period of days. But the original affection of these bodies I believe to have been in no way connected with the reappearance of the September cholera. The cholera-conveying wave had dropped its vitalised cholera as it passed on, and it was this same earth-sown cholera that came forward three weeks later. The conditions for manifestation were not wanting; this cholera had at least a fortnight of vitality left, and the moist and stagnant air of the termination of the scanty rains sufficed to rouse it into manifest epidemic life for these fourteen days.

This is one explanation which I give of the affection of a cantonment for longer than the primary period during which a given body once struck carries its cholera. It is constantly the case that what are called successive waves affect the same station in the course of one and the same reproduction. What are called localising conditions (or, in other words, the facilities afforded to an earth-sown cholera for revival after precipitation) tended to perpetuate cholera in the camp before Delhi in 1857 up to the middle of September, and retained up to the same date the Meean Meer cholera of 1856 and 1861. The table which concludes this chapter is also a striking illustration of the attachment of epidemic cholera to a locality for the entire period during which in any year the reproduction continues vital.

It is a mistake to shut our eyes to the fact, that in the rains little is needed for localisation. A moist grassy plain is probably as efficient for the purpose as is a foul and stagnant marsh. I think it is a great mistake to insist too strongly that conditions which in themselves are nuisances alone predispose to the localisation of cholera. I believe that an air-conveyed cholera selects the purest of all vehicles, and this we should not overlook. We do not give to the latrines of our cantonments the credit for the diffusion of an air-conveyed malaria; elevation above ground level and dryness around our cantonments are what we regard as the means of protection most efficient against the moisture-loving malaria poison.

I have strongly insisted, that it is not the open and arid plain that is selected as a breeding ground, and that it is not in such situations that we find a dormant cholera revive;

but that it is along low river banks, along the course of canals, in extensive jheel countries, and in moist situations along the base of the hills, that the cholera of invasion delights to propagate itself. I have shown also how rare an event it is for any station of the western area to be struck, and for the phenomena which characterise the outbreak to occur before the setting in of the rains. As an exception, in 1867, we had the example of an air-conveyed cholera falling thick into the Peshawur Valley on 19th May. Here the meteorological agency which brought up the cholera was of a temporary character. If this cholera fell thick it was short lived. Ten days saw its termination in the 42nd Highlanders, and it survived but a month in all. The dryness of May and June was not favourable to the localisation of this cholera, and probably whatever amount was precipitated was scorched up beyond recovery before the recurrence of moisture in July afforded to it the chance of revitalisation. In the Bunnoo District the same cholera survived until October.

In speaking of localisation the phenomenon does not present itself to my mind as necessarily limited to a cantonment or its neighbourhood. Localisation may imply the sowing of the seed over many hundreds of miles—seed which shall spring up and manifest its existence as an air-borne cholera, as an apparent second wave traversing the provincial area under the same conditions and in the same direction as the first or invading wave.

The revitalisation *in situ* during the vitality of the same reproduction of a cholera distributed over an invaded area, is very much the same thing in homology as the revitalisation which occurs provincially after the normal period of dormancy: after lying dormant for six months vitality returns to the cholera seed sown over a province; in invasion it is usually a vital cholera that is precipitated, and this seems to be readapted for fresh manifestation within a fortnight after it is sown. It can be readily understood that many spots and special localities are far more favorable than others for preventing the decay of the distributed miasm and for promoting its propagation, and are, in short, adapted to bring about localisation, and consequent intensity of manifestation, even during the course of the current reproduction.

The succession of what seem to be waves is a very remarkable phenomenon. Sometimes the interval is well marked, as in the cases above quoted; at other times a minimum only and not an actual break indicates the fact of the second or third wave flowing over the province before the recession of the wave that went before. In the invasion of 1856, the death rolls of the two European Regiments at Ferozepore and Meean Meer, which had become affected by the invading cholera, the one on the 7th and the other on the 15th August, show a sudden rise in mortality on the 22nd; at Ferozepore, the deaths rose from two on the 21st to eight on the 22nd, and at Meean Meer from two on the 21st to thirteen on the 22nd. In both cases a second period of minimum was reached between the 30th August and 2nd September; but from the 2nd and 3rd of September the mortality recommenced, and continued steady day after day up to the 22nd in the one case and up to the 23rd in the other. The attack of the Umballa cantonment on 4th September was coincident with the appearance of the second wave at Ferozepore and Meean Meer.

I shall close these illustrations with an illustration which is a perfect parallel with the case of 1860, namely, that of the stations of the western epidemic province in 1862.

Phenomenon of the succession of waves shown in the western cholera of 1862.

The effects of the first wave of the monsoon reproduction of 1862—the revitalised cholera of 1861 in the western province—ceased at Morar on 19th July, at Jhansi on 23rd July, and at Meerut on 22nd July (see Table IV, p. 173). This cholera became a second time apparent after an interval of thirteen days at Morar, of eight at Jhansi, and of three at Meerut. The second wave probably affected Meerut about the 25th July; on 29th July Gwalior was attacked; on 30th Jhansi; on 31st Morar; and on August 2nd Agra, and the effects of this wave terminated in an *absolute* break in all five cases:—

From 18th August to 1st September cholera ceased in Her Majesty's 13th Regiment at Morar.

On 14th August cholera ceased for the year in Her Majesty's 52nd Regiment at Jhansi.

On 12th August the cholera of the Head Quarters Her Majesty's 35th Regiment at Agra ceased.

On 14th August the cholera of the Wing of Her Majesty's 52nd Regiment at Gwalior ceased.

On 11th August the cholera of Her Majesty's 104th Regiment at Meerut ceased.

To this list remain to be added the cases of Her Majesty's 19th Regiment at Meean Meer, in which cholera ceased from the 14th to 25th August; and of Her Majesty's 93rd Regiment at Peshawur, in which cholera ceased from the 12th August to 9th September.

But this general subsidence of cholera over this vast province between 11th and 18th August was but a break after all. At Morar Her Majesty's 13th carried cholera for the third time in 1862 from 1st to 20th September; the 19th Regiment at Meean Meer carried cholera from 25th August to 11th September; in the 93rd Highlanders, the third attack of 1862 ceased on 16th September;* and by this final wave of the monsoon reproduction of 1862 the 81st Regiment at Umritsur was struck on 29th August and carried cholera up to the 5th September.

* Report by Dr. Munro, Army Blue Book for 1862, p. 413.

If the grand parallels of years and epidemics which I have sought to establish in the first section of the report be wonderful, not less astonishing are the parallels of details such as I have shown in these paragraphs. The interpretation which I have made of them may be wrong, but this at least is certain, that the occurrences are subordinate to no laws but such as are natural, and that the affection of a cantonment or of a province takes place in obedience to such laws and occurs by no casual invasion attributable to minor or secondary agencies.

The detailed statistics of what I have indicated generally in these paragraphs follow :—

THE WESTERN AREA AS A NATURAL CHOLERA PROVINCE IN THE EPIDEMICS OF 1856, 1860, 1861, AND 1862. A SERIES OF PARALLEL STATEMENTS TO ILLUSTRATE THE SUCCESSION OF OUTBREAKS, THE DURATION OF THE REPRODUCTION, AND THE LIABILITY TO CHOLERA THROUGHOUT THE PERIOD OF ITS DURATION.

I.—*European Army of the Western Division*, 1856.*

DATE OF ADMISSION.	DEATHS OUT OF THE ADMISSIONS OF EACH DAY OF THE REPRODUCTION.							
	Meerut, 1-60th Rifles.	Meerut, 3rd Company, 3rd Battalion Bengal Artillery.	Ferozepore, 70th Regiment.	Ferozepore, 6th Battalion Bengal Artillery.	Mean Meer, 81st Regiment.	Mean Meer, 4th Battalion Bengal Artillery.	Mean Meer, 2nd Brigade Bengal Horse Artillery.	Umballa, all Corps.
July 28	...	1	...	...	...	...	...	...
„ 29	...	...	...	...	...	...	...	...
„ 30	...	...	...	...	...	...	...	...
„ 31	...	...	...	...	...	...	...	...
August 1	2	1	...	...	...	...	...	...
„ 2	2	...	...	...	...	...	...	...
„ 3	3	1	...	...	...	...	...	...
„ 4	1	...	...	...	...	...	...	...
„ 5	1	...	...	...	...	...	...	...
„ 6	1	1	...	...	...	...	...	...
„ 7	1	1	...	...	...	...	3	...
„ 8	4	...	...	...	...	1	5	...
„ 9	5	...	...	...	...	1	4	...
„ 10	1	...	...	...	...	3	2	...
„ 11	3	...	...	...	...	7	6	...
„ 12	2	...	1	...	...	9	6	...
„ 13	...	...	2	...	...	9	5	...
„ 14	1	...	3	...	...	9	5	...
„ 15	1	1	1	1	2	11	5	...
„ 16	...	...	10	...	3	11	3	...
„ 17	...	1	9	2	2	4	...	...
„ 18	...	...	4	2	2	5	...	..
„ 19	...	...	6	...	2	8	3	...
„ 20	...	...	2	3	3	1	3	
„ 21	...	...	2	3	2	3	1	...
„ 22	1	...	8	5	13	1	1	...
„ 23	...	...	5	7	6	1	1	...
„ 24	...	...	6	2	6	1	...	...
„ 25	...	...	3	...	9	2	...	...
„ 26	...	...	3	5	3	...	...	...
„ 27	...	...	3	5	8	...	...	...
„ 28	...	...	...	2	10	3	...	...
„ 29	...	...	...	2	4	...	...	...
„ 30	...	...	2	...	...	2	...	...
„ 31	...	...	1	...	1	...	...	...
September 1	...	...	1	1	1	...	...	...
„ 2	...	...	2	...	1	...	...	...
„ 3	...	...	...	...	9	1	...	...
„ 4	...	...	3	...	5	...	...	3
„ 5	...	...	2	1	2	...	...	...
„ 6	...	...	1	...	5	...	...	1
„ 7	...	...	3	1	5	...	...	...
„ 8	...	...	1	...	1	1	...	...
„ 9	...	...	1	...	4	...	...	...
„ 10	...	...	...	...	...	...	...	...
„ 11	...	...	1	...	4	...	...	...
„ 12	...	...	...	...	...	...	...	...
„ 13	...	...	...	...	3	...	...	...
„ 14	...	...	...	...	...	...	...	...
„ 15	...	...	1	...	...	...	...	...
„ 16	...	...	...	...	...	...	...	...
„ 17	...	...	...	1	2	...	...	...
„ 18	...	...	...	...	1	...	...	...
„ 19	...	...	1	...	1	...	...	...
„ 20	...	...	...	...	...	...	...	...
„ 21	...	...	...	...	...	...	...	...
„ 22	...	...	1	..	1	...	...	...
„ 23	...	...	...	...	1	...	...	...
„ 28	...	...	...	...	1	...	...	...

* After the epidemic movement of the cholera of the Agra District towards the North-West.

II.—*European Army of the Western Division*, 1860.

DATE OF ADMISSION.			Deaths out of the admissions of each day of the reproduction.					
			Morar, 71st Regiment.	Gwalior, 11th Brigade, 5 Battery, Royal Artillery.	Jhansi, 89th Regiment.	Agra, 3rd Battalion Rifle Brigade.	Muttra, 3rd Troop, 3rd Brigade Horse Artillery.	Muttra, 2nd Regiment Bengal European Cavalry.
July	22	...	1	...	...	...	...	...
,,	23	...	1	...	...	...	...	...
,,	24	...	...	1	...	...	...	...
,,	25	...	...	...	...	...	...	...
,,	26	...	3	...	...	...	...	...
,,	27	...	1	...	...	...	...	...
,,	28	...	...	1	...	...	...	...
,,	29	...	...	...	...	...	...	...
,,	30	...	2	...	...	...	...	...
,,	31	...	2	...	...	...	...	...
August	1	...	2	2	..	...	...	...
,,	2	...	2	3	1	...	...	...
,,	3	...	1	1	1	...	...	...
,,	4	...	4	2	...	...	...	...
,,	5	...	2	...	...	...	...	...
,,	6	...	3	...	...	...	...	...
,,	7	...	...	...	2	...	...	...
,,	8	...	...	1	1	...	...	...
,,	9	...	7	...	1	...	...	...
,,	10	...	11	...	1	1	...	...
,,	11	...	2	...	1	...	...	...
,,	12	...	...	...	3	1	...	...
,,	13	...	3	1	...	1	...	...
,,	14	...	1	...	...	...	...	...
,,	15	...	1	...	1	1	...	1
,,	16	...	4	...	...	...	...	1
,,	17	...	2	...	...	1	3	...
,,	18	...	1	...	1	2	3	...
,,	19	...	...	...	...	...	1	...
,,	20	...	1	...	...	1	...	3
,,	21	...	1	1	...	1	3	...
,,	22	...	...	...	...	...	1	1
,,	23	...	1	...	...	4	...	...
,,	24	...	...	...	...	2	...	1
,,	25	...	...	...	...	1	1	...
,,	26	...	...	...	...	...	...	1
,,	27	...	1	...	...	2	...	...
,,	28	...	...	...	...	...	...	...
,,	29	...	...	...	...	...	...	...
,,	30	...	...	...	...	4	...	1
,,	31	...	...	...	...	5	...	...
September	1	...	...	...	...	...	...	...
,,	2	...	...	...	...	...	...	...
,,	3	...	...	...	...	1	...	...
,,	4	...	...	...	...	7	...	...
,,	5	...	...	1	...	5	...	1
,,	6	...	1	1	...	2	...	...
,,	7	...	...	...	...	3	...	...
,,	8	...	2	...	...	1	...	...
,,	9	...	2	...	...	3	...	...
,,	10	...	...	...	...	...	...	...
,,	11	..	1	...	...	1	...	...
,,	12	...	...	1	...	...	...	...
,,	13	...	...	...	...	2	...	1
,,	14	...	...	...	...	...	...	...
,,	15	...	1	...	...	...	...	...
,,	16	...	2	...	...	...	...	...
,,	17	...	..	...	...	1	...	...
,,	24	...	...	...	...	...	...	1

III.—*European Army of the Western Division*, 1861.

DATE OF ADMISSION.	Deaths out of the admissions of each day of the reproduction.									
	Agra, 42nd Regiment.	Delhi, 82nd Regiment.	Meerut, 8th Hussars.	Meerut, 35th Regiment.	Morar, 27th Regiment.	Umballa, 89th Regiment.	Umballa, 7th Hussars.	Mean Meer.*	Umritsur, 94th Regiment.	Ferozepore, 4th Goorkhas.
June 21	1	...	...	...	...	...	...	...	...	...
„ 28	1	...	...	...	...	...	...	...	...	...
July 2	1	...	...	...	...	...	...	...	...	...
„ 3	...	...	...	...	...	...	...	...	...	...
„ 4	...	1	...	...	...	...	...	...	...	...
„ 5	...	1	...	...	...	...	...	...	...	...
„ 6	...	...	1	...	...	...	...	...	...	...
„ 7	...	1	...	...	...	...	...	...	...	...
„ 8	...	...	2	...	...	...	...	...	...	...
„ 9	...	2	1	...	...	...	...	...	...	...
„ 10	...	...	...	...	...	...	...	...	...	...
„ 11	...	1	...	...	...	...	...	...	...	...
„ 12	...	1	...	...	...	...	...	...	...	...
„ 13	...	...	1	...	...	...	...	...	...	...
„ 14	1	4	2	...	...	...	...	...	...	...
„ 15	...	3	1	...	...	...	...	...	...	...
„ 16	1	...	1	...	...	...	...	...	...	...
„ 17	2	2	1	1	...	...	...	...	...	...
„ 18	1	3	...	1	...	...	...	...	...	...
„ 19	...	2	...	1	...	...	...	...	...	...
„ 20	...	2	1	1	...	...	...	...	...	...
„ 21	...	2	1	2	...	...	...	...	...	...
„ 22	3	2	...	...	...	...	...	...	...	...
„ 23	...	...	1	...	...	...	...	...	...	...
„ 24	4	1	...	2	...	...	...	...	...	...
„ 25	2	6	...	1	3	...	...	...	...	...
„ 26	2	3	2	2	...	...	...	...	...	...
„ 27	1	3	1	1	2	...	...	...	...	...
„ 28	5	...	4	...	3	...	...	...	...	...
„ 29	2	1	2	...	7	...	...	...	...	...
„ 30	1	1	2	...	6	3	...	...	...	...
„ 31	5	1	...	...	4	1	...	...	...	...
August 1	1	1	2	...	3	2	...	...	...	...
„ 2	1	...	1	1	8	...	...	...	...	...
„ 3	1	...	1	...	6	...	...	...	...	...
„ 4	...	...	...	...	10	3	...	...	...	...
„ 5	1	1	1	...	4	9	...	...	...	...
„ 6	...	...	...	...	3	2	...	1	...	...
„ 7	...	...	...	...	3	3	...	...	...	...
„ 8	1	...	1	2	2	3	...	2	...	...
„ 9	...	...	...	1	5	...	...	5	...	...
„ 10	...	1	...	...	4	1	...	8	...	...
„ 11	1	...	...	3	3	3	...	5	...	...
„ 12	...	...	...	2	8	2	...	3	...	...
„ 13	...	...	...	1	3	1	...	4	...	...
„ 14	...	1	...	1	6	3	...	26	...	...
„ 15	...	...	...	1	2	...	...	43	...	...
„ 16	...	1	...	2	5	2	...	38	...	...
„ 17	...	...	...	1	3	1	...	30	...	...
„ 18	...	...	...	...	5	...	...	41	...	...
„ 19	...	...	...	...	5	...	...	28	...	...
„ 20	...	...	...	...	9	...	3	45	...	...
„ 21	...	...	...	...	3	...	...	90	...	...
„ 22	...	...	...	...	...	1	...	64	...	...
„ 23	...	...	...	...	...	1	...	58	...	...
„ 24	...	...	...	...	...	1	...	45	...	...
„ 25	...	...	...	...	3	1	...	50	...	...
„ 26	..	...	...	...	...	1	...	53	...	...
„ 27	...	...	...	...	1	...	...	42	...	...
„ 28	...	...	...	...	3	...	1	41	...	...
„ 29	...	...	...	...	1	...	...	43	...	...
„ 30	...	...	...	...	1	...	...	23	...	...
„ 31	...	...	...	...	...	...	...	18	...	...
September 1	...	...	...	...	...	...	...	17	...	...
„ 2	...	...	...	...	1	...	1	8	...	...
„ 3	...	...	...	...	...	...	...	15	1	...
„ 4	...	...	...	...	1	1	...	10	...	...
„ 5	...	...	...	...	1	...	...	4	...	...
„ 6	...	...	...	...	...	...	1	7	4	...
„ 7	...	...	...	...	1	...	...	...	6	...
„ 8	...	...	...	...	3	...	...	3	1	...
„ 9	...	...	...	...	1	...	...	3	2	...
„ 10	...	...	...	...	1	...	...	...	...	...
„ 11	...	...	...	...	...	...	...	4	7	1

Table continued on following page.

* Admissions of all corps with women and children.—*Strachey.*

III.—*European Army of the Western Division*, 1861,—continued.

DATE OF ADMISSION.	Deaths out of the admissions of each day of the reproduction.									
	Agra, 42nd Regiment.	Delhi, 82nd Regiment.	Meerut, 8th Hussars.	Meerut, 35th Regiment.	Morar, 27th Regiment.	Umballa, 89th Regiment.	Umballa, 7th Hussars.	Mean Meer.	Umritsur, 94th Regiment.	Ferozepore, 4th Goorkhas.
September 12	..	...	...	...	1	...	...	1	3	...
„ 13	...	...	...	...	...	...	...	...	4	1
„ 14	...	...	...	...	1	...	...	...	2	...
„ 15	...	...	...	...	1	...	...	3	2	...
„ 16	...	...	...	...	...	...	...	...	1	...
„ 17	...		...	...	...	...	...	...	4	...
„ 18	...	...	...	...	...	...	...	...	...	1
„ 19	...	...	...	...	...	...	...	...	1	4
„ 20	...	...	...	...	...	...	...	...	1	11
„ 21	...	...	...	...	...	...	...	...	...	4
„ 22	...	...	...	...	...	...	...	...	...	3
„ 23	..	...	...	...	...	...	...	...	...	...
„ 24	...	...	...	...	...	...	...	...	...	3
„ 25	...	...	...	...	...	...	...	...	...	3
„ 26	...	...	...	.	1	...	...	...	...	...
„ 27	...	...	...	...	1	...	...	...	...	1
„ 28	...	...	...	...	...	...	...	...	1	1

IV.—*European Army of the Western Division*, 1862.

DATE OF ADMISSION.	Deaths out of the admissions of each day of the reproduction.						
	Morar, 13th Regiment.	Gwalior, Wing 52nd Regiment.	Jhansi, 52nd Regiment, Head Quarters.	Agra, 35th Regiment.	Meerut, 104th Regiment.	Mean Meer, 19th Regiment.	Umritsur, Detachment 81st Regiment.
July 10	1	...	...	...	...	...	...
„ 11	...	...	...	...	...	...	...
„ 12	2	...	...	...	...	...	...
„ 13	1	...	...	...	...	...	...
„ 14	...	...	...	...	...	...	...
„ 15	...	...	...	...	1	...	...
„ 16	1	...	...	...	...	...	...
„ 17	...	...	...	...	...	...	...
„ 18	3	...	...	...	...	...	...
„ 19	3	...	...	...	...	...	...
„ 20	...	...	...	...	...	...	...
„ 21	...	...	...	...	1	...	...
„ 22	...	...	...	...	2	...	...
„ 23	...	...	1	...	...	...	...
„ 24	...	...	...	...	...	...	...
„ 25	...	...	...	...	1	...	...
„ 26	...	...	...	...	1	...	...
„ 27	...	...	...	...	1	...	...
„ 28	...	...	...	...	1	...	...
„ 29	...	1	...	...	...	...	...
„ 30	1	...	4	...	1	...	...
„ 31	1	1	1	...	3	...	...
August 1	...	...	...	...	...	...	...
„ 2	...	1	1	4	2	...	...
„ 3	2	2	6	1	...	...	...
„ 4	...	4	1	...	1	...	...
„ 5	...	...	1	4	...	...	...
„ 6	...	2	1	2	...	...	...
„ 7	...	1	...	3	1	...	...
„ 8	...	1	1	4	1	...	...
„ 9	4	1	5	6	1	...	...
„ 10	2	1	...	6	1	...	...
„ 11	1	1	2	1	1	...	...
„ 12	...	1	3	2	...	...	...
„ 13	...	...	1	...	...	...	...
„ 14	...	1	1	...	...	1	...
„ 15	...	...	...	1	...	...	...
„ 16	...	...	...	...	...	...	...
„ 17	...	...	...	2	...	...	...
„ 18	1	...	...	...	...	...	...
„ 19	...	1	...	2	...	...	...
„ 20	...	...	...	3	...	...	...
„ 21	...	...	...	2	...	...	...
„ 22	...	...	...	...	...	...	...

IV.—*European Army of the Western Division*, 1862,—continued.

DATE OF ADMISSION.			Deaths out of the admissions of each day of the reproduction.						
			Morar, 13th Regiment.	Gwalior, Wing 52nd Regiment.	Jhansi, 52nd Regiment, Head Quarters.	Agra, 35th Regiment.	Meerut, 104th Regiment.	Mean Meer, 19th Regiment.	Umritsur, Detachment 81st Regiment.
August	23	...	...	...	...	2	1	...	...
"	24	...	...	...	...	2	...	...	...
"	25	...	...	...	...	1	...	7	...
"	26	...	...	...	-	...	...	6	...
"	27	...	...	...	...	1	...	12	...
"	28	...	...	...	...	...	...	5	...
"	29	...	...	...	...	...	...	8	1
"	30	...	...	...	...	...	...	3	1
"	31	...	...	...	...	...	...	6	2
September	1	...	1	...	...	...	...	2	1
"	2	...	...	...	...	...	...	2	2
"	3	...	1	...	...	...	...	3	...
"	4	...	...	...	...	...	...	3	1
"	5	...	1	...	...	...	...	1	1
"	6	...	...	...	...	...	...	3	...
"	7	...	2	...	...	...	...	1	...
"	8	...	...	...	...	...	...	...	...
"	9	...	3	...	...	...	...	1	...
"	10	...	...	...	...	...	...	1	...
"	11	...	1	...	...	...	...	1	...
"	12	...	1		...	...	...	...	...
"	13	...	...	...	...	...	...	...	...
"	14	...	...	...	...	...	...	...	...
"	15	...	2	...	...	...	...	...	...
"	16	...	...	...	...	...	...	...	...
"	17	...	...	...	...	...	...	...	...
"	18	...	...	...	...	...	...	...	...
"	19	...	...	...	...	...	...	...	...
"	20	...	1	...	...	...	...	...	...
"	21	...	...	...	...	...	...	...	...
"	22	...	...	...	...	...	...	1	...
"	23	...	...	...	...	...	...	...	...
"	24	...	...	...	...	...	...	...	...
"	25	...	...	...	...	...	...	...	...
"	26	...	...	...	...	...	...	2	...
"	27	...	...	...	...	...	...	...	...
"	28	...	...	...	...	...	...	...	...
"	29	...	...	...		...	...	...	...
"	30	...	...	...	...	...	...	...	...
October	1	...	...	...	...	...	...	1	...

Without a clear comprehension of the truth that the outbreak has two distinct associations—that in the one case it takes its character from its relations to the epidemic cholera of the reproduction, and in the other from the fact that affection of the community has taken place—the natural history of the outbreak cannot be viewed aright. The two types of the outbreak resulting from these associations are, in my estimation, entirely distinct one from the other. In the next chapters I shall try to show the type of the outbreak in a community affected on a known day, and to illustrate the influence of the conditions which may lead to its aggravation or prolongation.

The table which follows illustrates the truth, that what we know to be the case for the province may hold good for a single locality of the province and for the community which it contains, and that localisation may give an aspect to the outbreak of persistent endurance throughout the entire life-period of the reproduction, which is not acquired from any peculiarity in the material affected, nor yet from conditions other than those due to the geographical site and physical aspect of the affected locality. The same locality is not always similarly affected in each epidemic visitation; invasion must be viewed in relation to the conditions which render persistence possible. For example, the 93rd Highlanders at Peshawur suffered in four distinctly repeated outbreaks between July and November 1862; but when the valley was entered in October 1858, the persistence of the invading cholera was limited to a fortnight, and the cholera of May 1867 survived for little more than a month. This is an illustration from a locality lying beyond the monsoon limits. But the experience of 1862 seems to me to indicate, that if the Peshawur Valley were transferred to within the monsoon area, the history of that year might be repeated in each succeeding invasion; that is to say, cholera might persist from the day of invasion uninterruptedly up to the date of the death of the reproduction, as an immediate consequence of the natural features of the cantonment and the adjacent country. I do not say that the cholera will necessarily continue in force throughout in such a locality. It may or it may not; but whether in shadow or substance the typical representation is the same. We have, unfortunately, a cantonment the experience of which illustrates what I wish to show, that, once infected, the normal duration of the outbreak is to be reckoned by months

and not by days. The experience of Morar in five years is shown in the statement below; it shows the coming of the cholera with the monsoon in July, its persistence throughout August, and its death with the decay of the reproduction in September in every one of these years. The experience of Her Majesty's 71st, 13th, and 27th Regiments is typical for what I wish to illustrate; the experience of 1865 and 1867 is the same in shadow.

Cantonment of Morar.

Statement demonstrating the persistence of Cholera in this Cantonment throughout the monsoon reproduction in different epidemics.

Deaths out of the admissions of each day of the reproduction.

1860, H. M.'s 71st Regiment, Morar.			1861, H. M.'s 27th Regiment, Morar.			1862, H. M.'s 13th Regiment, Morar.			1865, Morar and Gwalior, all Corps.			1867, Morar and Gwalior, all Corps.		
July	22,	1	July	25,	3	July	10,	1	July	23,	1	July	10,	1
,,	23,	1	,,	27,	2	,,	12,	2	August	9	1	,,	13,	1
,,	26,	3	,,	28,	3	,,	13,	1	,,	12,	1	August	12,	1
,,	27,	1	,,	29,	7	,,	16,	1	,,	14,	1	,,	14,	1
,,	30,	2	,,	30,	6	,,	18,	3	,,	17,	2	,,	16,	1
,,	31,	2	,,	31,	4	,,	19,	3	,,	18,	1	,,	17,	1
August	1,	2	August	1,	3	†	†	†	,,	19,	1	,,	23,	1
,,	2,	2	,,	2,	8	,,	30,	1	,,	22,	1	,,	24,	1
,,	3,	1	,,	3,	6	,,	31,	1	September	18,	1	,,	25,	1
,,	4,	4	,,	4,	10	August	3,	2				,,	28,	2
,,	5,	2	,,	5,	4	,,	9,	4				,,	29,	1
,,	6,	3	,,	6,	3	,,	10,	2				September	4,	1
,,	9,	7	,,	7,	3	,,	11,	1				,,	11,	1
,,	10,	11	,,	8,	2	,,	18,	1						
,,	11,	2	,,	9,	5	†	†	†						
,,	13,	3	,,	10,	4	September	1,	1						
,,	14,	1	,,	11,	3	,,	3,	1						
,,	15,	1	,,	12,	8	,,	5,	1						
,,	16,	4	,,	13,	3	,,	7,	2						
,,	17,	2	,,	14,	6	,,	9,	3						
,,	18,	1	,,	15,	2	,,	11,	1						
,,	20,	1	,,	16,	5	,,	12,	1						
,,	21,	1	,,	17,	3	,,	15,	2						
,,	23,	1	,,	18,	5	,,	20,	1						
,,	27,	1	,,	19,	5									
†	†	†	,,	20,	9									
September	6,	1	,,	21,	3									
,,	8,	2	,,	25,	3									
,,	9,	2	,,	27,	1									
,,	11,	1	,,	28,	3									
,,	15,	1	,,	29,	1									
,,	16,	2	,,	30,	1									
			September	2,	1									
			,,	4,	1									
			,,	5,	1									
			,,	7,	1									
			,,	8,	3									
			,,	9,	1									
			,,	10,	1									
			,,	12,	1									
			,,	14,	1									
			,,	15,	1									
			,,	26,	1									
			,,	27,	1									

CHAPTER II.

METHODS AND COURSE OF INFECTION, THE DURATION OF OUTBREAKS, AND THE CIRCUMSTANCES WHICH TEND TO PROLONG OR TO CUT SHORT THE OUTBREAK.

THE anticipation in regard to any outbreak must be based upon parallel history, which has accepted as a fundamental doctrine the truth that every local manifestation of cholera within the epidemic area occurs as a portion of an epidemic and in subordination to the meteorology of the natural province within which the locality is situated. The affirmation that the outbreak is a mere contingency, receives no support from any fact in the history of the past fifteen years. Every outbreak has ranged itself under a reproduction, and every reproduction has fallen into its place in the epidemic.

The outbreak must be anticipated as a portion of the epidemic. We have as yet no clear indices based upon statistical data, to give us warning of the approaching exit of the epidemic from the endemic province. The warning may, however, be found probably in every instance, in a manifestation regarded as merely an unusual prevalence of the endemic cholera. The years noted in former times as great cholera years in Calcutta are those immediately preceding the years of the epidemic prevalence of cholera in Upper India. So in our times, while cholera was dead in the war provinces in 1858, no sooner were regiments and detachments transferred to Lower Bengal than they were attacked by cholera, and 273 men were thus lost; looking back we now recognise that this cholera of 1858 was the same body which formed the invading cholera of 1859-60 and 1861. So, again, the great prevalence of cholera over the famine districts in 1866 was regarded as due to the casual aggravation of the endemic miasm by the circumstances of the population, while it was in reality due to the presence of the great body of cholera which moved out to form the invading epidemic of 1866-67.

The outbreak in any locality appears at the date normal for that locality. No circumstances which are merely contingent can determine the occurrence in time of the outbreaks of an epidemic.

It was owing to the want of systematic information regarding the progress of epidemic cholera within the endemic area that I failed to recognise in the cholera of the Central Provinces of 1868 an epidemic of a new invasion, although the epidemic character of the cholera prevalent within the endemic bounds warned me that the exit of a new epidemic was imminent. The retrospect of the history of epidemic advance in 1868 has, however, taught us much regarding the primary exit of invading cholera. The universal prevalence of epidemic cholera in the western districts of Bengal Proper, north of a certain line, in the early months of 1868, was followed by the sudden appearance of epidemic cholera universally spread between the margins of the endemic province and the Jubbulpore and Mundla Districts. The sudden projection of this offshoot across a tract five hundred miles in width, implied the occupation by aerial invasion of a provincial area; this was the first leap in the history of the newly invading epidemic. The nature of the tract thus occupied demonstrates to us at once that human intercourse could have had no share in the transmission of the cholera of this geographical area. I have said that cholera viewed as a natural object, will play out its part in a country in which no human being is found. This invading cholera of 1868 was carried from the inhabited tracts in the east into the inhabited tracts in the west of this area of five hundred miles, across a vast extent of country almost void of population and entirely unprovided with the usual channels of communication. The distribution was geographically defined. There was no extension to the southward from the territories covered by this offshoot. The great Chuteesghur Division of the Central Provinces, one of the worst cholera tracts of India and which has again been ravaged within the last two months, remained absolutely free in the invasion, only eight cholera deaths having been registered throughout the division in 1868.

The primary exit of the cholera of invasion from within the endemic province has no relation to lines of human communication.

Next, we have been taught that the occupation of the southern epidemic highway takes place not progressively from district to district, but in a succession of leaps; and that although there may have been three distinct stages of progress, Hyderabad, Bombay, and Malwa may be covered before the end of the year by a cholera leaving its endemic home in the spring.

The history of this invasion I have been compelled to write from a retrospect of the events of 1868. It affords a standard which will be available in after years when cholera epidemic within its endemic province, is being watched in anticipation of the probability of advance upon the epidemic area. Every effort should be used in future to follow out with accuracy the details of primary invasion. The general facts have been sufficiently evident from the history even of the earliest epidemics. What I have written in detail for 1868, is the same thing to which I have so repeatedly called attention, namely, the overflowing of endemic cholera upon the highlands of Hazareebaugh and Chota Nagpore and its descent upon the plains of Behar and upon the districts lying to the west and south-west. We know that it is not always the one tract which is selected, and, therefore, we must be prepared to shape our estimate of the probabilities according to more than the one standard; the causes of the divergence of this invading cholera in different directions will be found in the varying meteorology of different years and seasons.

I do not believe that for the eastern division of the epidemic area our parallels will ever tell us the exact date at which the appearance of cholera is to be expected in any station. We

can suggest generally as the probable months April and July, or May and August. More than this we cannot say, knowing that even in March with early rains general invasion or revitalisation may occur, while with steady hot winds a body of cholera equally powerful may be repressed from manifesting its effects up to June or until the monsoon sets in. In the extreme east of the province we know that the danger is to be looked for much earlier. No troops should be moving on the lower section of the Grand Trunk Road after the middle of February; in a year of fresh invasion it seems almost an impossibility for troops to make these marches in March and April without encountering cholera, and the experiment should not be tried. In the same locality the November reproduction in an epidemic year is quite as severe, and movement between the middle of December and the middle of February will ensure only a minimum of risk and not exemption. The great mortality of the Native Regiments on the river in November 1856 shows, that the water highway in the east is as deadly as the road, when cholera is abroad as an epidemic. As regards the districts of the extreme west of the province, Banda, Humeerpore, Jaloun, and Cawnpore, we shall not err in reckoning May as the month in which the outbreaks of an epidemic cholera are likely to begin.

I need not recapitulate the dates which I regard as normal for the cholera of the western province. I have traced them in the previous chapter and in describing the various epidemics and reproductions, and when I have drawn the parallels almost to a day, the objection most likely to be raised is, that the parallels are too severely correct to be true. In my opinion, however, these dates will hold good for all time to come, and if we fail to detect the parallel in the history of one invasion or reproduction we shall find it in that of another, and the reason of the failure of the parallel will also be found if carefully looked for.

Forerunners in advance of the actual invasion, often give warning of the threatened outbreak.

In anticipation of the outbreak in any special locality, besides studying the general history of the geography and date of previous invasions, we should not fail when invasion is in progress to look for the aura and the outrunners of the coming cholera. In the western province I have said that we may often find them, for example, at Meerut in April and May, when invasion is imminent in July or August; the cases in May 1860 at Meean Meer I regard to have been distinctly premonitory of the cholera which did not come before August of the year following; and I have instanced cases occurring at Huzara and Kohat during the progress of the cholera of 1861, as the herald in the one case of the cholera of the May following, and in the other, the representative of a cholera which never actually invaded the district. In the east, I should expect to find these premonitory cases thrown forward in the November reproduction in anticipation of invasion in March following;* occurring at any other season they would be overlooked, from the fact that cases occur in every year in a province in which the extinction of cholera is very rare. Small invasions the aggregate of such premonitory cases, are not to be disregarded, since we never know what may be behind them; they may be the entire representative of an epidemic (as in the invasion of the western division of May 1865), or they may be but the advanced guards of a coming cholera.

General considerations to be looked to in estimating the causes determining the duration and aspect of the outbreak.

It is very important to have a clear comprehension of the truth, that infection of a locality and infection of a community is not the same thing. Infection of the community is not necessarily an indication of a locality having become infected; a body may be infected and nothing may occur subsequently to show that this same cholera has found a local habitat. But again, the cholera of a camp or cantonment may by its persistence, and by the appearance of the features peculiar to a localised cholera, prove the fact, that the locality is an infected locality within which human life is in peril so long as the reproduction remains in vitality. The normal duration of the outbreak is only to be determined after taking into account such prolongations as are due to the localisation of cholera. The minimum period of persistence may readily be calculated from instances of infection on a known day in bodies of men moving through a country remaining comparatively or absolutely uninfected; and the maximum may be illustrated from instances in which movement has been impossible or has been deemed unadvisable. These data will at least afford the groundwork for an enquiry into the causes which shorten or lengthen out an outbreak or a series of outbreaks.

There is another point which cannot be too carefully studied, namely, the facies of individual outbreaks. Some would tell us that the outbreak is typically represented in a diagram by the spindle shape; that it progresses from small beginnings, rises by stages to a maximum, and then declines. This may be true on some occasions of the outbreaks of a reproduction when viewed in the aggregate; it may be true even of certain individual outbreaks; but it certainly is not the case that the typical outbreak exhibits this form. The wonder is, that so few outbreaks should put on this shape, when we reflect, that it is only in a certain number of cases that attack occurs with the onset of invasion, and that at any time from first to last a body within the affected area may suffer. What are apt to be taken for the cases introducing the outbreak are the sporadic cases which are constantly liable to occur in every community, when, for example, a large cantonment is affected in the course of an invasion; these are not

* In the first invasion of which we have a clear record this was the case. Jameson, speaking regarding the cholera of Oude of 1818, mentions that a few cases of cholera did certainly appear at Lucknow in December and January, but he remarks that these were probably merely sporadic, and an exception to the general rule, that until the end of March 1818, no spot of the immense tract stretching from Scharunpore to Tirhoot was visited by the disease. For quotation, see p. 98.

necessarily part and parcel of the outbreak which follows, although they are an indication that the choleraic atmosphere is present. To distinguish between these cases and the commencement of an actual outbreak is of great importance when movement into camp is contemplated, but I know of no method of making the distinction. These premonitory cases should not generally be included in studying the aspect of the outbreak.

The probability of various distinct outbreaks occurring during the course of the same visitation of cholera must not be overlooked. It seems as if on some occasions the cholera of the reproduction adhered to a body affected from the first day to the last. At one time we find scarcely a day of the period without its fatal cases, while at another the blanks are so distributed as clearly to show that the occurrence is merely a casual breach in the continuous outbreak; in a third case, however, the date of different reattacks is perfectly defined. Such persistence is not found in the case of moving bodies; and therefore its occurrence is fairly attributable to conditions of locality or to conditions affecting the body because of its being stationary. The Regiments at Morar in 1860, 1861, and 1862 carried cholera throughout, from the day of invasion to the day of devitalisation—the 71st from July 22nd to September 16th, losing sixty-nine men; the 27th from July 25th to September 27th, losing 148 men; and the 13th Regiment from July 10th to September 20th, losing thirty-six men. (See Table, p. 174). The affection of the Peshawur Valley in 1862 is also a case in point. The cholera was localised in the valley and not in the barracks of the 93rd Regiment, and this Regiment was visited on four separate occasions during the persistence of the vitality of this cholera. Dr. Munro recognised the distinctness of these several outbreaks. He writes:—"There were four separate or distinct outbreaks of cholera in the Regiment. The first commenced on 7th July and terminated on the 17th; the second commenced on 26th July and terminated on 10th August; the third commenced on 9th September and terminated on the 16th; the fourth commenced on 12th October and terminated on 3rd November." The Surgeon of Her Majesty's 77th, writing during the prevalence of the cholera of June 1867, says:—"Peshawur seems to me the most unfavourable station I have been at for an epidemic of cholera to occur in. It seems impossible to get rid of it. It is going round and round as in a basin, and the only way, in my opinion, to get clear of it is by a good start off from the place. The importance of the presence of European Troops in the station renders this most necessary measure impossible, and, therefore, when cholera makes its appearance at Peshawur the gravest consequences may be looked for." The 42nd marched out of the valley, and finally parted with its cholera in ten days after its first infection; the 77th remained, and suffered from 21st May to 25th June.

Sometimes it has happened that a Regiment has been unfortunate enough to suffer from cholera under several conditions in the same year. In 1857, Her Majesty's 84th Regiment was attacked on three different occasions: in cantonments at Chinsurah, cholera continued from 2nd to 16th April; while marching on the Grand Trunk Road above Sherghotty, from 10th to 21st June; and again when in the field with Havelock's Force, from July 23rd to September 15th, while broken up into numerous detachments. These outbreaks presented different phases, each requiring to be regarded in a special light.

The outbreak is not represented under the same aspect in all bodies of men subjected to the same choleraic influence—I mean bodies of the same constitution, for the disparity of affection in different classes and races is a subject requiring separate consideration. What shows itself as a great outbreak in one body, may in another body in the immediate neighbourhood, be represented by premonitory cases only, without any outbreak. It is very curious that such cases should sometimes occur in parallels. The following instance taken from the history of the Meerut cantonment strangely repeats itself after an interval of forty-eight years. The 14th Regiment was attacked on the 8th August 1819; 221 men became affected, out of whom forty-one died, and so universal was the cholera that the idea got abroad that it had become a contagious disease. After commenting on the facts, Jameson goes on to say:—"These causes do not explain why the Horse Brigade on the right, and the 8th Dragoons on the left, should have scarcely suffered, and the whole of the Native Troops have entirely escaped, although the latter were from their modes of life doubtless much exposed to the damps of the night and to the heat and sun by day, nor why the sudder bazaar, the most crowded and filthy of all the bazaars, should have enjoyed entire immunity."

The outbreaks of a special locality in different epidemics are sometimes parallel.

Meerut outbreak of 1819,—Jameson.

The parallel of 1867 is as follows:—

"From the 15th August to the 25th September the Buffs lost one Officer, 105 men, 12 women, and 20 children, in all 138. There were five cases in all among the men of the Royal Artillery."

Meerut outbreak of 1867,—Cuningham.

"The 19th Hussars remained free from the scourge up to the 8th September, when a man under treatment in hospital for contusion was seized and died, and on the 20th September a woman was also carried off. It was not considered necessary to move the Regiment from barracks, no further symptom of cholera having appeared. The Native Troops preserved perfect immunity throughout. The native population was scarcely touched by this second epidemic, nor were the native followers of the European Regiments, only two of whom died."

In a minor epidemic, that of 1838, I find in the report of the Superintending Surgeon of the Meerut Division a third parallel:—"Towards the end of July cholera appeared amongst the Europeans at Meerut. The 3rd Buffs suffered the most, but some of the Lancers and

Artillery also fell victims to the disease. It prevailed greatly in the town. Some cases occurred in the sudder bazaar, but the sepoys and the regimental bazaars escaped almost entirely."

Such an example as this might seem to give countenance to the view that the predilection of cholera for a special locality is a very constant phenomenon; and no doubt it is so.* This, however, is to be remarked, that localisation during the course of an invading cholera does not of consequence imply revitalisation upon the same spot, a doctrine which has been much insisted on. The phenomenon of the reappearance in a certain locality of a cholera on awaking from a state of dormancy is not uncommon, but the exceptions far preponderate; and the whole aspect of a cholera which reappears in a year following invasion is opposed to the dogma, that revitalisation is local in distinction to its being provincial. All outbreaks in the second or third seasons of an invading cholera are secondary to provincial manifestation, and the circumstances attending such outbreaks will in nearly every case point to the operation of a general and not of a local influence.

Lastly, the effect of special conditions in lengthening out or shortening the duration of the outbreak remains to be considered; of confinement within walls, as in the case of prisoners; of confinement to cantonments in the case of European and Native Troops; of marching; of boat voyages; and of change of locality subsequent to infection.

From the effects in different cases, having at the same time due regard to the nature of the cholera miasm, the measures for the prevention or alleviation of the outbreak should be framed; and I shall try to show in the conclusion of the enquiry in what direction the results of this study point.

Outbreaks of communities. The types of minimum and maximum duration.

European Regiments on the March,—a Statement illustrating the minimum in time during which an infected body may carry cholera.†

Outbreak.	Fatal cases out of the admissions of each day of the outbreak.																			
	1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.
Her Majesty's 32nd Regiment on the day after leaving Kussowlie, October 31st, 1856 ...	1	6	2	5	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Her Majesty's 32nd Regiment reattacked near Thanesur, November 7th, 1856	1	1	8	9	...	1	1	1	1	...	1	...	...	...	...	1	...	...	...	...
1st Fusiliers, between Kalka and Umballa, May 16th, 1857...	3	3	2	1	...	...	2	1	1	...	...	1	...	...	...	...	...	...	...	...
Her Majesty's 75th Regiment, between Kalka and Umballa, May 15th, 1857	2	5	1	...	...	...	1	...	4	2	3	5	5	...	...	1	...	...	...	...
Her Majesty's 9th Lancers, Umballa and Trunk Road, May 16th, 1857	2	2	1	2	3	...	...	...	...	1	1	2	...	1	...	...	...	...	...	...
Her Majesty's 84th Regiment, Grand Trunk Road, between Raneegunge and Benares, June 10th, 1857	6	1	...	1	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Her Majesty's 42nd Regiment, Grand Trunk Road, between Raneegunge and Benares, November 26th, 1857	1	2	1	1	...	1	1	3	...	...	...	...	...	...	...	...	...	...	...	...
Her Majesty's 19th Regiment, Grand Trunk Road, between Raneegunge and Benares, November 25th, 1857	2	2	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Her Majesty's 37th Regiment, Grand Trunk Road, between Raneegunge and Benares, July 1st, 1857	1	...	1	1	...	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Her Majesty's 38th Regiment, Grand Trunk Road, between Raneegunge and Benares, July 29th, 1857	1	...	...	...	1	1	1	3	1	1	1	...	...	1	...	...	...	...	...	...
Her Majesty's 90th Regiment, on River Steamer above Dinapore, August 19th, 1857	3	...	1	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...
Field Force proceeding from Lahore towards Dera Ismail Khan, Camp Kamokee, September 23rd, 1858	9	4	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Her Majesty's 35th Regiment, Grand Trunk Road, above Raneegunge, February 7th, 1858	2	6	7	6	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Her Majesty's 92nd Regiment, on board Steamer in Sunderbuns, March 26th, 1862	1	...	1	1	...	...	...	...	1	...	...	1	...	...	...	1	1‡	...	...	1‡
Total ...	35	32	27	28	9	7	6	9	11	5	6	10	5	2	...	3	1	...	...	1

* With reference to the note regarding the cholera of Scotland of 1439, at page 108, it is remarkable to find the very same town selected four hundred years later. No locality has suffered more than Dumfries in the epidemics of the present century.

† The cases in this table are all that I can make available for tabulation. The only other case of importance that has occurred of late years is that of Her Majesty's 55th Regiment, of which three detachments were successively attacked while marching between Raneegunge and Hazarebaugh in March and April 1864; the deaths are given in a common roll, and therefore those of each detachment cannot be shown separately. The termination of the outbreak in each case occurred before the detachment reached Hazarebaugh, so that the duration of the outbreak must have been very limited.

‡ These cases occurred after the arrival of the Wing at Fort William.

The outbreak is, as the rule, an inevitable evil. It cannot be avoided, but it may be mitigated; it may be cut short in duration, or the ratio of attack may be much diminished. This statement I believe to be in theory perfectly true; practically, the results have not come up to the expectations formed by the supporters of the theory. The theory is held, that by abandoning cantonments when cholera is imminent or present, troops may avoid the threatened invasion altogether, or, if attacked, will carry cholera for a minimum period with a minimum of intensity. The minimum of virulence and of duration to be hoped for in the case of attack having occurred, is that attained by Regiments struck on the line of march on a known day, and not subjected to reattack after this day. Above I have tabulated all the instances which I have been able to select from the death rolls of Regiments of European Regiments struck on the march between 1856 and the present time; and there can, I think, be little doubt that these cases are typical of the minimum duration of the outbreak, and also for its facies. In this table it is shown that out of a total of 197 cases which ended in death, 122, or 62 per cent., were admitted within the first four days after the outbreak began to prove fatal; and that 94 per cent. of all casualties occurred during the first twelve days, leaving only 6 per cent. for admissions subsequent to the 12th day.

The Duration of the Outbreak among Native Troops affected while on the March.

OUTBREAK.	FATAL CASES OUT OF THE ADMISSIONS OF EACH DAY OF THE OUTBREAK.																			
	1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.
2nd Sikh Infantry, on the march from Dhurmsalla to Huzara, October 31st, 1856	3	3	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	2	3	4	6	1	3	12	1	...	...	1	1	...	...	...	...	...	...	...	...
19th Native Infantry, Grand Trunk Road near Sherghotty, April 5th, 1856	7	4	...	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19th Native Infantry, reattacked near Raneegunge, April 18th, 1856	1	...	6	2	3	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...
3rd Sikh Infantry, Rawulpindee District, October 12th, 1856	4	...	...	...	1	...	1	1	1	1	...	...	...	...	...	...	...	...	...	...
66th Goorkhas, Head Quarters' Wing, below Nynee Tal, March 16th, 1857	1	2	10	9	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
66th Goorkhas, Left Wing, at Birmdeo, March 21st, 1857	1	2	2	18	8	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Nusseeree Battalion, near Umballa, May 31st, 1857 (admissions)*	11	5	11	6	9	5	6	4†	...	...	...	...	...	...	...	...	...	...	...	...
3rd Bengal Police Battalion,‡ Rajshahye to Sooree, May 11th, 1859	6	3	3	...	2	1	...	5	3	...	2	...	...	1	1	...	...	1	...	...
65th Native Infantry, Grand Trunk Road between Raneegunge and Burhee, Nov. 17th, 1860	2	...	...	2	...	4	4	4	...	1	...	...	...	...	...	...	...	...	...	...
Detachment 3rd Police Battalion,‡ Purneah to Sooree, May 10th, 1860	3	2	1	1	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Goorkha Company, 9th Native Infantry, between Fyzabad and Lucknow, December 17th, 1863	3	1	1	1	...	...	...	1	...	2	...	1	1	...	...	...	...	...	...	...
Wing 38th Native Infantry, on march to Nagode, May 20th, 1865	1	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12th Native Infantry, Grand Trunk Road above Raneegunge, March 15th, 1866	1	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
36th Native Infantry, on march from Agra to Meerut, November 28th, 1866	1	2	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL	47	28	44	48	31	17	28	16	4	6	3	2	1	1	1	...	...	1	...	...

The above table includes all records that are available of Native Troops struck under like conditions on the line of march. The results are strikingly similar to those afforded by the European Regiments. Of all fatal cases, 60 per cent. occurred among the admissions of the first four days; 72 per cent. among the admissions of the first five days; and 98 per cent. among the admissions of the first twelve days following the attack. The facies is also typically the same as in the case of European Regiments.

Lorimer has tabulated the results for twenty Regiments of the Madras Army struck while on the march, between 1829 and 1844. He has given a column in which the duration of a premonitory period before the setting in of the virulence of the outbreak, is indicated, a period varying from about two to six days, except in a few instances in which casual cases may have occurred forming no portion of the actual outbreak. The phenomena of this period will be studied in trying to trace the possible duration of the latency of the cholera miasm in the human economy. The chief thing to be noticed is, that these most deadly outbreaks parted with their virulence on or before the thirteenth day, dating from the first day of the appearance of the cholera, in fifteen out of the twenty cases, and before the seventeenth day in eighteen out of the twenty. The two remaining cases, probably compound outbreaks, lost their virulence on the twentieth and twenty-second day. Lorimer concludes, that the period of virulence is normally limited to about nine days; he notices the ninth day as the earliest on which the intensity of any of these great outbreaks ceased.

* One case, not fatal, occurred on 25th May on the march from Subathoo.
† Six cases occurred after this date; none of these were fatal.
‡ Goorkhas.

Lorimer's Table showing the results for twenty Native Regiments of the Madras Army attacked on the line of march by cholera between 1829 *and* 1844. *(Rearranged). Average strength* 900.

Case.	Attacked.	Died.	Duration in days from first case to termination of virulence.	Duration of the outbreak in days.		
				Before onset of virulence.	During virulence.	Subsequent to passing away of virulence.
1	221	97	13	3	10	8
2	124	58	10	4	6	6
3	103	43	13	5	8	10
4	126	40	14	8	6	2
5	89	32	9	4	5	23 ?
6	107	55	12	6	6	40 ?
7	46	18	10	7	3	5
8	119	45	11	3	8	8
9	99	30	12	5	7	9
10	188	84	20 ?	10	10	7
11	302	174	22 ?	5	17	11
12	65	29	16	9	7	None.
13	41	24	10	3	7	1
14	92	30	12	6	6	6
15	178	73	16	3	13	32 ?
16	198	59	12	2	10	4
17	135	79	13	2	11	3
18	189	69	17	4	13	15 ?
19	151	80	12	2	10	18 ?
20	133	62	13	2	11	7

The duration of the outbreak after the passing off of virulence indicated in the above table, is a phenomenon of which our illustrations afford little that is parallel, and the facts are not exhibited in such a form as to be capable of adaptation in relation to modern examples. These are evidently cases selected rather for their gravity than as being typical; and the special history attached to each would no doubt throw light upon what stands here apparently at variance with our experience. Of the cases which I have given, two have been divided—those of Her Majesty's 32nd Regiment, and of the 19th Native Infantry. This is done on the authority of the medical officers, (Dr. Boyd in the first case, and Dr. Wilkie in the second), who state, that the second appearance was distinctly a reattack unconnected with the former. Cholera was prevailing at Thanesur when the 32nd Regiment passed near it on 7th November, and by this time the cholera which had struck the men on the very day on which they came down the hill from Kussowlie was considered to be at an end; and the original outbreak had ceased for eight days in the 19th Native Infantry when the reattack commenced in the locality in which cholera so constantly occurs, namely, the lower section of the Grand Trunk Road.

I have little doubt that the two tables given above, show what is the typical fact, that a Regiment moving, without incurring reattack, parts with virulent cholera before the twelfth day. I regard such a body as in the same position as a community over which an air-conveyed cholera has passed.* We picture to ourselves the body occupying a certain encamping ground upon which a cholera-bearing stratum of air has settled; towards morning or later, according to circumstances, cholera begins to show itself, and from this date we reckon that the outbreak has commenced. The march is resumed. But now the Regiment is an infected body, although the district daily traversed may be absolutely free from a cholera capable of manifesting its presence; and the experience above tabulated teaches, that the immediate disappearance of the outbreak is not to be reckoned on, and that the cholera will continue virulent for a definite period of days, not from increase of the virus among the affected body, but from the coming forward in each individual of the virus implanted on the known date.

Type of the outbreak after infection of a Regiment as a body. A. On the march.

One of the instances tabulated is singularly instructive. It is that of the 66th Goorkha Regiment, of which both Wings were simultaneously struck when seventy miles apart, while marching from the plains to the hill stations of Almorah and Lohooghat in March 1857. The Head Quarters encamped in the Terai below Nynee Tal on the 13th March, in a region filled, as in 1867, with the cholera revitalised from the previous year—the great invading cholera of the monsoon of 1856. On the morning of the 14th, the Regiment marched up the hill and encamped beside the Nynee Tal, and here the first man was struck down. The history of the infection is perfect, for cholera is unknown at Nynee Tal.

The tents were struck the same evening, and the Regiment continued its march. The first fatal case admitted was on the 16th; on the 17th two fatal cases occurred; and on the 18th and 19th the virulence of the poison imbibed on the night of the 13th was in full operation, when nineteen fatal cases came forward out of a total of twenty-three. The last fatal case was on the 22nd, but we have no record to show whether or not a few mild cases terminated the outbreak.† Sixty admissions in all occurred in this Wing out of a strength of 611.

66TH GOORKHAS, 1857.
HEAD QUARTERS' STRENGTH 611.
Deaths out of the admissions of each day.

March 16th	1	March 18th	10
„ 17th	2	„ 19th	9
March 22nd	1		

* See Note, page 199.

† A traveller who has passed through this Terai in a season when malarious fever is known to prevail is considered liable to attack up to the eleventh day.

Here is the parallel. The other Wing, 361 strong, reached Birmdeo a week after; and in this evil Terai (see note page 129) the men were affected. The Wing moved daily and reached Lohooghat on the 23rd March. The first fatal case showed itself on the 21st; on the 22nd and 23rd four cases which proved fatal were admitted; the great mortality was on the 24th and 25th, when twenty-six out of a total of thirty-three fatal cases were admitted; and from among the admissions of the two following days, the 26th and 27th, the two last fatal cases occurred. In all there were forty-three admissions and thirty-three deaths out of this Wing. These two cases corroborating each other, come up to my ideal of the type, and exhibit the results of a single infection of which we can tell the date; for almost to an hour we can tell when these Wings were infected.

66TH GOORKHAS, 1857.
STRENGTH OF WING 361.
Deaths out of the admissions of each day.

March	21st 1	March	24th 18
„	22nd 2	„	25th 8
„	23rd 2	„	26th 1
	March 27th 1		

Sometimes the stational outbreak affords a facies which conforms very much to this type, and I cannot but regard this typical aspect of the outbreak as the ultimate aspiration to be hoped for in the event of the extreme of infection having occurred. To allege that the effects of the miasm shall be suddenly aborted or prevented from displaying themselves, by movement subsequent to infection or by other means, is to hold out illusory hopes which are warranted neither by theory nor experience. The most satisfactory result as regards the duration of the outbreak attended the removal of the 42nd Regiment to Cheerat in 1867, and yet out of a strength of 765, 129 men were attacked and sixty-seven died within twelve days. This is an outbreak singularly resembling that of the Goorkhas in 1857, and I conclude that movement effected all that could possibly have been hoped for in both cases. The descent of the miasm on the 19th May determined the immediate victims of the 20th, 21st, and 22nd. The effects showed themselves generally on the 23rd and 24th, and in a minor degree on the 25th and 26th; and the subsequent history is that of a few dropping cases coming forward for four days afterwards.

Type of the outbreak after infection of a Regiment as a body. B. In the Station.

42ND HIGHLANDERS, 1867.

Cholera Deaths.		*Cholera Deaths.*	
May	20th 7	May	25th 5
„	21st 4	„	26th 7
„	22nd 1	„	27th 2
„	23rd 21	„	28th 1
„	24th 18	„	29th 1

The aspect of the outbreak in Her Majesty's 77th and in the Artillery, which did not quit the valley, had no alliance whatever to that of the 42nd.* In the case of the other troops the phenomena were those of the effects of a cholera localised and unable to escape from within the retaining walls, and dying on the spot. The general indications are, however, much the same in both cases. From the 26th May we note in both cases the decline of the invading cholera of the 19th and 20th. Cholera is not absent in the interval between the 26th May and 7th June, but the abeyance of virulence is evident, and I see in the outbreaks between the 8th and 20th June the sprouting of the seed sown on the 19th May, a source of infection which the 42nd escaped altogether by change of locality to an elevation above the cholera level.

Aspect due to retention of bodies within the area of infection. Apparent prolongation of the outbreak throughout the vital period of the reproduction.

EUROPEAN TROOPS AT PESHAWUR, 1867.
(EXCLUDING 42ND REGIMENT).

Dates of admissions of fatal cases.		*Dates of admissions of fatal cases.*	
May	20th 1	June	12th 5
„	21st 2	„	13th 5
„	22nd 3	„	14th 1
„	23rd 1	„	15th 9
„	24th 4	„	16th 3
„	25th 4	„	17th 2
„	26th 5	„	18th 2
„	27th 2	„	19th 3
„	28th 1	„	20th 1
„	29th 2	„	21st 1
„	30th 1	„	22nd 3†
„	31st 2	„	23rd 1
June	1st 0	„	24th 1
„	2nd 1	„	25th 1
„	3rd 2	„	26th 0
„	4th 3	„	27th 0
„	5th 1	„	28th 1
„	6th 3	„	29th 0
„	7th 1	„	30th 0
„	8th 7	July	1st 0
„	9th 1	„	2nd 0
„	10th 5	„	3rd 0
„	11th 4	„	4th 1

Such an example as that of Peshawur in 1867, is not to be held up as a type of the stational outbreak. It is as exceptional as is the case of Morar before tabulated, and has its alliance rather in the Peshawur outbreak of 1862.‡

Before I speak of the aspect of the outbreak normal for a Cantonment or a Jail, I shall instance as parallel with the case of the Morar Cantonment that of the camp before Delhi in 1857 and of the 32nd in the Lucknow Garrison in the same year and at the same season, where the necessity of holding fixed positions extended the outbreak for the entire period of the reproduction. In the case of the Goorkhas, the hour in which the Regiment left the Terai was that of its removal above choleraic influence, and in the case of the 42nd a single march placed it beyond the reach of the miasm. Both were still affected bodies; but there was no miasm of locality to reinfect them, and a period of ten days saw their cholera at an end. The 77th was an infected body, and so also were the Regiments before Delhi and the Garrison of Lucknow; but because these bodies were retained within an infected focus, the duration of their cholera is reckoned by months and not by days.

* I shall allude afterwards to the circumstances determining the ratio of attack in the 42nd Regiment.

† These cases seem to have appeared on the 19th and 20th.

‡ With the death of the spring cholera, the invading cholera of May, the miasm disappeared from the Peshawur Valley. The invading miasm became devitalised after the termination of the spring reproduction on 20th June, and did not reappear during the course of the epidemic, although the same cholera was roused again into epidemic vigour in all the districts of the province lying under primary monsoon influence. This phenomenon is attributable to the normal and enforced decay of spring cholera, and to the fact that in 1867, as in 1856 and 1861, Peshawur lay beyond the reach of the aerial influences of the monsoon months which determine the limits of fresh invasion in July, August, and September.

Case parallel with that of the infection of the Peshawur Cantonment. Ship *Renown*, August 1865.

The case of the *Renown* given by Dr. Sutherland in his Report on Gibraltar, seems to me an instance of the seed sown on a known date, springing into vigour after a period of latency. By a coincidence, the days of the months correspond with those of the Peshawur outbreak, and the parallel can be the more easily read. The *Renown* was infected apparently on the day on which she left Gibraltar, on 19th August 1865. Dr. Sutherland's Report states: "Cholera appeared in the town of Gibraltar on 19th August. On the 21st the Head Quarters Wing of the 19th Regiment went on board the *Renown*; and the next day, the 22nd, the third day after cholera was in the town, the fatal case of cholera referred to in the text took place. The transport was hauled out into the bay and kept for thirty hours, and no subsequent case having occurred she proceeded on her voyage. On the 5th September, a fortnight after the fatal case at Gibraltar, cholera broke out on board the *Renown* and lasted for fourteen days, till the 19th. It was fatal to the ship's surgeon, nine men, one woman, and several children. It is worthy of remark that the period of outbreak on board corresponded to the period of maximum intensity of the epidemic in Gibraltar, although the *Renown* was at the time far on her voyage to the Cape. The Left Wing which took its departure on the very day cholera broke out in the town escaped. The Head Quarters Wing, which left four days later, suffered" (p. 8).

This case appears to me to be a rare and important one. It is a pure illustration of a cholera outbreak of normal duration (fourteen days), with the miasm having a dormancy between the 19th August and 5th September. Compare the Peshawur outbreak. It is a certain truth that Peshawur was struck on 19th May; it is equally a fact that Gibraltar was struck on the 19th August. I regard it as distinctly proved that there was a reappearance of cholera in the Peshawur Valley in the first week of June, and this I attributed at the time to the coming forward into life of the seed sown on 19th May. Here on the 5th September is the same coming forward, although the vessel had been a fortnight at sea, *after exactly the same number of days*. This coming forward of the latent cholera was the origin of the fourteen-day (5th to 19th September) outbreak, of which the parallel is the Peshawur cholera occurring between the 5th and 19th June, after which date cholera was sporadic only (see marginal statement on previous page); and *it coincided with the period of maximum intensity in the Gibraltar Garrison*. It may be suggested that this cholera was latent in the individuals attacked, or that the vessel sailed into a cholera-bearing stratum of air a fortnight after leaving Gibraltar. Neither possibility has any degree of probability attached to it. The germ was evidently brought on board with the Wing. The clothes of the Regiment may have been infected while being washed in anticipation of the voyage, or the regimental baggage may have been infected while lying exposed before being taken on board. In what shape the miasm was introduced must be a mere matter of conjecture, but it is clear that there was the infection of the men or their property; and the test that infection of attendants implies affection of locality, to which I shall have occasion to allude afterwards, holds, for we find that the surgeon of the ship also died. I consider this case to be typical for nearly all outbreaks clearly originating on board ships, and we are fortunate in being able to illustrate it by such a parallel as the infection of the Peshawur Valley in 1867.

The following is an example of the minimum duration of an outbreak due to the fact of the cholera miasm having been taken on board in some form, probably in a dormant state. Since both the crew and the troops suffered, and since the duration of the outbreak was limited to eleven days, the inference is that the poisoning took place within a very short period, and from a cholera emanating from some special part of the ship or portion of its cargo. Dr. Tulloch, of Her Majesty's Service, makes the following communication in his answer to Dr. Murray's circular regarding the origin and treatment of cholera:—

"On the 21st May 1859, I embarked at Calcutta on the Ship *Gertrude*, in medical charge of a party of wounded and other invalid soldiers for England. Cholera was then universally prevalent in Calcutta, and in several troop ships that had sailed earlier in the season, the disease broke out when they were in the river—a circumstance which caused serious apprehension for our safety at this advanced season, and, I may add, led to our using every available sanitary precaution. Having reached the equator without any signs of cholera, we congratulated ourselves on what we believed to be our escape. But it was not so; for on the 15th of June, when in the 4th degree of south latitude, and 24 days from all communication with the shore, hundreds of miles from land, the weather hot and steamy, but not unusual for that latitude, a soldier, invalided for ophthalmia (then convalescent from dysentery contracted on board), was seized in the morning and died next day. On the same morning, the Chief Officer of the ship, perhaps the strongest and healthiest man on board, was seized and died in three and half hours. In the afternoon, a soldier's child, a boy six years of age, was attacked and died on the following morning. On the 20th, a soldier recovering from dysentery, was attacked and died on the 21st; and on the 25th, a strong healthy sailor was seized and died next day."

Camp before Delhi, and the Lucknow Garrison, 1857.

A Statement to illustrate the persistence of cholera throughout the life-period of the Reproduction.

Date of Admission.		Total deaths of each day.	Died out of the admissions of each day during the siege.										
			Artillery.	6th D. Guards.	1-60th Rifles.	9th Lancers.	1st Fusiliers.	2nd Fusiliers.	75th Regiment.	8th Regiment.	52nd Regiment.	61st Regiment.	Lucknow Garrison, 32nd Regiment.
June	9	...	...	...	...	...	...	...	...	...	...	...	1
,,	10	...	...	...	...	...	...	...	...	...	...	...	1
,,	11	2	1	...	1	...	...	...	...	...	...	...	1
,,	12	...	...	...	...	...	...	...	...	...	...	...	1
,,	13	2	...	...	...	1	...	1	...	...	...	...	...
,,	14	1	...	...	...	...	...	1	...	...	...	...	1
,,	15	...	...	...	...	...	...	...	...	...	...	...	1
,,	16	1	...	...	...	...	1	...	...	...	...	...	...
,,	17	2	1	...	...	...	...	1	...	...	...	...	...
,,	18	3	...	...	...	...	1	2	...	...	...	...	2
,,	19	...	...	...	...	...	...	...	...	...	...	...	...
,,	20	5	1	...	1	...	...	3	...	...	...	...	...
,,	21	3	...	1	...	...	...	2	...	...	...	...	...
,,	22	1	...	...	...	...	...	1	...	...	...	...	...
,,	23	2	1	...	1	...	...	...	...	...	...	...	1
,,	24	...	...	...	...	...	...	...	...	...	...	...	...
,,	25	4	1	...	1	...	2	...	...	...	...	...	...
,,	26	2	...	...	1	...	1	...	...	...	...	...	...
,,	27	3	1	...	...	...	1	1	...	...	...	...	1
,,	28	5	2	2	...	...	1	...	...	...	...	...	2
,,	29	5	1	1	...	1	...	...	2	...	...	...	...
,,	30	2	...	...	...	...	...	...	1	...	...	1	...
July	1	4	...	...	...	1	1	...	...	1	...	1	...
,,	2	9	...	...	...	...	...	1	2	4	...	2	...
,,	3	3	...	...	1	1	...	...	...	1	...	...	1
,,	4	3	1	...	...	...	...	...	...	1	...	1	...
,,	5	5	...	...	...	...	1	...	...	1	...	3	2
,,	6	6	1	...	...	...	...	...	...	1	...	4	3
,,	7	5	...	...	...	...	...	...	1	1	...	3	1
,,	8	5	...	...	...	...	...	...	...	2	...	3	2
,,	9	7	...	...	...	...	...	...	...	2	...	5	...
,,	10	16	...	...	2	...	...	1	1	7	...	5	...
,,	11	5	...	...	...	...	2	...	...	3	...	...	...
,,	12	8	...	...	...	...	...	...	1	3	...	4	...
,,	13	4	...	...	...	...	...	...	...	3	...	1	2
,,	14	1	...	...	...	...	...	...	...	...	...	1	3
,,	15	7	...	1	...	...	2	1	...	1	...	2	1
,,	16	1	...	...	...	...	...	...	1	...	...	...	...
,,	17	5	1	...	...	...	1	2	...	1	...	...	...
,,	18	6	...	...	...	1	3	1	1	...	...	...	...
,,	19	3	...	...	...	...	2	...	...	...	...	1	...
,,	20	5	...	1	...	...	...	1	2	1	...	...	...
,,	21	4	1	...	...	...	2	...	1	...	...	...	...
,,	22	7	...	...	1	1	...	3	...	...	...	2	...
,,	23	1	...	...	...	...	...	...	1	...	...	...	...
,,	24	3	...	1	1	...	...	...	...	...	...	1	1
,,	25	2	1	...	...	...	...	...	...	...	...	1	...
,,	26	2	...	...	...	...	...	1	...	1	...	...	1
,,	27	3	...	...	...	...	...	1	...	1	...	1	...
,,	28	1	...	...	1	...	...	...	...	...	...	...	...
,,	29	...	...	...	...	...	...	...	...	...	...	...	...
,,	30	...	...	...	...	...	...	...	...	...	...	...	...
,,	31	...	...	...	...	...	...	...	...	...	...	...	1
August	1	...	...	...	...	...	...	...	...	...	...	...	...
,,	2	2	...	...	...	...	1	...	...	1	...	...	...
,,	3	1	...	1	...	...	...	...	...	...	...	...	1
,,	4	2	1	...	...	1	...	...	...	...	...	...	2
,,	5	...	...	...	...	...	...	...	...	...	...	...	...
,,	6	1	...	...	...	...	...	...	1	...	...	...	...
,,	7	...	...	...	...	...	...	...	...	...		...	...
,,	8	...	...	...	...	...	...	...	...	...	...	...	...
,,	9	1	...	...	...	...	...	1	...	...	...	...	...
,,	10	...	...	...	...	...	...	...	...	...	...	...	...
,,	11	...	...	...	...	...	...	...	...	...	...	...	...
,,	12	...	...	...	...	...	...	...	...	...	...	...	2
,,	13	1	...	...	1	...	...	...	...	...	...	...	...
,,	14	1	...	...	1	...	...	...	...	...	...	...	...
,,	15	1	...	1	...	...	...	...	...	...	...	...	1

Continued on following page.

Deaths during the Sieges of Delhi and Lucknow,—continued.

Date of Admission.		Total deaths of each day.	Died out of the admissions of each day during the siege.										
			Artillery.	6th D. Guards.	1-60th Rifles.	9th Lancers.	1st Fusiliers.	2nd Fusiliers.	75th Regiment.	8th Regiment.	52nd Regiment.	61st Regiment.	Lucknow Garrison, 32nd Regiment.
August	16	...	.....	.....	...	...	...	...	...	...	...	...	.....
,,	17	5	2	.....	...	...	...	...	...	...	...	3	.....
,,	18	1	.....	.....	...	...	...	1	...	...	...	...	.....
,,	19	4	.....	.....	1	...	...	1	...	...	...	2	.....
,,	20	8	.....	.....	...	...	1	...	...	...	3	4	.....
,,	21	6	.....	.....	...	...	...	...	...	...	2	4	.....
,,	22	5	1	.....	...	...	...	...	...	...	1	3	.....
,,	23	14	1	.....	1	...	...	...	...	1	2	9	...
,,	24	5	.....	.....	...	...	...	...	...	.	2	3	1
,,	25	3	.....	.....	...	...	...	...	...	...	1	2	.....
,,	26	4	.....	.....	...	...	...	...	...	...	3	1	.....
,,	27	5	.....	.....	...	...	...	...	...	...	3	2	.....
,,	28	9	2	.....	...	...	...	...	...	...	3	4	.....
,,	29	8	1	.....	...	...	...	...	...	...	1	6	.....
,,	30	7	1	.....	...	...	...	...	...	...	1	5	.....
,,	31	6	.....	.....	...	...	1	...	1	...	1	3	.....
Sept.	1	6	.....	.....	...	...	1	...	...	...	1	4	1
,,	2	...	.....	.....	...	...	...	...	...	...	...	...	.....
,,	3	3	.....	.....	...	...	...	...	...	.	1	2	.....
,,	4	4	.....	.....	...	...	...	...	...	...	2	2	.....
,,	5	5	.....	.....	...	...	1	...	...	1	2	1	1
,,	6	5	.....	.....	...	...	...	...	...	2	2	1	.....
,,	7	6	.....	.....	...	...	...	...	...	2	3	1	1
,,	8	8	3	.....	...	...	1	2	..	...	...	2	.....
,,	9	8	2	.....	...	...	...	...	...	...	4	2	.....
,,	10	6	2	1	1	...	...	...	...	1	...	1	.....
,,	11	5	.....	.....	...	...	...	...	...	5	...	...	.....
,,	12	7	1	1	2	...	...	...	...	...	3	...	.....
,,	13	6	3	.....	...	...	...	1	...	...	2	...	.....
,,	14	5	1	.....	...	...	...	1	...	...	2	1	.....
,,	15	1	.....	.....	...	...	...	1	...	...	...	...	.....
,,	16	2	.....	.....	...	...	...	...	...	1	1	...	.....
,,	17	3	.....	.....	...	...	...	...	...	2	1	...	.....
,,	18	4	.....	.....	...	...	1	...	...	3	...	...	.....
,,	19	5	1	.....	...	...	2	2	...	...	...	...	.....
,,	20	1	.....	.....	1	...	..	...	...	...	...	...	.....
,,	21	2	.....	.....	...	...	1	...	...	...	...	1	.. ...
,,	22	...	.....	.....	...	...	...	...	...	...	...	...	.....
,,	23	3	.....	.....	1	...	1	...	...	...	...	1	.....
,,	24	4	.....	.....	...	...	...	...	...	...	1	3	.....
,,	25	4	.....	.....	...	...	1	1	...	...	1	1	.....
,,	26	3	.....	.....	...	...	1	...	...	1	...	1	.....
,,	27	1	.....	.....	...	...	...	...	...	...	1	...	.....
,,	28	...	.....	.....	...	...	...	...	...	...	...	...	.....
,,	29	8	.....	.....	...	...	...	2	...	...	...	6	.....
,,	30	4	.....	.....	...	...	...	1	1	...	...	2	.....
October	1	4	1	.....	1	...	2	...	...	...	..	...	.....
,,	2	3	1	.....	...	...	...	1	...	...	...	1	.....
,,	3	3	.....	.....	...	...	...	1	...	...	1	1	.....
,,	4	4	1	1	...	...	...	1	...	...	...	1	.....
,,	5	1	.....	.....	...	...	...	...	...	...	..	1	.....
,,	6	...	.....	.....	...	...	...	...	...	...	...	...	.....
,,	7	2	.....	.....	...	...	...	...	...	...	...	2	.....

In the case of the Morar Cantonment (see Table, p. 174), the date of invasion is seen to be between July 10th and 25th in each of the five years of infection, and the date of disappearance in each is as follows :—September 11th, 16th, 18th, 20th and 27th ; and we may, therefore, roughly estimate the duration of the outbreak as two months. I have shown the date of appearance at Meean Meer to be generally nearly a month later, and yet the termination falls exactly as in the case of Morar, being in the six cases below tabulated (including Ferozepore, 1856,) September 8th, 15th, 16th, 22nd, 28th, and 1st October. The phenomenon is precisely the same illustrated in the case of Morar, namely, local infection up to the natural decay of the reproduction. I have added the case of Her Majesty's 46th Regiment at Cawnpore in 1863, to show that even in the eastern division the very same persistence may occur; the 46th carried cholera typically from the 17th July to 26th September.

Further examples of protraction throughout the reproduction.

Further examples of the stational outbreak protracted throughout the life-period of the reproduction—Ferozepore, Meean Meer, Lahore, Cawnpore.

1856, H. M.'s 70th Regt., Ferozepore.		1856, H. M.'s 81st Regt., Meean Meer.		1861, Admissions, all Corps,* Meean Meer.		1862, H. M.'s 10th Regt., Meean Meer.		1856, Admissions, Lahore Jail.		1862, Deaths, Lahore Jail.		1863, H. M.'s 46th Regt., Cawnpore.	
August	7, 1	August	15, 2	August	6, 1	August	14, 1	August	20, 1	August	2, 2	July	17, 1
,,	12, 1	,,	16, 3	,,	8, 2	,,	25, 7	,,	21, 1	,,	5, 3	,,	22, 1
,,	13, 2	,,	17, 2	,,	9, 5	,,	26, 6	,,	22, 3	,,	7, 2	,,	29, 1
,,	14, 3	,,	18, 2	,,	10, 8	,,	27, 12	,,	23, 1	,,	8, 2	,,	30, 1
,,	15, 1	,,	19, 2	,,	11, 5	,,	28, 5	,,	24, 11	,,	9, 1	,,	31, 1
,,	16, 10	,,	20, 3	,,	12, 3	,,	29, 8	,,	25, 10	,,	10, 4	August	1, 1
,,	17, 9	,,	21, 2	,,	13, 4	,,	30, 3	,,	26, 15	,,	11, 2	,,	3, 1
,,	18, 4	,,	22, 13	,,	14, 26	,,	31, 6	,,	27, 28	,,	12, 1	,,	4, 1
,,	19, 6	,,	23, 6	,,	15, 43	Sept.	1, 2	,,	28, 35	,,	13, 2	,,	5, 4
,,	20, 2	,,	24, 6	,,	16, 38	,,	2, 2	,,	29, 40	,,	15, 1	,,	6, 1
,,	21, 2	,,	25, 9	,,	17, 30	,,	3, 3	,,	30, 38	,,	16, 1	,,	7, 1
,,	22, 8	,,	26, 3	,,	18, 41	,,	4, 3	,,	31, 57	,,	18, 3	,,	15, 1
,,	23, 5	,,	27, 8	,,	19, 28	,,	5, 1	Sept.	1, 47	,,	19, 3	,,	25, 2
,,	24, 6	,,	28, 10	,,	20, 45	,,	6, 3	,,	2, 29	,,	20, 3	,,	31, 1
,,	25, 3	,,	29, 4	,,	21, 80	,,	7, 1	,,	3, 33	,,	22, 1	Sept.	12, 1
,,	26, 3	,,	31, 1	,,	22, 64	,,	9, 1	,,	4, 23	,,	23, 3	,,	13, 1
,,	27, 3	Sept.	1, 1	,,	23, 58	,,	10, 1	,,	5, 4	,,	28, 2	,,	14, 1
,,	30, 2	,,	2, 1	,,	24, 45	,,	11, 1	,,	6, 8	,,	31, 1	,,	20, 1
,,	31, 1	,,	3, 9	,,	25, 50	,,	*	,,	7, 4	Sept.	2, 2		
Sept.	1, 1	,,	4, 5	,,	26, 53	,,	22, 1	,,	8, 4	,,	4, 1		
,,	2, 2	,,	5, 2	,,	27, 42	,,	26, 2	,,	9, 1	,,	5, 1		
,,	4, 3	,,	6, 5	,,	28, 41	October	1, 1	,,	10, 2	,,	8, 1		
,,	5, 2	,,	7, 5	,,	29, 43			,,	11, 1				
,,	6, 1	,,	8, 1	,,	30, 23			,,	12, 1				
,,	7, 3	,,	9, 4	,,	31, 18			,,	13, 1				
,,	8, 1	,,	11, 4	Sept.	1, 17			,,	14, 0				
,,	9, 1	,,	13, 3	,,	2, 8			,,	15, 0				
,,	11, 1	,,	17, 2	,,	3, 15			,,	16, 1				
,,	15, 1	,,	18, 1	,,	4, 10								
,,	19, 1	,,	19, 1	,,	5, 4								
,,	22, 1	,,	22, 1	,,	6, 7								
		,,	23, 1	,,	8, 3								
		,,	28, 1	,,	9, 3								
				,,	11, 4								
				,,	12, 1								
				,,	15, 3								

The one grand and incontrovertible fact apparent from all this is, that while the outbreak may be prolonged up to the period of the natural decay of the reproduction, it cannot be prolonged beyond it. This is a primary truth of the same value as that which I have previously determined, that epidemic cholera cannot be introduced into and propagated within a natural province in which it is not due at the time. I do not discuss here the question how it comes about, that while in the endemic province or on the march, the tenth day sees the end of the outbreak, the normal duration in stations of the epidemic area is often six times as long. I go on meantime to show what is the aspect of the outbreak in different localities, viewed apart from any circumstances which may possibly affect its facies.

The outbreak in cantonments and jails.

Between the extremes determined by immediate removal from the sphere of the influence of the miasm, and by local persistence throughout the reproduction, fall the great majority of all outbreaks. I would not have it supposed that the fact of remaining in the same position subsequent to infection on a known day necessarily determines the lengthening out of the outbreak. I think, however, that we are warranted in dreading that such may be the case in any station of the epidemic area. This I say as the result of experience. It is a very curious fact that among European Troops the minimum of the duration of cholera outbreaks should be found in the endemic province. The following table includes all the regular outbreaks which I have been able to collect, and I reckon them to be typical for the duration of the outbreak in Lower Bengal. Sometimes the effect of the air-borne miasm is even more transient, as in the case of all outbreaks in Fort William that have occurred since 1860, and in the three remarkable attacks of the Chinsurah Depôt in 1868. In the latter fourteen men were lost—four in the first outbreak, between April 7th and 16th; five in the second, between May 20th and 22nd;† and five in the third, on June 20th and 21st.

The outbreak in Lower Bengal.

European Troops—Date of the Admissions of Fatal Cases.

Fort William, 53rd Regiment, 1856.		Fort William, 37th Regiment, 1857.		Chinsurah,* 84th Regiment, 1857.		Barrackpore, 67th Regiment, 1859.		Barrackpore, Recruit Depôt, 1859.		Dum-Dum, Artillery Depôt, 1859.		Dum-Dum, Depôt H. M.'s Troops, 1859.		Dum-Dum, 3rd Buffs, 1859.	
	Died.		Died.		Died.		Died.		Died.		Died.		Died.		Died.
August	30 2	June	17 6	April	2 1	Aug.	8 2	Aug.	5 2	Aug.	9 1	Aug.	10 4	Aug.	10 3
,,	31 6	,,	18 1	,,	3 6	,,	9 3	,,	6 1	,,	10 10	,,	11 1	,,	11 1
Sept.	1 6	,,	19 7	,,	4 2	,,	10 3	,,	8 1	,,	11 6	,,	14 2	,,	13 1
,,	2 2	,,	20 1	,,	5 2	,,	12 1	,,	11 2	,,	12 10	,,	15 1	,,	16 1
,,	3 1	,,	21 4	,,	6 1	,,	14 1	,,	13 2	,,	13 15		* *		
,,	4 3	,,	23 2	,,	7 1	,,	15 3	,,	* *	,,	14 7	,,	27 1		
,,	5 3	,,	24 1	,,	8 1			,,	27 2	,,	17 1				
,,	6 3			,,	9 1			,,	29 1	,,	19 1				
				,,	10 1						* *				
					* *					,,	23 1				
				,,	13 1					,,	24 1				
				,,	16 2					,,	25 2				

* Including women and children.

† On the very same day the detachment of the 25th Regiment was struck at Berhampore, and two men died on 22nd and 23rd.

These examples show the outbreak in its purest type, unaffected from beginning to end by any adventitious circumstances; for, as far as I know, every one of these outbreaks was treated throughout in the barracks in which it commenced. These are probably examples of infection at a certain hour from an air-borne cholera from which no localisation of the miasm occurred, as pure as those in which the Goorkhas were affected in March 1857 from sleeping for the night in the cholera-bearing atmosphere of the Terai. The type is the very same as that of the outbreak of the 42nd, struck on the 19th May 1867, as truly as Dum-Dum was struck on the 9th August in 1859.

The affection of Native Troops in Lower Bengal shows rather the fact that at any time during the prevalence of epidemic cholera, men are liable to be picked off, than anything coming up to my idea of an outbreak. The cases are generally attributed to the effects of night guards in different parts of Calcutta, especially those close to the bank of the river, the Mint guard, and the guard of the Bank of Bengal. In the epidemic of 1866 the distribution of the deaths of the Native Regiments was as under:—

Sporadic character of the manifestation of epidemic cholera in the Native Regiments of Bengal Proper. Deaths during the prevalence of epidemic cholera in the spring of 1866.*

Alipore, 1866, 26th N. I.		Alipore, 1866, 36th N. I.		Fort William, 1866, 17th N. I.		Fort William, 1866, 34th N. I.	
April	7, 1	February	14, 1	May	12, 1	January	20, 1
„	12, 2	March	1, 1	„	15, 1	„	22, 1
„	14, 2	„	8, 1	June	13, 1	„	31, 1
„	25, 1	„	23, 1	July	2, 1	February	14, 1
May	1, 1	„	27, 1	„	3, 1	March	27, 1
„	2, 1	„	30, 1	„	29, 1	„	29, 2
„	6, 1	April	2, 1	August	28, 1	„	30, 1
		May	27, 1			April	4, 1
		June	19, 1			„	12, 1
		„	30, 1				

Here there is no tendency shown to accumulation; almost every case seems to stand isolated.

Aspect of the Outbreak in the Jails of Lower Bengal.

With reference to the table which follows, I must premise that I have been compelled to make selections and occasionally to exclude instances in which the provincial infection was represented in outline. To compensate for this, while showing the facies of sixty-seven outbreaks occurring in the jails of Lower Bengal between 1859 and 1867, I have taken the entire mortality of the jails of the Behar Provinces in the invasion of 1866, and exhibited it day by day up to the end of the reproduction; the mortality of 1860 of the same province could have been accurately represented only by a similar arrangement.

Making allowance for this, we cannot help observing how singularly the facies of the total is allied to what we have found true in the case of Regiments on the march and among the European Troops in the endemic province. Of the total mortality, 58 per cent. is included within the first seven days from the commencement of the outbreak; 90 per cent. within the first fourteen days; and 10 per cent. only occurred after the fourteenth day, and this last ratio would have been still further diminished could the cases of re-infection have been separated. In this aggregate there is no spindle shape, no swell in the centre, to point to propagation from man to man. And it must not be lost sight of, that one and all of these outbreaks were treated from first to last within the prison walls, and that the outbreak therefore died naturally, without the abbreviation which might otherwise have been attributable to change of locality.

* This was the manifestation in Calcutta and the neighbourhood, of the epidemic invading the Behar Provinces in July 1866, and Northern India in 1867.

Statements to illustrate the duration of the outbreak among Prisoners.

I.—Outbreaks of the Jail Population of Bengal Proper and the Behar Provinces, 1859-67.

Jail.	Day of commencement of the outbreak.	Number of Deaths out of the Admissions of each day of the outbreak.																										
		1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.	21st day.	22nd day.	23rd day.	24th day.	25th day.	26th day.	27th day.
Burdwan ...	June 16, 1859 ...	1	...	3	1	2	2	5	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rajshahye ...	May 12, „ ...	1	...	1	1	...	2	1	2	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Backergunge ...	November 18, „ ...	3	1	1	2	3	1	4	...	2	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Monghyr ...	July 13, „ ...	1	1	1	...	1	1	...	1	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bhaugulpore ...	May 8, „ ...	1	...	1	2	4	4	3	2	1	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ditto ...	August 14, „ ...	1	1	...	...	...	...	3	2	1	1	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Purneah ...	May 25, „ ...	3	...	2	...	2	1	...	1	...	1	1	...	...	...	1	...	1	...	...	2	...	...	...	...	...	...	...
Patna ...	October 29, „ ...	1	1	...	1	...	3	3	...	...	1	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Dinagepore ...	May 23, 1860 ...	1	...	1	1	1	1	...	...	...	3	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymensingh ...	March 24, „ ...	1	...	...	1	1	2	...	...	...	...	1	1	...	...	...	2	...	...	1	...	...	1	...	3	...	...	...
Gowalparah ...	May 4, „ ...	3	3	1	6	1	8	2	3	...	1	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Gowhatty ...	September 21, „ ...	1	...	2	4	...	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ditto ...	October 6, „ ...	1	...	...	2	...	1	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Midnapore ...	March 20, „ ...	1	...	...	1	4	...	2	...	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ditto ...	June 16, „ ...	1	19	16	3	5	4	2	...	2	2	1	...	2	1	...	...	...	...	1	...	...	...	...	...	...	...	...
Hazareebaugh ...	May 4, „ ...	1	1	...	2	2	3	4	...	1	4	...	3	2	4	...	...	...	...	2	...	...	...	...	...	...	...	...
Monghyr ...	April 6, „ ...	2	2	...	1	4	2	1	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bhaugulpore ...	March 11, „ ...	1	...	...	1	1	...	1	2	1	1	2	...	...	1	1	1	3	...	1	...	2	..	2	1	2	...	...
Purneah ...	„ 31, „ ...	1	1	1	...	1	1	1	2	...	5	1	1	2	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Gyah ...	August 2, „ ...	3	4	...	3	3	1	1	...	2	1	1	...	...	2	...	...	1	1	1	3	...	...	...	...	...	...	...
Patna ...	July 23, „ ...	1	1	...	1	...	...	...	1	1	1	...	...	...	1	...	...	...	...	1	...	1	...	1	...	...	...	...
Arrah ...	„ 13, „ ...	3	...	4	6	10	6	4	1	1	3	1	...	2	...	1	...	...	...	2	...	..	...	...	...	...	...	...
Mozufferpore ...	September 11, „ ...	1	3	...	...	1	2	1	...	1	1	...	...	...	...	...	...	...	...	...	...	1	.	...	...	..	...	...
Sooree ...	May 17, 1861 ...	8	5	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Mymensingh ...	„ 25, „ ...	2	...	2	1	...	1	...	1	...	...	1	...	...	...	...	...	...	1	...	...	...	..	...	...	...	...	...
Ditto ...	October 27, „ ...	1	...	4	3	3	2	2	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...
Bhaugulpore ...	April 5, „ ...	1	2	2	3	2	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patna ...	July 3, „ ...	1	...	...	1	6	...	...	2	...	...	1	1	...	...	...	1	1	...	...	...	...	..	...	...	...	...	...
Deegah ...	April 7, „ ...	1	...	...	2	1	...	1	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferpore ...	May 2, „ ...	1	...	...	1	...	1	...	...	...	1	2	...	...	...	...	...	...	...	..	...	...	...	...	1	...	...	...
Monghyr ...	April 13, 1862 ...	1	...	...	...	1	6	2	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bhaugulpore ...	„ 4, „ ...	1	...	...	...	...	2	1	3	1	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Hooghly ...	October 31, 1863 ...	1	3	4	...	1	2	3	...	2	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Backergunge ...	March 18, „ ...	1	...	1	...	2	...	1	...	3	2	1	3	1	...	...	...	...	...	...	1	...	...	1	...	1	...	...
	Carried over ...	53	48	47	51	63	62	50	30	21	40	18	18	15	13	5	8	6	3	10	6	4	1	4	5	3	...	...

Statement to illustrate the duration of the outbreak among Prisoners,—continued.

I.—Outbreaks of the Jail Population of Bengal Proper and the Behar Provinces, 1859-67.

Jail.	Day of commencement of the outbreak.	Number of Deaths out of the Admissions of each day of the Outbreak.																										
		1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.	21st day.	22nd day.	23rd day.	24th day.	25th day.	26th day.	27th day.
	Brought forward ...	53	48	47	51	63	62	50	30	21	40	18	18	15	13	5	8	6	3	10	6	4	1	4	5	3	...	...
Backergunge ...	November 28, 1863 ...	2	...	2	1	2	...	2	1	...	2	...	3	2	1	1	1	...	...	...	1	...	...	1	1	1	...	...
Hazareebaugh ...	August 16, „ ...	1	...	1	...	1	...	...	...	...	2	...	...	1	1	1	...	1	...	1	...	...	...	...	...	...	...	...
Monghyr ...	March 17, „ ...	1	...	...	3	4	1	...	2	5	...	3	...	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Ditto ...	July 4, „ ...	1	...	...	...	...	...	...	...	1	...	2	2	...	5	1	...	1	...	...	...	...	...	...	...	...	...	...
Bhaugulpore ...	March 25, „ ...	1	...	...	...	...	1	1	5	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Purneah ...	„ 7, „ ...	9	1	10	11	13	7	10	2	11	2	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Gyah ...	July 28, „ ...	1	...	...	...	1	...	1	1	...	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...
Patna ...	March 12, „ ...	1	1	...	...	1	1	...	1	1	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ditto ...	July 24, „ ...	1	...	1	1	...	1	2	...	...	1	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferpore ...	May 4, „ ...	1	3	...	...	1	...	1	3	...	...	1	...	...	1	...	...	...	3	...	1	...	...	...	...	...	...	...
Chupra ...	July 6, „ ...	1	1	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jessore ...	April 3, 1864 ...	1	1	1	3	3	3	1	3	...	4	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bancoorah ...	March 5, „ ...	1	1	...	2	1	...	...	...	3	...	...	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...
Rajmahal ...	May 19, „ ...	1	2	2	2	3	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dinagepore ...	April 12, „ ...	1	5	1	3	1	3	2	2	2	3	1	2	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Rajshahye ...	February 18, „ ...	1	...	1	...	...	...	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Ditto ...	March 22, „ ...	1	...	...	4	2	1	1	2	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...
Sumbulpore ...	April 16, „ ...	1	...	1	...	4	3	1	3	...	...	3	8	8	4	3	4	1	...	...	...	...	...	...	...	...	...	...
Bhaugulpore ...	June 8, „ ...	1	...	1	1	...	...	...	...	...	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Patna ...	April 3, „ ...	1	...	...	...	...	...	...	...	1	...	1	2	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...
Bancoorah ...	March 23, 1865 ...	1	...	...	1	1	1	...	1	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Gowhatty ...	April 3, „ ...	1	1	3	3	1		2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	October 17, „ ...	1	...	...	...	...	2	1	1	...	...	...	3	4	2	1	1	...	4	...	...	...	...	...	...	...	...	...
Purneah ...	April 10, „ ...	4	1	2	1	7	1	1	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patna ...	„ 8, „ ...	1	...	...	...	...	...	...	2	...	1	3	2	3	2	2	...	1	1	...	2	...	...	...	...	...	...	...
Deegah ...	„ 18, „ ...	2	..	...	...	...	1	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chupra *(a)* ...	July 19, „ ...	3	...	1	...	4	...	...	...	1	3	...	...	...	...	...	1	...	:	...	...	...	...	...	...	...	...	...
Chupra *(b)* ...	October 6, „ ...	1	1	1	...	...	1	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	April 9, 1867 ...	1	4	3	2	...	...	1	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Monghyr ...	July 15, „ ...	1	...	...	1	...	...	4	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Purneah ...	April 30, „ ...	1	2	2	5	5	8	6	...	3	1	3	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deegah ...	August 25, „ ...	1	...	1	...	1	...	...	1	...	2	2	5	4	3	2	2	2	...	...	...	...	...	...	...	...	...	...
Patna ...	October 26, „ ...	1	...	1	1	1	...	...	1	3	2	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Total of the above outbreaks ...		101	72	82	96	120	100	90	63	60	69	47	52	46	38	19	18	15	12	13	14	4	1	6	6	4	...	...

Jails of the Behar Provinces—Cholera Deaths in the Invading Cholera of July 1866.

DEATHS OF EACH DAY.

DATE.		HAZAREEBAUGH.	GYAH.	BHAUGULPORE.	MONGHYR.	PATNA.	DERGAH.	ARRAH.*	CHUPRA.	MOZUFFERPORE.	CHUMPARUN.
		Strength 689.	Strength 649.	Strength 341.	Strength 468.	Strength 571.	Strength 605.	Strength 492.	Strength 499.	Strength 457.	Strength 286.
June	24	1	.....	.....	.....	.....	.....	.....	1	.....	...
,,	25	1	.....	.....	.....	.....	.....	.....	1	.....	...
,,	26	1	.....	.....	.....	.....	.....	.....	1	.....	...
,,	29	1	.....	.....	.....	.....	.....	.....	.....	.....	...
,,	30	...	1	.....	.....	.....	.....	.....	1	.....	...
July	1	...	.....	.....	.....	.....	.....	.....	1	.....	...
,,	2	...	.....	.....	.....	.....	.....	.....	2	.....	...
,,	3	...	.....	.....	.....	.....	.....	.....	.....	.....	...
,,	4	...	.....	.....	.....	.....	.....	.....	.....	.....	...
,,	5	...	1	.....	.....	.....	.....	.....	.....	.....	...
,,	6	...	.....	.....	.....	.....	.....	.....	1	.....	...
,,	7	...	2	.....	.....	.....	.....	.....	1	.....	...
,,	8	...	1	.....	.....	.....	.....	.....	1	.....	...
,,	9	1	.....	.....	.....	.....	.....	.....	.....	.....	...
,,	10	...	.....	.....	.....	.....	.....	.....	1	1	...
,,	11	...	.....	.....	.....	.....	.....	.....	1	.....	...
,,	12	...	.....	.....	.....	.....	.....	.....	1	1	...
,,	13	...	.....	.....	.....	.....	.....	.....	.....	5	...
,,	14	1	.....	.....	.....	.....	.....	.....	.....	1	...
,,	15	2	.....	.....	.....	.....	.....	.....	.....	1	...
,,	16	...	.....	.....	.....	.....	.....	.....	.....	2	...
,,	17	1	2	.....	.....	.....	.....	.....	2	2	...
,,	18	2	.....	.....	.....	.....	.....	...	.....	1	...
,,	19	4	.....	.....	.....	.....	.....	1	.....	.....	...
,,	20	4	.....	.....	.....	.....	1	.....	1	1	...
,,	21	1	.....	.....	.....	.....	1	3	.....	1	...
,,	22	10	.....	.....	.....	.....	.....	.....	1	.....	...
,,	23	7	.....	.....	.....	.....	.....	2	.....	.....	...
,,	24	9	.....	.....	.....	.....	.....	.....	.....	.....	...
,,	25	8	.....	.....	.....	.....	.....	.....	.....	.....	...
,,	26	3	1	.....	.....	.....	.....	1	.....	1	...
,,	27	4	.....	.....	.....	.....	1	3	.....	.....	...
,,	28	1	.....	.....	.....	.....	.....	1	.....	.....	...
,,	29	3	.....	.....	.....	.....	.....	.....	.....	.....	...
,,	30	...	.....	.....	.....	.....	1	.....	.....	.....	...
,,	31	3	.....	.....	.....	.....	.....	1	.....	.....	...
August	1	2	.....	.....	.....	.....	1	1	.....	.....	...
,,	2	3	.....	.....	.....	.....	.....	.....	.....	.....	...
,,	3	1	.....	.....	.....	.....	2	1	.....	.....	...
,,	4	...	.....	.....	1	.....	4	1	.....	.....	...
,,	5	...	.....	1	.....	.....	1	1	.....	.....	...
,,	6	...	.....	.....	.....	.....	.....	.....	.....	.....	1
,,	7	...	.....	.....	3	.....	1	.....	.....	.....	...
,,	8	1	1	.....	.....	.....	4	.....	.....	.....	...
,,	9	...	1	1	1	.....	1	.....	.....	.....	...
,,	10	2	.....	.....	.....	.....	2	.....	.....	.....	...
,,	11	...	.....	2	.....	.....	1	.....	.....	.....	...
,,	12	...	.....	1	.....	.....	.....	.....	.....	.....	...
,,	13	...	.....	.....	.....	.....	1	1	.....	.....	...
,,	14	...	.....	2	.....	.....	.....	.....	.....	.....	...
,,	15	1	.....	2	.....	.....	.....	1	.....	.....	1
,,	16	...	.....	1	.....	.....	.....	1	.....	.....	...
,,	17	...	.....	.....	.....	.....	1	.....	.....	.....	1
,,	18	...	.....	.....	.....	.....	1	1	.....	.....	2
,,	19	...	.....	1	.....	.....	.....	.....	.....	.....	2
,,	20	...	.....	2	.....	.....	.....	.....	.....	.....	...
,,	21	...	.....	.....	1	3	.....	1	.....	.....	2
,,	22	...	.....	.....	.....	1	.....	.....	.....	.....	1
,,	23	...	.....	.....	.....	.....	.....	.....	.....	.....	2
,,	24	1	.....	.....	.....	1	.....	.....	.....	.....	...
,,	25	...	.....	.....	.....	1	.....	.....	.....	.....	...
,,	26	...	.....	.....	.....	1	.....	.....	.....	.....	1
,,	27	...	.....	.....	.....	.....	.....	.....	.....	.....	...
,,	28	...	.....	.....	.....	1	.....	.....	.....	.....	...
,,	29	...	.....	.....	.....	1	.....	.....	.....	.....	...
,,	30	...	.....	.....	.....	1	.....	.....	.....	.....	...
,,	31	...	.....	.....	.....	1	.....	.....	.....	.....	1
September	1	...	.....	.....	.....	1	.....	.....	.....	.....	...
,,	2	...	.....	.....	.....	1	.....	.....	.....	.....	...
,,	3	...	.....	.....	.....	.....	.....	.....	.....	.....	1
TOTAL	...	79	10	13	6	13	24	21	17	17	15

* This jail had an additional outbreak between 14th October and 18th November, in which nine prisoners died.

This table showing the cholera deaths of the jails of Behar during the invasion of July 1866, teaches that we are not to dogmatise that the outbreak is a thing extending over a certain number of days. It shows us the play of the epidemic over this area from the last week of June to the first week of September. In theory, any one of these jails might have suffered in repeated invasions for the whole of this period. The typical outbreak is represented probably in the case of Patna, Bhaugulpore, Mozufferpore, and Chumparun. But the other examples give evidence of something over and above the effects of a choleraic influence once applied. In Arrah we find the influence present from the 19th July to 18th November; in Gyah, from the end of June to the middle of August fatal cases continued to crop up throughout at intervals of about ten days; in Hazareebaugh, we see on the 22nd July evidence of a great and sudden increase followed by decay on the 12th day after. Whether this was founded on the cholera invading between the 9th and 14th, or whether it was a fresh invasion, we cannot say. Those who believe in the growth of cholera in communities would point to this as an example, and would instance the death of the medical officer as a proof of the communicability of this cholera, while others would see only the typical outbreak—intense in the first few days of attack, tailing off gradually, and dying at the date on which the typical outbreak dies. This much may be fairly inferred, that with the universal presence of epidemic cholera over a province we are not entitled to overlook the extreme probability of the repetition of outbreaks and of the lengthening out of outbreaks due to this cause only.

The same remarks apply to the cholera of the epidemic area. Calling to mind individual examples, the impression left on the mind is, that the outbreak in the jails of Upper India has a different aspect, and is of much longer duration than the outbreak of the Lower Provinces. And yet when tabulated, the results are not very different. The following table shows fifty-seven outbreaks in Upper India with a mortality of 1,164. Of this mortality 54 per cent. occurred during the first seven days, 85 per cent. during the first fourteen days, and 15 per cent. subsequent to the 14th day.

Against the generalisation deduced from this table, the experience of the great jails of the Upper Provinces may be adduced. The aspect of the outbreak in these would seem to give countenance to the views of those who have held that the prolongation of the outbreak may be related to the numerical strength of the body aggregated under the same conditions. To this question I shall return in speaking of the circumstances determining the intensity of the outbreak. The proposition involved as it is generally put is certainly not true, namely, that towns retain cholera longer than villages and country districts. The provincial reproduction is at an end in the great cities of an affected area quite as soon as among the rural population. This is a perfectly well known fact in Upper India, and the history of the cholera of any epidemic bears out the statement.

II.—*Outbreaks of the Jails of the Epidemic Area.—Jail Population of Upper India*, 1858-67.

Jail.	Day of commencement of the outbreak.	Number of deaths out of the admissions of each day of the outbreak.																												
		1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.	21st day.	22nd day.	23rd day.	24th day.	25th day.	26th day.	27th day.	28th day.	29th day.	30th day.
Delhi	August 12, 1858 ...	1	...	...	...	...	...	1	1	3	3	...	...	1	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Hoshiarpore ...	September 14, „ ...	5	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad	May 18, 1859 ...	1	1	...	1	1	...	4	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	June 7, „ ...	3	5	3	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	July 20, „ ...	1	1	...	...	2	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	August 18, „ ...	1	...	...	...	1	...	...	1	1	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Benares	„ 17, 1860 ...	1	...	1	2	1	1	3	2	...	1	4	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore... ...	May 18, „ ...	1	...	...	1	...	1	1	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundlaisir	March 6, „ ...	1	...	3	...	...	...	...	...	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra	August 9, „ ...	2	3	8	16	25	27	14	14	2	8	15	10	7	4	5	1	2	6	2	1	...	...	2	1	...	...	...	...	1
Mirzapore	July 3, 1861 ...	1	2	1	1	...	...	1	...	...	...	1	1	1	..	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow	September 1, „ ...	1	2	2	1	...	...	1	...	...	2	...	3	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur	July 23, „ ...	1	...	...	...	...	...	1	3	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Allahabad	May 13, „ ...	2	1	...	...	1	...	1	...	1	2	...	4	1	7	...	1	...	...	1	1	1	...	...	...	...	...	...	...	...
Agra	July 6, „ ...	3	1	7	9	3	3	3	6	2	1	1	2	2	1	1	1	2	...	1	1	3	3	2	4	...	...	...	...	2
Delhi	„ 1, „ ...	2	5	3	4	1	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rohtuck	August 17, „ ...	1	...	1	...	1	...	1	1	...	1	1	1	...	...	1	8	...	2	2	...	...	...	2	...	1	...	...	...	...
Umballa	September 7, „ ...	1	...	3	...	1	4	3	3	1	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Ajmere	July 21, 1862 ...	2	1	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Agra	August 11, „ ...	3	1	1	3	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore	„ 7, „ ...	2	2	1	4	2	1	2	1	1	...	3	3	3	...	1	3	...	...	...	...	2	...	...	1	...	2	...	1	1
Sealkote	„ 13, „ ...	2	...	1	1	...	1	1	1	...	1	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	„ 20, „ ...	1	...	3	...	...	3	4	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur	July 6, „ ...	2	1	1	2	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ditto	October 17, „ ...	1	1	...	2	5	1	1	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Benares	June 15, 1863 ...	4	...	2	1	1	2	...	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ditto	July 8, „ ...	1	2	...	2	2	...	2	3	1	3	3	3	2	1	...	1	...	...	2	...	1	...	...	1	...	1	...	...	...
Goruckpore ...	„ 17, „ ...	3	5	6	2	5	3	1	3	1	1	...	1	...	...	1	1	1	1	1	...	1	1	2	...	...	2	...	...	...
Fyzabad	August 3, „ ...	1	...	...	1	...	1	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
RaeBareilly... ...	„ 6, „ ...	1	...	1	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow	July 15, „ ...	2	1	8	5	9	17	10	8	11	8	5	6	3	5	1	3	3	...	...	...	...	...	...	...	...	...	...	...	...
Ditto	October 31, „ ...	1	1	1	2	...	1	...	...	...	1	2	1	...	...	2	...	1	...	2	...	1	1	1	1	1	1	1	1	...
Mundla	June 11, „ ...	1	...	2	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore	July 15, „ ...	1	4	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee	June 20, „ ...	1	...	1	...	1	...	...	1	2	...	...	1	1	2	...	...	...	...	1	...	1	...	1	1	...	...	1	...	...
Agra	July 12, „ ...	1	4	3	2	...	3	...	...	1	...	...	...	...	1	...	...	1	...	1	...	3	2	1	2	3	...	...	1	...	...
Benares	August 4, 1864 ...	1	6	1	2	1	...	1	3	2	2	...	1	...	...	1	...	1	...	...	1	...	...	...	...	...	...	...	...	...
Goruckpore ...	June 13, „ ...	1	1	...	...	1	1	...	...	...	...	...	...	1	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Ditto	July 22, „ ...	1	1	...	...	1	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fyzabad	April 18, „ ...	1	5	7	3	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Sultanpore	May 23, „ ...	6	1	1	4	1	...	...	2	...	...	1	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Allahabad	June 8, „ ...	4	15	3	1	4	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagpore	March 13, „ ...	1	...	...	1	...	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...
Seetapore	September 1, 1865 ...	1	...	1	...	1	1	2	...	...	1	...	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagpore	April 9, „ ...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...
Ditto	July 8, „ ...	2	1	2	1	...	...	1	1	1	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ditto	„ 25, „ ...	1	8	4	6	3	1	...	3	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Raepore	April 27, „ ...	1	3	...	...	1	2	6	2	3	...	2	1	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Bandhara	June 29, „ ...	3	...	2	...	2	2	1	2	2	2	1	4	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	April 15, „ ...	2	1	...	...	...	...	...	...	...	...	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra	July 25, „ ...	3	2	1	...	1	...	...	2	1	1	...	...	...	...	1	1	4	...	...	...	1	...	2	...	...	...	...	...	...
Allahabad	March 21, 1867 ...	1	2	...	...	2	1	...	1	4	2	3	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seetapore	August 15, „ ...	1	...	...	...	1	2	1	1	1	2	...	...	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	„ 6, „ ...	1	...	...	...	2	...	...	...	...	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Lahore Female Jail ...	July „ 10, „ ...	2	2	...	1	1	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur	May 24, „ ...	1	...	...	...	...	...	...	1	...	...	...	...	...	1	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Total of the above outbreaks ...		91	93	86	84	94	85	69	76	48	50	52	51	33	30	26	23	19	13	13	5	14	9	12	10	6	7	2	4	3	1

Native Troops in Boats on the River.

Native Regiments during Boat Voyages.	Fatal cases out of the admissions of each day of the outbreak.																							
	1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.	21st day.	22nd day.	23rd day.	24th day.
10th N. I., Ganges *en route* to Futtehghur, January 8, 1855	1	1	...	1	1	...	...	...	...	1	2	...	1	1	...	3	1	2	...	...	...	...	1	...
68th N.I., Ganges *en route* to Bareilly, March 20, 1855	1	1	1	...	1	...	...	1	...	...	...	...	3	...	...	...	...	...	...	1	...	...	...	...
8th N. I., Ganges, below Cawnpore, August 31, 1855	2	2	...	3	2	3	3	6	4	4	2	3	1	2	1	1	...	...	...	...	...	...	...	...
43rd N. I., on Matabanga, January 10, 1856 ...	1	...	...	...	1	1	...	1	1	3	1	1	1	...	1	11	7	1	...	...	...	...	...	...
34th N. I., Ganges below Cawnpore, April 4, 1856	2	1	1	6	...	...	6	2	6	3	1	1	1	1	...	...	...	...	...	...	...	...	...	...
34th N. I., on voyage to Barrackpore, October 29, 1856	1	...	2	1	2	4	3	7	3	2	...	4	...	4	...	1	...	...	...	...	...	...	...	...
73rd N. I., Ganges below Dinapore, November 8, 1856	1	...	2	8	3	...	1	...	...	3	2	2	1	2	1	2	...	...	...	4	...	1	...	...
32nd N. I., Ganges below Dinapore, November 28, 1856	1	2	1	1	7	6	14	10	6	22	25	11	7	6	5	2	...	...	1	1	...	...	...	...
70th N. I., on the Ganges, December 5, 1856 ...	1	...	...	...	2	...	1	...	...	...	1	3	1	...	...	...	...	...	...	...	...	...	...	...
25th N. I., river steamer below Mirzapore, May 1862	2	...	1	...	...	3	2	2	2	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Wing, 7th Native Infantry in boats between Dacca and Cachar, January 3, 1868	3	2	1	4	2	...	2	...	...	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...

The aspect of the outbreak of cholera on board boats, deduced from the experience of former years when it was the custom to move Regiments by water, differs materially from that which the outbreak of Regiments on the march presents. Its aspect is much more that of the cholera of the Central Jails of the epidemic area. The typical duration is from twelve to sixteen days, and where this is exceeded, there will generally, I think, be found the probability of a second infection. The typical aspect is not that of cholera with a period of maximum during the first five days, as in the case of the cholera of the march, although this aspect may be exhibited, as in the last of the examples above tabulated. It seems rather as if the cholera naturally inclined to die out, was fostered, and appeared in power between the 5th and 12th day, and as powerfully at the end as at the beginning of these eight days. It looks, in short, as if the cholera poison had been repressed from coming forward, and the inference may be made that it would never have come forward at all but for the speciality of the conditions, namely, the crowding up within a limited space. I believe that the aspect of the outbreak shown in this table is the same which is so often exhibited in the great jails of Upper India, and that it is determined by the confinement of the men to the boats. Of this there can be no doubt, that the cholera miasm determines cholera in an infinitely higher ratio when the amount of space furnished is limited; crowding up a body of men when the cholera miasm is abroad diminishes the chance of preventing the explosion in proportion to the extent of overcrowding.

I am not inclined to attach much weight to the cases of the 73rd and 32nd Native Infantry shown in the above table, as indicating the simulated cumulativeness of the cholera poison. These Regiments were passing through a tract ravaged by cholera at the time, in every mile of which they might have received fresh infection; and much of their mortality occurred after leaving the boats. Regiments marching along the banks of the Ganges between Bhaugulpore and Dinapore parallel with their course suffered equally.

The case of the 43rd is very remarkable for the sudden blaze which occurred after the Regiment reached Barrackpore, while lying at the river bank immediately before disembarking, and when the original outbreak was apparently concluded. Twenty fatal cases occurred within four days. The aspect is very much that of re-infection cut short by immediate withdrawal from the boats.

The type of the outbreak on board boats is evidently that shown in the cases of the 8th, 34th, and 25th Native Infantry. The case of the 25th Native Infantry occurred at a time when there was no epidemic cholera abroad. The infection took place near Mirzapore on a known day, and the cholera continued up to the 12th day during the voyage down stream.

I may here remark that the distance to which an infected body is removed makes no difference in the duration of the outbreak. When the Chinsurah Depôt suffers, the men removed from it may be admitted into the hospital at Allahabad. The following is a case in point:—

In Dr. Beatson's Report for 1864 we read:—"The cholera admission of November was a recruit, who scarcely had time to settle himself in camp after arrival from Chinsurah before he was attacked. The detachment to which he belonged had been sent away from that depôt in consequence of the appearance of cholera amongst the men, and after they reached Allahabad, while they were under canvas, three cases more occurred amongst them."

A newly landed Regiment gets cholera while encamped in Calcutta, and carries cholera into the Benares cantonment (Her Majesty's 58th Regiment, 1865); a Native Regiment on the march (39th Native Infantry, 1863), is affected between Allahabad and Benares, and continues to suffer after reaching Calcutta. In these cases the removal was by railway.

The tabulation of 105 outbreaks among European Troops with a total of 2,127 deaths gives the following result:—50 per cent. of the total mortality occurred within the first seven days; 80 per cent. within the first fourteen days; and 20 per cent. between the 14th and 28th day of outbreak.

The chief outbreaks of 1867, arranged after the method adopted in the tables for the previous years, appear in the following form. Several of the cases tabulated have been broken up in relation to the normal type of the outbreak, and to the probability of reattack having occurred.*

* The breaking up of the Regiment affected into different parties of which all the casualties appear in a common roll, adds much to the difficulty of accurately tabulating the duration of the outbreak. In this statement I have taken each corps simply as one affected body.

Statement to show the duration in days of the outbreaks of the European Army in 1867.

Regiment and Station.	Date of outbreak.	Premonitory cases.	Number of fatal cases out of the admissions of each day.																									
			1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.	21st day.	22nd day.	23rd day.	24th day.	25th day.
Umballa, 94th Regiment	May 5th	April 22nd, 1; 28th, 1; May 2nd 1	2	...	2	3	4	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur, 42nd Regiment	,, 20th	... ...	5	4	1	18	23	5	7	3	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, 77th ,, ...	,, 21st	... ...	2	1	2	2	1	3	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, ,, ,, (2)	June 3rd	... ...	4	1	1	3	1	5	1	3	1	2	1	1	2	2	1	1	...	1	1	...	1	...	...	...	...
,, F. Brigade, E. Battery, Artillery	,, 13th	May 26th, 1	1	5	2	...	1	1	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...
,, F. ,, F. ,, ,, ...	May 20th	... ...	2	1	...	2	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, ,, ,, ,, ,, ,, (2)	June 19th	... ...	1	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, XIX Brigade, E. Battery, Artillery	May 25th	... ...	2	...	...	...	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, ,, ,, ,, (2)	June 10th	... ...	1	3	1	2	1	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, XXII Brigade, 4th Battery, Artillery	May 25th	... ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, ,, ,, ,, (2)	June 8th	... ...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Subathoo, 90th Regiment	July 28th	April 28th, 1; June 5th, 1; 13th, 1	1	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, ,, (2)	August 9th ...	... ...	2	1	...	...	...	2	1	...	1	...	...	4	...	...	...	...	...	...	...	...	2	...	...	...	...	...
Meean Meer, 106th Regiment	May 27th	... ...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, ,, (2)	June 8th	... ...	1	3	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, ,, (3)	,, 30th	... ...	3	3	3	3	...	1	...	1	...	2	2	...	...	3	3	2	1	...	...	...	...	...	...	...	...	...
,, ,, (4)	July 22nd	... ...	1	4	1	2	2	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur, 82nd Regiment	September 5th ...	... ...	1	...	...	...	1	...	...	2	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore, XIX Brigade, A. Battery, Artillery	July 4th	... ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, 1-5th Regiment	June 27th	... ...	1	1	1	...	...	...	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore, 36th Regiment, Wing	August 13th ...	August 8th, 1	1	1	1	3	...	2	4	...	1	2	...	...	1	...	...	1	...	...	...	1	...	...	...	...	...	...
Moradabad, 36th ,, ,, ...	July 24th	... ...	1	...	...	...	...	...	1	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Meerut, 1-3rd ,, ,, ...	August 17th ...	... ...	1	...	...	...	2	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, 1-3rd ,, (2)	,, 27th	... ...	2	4	1	1	4	8	9	10	7	9	6	5	4	3	3	5	4	6	3	1	...	1	1	...	1
Allahabad, 107th ,, ...	,, 5th ...	July 28th, 1	2	2	1	...	3	...	3	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL	... ...	... ...	44	36	19	42	45	34	30	22	18	20	14	11	7	9	7	10	5	7	4	2	3	1	1	...	1

Outbreaks of the European Army, 1856 *to* 1866.

The fatal cases only have been selected in drawing up these Tables illustrating the Duration of the Outbreak, not because they are supposed to give results more accurate than those which the detail of the admissions would have afforded, but because the data from which such information might have been drawn do not exist. The figures are taken from the death rolls of Regiments; and as the form in use since 1860 does not specify the actual date of the admission of fatal cases, this has been deduced from the columns showing the day of death and the duration of the disease in days.

The numerous examples which show modification of, or recession from, the type, must be viewed as having been changed as regards their aspect by the conditions causing the difference in aspect studied in the text, and more especially in relation to the fact of the presistence of the vitality of the cholera of the reproduction over the affected area.

REGIMENT AND STATION.	Date of commencement of the outbreak.	Number of fatal cases out of the admissions of each day.																										
		1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.	21st day.	22nd day.	23rd day.	24th day.	25th day.	26th day.	27th day.	28th day.
Fort William, 53rd Regiment	August 30th, 1856(1)...	2	6	6	2	1	3	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow, 52nd Regiment ...	June 21st, „ ...	1	2	3	1	1	2	3	3	5	2	2	...	2	...	1	5	2	...	...	1	...	...	...	1	...	...	2	1
Agra, 3rd Europeans ...	„ 10th, „ ...	1	2	1	...	1	1	1	4	1	2	2	2	3	4	5	4	6	8	11	7	1	6	...	5	1	2	1	...
„ 2nd Company, 6th Battalion Artillery ...	„ 23rd, „ ...	3	...	...	2	1	2	1	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut, 1-60th Rifles ...	August 1st, „ (2) ...	2	2	3	1	1	1	1	4	5	1	3	2	...	1	1	...	...	...	...	...	...	1	...	...	...	...	...	...
„ 3rd Company, 3rd Battalion Artillery ...	July 28th, „ (3) ...	1	...	...	..	1	...	1	...	...	1	1	...	...	...	...	...	...	...	1	...	1		...	...	...	...	...	...
Ferozepore, 70th Regiment ...	August 12th, „ (4) ...	1	2	3	1	10	9	4	6	2	2	8	5	6	3	3	3	...	...	2	1	1	2	...	3	2	1	3	1
„ 6th Battalion Artillery	„ 15th, „ ...	1	...	2	2	...	3	3	5	7	2	...	5	5	2	2	...	...	1	...	...	...	1	...	1			...	...
Mecan Meer, 81st Regiment	„ 15th, „ ...	2	3	2	2	2	3	2	13	6	6	9	3	8	10	4	...	1	1	1	9	5	2	5	5	1	4	...	4
„ 4th Battalion Artillery	„ 8th, „ ...	1	1	3	7	9	9	9	11	11	4	5	8	1	3	1	1	1	2	...	...	3	...	2	...	...	...	1	...
Mecan Meer, 2nd Brigade Horse Artillery ...	„ 7th, „ (7) ...	3	5	4	2	6	6	5	5	5	3	...	...	3	3	1	1	1(6)	...	...	...	...	...	...	...	...	...	...	...
Fort William, 37th Regiment	June 17th, 1857 ...	6	1	7	1	4	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chinsurah, 84th Regiment ...	April 2nd, „ ...	1	6	2	2	1	1	1	1	1	...	...	1	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur, Wing H. M.'s 24th Regiment	August 20th, „ ...	2	1	8	2	4	3	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa, 9th Lancers ...	May 16th, „ ...	2	2	1	2	3	...	...	...	...	1	1	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dugshaie Depôt, 1st Fusiliers	„ 23rd, „ ...	2	...	1	...	...	...	...	1	2	...	...	...	...	...	...	2	3	...	...	...	...	...	...	...	...	...	...	...
Jullundur, 87th Regiment ...	August 26th, 1858 ...	6	5	3	...	...	...	1	...	...	...	...	1	1	2	...	...	...	...	...	2	...	...	...	...	...	...	...	...
Murree Depôt	July 12th, „ ...	1	2	6	4	4	4	1	...	2	2	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Peshawur (all Corps) ...	October 26th, „ ...	1	...	1	...	...	2	...	...	...	...	...	1	...	...	...	...	...	1	...	...	1	...	1	...	...	...	...	...
Fort William, (Recruits) ...	April 16th, „ ...	1	1	2	4	...	4	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ 77th Regiment	June 28th, „ ...	4	2	3	2	...	2	4	6	3	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ 77th „	July 26th, „ ...	5	...	1	1	...	...	...	2	...	1	1	1	...	...	...	1	1	...	1	...	...	..	...	...	...	...	...	...
	Carried over ...	49	43	62	38	49	55	44	70	51	32	34	32	29	29	21	17	16	13	16	20	12	12	8	15	4	7	7	6

1. No case occurred after the 10th day.
2. A premonitory case on 16th June.
3. A premonitory case on 10th July.
4. A premonitory case on 7th August.
5. A concluding case on 28th September.
6. A case occurred on October 15th in this Brigade.
7. A premonitory case on 8th June.

Outbreaks of the European Army, 1856 *to* 1866,—continued.

REGIMENT AND STATION.	Date of commencement of the outbreak.	Number of fatal cases out of the admissions of each day																											
		1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.	21st day.	22nd day.	23rd day.	24th day.	25th day.	26th day.	27th day.	28th day.
	Brought forward ...	49	43	62	38	49	55	44	70	51	32	34	32	29	29	21	17	16	13	16	20	12	12	8	15	4	7	7	6
Calcutta, 2-60th Rifles ...	June 8th, 1858 ...	2	2	1	7	...	...	1	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dum-Dum, Bengal Artillery	August 9th, 1859 ...	1	10	6	12	15	7	...	...	1	...	1	...	...	...	1	1	2	...	...	...	..	...	...	...	...	...	...	...
„ Depôt, Her M.'s Troops ...	„ 10th, „ ...	4	1	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
„ 3rd Buffs ...	„ 10th, „ ...	3	1	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	..
Barrackpore, 67th Regiment	„ 8th, „ ...	2	2	3	...	1	...	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ Recruit Depôt ...	„ 5th, „ ...	2	1	...	1	...	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...
Depôt of discharged men ...	„ 13th, „ ...	1	2	...	1	...	...	...	1	1	6	4	2	3	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...
Benares, discharged men ...	„ 17th, „ ...	...	...	...	...	4	...	...	...	...	...	...	3	...	...	...	..	...	...	4	...	...	...	...	...	...	...	...	...
Cawnpore, 1st Cavalry ...	July 30th, „ ...	1	...	...	...	...	3	...	...	2	1	...	1	1	3	1	...	...	...	1	1	...	...	...	1	...	...	1	...
Cawnpore, 80th Regiment...	May 5th, „ ...	1	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	4	...	2	...	...	...	...	...	...	...
	August 5th, „ ...	1	...	...	...	1	...	...	1	1	1	1	...	...	...	...	1	...	2	1	...	1	1	1	1	...	...	...	...
Allahabad, 60th Rifles ...	May 16th, „ ...	3	2	3	3	3	2	...	1	..	...	1	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Allahabad, 5th Fusiliers ...	April 19th, „ ...	1	...	...	...	...	...	1	1	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	May 6th, „ ...	1	2	...	2	3	2	1	2	...	2	...	...	3	1	1	...	...	1	2	...	...	1	...	1	...	(11)	(3)	(1)
	August 10th, „ ...	2	...	...	1	2	...	...	1	3	3	1	1	...	3	1	1	...	...	1	...	...	...	1	...	...	..	...	...
Lucknow, 23rd Regiment ...	„ 9th, „ ...	1	...	...	3	...	2	...	...	3	...	1	2	...	...	...	2	...	...	...	...	1	1	...	...	...	...	...	...
Allahabad, 4th Europeans ...	April 19th, „ ...	6	3	3	...	1	2	...	1	...	1	...	...	...	...	...	1	1	2	5	1	...	2	...	...	...	...	...	...
Ghazeepore, 77th Regiment...	„ 1st, 1860 ...	1	2	3	3	...	2	3	...	...	2	1	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...	...
„ 37th Regiment ...	March 29th, „ ...	4	1	2	8	2	9	1	2	3	2	2	1	2	1	...	1	2	1	1	1	...	...	...	...	...	...	...	...
Fyzabad, 34th Regiment ...	April 6th, „ ...	6	4	1	...	2	...	1	...	2	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Gondah, 20th Regiment ...	March 25th, „ ...	1	...	1	...	...	...	2	1	1	...	1	1	1	...	...	...	1	...	...	...	..	1	2	...	...	...	...	...
„ 3rd Troop, 1st Brigade Artillery ...	„ 23rd, „ ...	1	...	...	...	1	...	...	...	..	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	1	...	...	...
Nagode, 1st Company, 1st Battalion Artillery ...	April 5th, „ ...	1	...	1	...	1	1	1	...	..	...	...	...	...	...	...	...	2	2	3	...	...	...	...	...	...	...	...	...
Allahabad, 70th Regiment ...	March 25th, „ ...	2	...	1	...	1	1	2	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Goruckpore, 13th Regiment...	April 6th, „ ...	1	...	...	1	1	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Chunar, Invalid Battalion ...	March 6th, „ ...	3	...	...	...	...	1	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore, 54th Regiment ...	August 12th, „ ...	1	...	1	...	...	1	...	...	1	...	1	...	1	2	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Jhansi, 89th Regiment ...	„ 2nd, „ ...	1	1	...	...	...	2	1	1	1	1	3	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Morar, 71st Regiment ...	July 22nd, „ ...	1	1	...	...	3	1	...	...	2	2	2	2	1	4	2	3	...	...	...	...	...	...	...	...	...	...	...	...
	August 9th, „ ...	7	11	2	...	3	1	1	4	2	1	...	1	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
	Sept. 6th, „ ...	1	...	2	2	...	1	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Agra 3rd Battalion Rifle Brigade	August 10th, „	1	...	1	1	...	1	...	1	2	...	1	1	...	4	2	1	...	2	...	...	4	5	...	...	...	...	...	...			
	Sept. 3rd, „	1	7	5	2	3	1	3	...	1	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...			
Agra, XI Brigade, 8 Battery Royal Artillery	August 16th, „	1	1	...	...	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Agra, XI Brigade, 8 Battery Royal Artillery	Sept. 2nd, „	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Muttra, 2nd B. Cavalry	August 15th, „	1	1	...	...	...	3	...	1	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...			
	Sept. 5th, „	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...			
„ 3rd Troop, 3rd Brigade Horse Artillery	August 17th, „	3	3	1	...	3	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Fort William — 1-8th	Feb. 16th, „	2	...	2	2	...	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Fort William — 37th	May 19th, „	1	...	...	1	3	3	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Fort William — 1-5th	„ 18th, „	1	...	3	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...			
Gwalior, XI Brigade, 5 Battery Royal Artillery	July 24th, „	1	...	...	...	1	...	...	...	2	3	1	2	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...			
	Sept. 5th, „	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Allahabad, 90th Regiment	July 21st, 1861	1	...	...	2	1	...	...	1	1	2	1	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...			
Cawnpore, 54th „	May 25th, „	1	...	...	1	...	2	...	2	...	...	...	...	...	...	...	...	1	2	...	...	...	1	...	...	...	...	...			
	July 29th, „	1	1	...	1	1	2	...	...	1	...	...	...	1	...	1	1	1	...	...	...	...	...	...	...	...	...	...			
Futtehghur, Wing 42nd Regiment	August 4th, „	1	2	2	1	...	...	...	...	2	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...			
Meerut, 35th Regiment	July 17th, „	1	1	1	1	2	...	...	2	1	2	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...			
	August 8th, „	2	1	...	3	2	1	1	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
„ 8th Hussars	„ 13th, „ [1]	1	2	1	1	1	...	..	1	1	...	1	..	...	2	1	4	2	2	...	2	1	1	...	1	...	...	1			
Agra, 42nd Regiment	July 14th, „ [2]	1	...	1	2	1	...	...	...	3	...	4	2	2	1	5	2	1	5	1	1	1	...	1	...	...	1	...			
Delhi, 82nd „	„ 4th, „	1	1	...	1	...	2	...	1	1	...	4	3	...	2	3	2	2	2	2	...	1	6	3	3	...	1	1	[3]			
Umballa, 89th Regiment	„ 30th, „	3	1	2	...	...	3	9	2	3	3	...	1	3	2	1	3	...	2	1	...	...	...	...	1	1	1	1	[4]			
„ 7th Hussars	August 20th, „	3	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...			
Umritsur, 94th Detachment	Sept. 3rd, „	1	...	...	4	6	1	2	...	7	3	4	2	2	1	4	...	1	1	...	...	...	...	...	...	...	1	...			
Meean Meer, (all Corps)	August 7th, „ [5]	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...			
„ 19th Regiment	„ 25th, 1862	7	6	12	5	8	3	6	2	2	3	3	1	3	1	...	1	1	[6]	...	...	...	...	...	...	...	...	...			
Umritsur, Detachment 81st Regiment	„ 29th, „	1	1	2	1	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
Peshawur, 93rd Regiment	July 9th, „	1	3	...	...	1	...	1	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
	„ 26th, „	1	...	...	...	1	...	1	1	1	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...			
	Sept. 9th, „	1	3	[7]	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
	October 12th, „	2	1	2	...	2	...	1	2	...	[7]	4	...	...	3	4	4	2	...	...	1	...	...	3	...	...	...	...			
Morar, 13th Regiment	July 10th, „	1	...	2	1	...	...	1	...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...			
	„ 30th, „	1	1	...	...	2	...	...	...	...	...	4	2	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...			
	Sept. 1st, „	1	...	1	...	1	...	2	...	3	...	1	1	...	...	2	...	...	...	...	1	...	...	...	...	...	...	...			
Jhansi, 52nd Regiment	July 30th, „	4	1	...	1	6	1	1	1	...	1	5	...	2	3	1	1	...	...	...	...	...	...	...	...	...	...	...			
	Carried over	164	129	133	114	142	118	96	115	116	89	98	65	58	70	59	53	38	41	45	31	26	31	20	23	7	11	11	8			

1. Four deaths on 6th, 8th, and 9th.
2. Three premonitory cases on June 21st, 28th, and July 2nd.
3. Four deaths subsequent to this date on 5th, 10th, 14th, and 16th August.
4. One death subsequent to this date on 4th September.
5. See separate statement, page 185.
6. Four cases on 22nd and 26th September and 1st October.
7. Admissions ended on 16th.
8. Suspicion of reattack on 29th October.

Outbreaks of the European Army, 1856 *to* 1866,—continued.

REGIMENT AND STATION.	Date of commencement of the outbreak.	Number of fatal cases out of the admissions of each day.																										
		1st day.	2nd day.	3rd day.	4th day.	5th day.	6th day.	7th day.	8th day.	9th day.	10th day.	11th day.	12th day.	13th day.	14th day.	15th day.	16th day.	17th day.	18th day.	19th day.	20th day.	21st day.	22nd day.	23rd day.	24th day.	25th day.	26th day.	27th day.	28th day.
	Brought forward ...	164	129	133	114	142	118	96	115	116	89	98	65	58	70	59	53	38	41	45	31	26	31	20	23	7	11	11	8
Agra, 35th Regiment ...	August 2nd, 1862 ...	4	1	...	4	2	3	4	6	6	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	„ 15th, „ ...	1	...	2	...	2	3	2	...	2	2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gwalior, 52nd Wing ...	July 29th, „ ...	1	...	1	...	1	2	4	...	2	1	1	1	1	1	1	...	1	...	...	...	...	1	...	...	...	...	...	...
Meerut, 104th Regiment ...	„ 25th, „ (1)	1	1	1	1	...	1	3	...	2		1	...	...	1	1	1	1	1	...	...	..	...	...	...	...	...	...	...
Benares, 20th Regiment	March 31st, 1863 ...	1	...	2	2	1	..	2	1	...	.	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	July 13th, „ ...	1	1	1	1	2	2	1	1	...	..	1	...	..	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Lucknow, 107th Regiment	„ 9th, „ ...	1	1	...	...	...	...	...	2	...	2	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
	August 12th, „ ...	1	..	...	1	...	1	...	...	...	..	...	...	...	..	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Agra, 1-23rd Regiment ...	July 30th, „ ...	1	...	1	1	...	2	...	1	1	...	...	...	...	...	1	1	...	...	...	...	...	1	...	...	...	...	...	...
„ XXII. F. Royal Artillery	„ 26th, „ ...	1	1	...	2	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow, 36th Regiment ...	Sept. 15th, 1864 ...	1	3	2	2	2	..	4	3	..	3	2	4	1	...	...	...	...	...	1	...	...	1	...	...	...	...	...	..
Allahabad, 77th Regiment ...	„ 14th, „ ...	1	2	1	1	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fyzabad, 1-11th Regiment ...	April 22nd, 1865 ...	2	4	1	1	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow, 46th Regiment ...	Sept. 5th, „ ...	1	...	1	...	...	1	...	..	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor, 97th Regiment ...	August 7th, „ ...	1	...	1	...	1	...	1	1	...	3	..	1	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...
Hazarecbaugh, 27th Regiment	July 29th, 1866 ...	1	...	...	1	...	...	..	...	1	1	...	...	...	...	...	...	1	...	2	...	1	...	...	...	...	...	...	...
	Total ...	184	143	147	131	155	138	119	130	132	102	107	72	62	73	65	56	43	43	48	31	27	34	20	23	7	11	11	8

1. Four premonitory cases between 15th and 22nd.

I shall say nothing here regarding the outbreak among Native Troops in cantonments, but leave this point for consideration when the relative mortality of European and Native Troops in cantonments comes to be examined. It will suffice meantime to say that, as in every other case, the limit of the general outbreak is the date of the provincial decay of the reproduction, and that the outbreak in the case of Native Troops is represented in outline only, and is seldom filled in in substance.

The duration of the outbreak among Native Troops in cantonments to be considered in the following chapter.

Thus, then, it appears that the outbreak may have three special aspects each significant of a different phase:—*first*, the outbreak may be typical, comprised within ten days from the date of poisoning; *second*, it may be supplemented by conditions of locality, so that it may endure from the date of attack up to the death of the reproduction; and in the *third* aspect, while the type presented is evidently that normal for the minimum, the affection of the body is maintained to about the 16th or 17th day.

General conclusions regarding the normal type of the outbreak and its duration, and the causes of aberrations from the normal type.

The last is the aspect of nearly all stational and jail outbreaks. I consider that this is due to the fact that these localities are not affected merely by the primary afflatus of the air conveyed miasm. As in the case of a locust flight, for days after the flight has passed over a locality, the individuals dropped from the main body are abundantly scattered over the tract traversed; and if the material of the locust flight constituted a miasm, the duration of its effects would be measured by the time during which these individuals remained visible.

In the case of cholera, when the source of infection has been removed, we do not, as some would have us believe, at once get rid of its effects; I reckon that for a week afterwards the cholera latent in the individual constitution is due to come forward. Judged by the standard which I have proposed, the celebrated outbreak attributed to the Broad Street Pump seems to me a pure case of the typical outbreak. We cannot suppose that the water was poisoned for a single day, and that all who drank of it on this day and these persons only, were affected; the facies of this local outbreak is precisely that which we know to result from the afflatus of the cholera miasm of a certain day—the nine-day poisoning dating from a known hour.* Here is observed the maximum during the past five days, the tailing off, and death on the ninth day, the 8th August, on which it is alleged that the pump handle was removed and that cholera as a consequence ceased. Had the cholera in question been due to the use of this water, the facies of the outbreak would not have been such as it was, and the removal of the source of infection on the 8th would not have been followed by the cessation of cholera until the 17th or 18th. (Compare the case of the Goorkhas in 1857 (p. 180), and that of the 42nd in 1867, (p. 181).

Deaths in the neighbourhood of the Broad Street Pump.

1854 August	...	31	31
„ September	...	1	131
„ „	...	2	125
„ „	...	3	58
„ „	...	4	52
„ „	...	5	26
„ „	...	6	28
„ „	...	7	22
„ „	...	8	14

We have been lately told that the cholera germ is the most insidious of all poisons, and that a single case of cholera may poison a nation. Nay more, that a single case of diarrhœa, undistinguishable from the simple and non-specific diarrhœa, may be the focus from which fatal cholera may radiate, multiplying as it goes until a kingdom has been ravaged. And this is held to represent the whole truth. The aspect under which I have represented the cholera of India is very different. I have as yet described it as no insidious miasm creeping along from man to man, from village to village, or from province to province, or as a thing to be watched for and isolated, and to be limited in its diffusion by quarantine restrictions. I have written the history of the cholera miasm as that of a thing individualised and appreciable, due at a certain date in a certain situation, budding forth from the soil because it has been sown there, revitalised in relation to what it is as a thing organised, and advancing, when invading, with a front as wide stretching as is the breadth of the natural province which is being covered. I have described the persistence between two definite dates as due, not to any meteorological reason, and certainly not to any contingency secondary to human infection; but as a leaf, or a flower, or an insect has a temporary existence absolutely defined and yet manifested in obedience to a known meteorology, so has the vitalised cholera its life period which no combination of conditions (however powerful these may be) can prolong.

The following table will illustrate what is meant in speaking of the insidious spread of a morbific agency in a community. I place it here that it may be viewed in contrast with the facts of the paragraph which succeeds, in which the explosive character of the outburst of cholera is depicted; the spindle-shape of the typhus outbreak is contrasted with the cone-shape of the cholera outbreak.

* It will, I think, be found to be the case, that the same shape of the outbreak may be impressed on the stationary population of a locality by a cholera in motion as is impressed upon a moving body which on a known day marches into a cholera-containing area. In the first week of June 1869, we had the evidence of the movement of cholera over an enormous tract of Upper India; this wave struck Deolee on the 2nd June, and the impress is thus shown in the case of the population as represented by the mortality in the Charitable Dispensary:—

1st	2nd	3rd	4th	5th	6th	7th	8th	9th
...	5	5	5	2	1	2	1	...

This statement should be compared with the other illustrations which I have given of the typical outbreak, in order that its significance may be understood.

*Facies of the outbreak in the case of diseases spread by contagion throughout a community. Relapsing Typhus of the Jails of Upper India.**

JAIL.	Year of outbreak.	Strength.	Number of Deaths from Relapsing Typhus.				
			First month after invasion.	Second month after invasion.	Third month after invasion.	Fourth month after invasion.	Fifth month after invasion.
Agra	1860	1,890	9	42	93	40	13
Agra	1864	1,993	15	39	76	134	43
Meerut	1860	2,096	8	14	35	92	59
Allahabad	1860	1,595	5	11	37	44	10
Loodianah	1861	...	4	29	37	18	1
Futtehghur	1864	404	7	9	22	11	3
Umritsur	1864	554	8	13	35	18	11

The phenomenon of a body of men being "struck by cholera" has been of late years too much overlooked.

When it has occurred that powerful outbursts have taken place suddenly and without the occurrence of premonitory cases, it has been alleged that all the phenomena might have been produced by the infection of a latrine or the pollution of the water supply from a human source. In the case of bodies marching, as in that of the Grand Army of 1817, it is useless to suggest the possibility of infection from human emanations in explanation of what occurred; and it is equally purposeless to enquire whether it were possible for the five latrines of the five different barracks of the Peshawur cantonment to have become simultaneously poisoned from unknown sources on the evening of the 19th May 1867. With every desire to trace in the poisoning of the water supply a fruitful source of cholera, believing, as I do, that in all truly epidemic cholera a vehicle of moisture is the means of conveying to the human economy the air-borne miasm, I cannot regard this alleged source of infection as of the value which some would attach to it, even when my opinion is qualified by the consideration, that the poisoning is much more likely to be due to an aerial cholera than to cholera emanating from the miasm after multiplication within the human system. Indeed, wide and constant as are our opportunities in this country for following up to their origin in such a source the ever-recurring outbreaks, there is still up to the present time no recorded evidence which proves that the water supply has been the means of introducing cholera into our jails or cantonments. I do not say that impregnation of water does not occur, or that water thus impregnated may not in certain instances have been the cause of special outbreaks; I state simply that I am in possession of no tangible facts bearing on the question, such as I would gladly have inserted in this place.

Modern writers do not seem to have appreciated rightly what is meant when the phrase "struck by cholera" is used, whether applied to a province or to a body of men. In the case of a body struck by cholera, the commencement of the outbreak dates from a given hour, and it is not individuals who are affected, but the entire body. The great outbreak of November 1817 was dead on the 22nd, the 14th day after its commencement; it was on the 16th, 17th, and 18th June, the 3rd, 4th, and 5th days of the outbreak, that the great mortality took place in the Kurrachee camp. On the 7th November 1817 the Grand Army is struck, and hundreds fall before evening; the Kurrachee camp is struck on the evening of the 14th June 1846 and 175 men come into hospital on the 15th from many different corps; Dum-Dum is struck on the evening of the 9th August 1859, and seventeen fatal cases are admitted from the different corps on the 10th. In such cases the mortality is generally compressed into a small number of days: thus at Dum-Dum, in the Recruit Depôt, of fifty-five deaths, six only occurred after the 6th day (the 14th August, the body having been struck on the evening of the 9th); it was on the 4th and 5th days (12th and 13th) that the great mortality occurred, when twenty-five men died. Peshawur was struck on the evening of the 19th May 1867; five fatal cases were admitted in Her Majesty's 42nd on the 20th, and it was on the 4th and 5th days (23rd and 24th) that the great mortality occurred, when forty-one fatal cases were admitted.

In none of these instances was prolongation coincident with universality of infection; the single outbreak in which thousands of lives are lost, is not prolonged beyond the day up to which the typical outbreak continues in a community which may lose but ten individuals.

I have selected a few cases in order that I may bring prominently forward the truth that there is such a phenomenon as that implied by the phrase "struck by cholera." The general fact is expressed statistically in all the figures and ratios of the preceding tables, but the constant obscuring of the fact by the antagonism of the phenomena of affection of bodies and affection of localities, leads the mind away from the contemplation of the type towards which we ought constantly to be turning for guidance, and therefore the truths supplied by the type cannot be too impressively brought forward.

Corbyn gives the following narrative of the commencement of the great outbreak of November 1817. He writes:—"I was the first person to observe it on 8th November.

* The duration of the outbreak of Typhus in a community is reckoned not by days, as in the case of the cholera outbreak, but by months; in the instances tabulated, the cessation of the outbreak occurred at the season when the meteorological conditions determine in every year the disappearance of the effects of the Typhus poison. During such outbreaks very few of the attendants on the sick escape infection.

A few dooly bearers were brought to me; and having never seen the disease before, I thought the men were in a state of inebriation, for the symptoms seemed to indicate as much. But soon discovering my mistake I reported the circumstance, and was immediately directed to proceed to the encamping ground of the preceding day. The officer commanding the rear guard having arrived, and reported that on the whole line of march multitudes were dead and dying, I proceeded escorted by a strong guard of cavalry. Whole families who, in the course of the morning in perfect health had accompanied their Regiments, before proceeding many miles, were attacked by the disease, and I found them lying dead by the side of tanks and nullahs. On the following day, being the second of its appearance in our camp, the disease burst forth with indescribable violence in every direction."*

Jameson continues the narrative:—"Unsubjected to the laws of contact, this cholera outstepped the most fatal diseases hitherto known in the destructive rapidity of its progress. Previously to the 14th it had overspread every part of the camp, sparing neither sex nor age in the undistinguishing virulence of its attack. The old and the young, the European and the Native, fighting men and camp followers, equally sunk in a few hours under its grasp. The mortality latterly became so great that there was neither time nor hands to carry off the bodies, which were thrown into the neighbouring ravines, or hastily committed to the earth on the spot in which they had expired.

"Hundreds dropt during each subsequent day's advance,† and covered the roads with dead and dying; the ground of encampment and line of march presented the appearance of a field of battle, and of the track of an army retreating under every circumstance of discomfiture and distress. In this fatal week 764 fighting men fell victims to the disorder, and of the camp followers it was estimated that about 8,000 were cut off. The disorder ceased to be epidemic on the 22nd or 23rd;‡ a few instances of mild attack were seen afterwards, but after the 8th December not a case occurred."

The following is another example taken from the cholera history of the year 1818. It is also from Jameson's report:—"In May, the Nagpore Subsidiary Force, encamped nine miles south of Nagpore, was suddenly attacked. Many loitering for water in the neighbouring rivulets were brought in expiring, and some dead. Of between seventy and eighty patients *brought to hospital on the first day* more than ten were found dead or in the act of expiring in the doolies."

The following is another description of a body struck by cholera; it is the history of the onset in the great Kurrachee outbreak of 1846. It is related by Dr. Arnott who was present. I give the narrative as published in the Bombay Medical Journal for 1855:—

"Between 5 and 6 p. m., during Divine Service on 14th June 1846, the wind veered round from south-west to north-east, and although there was scarcely any breeze, it was raw, chilly, and unpleasant to the feelings, and a thick lurid cloud, apparently of dust, hung low and almost stagnant over the camp. Some people observed, or fancied they observed, at the same time an offensive suffocating and putrid odour, and that a sudden nausea was produced; but these I did not remark. The atmosphere had for about half an hour the appearance that often precedes a storm, but it gradually cleared away, and by 7 o'clock it was clear and again fine. It is certainly possible that the epidemic cholera virus had no previous existence, but was generated and diffused by the peculiar state of the atmosphere on the evening of the 14th of June, although I am inclined to believe that the origin of its sudden fatal and fearful intensity, so immediately manifested, was due to that agency of which the meteorological disturbance was a sign or effect." The sequel was that, on the night of the 14th, thirteen different corps were at once affected. This cholera was dead by the 11th of July, but its virulence was confined to the first days of the outbreak.

Dr. Arnott continues the narrative thus:—"On the 14th of June, the admissions into the different hospitals were numerous, and they increased rapidly during the night. On the 15th, 175 men were admitted and seventy-five died. On the 16th, 277 were admitted and 186 died. Next day there were only 245 admissions and 116 deaths, and on the following day, the admissions were 117 and the deaths sixty-five. In the 60th Rifles, the 86th Regiment, the Bombay Fusiliers, and the 12th Native Infantry, the disease broke out simultaneously; on the 15th June, fifty-one men were admitted from Her Majesty's 86th Regiment, and twenty-eight from each of the others."§

I take a fourth example from the cholera history of 1867. In the last letter written by Dr. MacIntyre, Deputy Inspector General at Peshawur, before he succumbed to cholera, he writes:—"I was at Peshawur until half past 12 on the night of the 19th May, and up to this time all was quiet. There was no cholera reported in my division within 130 miles, and the troops were healthy. I was anxious about Rawulpindee, for the disease was in the district, and I left in order to look after this station. I had scarcely refreshed myself with a short sleep when I received a telegram from the General, saying that cholera had appeared at Peshawur. I therefore returned on the following morning, and found that about five hours after I left on the night of the 19th, the Horse Artillery and 42nd Highlanders had been attacked." The following report from the Surgeon, Her Majesty's 42nd Highlanders, for the week ending 24th May clearly indicates the fact of the Regiment having been struck by the cholera wave:—"Up to the morning of the 20th May, the health of the Regiment was inconceivably good, fifteen men

* Corbyn on cholera, p. 6.

† The camp was broken up on the 13th.

‡ Its decline is dated from the 17th November, the ninth day. Jameson says:—"The disease sensibly declined from the 17th, and wholly withdrew towards the latter part of the month."

§ For the epidemic relations of this Kurrachee cholera, see the cholera history of 1846, p. 115.

only being under treatment, and of these all were either chronic or incurable cases, or else mild and trifling ones. The weather has been unusually cool, and on the evening of Sunday, the 19th, a very heavy and long continued dust-storm blew into the station from the south-east; and this, I think, may have brought up the cholera. During morning visit on the 20th, two cases of cholera were brought into hospital, and in the course of the day, four others were admitted.* The cholera was in its most virulent form, and there were no premonitory symptoms. Up to the 23rd, the number of cases increased daily; on this day thirty-six cases were admitted. On the 24th (the last day included in the weekly return), the admissions fell to twenty-four." The report for the week ending May 31st shows that the maximum was reached on the 23rd, the 5th day after invasion, and that even the character of the cholera was altered. This report says: "Cholera has shown, not only as regards the numbers attacked, a tendency to decline, but also those attacked have not complained of the intense and painful spasms present in all the first cases." Thirty-five cases were admitted in this week. By the end of May, the cholera of the 19th was dead. The following is the report of 7th June:—"There has been no case of cholera since the 31st May; all cases remaining are progressing favourably."

I quote, finally, a remarkable case which occurred ten days after the Peshawur outbreak at the opposite extremity of the province, that of the female orphans at Secundra, who were struck on 29th May 1867. Dr. Playfair thus records the occurrence:—"Secundra is five miles from Agra on the Muttra road, not far from the tomb of the Emperor Akbar. Here, in numerous buildings, are located many orphans of both sexes; on the 29th May, there were 169 male orphans and 168 female orphans. On that date all were in apparently perfect health. On the evening of the 29th May, the girls were out for their usual walk, and when returning and already within the compound of the orphanage, a sudden shower of rain fell. The younger girls were close to their dwelling and escaped, but the elder girls having to go about a hundred yards further got more or less wet.

"Next morning about half past 4 o'clock one of the elder girls was found lying moribund in the court attached to the sleeping verandah. She died in an hour and a half. On the same day, May 30th, sixteen cases were admitted, and on the 31st, fifteen, and between the 1st and 6th of June, fifteen cases more; in all forty-six. Of the elder girls, forty were attacked; of the small children six. The first twenty-eight cases were among the elder girls who had been exposed to the rain; the first small girl was seized at noon on 31st May. The boys were immediately removed to the large verandah round the base of Akbar's tomb; while the girls were placed in a ruined tomb, half a mile distant. Not one boy was attacked. But the smaller children were also moved out to the old tomb among the elder girls, and this I believe to have been a mistake. But I did not know that the big and small girls always lived apart, and I did not at the time clearly understand the circumstances under which apparently the epidemic commenced. Had I kept the small girls separate, they might have remained as free from the disease as the boys did.

Typical Outbreak—Secundra Orphans, 1867.

May	30	...	16	admissions.
„	31	...	15	„
June	1	...	4	„
„	2	...	3	„
„	3	...	4	„
„	4	...	3	„
„	6	...	1	„

"Thirty-six persons were exposed day and night in attending to the sick, and in addition three mehtranees. Not one caught the disease, although several of the girls, tired with watching, were found asleep on the beds of the patients."

The orphans were removed on the morning of the 30th May. Cholera died out on the 6th June, the ninth day from the attack of the 29th, after forty-six children had been seized. This case is an exact counterpart to that attributed to the impure water of the Broad Street Pump.

The duration of the Hurdwar Outbreak of April 1867.

From the narratives which have been written of the outbreak at Hurdwar on the 12th April 1867, the impression which is apt to be left upon the mind is, that the facies of this cholera was different to that of the typical outbreak. But it is only when the facts are viewed with the preconceived theory, that the pilgrim cholera was the epidemic cholera of the year, that the aspect of the outbreak is pictured in this light. To any one investigating the facts statistically they come out in their true light, and prove that the typical outbreak is not subject to modification by the circumstance that the number attacked is large or small. The dying out of the Hurdwar cholera to the east and south, coincident with its increase to the west and south-west of Hurdwar, is considered an inexplicable phenomenon. It is easy of explanation when the theory with which it is viewed in connection is set aside. Taking Hurdwar as the centre, the known spot upon which it is universally admitted that the assemblage was poisoned on the 12th April, the pilgrims died in those districts only which were reached in the daily march before a given date. The great bulk of the mortality occurred in the districts not immediately round Hurdwar, but such as were reached in the first few days' march. Bijnour, the north of Moradabad, the Jumna ferries of the Meerut District, Mozuffernuggur, Scharunpore, Kurnaul, Umballa, and Loodianah give the great bulk of the Hurdwar mortality, while the pilgrim mortality of the Bareilly, Shahjehanpore, Budaon, Southern Moradabad, and Allyghur Districts for April, was so trifling as scarcely to deserve mention. The same remark applies to the districts west of the Jumna. The figures shown at page 137 distinctly prove the dying away of the Hurdwar cholera before the end of April in the districts of the Punjab as well as in the districts lying east of Hurdwar. The pilgrim mortality was great, but it was far short of what the promoters of the pilgrim theory have

* Five different barracks in the cantonment were simultaneously affected on 20th May.

alleged. That the epidemic cholera of the Punjab of May 1867 was the same cholera, exhibited after its propagation, is the theory which suits the belief in the constant spread of cholera by human intercourse. I see the termination of the Hurdwar outbreak—viewed as an outbreak—at a date as early as that of the great outbreaks detailed in the previous paragraphs; and I trace no connection between the May cholera of the Punjab and the return of Hurdwar pilgrims. I speak of the grand fact, not of the secondary question, whether in any case the propagation of cholera in individual cases was due to the returning pilgrims.

But it is not on every occasion that bodies are so struck by cholera. If all bodies were struck, the probability is, that cholera would, in the great majority of cases, die between the 5th and 9th day. But a cholera lasting from fourteen to twenty-one days comes up in a community affected like the seed sown in a field, all due to appear before a certain date if its vitality remains, and bursting forth day by day *without intermission*, until all that is destined to spring has sprung into life. This is the more general facies of the cholera outbreak.

A body affected while moving is beyond doubt in the condition most favourable for getting rid of cholera infection at the earliest date. No one will venture to assert that it is safe to trust to the possibility of a stationary body parting with its cholera on or before the 9th day, when the outbreak, viewed in relation to the type, ought to be at an end. Most observers can from their experience of cantonments recall cases of the typical outbreak; but when we place against these the experience of cantonments such as Morar or Meean Meer, which habitually maintain the invading cholera up to the conclusion of the reproduction, few would assert that the stational outbreak ought to be allowed to have its sway unchecked. And it is upon a knowledge, on the one hand, that removal from an infected spot will almost to a certainty be followed by the cessation of cholera within the 9th day, and possibly much sooner, and a dread, on the other, that the conditions of the locality may lengthen out the life of the miasm up to the end of the reproduction, that removal in every case, as the rule, is advocated. Before speaking of movement into camp, let me place here the case of the 70th Regiment, which suffered at Cawnpore in 1853—a case to show how terrible may be the calamity when local infection is not recognised and made the ground for the removal of the infected body.

Compare this marginal statement with the Peshawur outbreak of 1867. It commenced on the very same day, the 20th May, and was at an end (as regards fatal cases) on the 24th. We know that this outbreak was due to a wave of enormous strength which swept up the valley of the Ganges at this time, as before noticed. I find the statement made that Chunar lost 1,000 out of 12,000 inhabitants, and Dinapore and Benares were ravaged at the same time, the 29th Regiment losing twenty-three men at the former station.

70th *Regiment, Cawnpore*, 1853.
STRENGTH 911, ADMISSIONS 261, DIED 183.

	Deaths.		Deaths.
May 20	1	July 26	7
„ 21	2	„ 27	13
„ 24	1	„ 28	4
* *	*	„ 29	8
June 4	5	„ 30	8
„ 5	5	„ 31	6
„ 6	1	August 1	13
„ 7	6	„ 2	4
„ 8	4	„ 3	8
„ 9	2	„ 4	5
„ 11	1	„ 5	4
„ 15	1	„ 6	7
„ 19	2	„ 7	11
„ 26	2	„ 8	8
„ 27	1	„ 9	6
* *	*	„ 10	3
July 19	2	„ 11	1
„ 21	2	„ 14	1
„ 23	4	„ 16	1
„ 24	8	„ 17	1
„ 25	13	„ 24	1
		TOTAL	183

The four deaths of May represent the primary attack. The outbreak commencing on 4th June was apparently the springing up of the seed sown. This is exactly what took place at Peshawur in the first week of June 1867, and the termination was the same to a day. Here the last case was on 27th June; at Peshawur (with the exception of a case on 4th July) the last case occurred on 28th June 1867. There was no doubt some localising cause which helped to revitalise the cholera of 20th May. The local cause to which I attributed the second Peshawur outbreak was the physical aspect of the Peshawur Valley; here it was attributed to the emanations from a cesspool. The report of the year says:—

"When the disease made its second appearance on 4th June it was chiefly confined to one barrack, and about twenty yards from the south-west corner of this barrack a cesspool had been recently opened, and the effluvia from this were thrown immediately through the barrack in question. The first case occurred in the corner nearest to the nuisance."

The localising cause was in abeyance only, and when the monsoon set in the cholera returned with renewed vigour.* The report goes on to say:—

"On 19th July the epidemic returned with increased severity, and on the 25th a Wing was removed to the Artillery Barracks, three miles distant. The Wing continued to suffer notwithstanding the change of quarters; and on the 4th and 5th August both Wings marched out of cantonments and encamped at Roomah, six miles from the Artillery Barracks." And the result is thus stated:—

"From the 4th to the 11th the epidemic continued to rage (cutting off forty-five men), and then suddenly ceased. The Regiment returned to cantonments on 20th September free of the disease."

"Some benefit would seem to have been derived from going into camp, for the disease continued rife in the cantonment bazaars long after it had entirely ceased in camp."

In this case the Regiment parted with its cholera on the seventh day after moving, and the fact of losing forty-five men after leaving barracks in this instance must not, as some would

* Compare Table, p. 78; and see remarks, p. 215.

conclude, be accepted as a proof of the inutility of the measure; it indicates only the more strongly how great was the necessity for movement, and intimates that had the movement taken place on 19th July, the terrible mortality that followed might have been in a great measure avoided. It will be observed that the facies of the outbreak from the 4th onwards was precisely that of the type, which proves that the source of infection was parted from on the day on which the Regiment moved out of cantonments.

The localisation which lengthens out the outbreak is not the localisation of cholera in the economy and its spread from one man to another by personal communication, nor is it to avoid such a contingency that Regiments go into camp. In the great majority of cases there is no prolongation of the outbreak beyond the 16th or 17th day, and such cases as those of Morar and Meean Meer and of Peshawur in 1862, (see marginal statement), are exceptional to the general rule; and, as I have shown, they are in a great measure due to local peculiarity in the station, and are very generally manifested coincidently with provincial phenomena. It is true that the typical stational or jail outbreak, has an extension of seven days over the typical outbreak of the march or that due to a single afflatus of the cholera miasm. But in both cases the termination is brought about by the fact of a certain number of days having elapsed since the outbreak commenced; and this being the case, we are forbidden in either to look to multiplication in the infected body as the cause of prolongation beyond the typical minimum of duration.

Her Majesty's 93rd Highlanders, Peshawur, 1862.

July	9,	1	Sept.	10,	3
„	10,	3	„	11,	2
„	13,	1	*	*	*
„	15,	1	October	12,	2
„	16,	1	„	13,	1
„	18,	1	„	14,	2
„	20,	1	„	16,	2
*	*	*	„	18,	1
„	26,	1	„	19,	2
„	30,	1	„	21,	7
August	1,	1	„	22,	4
„	2,	1	„	25,	3
„	3,	1	„	26,	4
„	10,	1	„	27,	4
„	12,	1	„	28,	2
*	*	*	„	31,	1
Sept.	9,	1	Nov.	2,	3

Sometimes we can almost tangibly grasp the fact of the infection of special localities, and when we can do so the fact is almost certainly confirmed to us by the phenomenon that the attendants on cholera patients are liable to be attacked. When this shows itself, the conclusion is hurriedly drawn that the sick are spreading the disease; the fact being, that it is the locality and not the patient which affords the miasm which strikes down the attendants. The most zealous supporters of the doctrine of contagion admit and dwell on the truth, that it is in rare instances that even in the most deadly outbreaks the attendants on the sick suffer, and they hold the fact to be inexplicable; and fifty years' experience of the great Calcutta cholera hospitals has led a succession of the most careful observers to deny that infection from cholera patients ever takes place at all.

The paper by Dr. McClelland on the causes localising cholera in the cantonment of Meerut in 1861 deserves to be reproduced here at length.* He traces in the epidemics of 1845, 1856, and 1861 cholera in the same bungalows and along the same lines, reappearing in each epidemic because of the conditions of these localities, and for no other reason. The soil is retentive of water; during the prevalence of the epidemic the open drains are overcharged and the compounds are flooded, and almost immediately those occupying the bungalows become affected. I quote the concluding paragraph only:—"The line of drainage divides the sandy surface of the Native lines from the clayey soil of the European lines. On the side of the Native lines, although occupied by bazaars and officers' bungalows, no case of cholera occurred. Dr. Wilkie considers this part of the station less liable to cholera than the European lines, and this may be considered to be entirely due to the protection it derives from the dry layer of sandy soil which overlies the clay. It has been observed at Meerut that those parts where this dry sandy soil is wanting and the surface is composed of a bare sterile clay have suffered most severely in the late as they always have done in every preceding epidemic."

There is no reason why the hospital building should escape when the barracks surrounding it are infected. In the epidemic of 1861, the hospital of Her Majesty's 35th Regiment at Meerut became infected eight days before a case of cholera appeared in the Regiment, *but simultaneously with its appearance in the adjoining barracks of the 8th Hussars*; and not only patients, but also the residents in the hospital and attendants, became affected. One theory alleged that these men became affected from their communication with those already affected, or with something emanating from them; the other, that the hospital suffered in common with the neighbouring Cavalry Barracks, and that *therefore* both patients and attendants were as liable to attack as if they had never left their own barracks. The alleged contrasted ratio of attack in barrack and hospital is very apt to be erroneous; and in any case the disparity becomes much less striking when the cholera cases admitted in the undeveloped stage are excluded from the calculation. I am led to regard the statement in regard to the alleged disparity as the more apt to be fallacious if it be the case that the normal incubation of cholera may in many cases be longer than is generally supposed.

Hospital infection is sometimes merely indicative of infection of a locality and nothing more. The facts do not bear out the theory of infection from man to man.

The case in point Dr. McClelland attributed to a faulty latrine situated in proximity to one corner of the hospital and joined on to it by a covered way, which, in his opinion, conducted the choleraic influence into the hospital from without. He pointed out that it was this

* Strachey's Report, pp. 97 to 99.

corner of the hospital ward that was infected, and not the hospital generally; and, consequently, that the case for infection from man to man could not hold good. I state this as his view communicated to me. In the report of the cholera of 1861, the case is stated thus:—

"*The first man in the Regiment attacked with cholera* was a patient in hospital under treatment for syphilis. He was seized early on the 11th July. He was immediately removed to a separate ward, and in about an hour afterwards the man in the next bed, who was also under treatment for syphilis, was attacked. After this there were no more cases (in connection with this Regiment) until the 15th July, when a man was seized with cholera in the hospital where he was in attendance on his sick wife and children, (who, I infer, were not cholera patients). On the 17th July there were two more cases in the hospital. One was a man, who was employed as clerk, and who lived in the hospital enclosure. The other was a patient suffering from syphilis, *who occupied a bed next to the beds of the two men who had previously been attacked in the same room. The first case was admitted from the barracks on the 19th July.*" From this date the accurate distinction between cases commencing in hospital and cases commencing in barracks ceases; but cases pointing to the fact of local infection continued to occur in hospital as late even as the 15th August. The hospital for women suffered as well as the hospital for men. Three out of five cases treated originated in the female hospital. The first sufferer was a patient, the second, the hospital matron, the third, the wife of the hospital sergeant. I suppose that the infection of this hospital enclosure must have occurred at the time when the lines of the 8th Hussars were affected (on 8th July); and that the Cavalry barracks and the hospital of the 35th had something in common which separated them from community with the regimental barracks of Her Majesty's 35th. The infection may have been that of a latrine as conjectured, or it may not; but some localising cause certainly did exist, a something peculiar to this spot, which retained in vitality the air-sown cholera which first reached Meerut on the 24th June and revived on the 8th July to show itself generally diffused and in epidemic life. This hospital cholera could not have been in existence before this date, for no cholera had appeared at Meerut after the death of the epidemic of 1856-58, that is to say, for three years previously.

The parallel fact from the cholera history of 1819 is as follows:—"It was the opinion of the Surgeon of the Corps (Her Majesty's 14th Regiment stationed at Meerut) that the disease had become contagious. This opinion was grounded upon his observing that the apothecary of the corps, the hospital serjeant and the apprentice were successively attacked, and that several men were taken ill while nursing their dying comrades."

I would not have it supposed, however, that all examples of apparent transmission of cholera from man to man are examples of infection of localities; but if we mistake the significance of such cases as that of the hospital of the 35th, we are apt to theorise in a direction away from the truth.

The fact of infection of locality warns us that it is unsafe where such a condition exists to continue to occupy the infected locality for any purpose; and, certainly, an infected hospital should not be maintained for the treatment of cholera patients. Such instances as the above are the cases which those who hold the transmission of cholera from man to man point to as conclusive of infection from something from within an infected person or from the excreta. To my mind the tendency of the evidence is very different. Much weight has been attached to this case of the hospital of Her Majesty's 35th Regiment; and the parallel has been transferred to the case of the hospitals of Morar and Mecan Meer in the same year, to show that the fact was of general and not of local significance. I have said, that, in my opinion, the ratios adduced are much more apt to be wrong than right. The excess to the discredit of the hospitals occurs from various causes. In the cantonments of Upper India hospitals and barracks mean the same thing; and the hospital is as liable to attack as the barracks, for it is unreasonable to expect that on the same plain one special building should be exempt from attack because it is a hospital. Add to the men thus seized (not because they are patients in hospital, but because they are men living in the hospital barrack), the patients who are admitted from barracks with undeveloped cholera, which has an incubation of days and which may exhibit its effects by the existence of premonitory diarrhœa or in some other manner, or may never cause any premonitory symptoms whatever; add, moreover, the cases contracted in barracks which come forward among the numerous orderlies whom until lately it was customary to tell off for attendance on their sick comrades, and it follows that the ratio for regimental hospitals, putting aside the possibility of contagion altogether, must normally be very much greater than for the barracks—the ratio ought probably to be three times as high. An uninfected body of men introduced among the most numerous collection of cholera patients does not necessarily become affected with cholera in our great hospitals of Calcutta; and I think there are good grounds for hesitating to adopt without reservation the theory that cholera hospitals are in Upper India a powerful means of propagating the cholera of the outbreak.

Significance of the high ratio of attack among orderlies employed in the hospitals of European Regiments during an outbreak.

But this reservation I would earnestly make, that the truth is not to be set aside that when a body, such as a Regiment, is suffering as a body, many secondary causes will develop the latent miasm, and no cause more powerfully than daily contact with the scenes of a cholera hospital in a great epidemic. Malarious poisoning does not necessarily end in malarious fever; poisoning with the cholera miasm does not necessarily end in cholera in any of its phases. But as shock,

mental or bodily, may determine a rigor, and its sequence in fever, so, in like manner, will mental or bodily shock determine collapse and death in cases where otherwise cholera would never have shown itself. The moral is evident, that in grave epidemics very serious consequences are to be apprehended from the employment of European orderlies over their sick comrades, and a ratio of attack much above the average is in their case to be anticipated.*

Native Soldiers employed as orderlies at Meean Meer in 1861 were not attacked.

A single fact embodied in the cholera report of 1861 seems to me to invalidate the conclusion that the hospitals became the foci of infection. We read with regard to the dreadful cholera of Meean Meer, the following:—"On the 23rd August, when the lamentable results of the employment of the European Soldiers as orderlies in the hospitals had become very manifest, it was suggested that the men of the 31st Regiment of Native Infantry might give assistance in these duties. There were about 330 men present when the cholera commenced, and when it became virulent, they furnished nearly all the guards supplied in ordinary times by the European Troops. From the 24th August, thirty men were sent every day to the Infantry Hospitals to assist in attending on the sick. *No case of cholera occurred among them.* The exemption from attack of the medical establishments in the hospitals was remarkable. There were very few cases of cholera among them, and hardly any of the native menial servants appear to have suffered."†

Infection of locality is constantly attended by the phenomenon of the attack of the attendants on the sick.

Virtually, we are treating men in the locality in which their cholera originated when we treat them in a regimental hospital in the north-west. When all other buildings are vacated the hospital building should not be occupied. To maintain the hospital is to subject the establishments to a risk which we count upon in removing the men from the barracks.

The difference between the results in Calcutta and in the North-West does not seem to me really to exist. The patients of the Calcutta hospitals are affected from a cholera which has its home on the river bank or in the filthy bazaars; they are removed from the sphere of its action, and no one suffers from being brought in contact with them; the patients of the regimental hospitals up-country are treated virtually in their own barracks in the locality in which they have been struck, and when those surrounding them fall stricken likewise, it is said that the phenomenon is the transmission of cholera from one man to another. So in public buildings in England or elsewhere; it will be found that attendants suffer only when cholera has actually invaded the building, and while patients seized within the building are being treated within the walls, and that great cholera hospitals spread the contagion of cholera as little as they do in Calcutta. (I make an exception of the conveyance of cholera by fomites, a subject to be studied afterwards). In attending patients at their own homes whether in this country or in Europe, the danger both to attendants and medical men is great. We know how frequently it occurs in this country that those occupying the same house suffer in common, and it is not less the case in Europe. We cannot tell what condition may have determined an offshoot of an epidemic cholera to one particular spot. It is sufficient to know that if we have good grounds for believing that a patient has become infected from a cholera which has its location in his neighbourhood, there is a risk incurred in attending on him; and when the risk is increased by the general spread of cholera in a neighbourhood, it is not surprising that medical men should fall, whose valuable lives would be saved were all cholera cases treated in General Hospitals. The risk is much greater in Europe than in India. There are many circumstances which in India tell in favour of the medical officer, and the chief is, I think, that his exposure takes place by day and rarely by night, for it is when the air is weighted with moisture and spread out over a sleeping body that cholera and typhus become diffused. I can recall only five cases in which medical officers have suffered, and not one of a fatal termination, in the typhus epidemic of the past nine years in which upwards of 6,000 prisoners have died, and in which scarcely a single attendant has escaped infection in any one of the great jail outbreaks. In 1817, only three or four medical men were attacked with cholera in this Presidency, while in Russia the deaths of medical men were very numerous. When a jail becomes infected in this country and prisoners are still confined within the walls, the medical officers have occasionally succumbed to the effects of the miasm, as at Agra in 1856 and Hazareebaugh in 1866; but it is the rarity of the occurrence and not its frequency that forces itself upon our notice. In Bengal Proper the known fact of the absolute termination of a cholera outbreak in a certain number of days has led to the fact being almost overlooked, that the attendants on the sick of our jails may suffer.

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* In a letter from Dr. Bruce published by Mackinnon, we find the following:—

"Mental depression predisposes as much to the disease as anything I know. So confirmed was I of this fact, that I latterly objected to let any soldier be attended by his comrade in hospital. I always caused his attendant to be selected from men who knew nothing and cared as little about him. It was a curious fact too, that the disease did not seem to attack the attendant till the excitement was over. It always followed after the death and funeral of the person he was anxious about. This predisposing effect of mental depression struck me as long ago as April 1833. Cholera then broke out in the Jail Hospital at Bancoorah; and I found that almost all those attacked and all the fatal cases, were among some Cole prisoners who had been caught and brought away from their homes during the insurrection in the Cole country, and who had been remarked as especially melancholy and dispirited during their confinement."—*Indian Annals, October* 1856, *p.* 141.

† Report on the cholera of 1861, p. 27.

Holding, as I do, the doctrines which I have stated in the first section to be essentially fundamental truths, I am led to scrutinise the facts of alleged contagion from my own part of view, and it may be that I am inclined to push my opinions too far towards the opposite extreme from that view which holds up the human being as the propagator and diffuser of cholera. Those who hold exclusively the doctrine of human transmission cannot feel aggrieved that we decline to subscribe to it as inclusive of the whole truth. Every one feels that it would facilitate much the study of the phenomena of cholera could we hold as a truth and not as a theory the constant or frequent presence of the cholera germ in the evacuations, and could we trace to this as a source the infection of localities or the poisoning of the water supply. In this country we act upon the belief in the transmissibility of cholera in such a manner, and the precautions used against the possibility of infection from such a source have been elaborated to the last degree; and yet it is a melancholy truth that the liability of our cantonments and regiments to cholera in its worst form is as great now as it has been at any time during the past fifty years, and that the absolute mortality is on the increase.

The spread of cholera from one man to another is neither the whole truth regarding propagation, nor yet the primary truth.

I have held up as a warning the case of the 70th Regiment in 1853, showing the effects of cholera localised in the Cawnpore cantonment, and the loss of 183 men as the result of the neglect of movement. The history of the 46th in the same cantonment in the invasion of 1863, presents a parallel which it will be well to study and to contrast with the history of the 88th Regiment in the same barracks in the year following. It is clear in the case of the 46th that the medical and military officers temporised, probably in order to avoid the movement into camp; but the urgent necessity for the movement is shown by the fact that the cholera survived in the cantonment up to the date of the decay of the vitality of the reproduction, since the return to Cawnpore in the first week of September was immediately followed by the renewal of the outbreak, and since two men left behind were attacked as late as the 26th of September. This last occurrence finds its exact counterpart in the history of the 88th in the outbreak of the year following; the Orderly Room Sergeant was sent into cantonments from the cholera camp on the 17th September, and on the 18th he was attacked and died.

Infection of locality in relation to the movement of troops. Cawnpore, 1863 and 1864.

The history of the movement is thus detailed in the weekly returns of Her Majesty's 46th Regiment:—

July 11*th*.—Regiment very healthy; sanitary conditions good.

" 17*th*.—General health of the Regiment remarkably good.

An increase in the number of cases of diarrhœa; two severe cases, of which one proved fatal in ten hours with choleraic symptoms. A second case of same kind under treatment this morning. Weather depressing, with heavy rain.

" 24*th*.—A fatal case from choleraic diarrhœa died in forty-seven hours. Eleven out of twenty-three admissions have been from diarrhœa.

" 31*st*.—Two isolated cases of cholera in Cavalry and Artillery. Choleraic diarrhœa attended with extreme depression on the increase among the men. Three deaths from this cause.

A Wing moves into camp tomorrow morning.

August 7*th*.—Neglected cases of diarrhœa rapidly present choleraic symptoms. Five deaths from cholera, and four cases of diarrhœa fatal during the week. One case of cholera attacked in hospital never rallied.

The entire Regiment is under canvas except the families. The reports from camp are very favourable; barracks are being whitewashed.

" 14*th*.—A marked change for the better since moving out. All cases of diarrhœa are discharged; no admission from cholera or choleraic diarrhœa during the week, nor is the tendency to depression marked in any case of simple diarrhœa.

" 21*st*.—A case of cholera proved rapidly fatal in camp. A second case of choleraic diarrhœa is progressing favourably. Camp changed to Maharajpore, and Right Wing encamped near Bhowpore Railway Station.

" 28*th*.—Three cases of cholera have occurred, two fatal; one case of choleraic diarrhœa admitted. The cholera cases occurred in the Right Wing; the other in the Left Wing.

September 4*th*.—Health of Left Wing very satisfactory. A fatal case of cholera in Right Wing. The Wing has been ordered into Cawnpore by the Commanding Officer.

" 11*th*.—Tendency to choleraic disease still presents itself. Among the men of the Right Wing, three admissions from cholera and one from choleraic disease during the week.

" 18*th*.—Two admissions and three deaths in the Wing at Cawnpore. The Wing was again moved into camp on 15th; one slight case since. The camp is six miles distant from Cawnpore on the Oude side of the river.

" 25*th*.—No admission from choleraic disease. The case remaining progresses favourably.

October 2*nd*.—One man died in Cawnpore from cholera, and another was attacked as soon as he reached camp from Cawnpore. Every man has been moved from the echelon barracks.

" 9*th*.—The one choleraic case remaining will be convalescent in a few days.

" 16*th*.—Regiment ordered into Cawnpore on 19th.

The outbreak of 1864 was more successfully met, and the facts regarding it may be recorded as illustrating all that is to be desired or expected from movement into camp:—

Annual Report, Her Majesty's 88th Regiment for 1864.—Surgeon A. H. Fraser.

"A man and woman were attacked by cholera on the 19th of August. I immediately recommended that the men, women, and children, as well as a party of sixty men who occupied a building in the neighbourhood, should be removed across the Ganges to a suitable piece of ground which had been previously selected in case cholera should appear, and then encamp. My recommendation was promptly acted upon by the Commanding Officer, and the party moved that same evening. On the 22nd of August a child was admitted with cholera from the married quarters; and on the 25th a man was admitted from the barracks. Seeing that the disease was now likely to gain a footing, I recommended that the Regiment should move out of cantonments at once; this was promptly responded to, and next day the Head Quarters and Right Wing marched across the Ganges to about seven miles distance from Cawnpore, the Left Wing to Rooma, about six miles from Cawnpore, on the Allahabad road."

"The whole of the sick men, women, and children accompanied the Head Quarters. Bedsteads were taken for all in order that any possibility of danger from sleeping on damp ground might be obviated. The tents were pitched well apart from each other, drains were made round each leading into larger drains cut in the direction of the natural drainage of the encamping ground. Latrines, consisting of a trench three feet deep, covered over with a tent, were constructed on each flank. A native attendant was constantly on duty at these pits to cover over with earth the excreta, and the trench was filled up and a fresh one dug every three days. A conservancy police was established, and native camp followers and servants were compelled to resort to trenches."

"The water supply was good and abundant."

"A patient in hospital complained of the premonitory symptoms of cholera after having left Cawnpore *en route* to the camp; the disease was checked, but he died from exhaustion on the 28th."

"The health of the Regiment began soon to improve. The men were almost constantly occupied, and there was a general buoyancy of feeling amongst them from knowing that they were out of Cawnpore, which has an evil reputation for mortality. Their amusements were not lost sight of. The library, cricket in the cool of the morning and evening, games, feats of strength and activity, and for the well conducted soldiers, shooting, fully occupied their minds."

"Both Wings remained in camp till the 26th of October, before which time it was not considered advisable to return to cantonments."

"*The Orderly Room Sergeant was sent into Cawnpore on the* 17*th September; on the* 18*th he was seized with cholera and died that night.* There can be no doubt but that the speedy removal of the Regiment from the influence of the disease in cantonments into camp saved it from the devastating consequences of an attack of epidemic cholera."

These parallel cases teach the same thing, namely, the probability of the localisation of cholera in the Cawnpore cantonment, as in Morar, up to the end of the reproduction, that is, from July to the last week of September, and the danger of keeping bodies of men within the sphere of its influence. It cannot be doubted that the tendency to localisation is much stronger in some localities than in others; and that, while in every station of the epidemic area there is the liability of attack on any day between the invasion or reappearance and the decay of the reproduction, few stations are so situated as to maintain throughout an uninterrupted manifestation such as has been shown in the case of Cawnpore, Morar or Meean Meer, of the camp before Delhi, or of the Lucknow Garrison. The probability of persistence is, however, to be determined less by inference than by actual experience; and we may always infer in anticipating the history of future epidemics, that what has once happened is almost certain to occur again.

European Troops, Cawnpore, 1826-68.

YEAR.	Strength.	Number of Deaths from Cholera in each Month.												
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Deaths of the year.
1826 ...	1,763	...	...	...	1	...	...	7	10	...	2	2	...	22
1827 ...	1,988	1	...	...	1	...	1	...	1	1	1		...	6
1828 ...	2,192	...	..	1	...	...	3	15	8	3	1	1	1	33
1829 ...	2,206	...	...	...	...	...	3	1	...	...	1	...	...	5
1830 ...	2,031	...	..	...	..	...	1	...	1	...	1	...	...	3
1831 ...	2,039	...	...	...	...	1	1	...	...	...	...	...	...	2

European Troops, Cawnpore, 1826-68,—continued.

YEAR.	Strength.	Number of Deaths from Cholera in each Month.												
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Deaths of the year.
1832 ...	1,945	...	...	...	...	...	...	...	...	...	...	...	...	...
1833 ...	1,842	...	...	...	...	...	1	1	35	63	1	...	...	101
1834 ...	1,885	...	...	1	...	1	...	...	3	2	1	...	...	8
1835 ...	1,905	...	..	...	...	...	...	...	...	...	...	...	...	...
1836 ...	2,059	...	...	...	...	...	...	...	1	1	...	...	...	2
1837 ...	2,049	...	...	...	...	...	3	5	23		1	...	...	32
1838 ...	1,890	...	...	1	4	4	13	9	6	2	1	1	1	42
1839 ...	1,277	...	...	...	...	...	2	...	3	2	1	...	...	8
1840 ...	1,271	...	...	...	...	...	...	...	...	..	...	...	...	...
1841 ...	1,336	...	...	...	...	...	5	5	3	1	1	...	...	15
1842 ...	1,583	...	...	...	...	...	..	...	57	2	...	...	2	61
1843 ...	1,966	...	...	...	...	...	9	2	7	..	1	...	...	19
1844 ...	2,297	...	...	...	...	...	.		...	...	...	...	...	...
1845 ...	1,944	...	...	...	..	...	44	7	4	11	1	1	...	68
1846 ...	1,487	...	...	...	...	...	...	...	...	...	...	...	...	...
1847 ...	1,102	...	...	...	...	...	...	...	5	3	...	...	...	8
1848 ...	789	...	...	...	...	7	7	23	27	3	...	...	...	67
1849 ...	786	...	...	...	...	...	...	31	1	1	...	...	...	33
1850 ...	...	...	...	...	1	5	2	...		...	...	...	...	8
1851 ...	...	...	...	...	...	...	...	...	5	2	...	...	...	7
1852 ...	...	...	...	...	...	...	...	1	1	...	...	...	...	2
1853 ...	...	...	...	...	...	4	30	64	97	...	...	...	...	195
1854 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1855 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1856 ...	...	...	...	...	...	...	...	2	...	...	...	...	...	2
1857 ...	...	...	...	...	...	...	...	*	*	*	...	...	...	*
1858 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1859 ...	1,372	...	...	...	5	25	2	1	10	3	...	...	1	47
1860 ...	1,228	...	...	2	6	1	...	...	14	1	...	...	...	24
1861 ...	1,230	...	...	1	2	4	7	6	12	2	...	1	...	35
1862 ...	1,259	...	...	...	...	...	...	...	...	...	...	...	...	...
1863 ...	1,162	...	...	...	...	...	1	5	12	5	1	...	...	24
1864 ...	1,131	...	...	...	...	...	1	...	3	2	...	...	...	6
1865 ...	880	...	...	...	...	...	...	...	...	1	...	...	...	1
1866 ...	813	...	...	...	...	...	...	...	...	...	...	...	...	..
1867 ...	691	...	...	...	...	1	...	...	1	...	...	...	...	2
1868 ...	722	...	...	...	...	...	...	...	...	...	...	...	...	...

I place here the Death Table for the Cawnpore cantonment from 1826 up to the present time as illustrative of various points of importance.

First of all, it shows the extraordinary fact that a single locality may prove an index station, furnishing a record in which we may accurately read the history of the succession of epidemics throughout a long course of years. Here is shown the invasion of 1828, dead in 1832; the invasion of 1833, dead in 1835; the invasion of 1837, dead in 1840; the invasion of 1841, dead in 1844; the invasion of 1845; the invasion of 1848, dead in 1852; the great invasion of 1853, after which troops were withdrawn, so that we lose the indices in 1854 and 1855; the great cholera of 1857 derived from the invasion of 1855-56, dead in 1858; the invasion of 1859, dead in 1862; the invasion of 1863, dead in 1866; and even of the invasion of 1867 the true index is afforded, although the Doab lay in the fork of the progressing cholera and escaped, the epidemic passing to the south of the Jumna and through Northern Oude.

Next, after the fact of the persistent affection of Cawnpore in every succeeding epidemic, the season of manifestation is to be observed. There is no difficulty in associating the cholera of Cawnpore in season with that of Northern India (See Tables, pages 38 and 50); and while we know that Cawnpore lies under eastern influences, the statistics of cholera are of themselves sufficient to prove the proximity of this station to the limit separating the eastern and western divisions of the epidemic area, the line of 80°. The table shows how, before the setting in of monsoon influences, the history of all these years has afforded little more than the warnings of the cholera so certain to appear when the vehicle of manifestation is afforded; for the absence of cholera in May implies repression, whether it be the advance of the materies that is retarded, or whether the materies be present and unable to exhibit its presence for want of a vehicle. When once the vehicle has been afforded, Cawnpore is clearly a favourite habitat, as is shown by the continuous manifestation of cholera on the occasion of almost every invasion up to September.

While we might point to the results of the past four years as affording grounds for estimating the advantages which have resulted from sanitary improvements and the occupation of spacious and lofty barracks, the explanation that attack was not due in 1866, inasmuch as

* See Table for 1857 and note in Appendix.

the invading cholera of 1863 was at an end, that in the epidemic of 1867 the Cawnpore District virtually escaped with the neighbouring districts of the Doab, and that the invading cholera of 1868 was repressed by the meteorology of the year into Allahabad and the districts lying to the east, must be admitted in making the calculation; and, therefore, I am inclined to look to future experience in estimating the effects for good of what has been done.

The account of the cholera of the Saugor Jail of the monsoon season of 1864 is interesting in many particulars—in respect to the measures taken in anticipation of the outbreak, the success of these measures, the evident localisation of the cholera and its persistence, and the fact of the attendants on the sick having suffered.

The cholera was raging in the city, and a site for the camp had been fixed on, so that there might be no delay in moving in the event of cholera appearing within the jail walls.

Dr. Rice writes:—"On the 11th July the first case occurred in the Saugor Jail; the man, a hospital sweeper, was taken ill at 2 A. M.; *and within twelve hours, seven cases had occurred in seven different wards.*"

SAUGOR JAIL, 1864.
STRENGTH OF PRISONERS, 350.
Cholera Deaths.

July	11	4
"	13	4
* * * * *		
August	5	1
"	8	1
"	12	2
"	22	1
* * * *		
September	28	1
October	4	1
"	23	1

"On the morning of the 12th every prisoner was out of jail on his way to the camp. The site selected was the narrow ridge of a crescent shaped hill two hundred feet higher than the jail and two and half miles to the south. The fall was good, and although the period during which the prisoners were upon this hill was the wettest of the whole season, no water ever lodged and no muddy half dried patches existed. There were no villages to windward; and to the south-west, the direction of the prevailing wind, the country stretches away in successive ranges of hills covered with low jungle."

"On this ground I placed the tents in echelon. On a lower plateau three quarters of a mile distant, I placed my cholera tents in three divisions; one for suspected cases, a second for convalescents, and the third for those in whom the disease was unmistakeably developed. Communication between the camp and infected localities was prohibited."

"In the main camp I abolished a general hospital, distributing the patients throughout the camp. An extra blanket was issued to all; and food was cooked and served out twice a day. When the weather was dry the prisoners were employed on light labour,—at first in clearing the camp of stones, brushwood, and roots. I then cleared the top of the hill of all jungle; and trenches were dug for the carrying out of a well regulated system of conservancy. As soon as the camp was made trim and all necessary work done, the prisoners were employed in road-making. There were parades morning and evening, and every prisoner suffering in the least was put under observation. The result was, that not only was cholera prevented from spreading, but the opening out and airing of the prisoners seemed to free them from the taint which they had acquired in the jail."

"On the 12th no cases occurred. During the night between the 12th and 13th seven cases more occurred, five in the camp, and two amongst the attendants on the cases first attacked. Of the seven, three died who had not been attendants: on the 16th, 18th, and 22nd three attendants were attacked."*

"Cholera ceased in the main camp on 13th July, and I considered I was safe in bringing the prisoners back to the jail on the 28th. I, however, took the precaution of bringing them back in detachments of twenty a day and distributing them throughout the entire jail. At the end of eight days some 150 men had thus returned, when, on the 5th August, a case occurred which proved speedily fatal. On the 8th another case appeared, and the occurrence of three cases in rapid succession warned me that I had better take to the tents again. Between the 8th and 12th eleven cases had come forward. For two months a case appeared every third or fourth day, chiefly among the attendants on the sick."

Contrasted with the probable results had the prisoners continued to occupy the jail, the effects of removal in this instance must be regarded as very satisfactory.

The type of cholera was deadly. In fifteen cases collapse set in within an hour of the first symptom of uneasiness: of these eleven died within eight hours. There was no diarrhœa in thirty-nine out of forty-eight cases; choleraic symptoms followed in from ten to twenty minutes after the first feeling of discomfort and sinking at the pit of the stomach.

I regard this as a typical outbreak, extending over the normal eleven-day period, but reduced to the minimum by the judicious measures adopted, and chiefly by the opening out and airing of the prisoners immediately after infection. The seventeen admissions appear to represent the abortion of an outbreak which under less favourable conditions would have been attended with a much higher ratio of attack.

SAUGOR JAIL, 1864.
Cholera Admissions.

July	11	7
"	12	...
"	13	7
"	16	1
"	17	1
"	22	1

In the jails of the endemic province recurrence rather than persistence is the prevailing phenomenon. It is not at all unusual for a jail of this area to have three cholera outbreaks in the year each distinct from

* Without any regard to whether those affected may have attended on the sick or not, we have here an evident example of the typical outbreak, dead on the eleventh day, and cut short and mitigated by the means employed to meet it. The primary effects of the infection were developed on the 11th and the secondary on the 13th; and under the most favourable circumstances cases were due up to the date at which they occurred.

the other, and so clearly has the duration of each been defined by experience that the medical officers have been content to await the result without moving out the prisoners. From some jails, indeed, it would appear that cholera is never absent. The monthly returns of Alipore or Hooghly Jails rarely fail to show the presence of cholera, which several times in each year is lighted up into an outbreak. In the intervals the phase is often changed, so that some might almost be inclined to deny that the symptoms were due to the true cholera miasm.

	HOOGHLY JAIL.														ALIPORE JAIL.													
		CHOLERA ADMISSIONS OF EACH MONTH.														CHOLERA ADMISSIONS OF EACH MONTH.												
YEAR.	STRENGTH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total of the year.	Died.	STRENGTH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total of the year.	Died.
1859 ...	776	4	5	3	4	...	1	1	2	...	33	1	...	54	23	1,706	5	1	3	5	2	5	34	2	...	1	13	3	74	30
1860 ...	672	...	39	8	18	...	...	...	7	7	81	13	53	226	87	1,896	...	...	2	33	30	2	...	8	3	3	...	...	1	82	42
1861 ...	713	...	...	4	32	20	4	1	6	14	12	6	4	103	15	1,759	...	...	...	5	7	6	1	4	1	2	3	...	1	30	11
1862 ...	688	2	3	28	36	2	...	13	19	3	11	7	2	126	19	1,823	...	...	...	8	15	4	5	6	2	7	1	6	2	56	13
1863 ...	571	...	18	7	10	9	9	4	2	...	3	39	...	101	28	1,817	4	1	28	6	2	6	9	2	3	10	4	...	75	13
1864 ...	451	...	17	2	3	...	...	1	4	...	1	...	...	28	7	1,793	2	4	14	19	7	3	3	3	4	1	6	3	69	17
1865 ...	578	2	...	...	6	1	...	1	2	1	2	...	...	15	6	1,811	2	6	...	2	1	...	...	...	3	36	13	3	66	25
1866 ...	642	...	...	10	...	2	...	4	...	6	...	...	19	41	17	1,904	1	6	9	3	5	41	8	2	4	5	2	...	86	24
1867 ...	593	...	...	...	9	...	...	...	...	...	...	1	...	10	5	2,356	...	2	36	8	5	2	15	...	2	1	2	4	77	20
1868 ...	549	...	...	...	...	...	...	...	...	...	4	...	2	6	2	2,451	1	5	11	1	5	5	1	...	1	1	4	2	37	12

We see the same sometimes in the jails higher up the country. The peculiar climatology of October 1859, which I have described as ushering in the malarious epidemic of the Gangetic Provinces, appears to have brought forward at the same time the latent cholera of this epidemic year.

Peculiar phase of the manifestation of the cholera miasm sometimes seen in jails, indicative, apparently, of the local growth of cholera at an unfavourable season. Patna, October 1859.

In the Patna Jail the symptoms took a low and deadly type, which it is important that we should not overlook nor undervalue; and the impression conveyed to the mind is, that this insidious cholera was revitalised within the very walls of the jail—a jail from which cholera has never been absent for thirty years. Dr. Sutherland described this as a congestive cholera, as opposed to the usually concussive character of the onset. He writes:—

"Collapse does not ensue rapidly, the case is apparently less urgent, reaction takes place to a certain degree, and the prognosis seems hopeful. But the appearance of improvement is fallacious; the tongue is dry, the pulse is slow and feeble, no urine is passed, but there are several dark, thin, and offensive evacuations, the patient falls into a state approaching to stupor, and finally dies comatose with the aspect of a person sinking from a narcotic poison. On the third or fourth days of an outbreak, great hopes are entertained that there will be but few casualties. But the conclusion is premature. On the fifth and sixth day the patients begin to sink, and it is fortunate if the mortality does not exceed one-half."

Of the outbreak which commenced on the 28th October 1859 Dr. Sutherland writes:—

"The facility with which reaction was established led me to hope and expect that the epidemic visitation would not be a fatal one. In this I was grievously disappointed. A degree of stupor almost amounting to coma generally ensued; the motions continued thin, and were eventually coloured red with blood; the pulse remained weak and rapid; and the patient passed into a state of coma. This followed every form of treatment. It was obvious that we had a disease to treat differing in some respects from every epidemic I had ever seen."

Mackinnon noted the very same phase of cholera. He writes, (op. cit., p. 280):—

Peculiar outbreak in the Tirhoot Jail, described by Mackinnon.

"In a report which it was once my duty to forward to the Medical Board descriptive of a dreadful visitation of cholera in the jail at Tirhoot, I had occasion to notice what was to me a very wonderful modification of symptoms." * * * * "After a check had been put to the vomiting and purging, the voice, breathing and warmth of skin became natural, and the face had none of the peculiar character of the disease. The patients walked about and called for food, saying, they felt well; on feeling the pulse it was barely perceptible, in some cases, I think, not to be felt at all. In this extraordinary condition some of the men lived for more than two days. They all died, if my memory serves me, invariably by coma."

Lucknow Jail in October and November 1863, after the close of the normal period of vitality of the invading cholera of the year.

In October and November 1863, following the new invasion of that year, the Lucknow Jail had eighty-five admissions and forty-five deaths from cholera. Dr. Cannon observes, that it is worthy of remark that this cholera of these months was entirely confined within the prison walls. During the invasion 105 prisoners died between the 15th and 31st of July; there was a complete cessation of cholera up to the 25th September, and from this date, when cholera ought to have

been at an end, as it was everywhere else, up to the 27th November scarcely a day passed without the occurrence of a fatal case of cholera. On no day did more than two deaths occur; between 19th October and 27th November there were fatal cases on twenty-two days, and but twenty-seven in all. The aspect of this cholera is that of a material kept in abeyance, unable from its diminished vitality to do more than indicate the fact that it is present.

Final illustration of affection of locality and affection of attendants. Kohat, 1858.

I shall conclude what I have to say on the localisation of cholera and its relation to the attack of attendants on the sick, with an illustration taken from the experience of the Native Army. The case is that of the 3rd Punjab Infantry, which suffered at Kohat in October 1858. The narrative is related by Mr. Deane:—

"On the 24th the first man fell; another was struck down on the morning of the 25th, a third on the same evening, and a fourth at noon on the 26th, and a fifth on the 27th."

"On the 28th ten men went down (the Regiment had been moved into camp on the 27th). On 29th and 30th six men were attacked; on 31st three. Eight more seizures occurred before the disease ceased on 7th November, before which date the camp had been three times shifted."

"On this occasion a dresser, a cook, and three coolies were attacked while in attendance upon cholera patients." But remark the simultaneous infection of the lines.

"Every day brought fresh proof that the atmosphere of the empty lines were charged with the cholera poison, which found victims among the few camp colormen who had been left behind to watch over regimental property. Nor were the men on quarter guard safe some forty yards in front of the lines, nor yet the tent-pitchers who were under canvas near the quarter guard, till in the end every man was turned out of the foul locality. One day's delay and I believe that the epidemic would have blazed up in the ranks with fearful energy; as it was, ten men were attacked in camp on the first day after removal."

When this case is looked at as regards its relation to the type, it loses much of the significant character which we might otherwise have felt inclined to attach to it. The Goorkhas were infected on the evening of the 13th and morning of the 14th May 1857 in the Nynee Tal Terai, and it was on the 18th that the outbreak blazed up; Peshawur was struck on the 19th May 1867, and it was on the 23rd that the conflagration occurred in the 42nd Highlanders (see page 181). In this case the same phenomenon of the outburst on the fifth day is seen. It is important to note this typical aspect in relation to the facts regarding the outbreak among Native Regiments in cantonments treated of subsequently, and as exhibiting, in all probability, the results of a single afflatus of the cholera miasm, in contradistinction to the effects produced by the cholera which has attached itself to a locality.

TYPICAL OUTBREAK, 3RD PUNJAB INFANTRY.
Kohat, October 1858.

		Admissions.
October	24,	1
"	25,	2
"	26,	1
"	27,	1
"	28,	10
"	29, 30,	6
"	31,	3
"	*	*
November 1st to	7	8

CHAPTER III.

THE CIRCUMSTANCES WHICH INTENSIFY OR DIMINISH THE RATIO OF ATTACKS DURING THE OUTBREAK. THE DIRECTION IN WHICH THE STUDY OF THE NATURAL HISTORY OF THE EPIDEMIC AND THE OUTBREAK POINTS IN TRYING TO DETERMINE THE PRINCIPLES ON WHICH THE OUTBREAK SHOULD BE MET.

It is not alone the strength of the miasm or its accumulation in a locality that determines the intensity of the outbreak.

Hitherto I have spoken of the circumstances which prolong or diminish the duration of the outbreak; now I have to speak of the conditions which determine intensity or comparative escape during the period of the outbreak with the view of determining the principles on which the outbreak should be met.

Could we so weigh the conflicting views of different theorists as to reduce the facts to a systematic whole appreciably true, we should lay the basis upon which the great question is to be solved—why it is that the British Soldier is struck down, and how his valuable life may be saved. No one has yet answered the question, why it is that the British Soldier alone is selected in the cantonments of Upper India as the victim of epidemic cholera, and why the Native Soldier living in circumstances which are theoretically opposed to all the sanitary conditions supposed to favour the spread and intensity of cholera, either absolutely escapes or exhibits but in shadow what is filled up in substance in the case of the European Regiment, and why localities regarded as enjoying the greatest immunity from cholera are no sooner occupied by European Troops than they acquire the character of plague-stricken spots. It is the British Soldier in himself or in his domestic relations that fixes the ratio of attack; the special localisation of cholera will not account for the absolute exemption of Native Troops and the decimation of every corps of Europeans in the same station at the same time, which is habitually the rule and not the exception. Mr. Strachey tells us that Mecan Meer had not the reputation of being an evil locality for cholera before it became a British cantonment; he says also:—"It is remarkable that not many years ago Gwalior and Morar had the character, apparently well founded, of enjoying an almost complete immunity from the attacks of epidemic cholera." This, however, is not the explanation; Gwalior has all along been a station lying directly on the route of invading cholera; it was the want of the pabulum for manifestation alone that prevented it from appearing in its true character. From the following note by Dr. Kirk, I have no difficulty, with subsequent experience, in inferring, that had Morar been occupied in the epidemic of 1856 by European Regiments, the mortality would have been reckoned by the hundred. He writes in August 1856:—"Cholera has been for six or seven weeks in the city of Gwalior. Up to within a few days ago, however, the irruption was comparatively slight, but since then the seizures and deaths have both increased. In the cantonment there was a marked increase at the same time. In four days we have had twenty-seven seizures, and about twenty people are ill now in the sudder bazaar. *In the Regiments* there have been a number of choleroid cases, and in one Regiment there have been some well marked cases of cholera among the sepoys.*"

An enormous responsibility is involved in the attempt to solve the problem of the causes of the cholera death rate of the British Soldier, and no theoretical considerations which do not seem consistent with the best understood hygienic laws should be allowed to divert our minds when we study it. But this we cannot help feeling, that no clear basis of theory has yet been laid upon which we can boldly urge our practical measures. Even immediate movement, the one remedy to which, above all others, we looked for a diminution of the death rate, which to every mind appealed as just and proper, has proved in its application below the standard to which its advocates sought to raise it, and the outbreaks of the Buffs and 42nd Regiment in 1867 take their place among the most deadly on record. The measure which it was hoped would diminish the average outbreak both in duration and intensity, has, we cannot doubt, effected in many cases what was hoped for; but the truth cannot be hid that in others the intensity during the period of the duration of the cholera has been extreme.

Suggestions apt to divert the mind from the points of essential importance in connexion with the study of how the outbreak is to be met.

In considering the grand problem I would have all minor facts and theories likely to decoy the mind from the essential truth placed on one side; for there are many rocks, small in themselves, which have stopped the progress of those trying to pass this difficult strait.

The abortion of the effects of the miasm in the individual.

One of these is the idea which exists, that the cholera which is coming forward in any individual may be aborted. It has been insisted that by the employment of remedies to check the preliminary symptoms of cholera the mortality of our European Soldiers has been lessened. There is no reason to question the truth of the statement that a cholera may be cut short in its earliest stage by sedatives or antispasmodics. Some of our most experienced men have satisfied themselves that they have succeeded in cutting short a cholera in this stage. It is right to use such remedies if no better course is available. But the employment of these remedies is not to be mistaken for a combat with an outbreak of epidemic cholera.

* Native Regiments of the Gwalior Contingent.

Taking into account all fallacies that may possibly arise in a statistical enquiry, it is certain that two-thirds of all men in whom cholera becomes developed die. When it comes to this, the medical mind is apt to ask itself whether nothing has been done to mitigate the calamity; and it is to be feared that the solace afforded by the suggestion that many cases of cholera may have been aborted by medical means is too often appropriated, and on insufficient grounds, since we find that in the case of Native Soldiers who reject such measures, the premonitory symptoms of the same period do not pass into cholera.

Good effects of a system of prophylaxis.

A second suggestion is, that cholera may be in a great measure averted by a system of prophylaxis. It is said, that as debilitating influences may lead to the coming forward in the economy of a cholera which a constitution better braced up would certainly have shaken off, so cholera which has infected a body may be prevented from developing by the individuals composing the body being placed in a position to bear up against the poison. This proposition also has a basis of truth. No one who recognises, as I do, the extreme resemblance of the two specifically distinct miasms of malaria and cholera, would hesitate to recommend the use of prophylactic remedies when cholera is threatened. But the general use of prophylactic measures will not, in very many cases, prevent the development of the outbreak, although some, perhaps not a few, lives will be saved by the fact of the individual being carried over the critical point which must be surmounted if he is to escape cholera and death. For I am strongly of opinion that there is in the cholera of any individual a point reached, marked, however, by no particular symptom, at which the disease advances or recedes, just as in the case of malarious poisoning. The individuality of cholera is more pronounced than that of the malaria poison, but I believe that in this alone the phenomena of the two miasmata differ. It is not in every one poisoned by malaria that febrile symptoms come forward, for before the critical point is reached at which rigor and the subsequent stages of fever follow, the scale of the balance has begun to sink backwards. I judge the same to be the case in cholera poisoning; it is not the case that in every one who imbibes the cholera poison cholera becomes developed.* I am sure that it is wrong to say that in all cases the existence of cholera in the system is marked by premonitory diarrhœa. It may be marked by diarrhœa or it may not, and probably the most deadly form of cholera is that in which no symptoms at all or symptoms attributed to dyspepsia merely, are present.

Effects of quarantine in preventing the development of the outbreak.

Next, it is advanced that a rigid system of quarantine is an efficient bulwark against the advance of cholera, and that cholera epidemics are to be met by circumscribing those affected by a sanitary cordon. In all cases in which we have evidence that cholera is being carried about a province by human intercourse, lives will be saved by this means which would be lost through its neglect. Quarantine, however, has never been efficient to prevent the introduction of cholera into any country, and to trust to quarantine measures as the root of a system by which the epidemic cholera of India shall be met and restricted, is to lean on a broken reed, and to leave our soldiers virtually unprotected. Quarantine should undoubtedly be enforced in many cases as conducive towards a good end; but if a general line of action be recommended on the theory that absolute protection follows strict quarantine, its adoption can end only in disappointment.

Measures adopted from the consideration of the contagious nature of cholera.

Another suggestion is, that the outbreak should be treated on the theory that cholera is one of the most subtilely contagious of diseases, and every developed case a possible focus of infection to all around. The epidemiologist will dread the spread of cholera as a disease as much in the incubative as in the developed stage if it be true that cholera is thus spread. The aspect of outbreaks, however, is strongly opposed to the reception of this view placed in this light. Viewing the question in the light that a body of men may suffer in consequence of aggregation and community, I would not lightly set aside what I conceive to be a truth, that the tainted stratum of air over a sleeping mass may be selected by the cholera miasm, as we see only too plainly that it is selected by the typhus poison when an outbreak is being fomented in our jails. This consideration should have no light weight in an estimate of the causes which augment the ratio of attack; but the empirical assertion, that because cholera is a contagious disease its ravages can be controlled by precautions directed against contagion, is a grave error, and not the less so because it has been so universally assented to of late.

Measures deduced from the theory of the poisonous character of the emanations of those already affected.

A fifth theory holds that cholera outbreaks are to be prevented by the adoption of a perfect system of conservancy and the use of an untainted water supply. The dry-earth system lately introduced is beyond question admirably adopted to secure the end aimed at; and if I believed to the full the proposition so eagerly put forth of late years, that cholera is multiplied in the *primae viae*, and that it is through the discharges that cholera is propagated from man to man, I too should hope to see the deaths of our European Army counted not by hundreds, but by tens. But the events of 1867 give no promise of the fulfilment of any such expectation.

* In replying to Dr. Murray's queries, Surgeon Eteson gives his impressions in regard to this subject in the following terms:—

"During the occurrence of an epidemic, I believe that every living soul within its influence must be infected; and all experienced medical men are familiar with a premonitory train of symptoms, which assumes greater or less severity according as the individual has in his system that which favours the development of the contagion or otherwise."

I have anxiously sought for evidence of the highly poisonous character of cholera evacuations, and I think that I have done so with an unprejudiced mind. I do not go so far as to say that the evidence against the presence of the cholera germ in the evacuations is decisive. On the contrary, I think it probable that latrines are occasionally infected and especially hospital latrines, as I judge by observing that in a year in which a reproduced cholera is due to appear, it not unfrequently happens that the first affected are men already in hospital with trifling ailments, which do not prevent them from leaving the wards or from making use of the hospital latrines. The following is a case to the point:—Dr. Sutherland, in his report for 1860 of the Patna Jail, calls attention to the fact that four men out of seven engaged in breaking up old privies which had become saturated with ordure were attacked by cholera; this happened during a general outbreak in the jail; but he affirms likewise that the wards to which the old privies were attached had three times as many cholera cases as those in which a better conservancy system was in force. Cholera has appeared in this same jail annually for thirty years, generally twice and frequently three times in each year.

It has been observed that on some occasions, cholera when about to become epidemic in a cantonment has appeared first among patients in hospital.

The following cases taken from the history of the eastern cholera of 1860 illustrate this statement:—

Seetapore, 7th to 18th May 1860. "Out of four fatal cases, two were patients in hospital with gonorrhœa and syphilis, and one was a convalescent."

Gondah. H. M.'s 20th Regiment. "All the cases fatal in April (four), were in hospital when attacked, suffering from trifling ailments (gonorrhœa and primary syphilis)."

Rae Bareilly. Royal Artillery. "The first case occurred in hospital; and three other patients were attacked the same evening with diarrhœa, and great depression."

Cawnpore. H. M.'s 54th Regiment. "It is remarkable that many of these men were seized when in hospital under treatment for other diseases."

Lucknow. 2nd Dragoon Guards. "Ten cases of cholera occurred in September; of these nine occurred among patients in hospital."

Allahabad. Royal Artillery. "In the course of the morning of 6th May, three men, patients in hospital for other diseases, were attacked, and another followed in the afternoon."

From noting that these cases occurred not in a year of invasion but in a year in which cholera was revitalised over an occupied area, the inference might be drawn that the cholera came forward in these hospitals in consequence of local poisoning due to the fact of patients having been treated in them on the occasion of the invasion of 1859. I find it very difficult to estimate the significance of these cases. But in bringing them forward, I do not wish the inference to be drawn that it is the rule for cholera to appear first in hospitals in the year succeeding an invasion, or that cholera necessarily reappears in a place in which cholera patients have been treated. The most deadly outbreak is not frequently succeeded by a second in any locality at the date when revitalisation is due, and when cholera does reappear in a second year, it is while a general provincial manifestation is occurring; but he is unwise who, after the invasion of a barrack or cantonment, neglects to remove whatever causes may favour the retention of the vitality of the cholera germ, whether inside or outside of the barrack walls.

The local reappearance of cholera in July and August after its distribution in spring, which so frequently occurs (see Tables, pages 78 and 203), suggests the important enquiry, how far the repressed cholera of May may be the very same materies which comes forward in our cantonments of Upper India when the conditions of the monsoon season are calculated to afford to a localised cholera which has shown itself on invasion as little more than an aura the means of exhibiting its presence in power; and how far there may exist local causes determining whether the invading cholera shall die or shall maintain its vitality until the season comes round when the means of manifesting its presence and its vitality are afforded. The nature of these localising causes must be studied in connection with the definition which I have given of the term localisation; but I think it right prominently to notice the phenomenon in order that those who regard the emanations from cholera patients as a source of the poisoning of a locality may have their attention directed to the fact.

I observe that a recent reviewer gravely reprehends the tendency of the work of Dr. Macpherson, as undervaluing the merits of disinfectants and the importance of the total destruction and scrupulous cleanliness in the removal of every particle of cholera excreta; and he suggests that as typhus dies out by heat and ventilation, so possibly in the hospitals of Calcutta may cholera die out by dilution and dissipation, a phenomenon not perceived at home. We are told that one series of facts is true of cholera in Lower Bengal, another of cholera in Upper India, and a third of the cholera of Europe. Primary and essential facts are unchangeable; but aspects alter, and theories are apt wrongly to shape these aspects and to elevate them into a significance to which they are not entitled. Conclusions derived from the alleged analogy between the typhus and cholera poisons are essentally erroneous. I have had the opportunity of studying most carefully a very large number of typhus outbreaks spread over the last nine years. We can foretell to a week when smallpox and typhus shall die out throughout the length and breadth of Upper India; and, far from there being any alliance between the poisons of cholera and typhus

as regards their relations to the influence of the seasons, there is a direct antagonism when the statistics showing the results of the two epidemic agencies are placed side by side. A certain number of weeks of dry heat inevitably cuts short the most deadly and wide spread typhus, and as inevitably chains down cholera. It is only when the vehicle comes forward and after typhus is dead that cholera appears; the typhus season of Upper India is from the end of October to the beginning of June; the cholera season from July to the beginning of October. The great typhus epidemic of the past nine years has never yet managed to establish a footing in Bengal Proper, merely because the climatology is inimical. It is scarcely necessary to repeat, that the seasons in which the cholera hospitals of Calcutta are crowded are those in which every facility seems offered to the propagation of cholera from man to man. The hospitals are filled at a season when cholera is universally in epidemic vitality and when the air is damp and saturated from surface moisture and from frequent fogs; and the fact of the lower wards of the hospital being on a level with the chief cholera wards seems also calculated to afford every opportunity for the local diffusion of the miasm; and yet the arrangement has been maintained for these fifty years because no evil results have been observed to follow. The reviewer appears to me to argue as if it were an established fact that cholera excreta are the means of propagating cholera, and that Dr. Macpherson ought to have conceded this point. But in this country we do not hold, except as a theory, the transmission of cholera by means of the evacuations, although we recognise the destruction of such materials to be a duty incumbent upon all who are called on to treat cholera.

It is a most unusual occurrence for our great cholera hospitals to become infected. The fact of its ever occurring at all has been absolutely denied by all who have had charge during the past fifty years of the great hospitals of Calcutta, general hospitals in which cholera patients are scarcely separated from others, from which cholera is never absent, and which in epidemic seasons are crowded with cases of the most malignant cholera. The infection of a medical officer or of an attendant on the sick or of the sweepers or washermen is a thing unknown. From first to last in these fifty years, this observation has been made by no careless observers, but by men whose position was in itself a guarantee for the highest intelligence. It is useless to suggest that the conservancy system is superior to a regimental system. It is not; on the contrary, greater liberties are used in general hospitals with cholera excreta than would be thought safe in regimental hospitals. Scriven who had the opportunity of observing cholera during some of the worst epidemic years in Calcutta in the General Hospital, confirms the experience of all his predecessors, and writes thus in his report to the Punjab Government on the cholera of 1862:—"I may sum up my own experience in the same way; and I had considerable experience of cholera during six years and a half at the General Hospital in Calcutta. It may be truly said that cholera is never absent from Calcutta, and at the changes of the seasons we used to have numerous cases of the severest kind. They were always treated on the south division of the large lower ward in the body of the building, which was not in any way shut off from the rest. I have often seen this ward full of cholera cases, with the attendants constantly employed among them, yet I never heard of any of them catching the disease, nor do I remember any of the other patients in the ward being infected. This southern part of the ward was so frequently filled with cholera cases that we never thought of taking any special steps to cleanse it otherwise than by ordinary washing, nor do I remember any facts occurring at the hospital that would have led me to think such a step was necessary."

It must not be concluded that cholera never originates in the hospitals of Calcutta. It is no very unfrequent occurrence for a patient under treatment for some other disease to be suddenly seized with cholera; and I know that oftener than once during the past five years several cases have come forward together in different wards and different buildings of the General Hospital. But this is an occurrence to be noted because of its rarity, and no one can say with certainty that it has resulted from poisoning of the hospital, seeing that such an occurrence has always been coincident with the *epidemic* prevalence of cholera in the city.*

In conclusion, although I am not unwilling to believe that there may be a certain amount of truth in the assertion that poisoning of a locality from the evacuations of cholera patients may occur, I cannot assent to the proposition that a community is always poisoned through latrines, nor should I make it the basis or theory of action in leaving a cholera-stricken cantonment; and, above all, I would not trust to immunity being obtained or to the mortality much lessened by the most perfect conservancy system. All the measures which I have enunciated are means towards a good end, but their inefficiency is terribly evident. To me it seems that none of these measures, nor all combined, grasp the one essential necessary to be recognised in the application of a remedy.

Management of individuals affected by cholera. Dr. Murray's Report.

It is not my place in a paper on the natural history of cholera to enter into the question of the treatment of a disease of the human economy. So long as but one-fourth, or, at best, but one-third of our European Soldiers who fall into the collapse of cholera survive, it is mere mockery to point to what has been done in the way of applying a direct antidote to the disease cholera. I am not prepared to say that all treatment is alike useless. Some methods of treatment are certainly more judicious and perhaps more successful than others.

* For continuation of this subject see page 239. In the last chapter of the first section, I have traced the coincidence of the cholera of March 1868 of the regimental department of the General Hospital with the general cholera wave, of which the effects appear to have ceased over a wide area in Lower Bengal on 17th April.

Dr. Murray, Inspector General of the Medical Department, has undertaken to tabulate and weigh the recommendations of those medical officers whose experience is wide and whose judgment is to be relied on as to what ought to be done and what ought not to be done during the progress of a case of cholera, and his report is now ready for publication.

Many suggestions have been made on the theory that it is possible to devitalise a virulent cholera. I have called attention to aborted cholera coming forward between epidemic visitations; to the western cholera of 1859, in which one died out of thirty-five; to the Oude cholera of the hot months of 1858, in which the mortality was one out of eighteen; and to the eastern cholera of 1862, in which the mortality was very trifling. These I cited as instances of natural decay occurring after the close of the normal life period of the epidemic. The employment of disinfectants is, I suppose, related to a theory of artificial devitalisation. But the measure is necessarily of very limited application, and when the assertions as regards its alleged efficiency are viewed in connection with the natural facies of the outbreak, the evidence in its favour will be found to be materially weakened. And when I regard the allegations as to the results that may possibly follow disinfection, keeping in mind the width of scope which I have admitted in defining what is included in the term "infection of locality," I can form no very high estimate of the practical utility of disinfectants towards lessening the intensity of the outbreak, even granting that all that has been said in their favour be true.

Estimate of the value of disinfectants.

Can the cholera germ be devitalised in the economy before the setting in of collapse? The question is associated with the possibility of the economy being braced up to resist the tendency to succumb until the miasm decays naturally, which occurs within the eight or nine days following infection, judging from a study of the typical outbreak. This question ought, I believe, to be studied through the parallel of the malarious poisoning, on the principle that each is an air-conveyed miasm entering the human system through the lungs. As in the one case we know that the system may be artificially placed in a position to resist the manifestation of malaria in fever, so in the other there would seem to be the possibility of the repression of the crisis which determines the manifestation of the disease cholera, and beyond which lies collapse and death.

THE GENERAL PRINCIPLES WHICH SHOULD BE ACCEPTED AS FUNDAMENTAL IN TRYING TO DETERMINE THE VALUE OF PRACTICAL SUGGESTIONS.

I believe that it is from a just conception of what the epidemic, the reproduction, and the outbreak are in all their relations that the sanitary code applicable to the prevention or mitigation of cholera will in time be framed. If it has been found necessary in the preceding chapters carefully to distinguish between cholera as a disease and cholera as an epidemic agent, not less carefully must the distinction be drawn in judging of the measures adapted to meet the epidemic and the outbreak. The physician and the epidemiologist see cholera under two aspects which are very different one from the other, and each is perhaps inclined to depreciate the aspect which is least prominently brought before him. But so perseveringly have the advocates for one view of the epidemic relations of cholera urged what they allege must be the facts in regard to cholera as a disease, that the physicians who treat cholera as a disease sinking their individual and aggregate experience, have been inclined to defer to the constantly repeated assurances of the epidemiologist, that his study insists that cholera shall be regarded as a communicable disease passed on from man to man.

The meaning of this I take to be, that as in the study of cholera as an epidemic, primary and secondary truths have been erroneously arranged one against the other in antagonism, so that harmony has been styled caprice, and the most perfect truths fallacies; so in the study of cholera as a disease the deductions from secondary truths have been exalted to the depreciation of those drawn from primary truths, and indeed to the ignoring of the latter altogether.

The study of the outbreak has shown us how in the type and in the vast majority of all recorded cases, primary and not secondary truths influence the facies and duration, and how powerful are local conditions in causing those very phases which are represented to be due to infection from a human source. If it be true that cholera is generally or very frequently a disease passed on from one man to another, the indication to be pursued is plain enough; the same measures that are powerful to prevent the spread of typhus or smallpox are available against cholera —quarantine to prevent infection, space or ventilation to ensure diffusion of the poison, segregation of those affected, and the destruction of fomites and of everything emanating from the cholera stricken patient. Those, on the contrary, who are slow to believe that cholera is thus propagated successively in a community, and who yet are unable in their minds to dissociate the idea of cholera as an air-borne miasm multiplied in the soil, from that of its being infinitely increased as is the typhus or smallpox germ in the human economy, find in the infection of drains and common latrines from human emanations the nidus of the general infection of a body, and promise that when greater care is taken in preventing the introduction of the germ into these sources of local infection and when a system of dry conservancy is rigidly carried out, cholera shall cease to show itself in violent outbreaks; and from a

Methods of meeting the outbreak suggested by different theoretical considerations.

Exemption will not be attained by dealing with cholera as with smallpox or typhus.

Or as a miasm sown in our cantonment through emanations from infected individuals.

belief in the danger and universality of local infection, abandonment of the spot in which cholera has once shown itself is the additional remedy which is suggested. Those who are not afraid to acknowledge to themselves that, as a portion of the epidemic, the outbreak is too often inevitable, maintain that with change of locality, elevation, efficient drainage, a pure water supply, in short, by the use of all such appliances as are unquestionably efficient against the poison of malaria, the ratio of attack may be much diminished; they believe that, as the rule, the localisation of epidemic cholera is apt to be proportionate to the existence of conditions favouring the localisation of the miasm which causes malarious fever, making, however, a wide reservation for the distinctive character of the two poisons, and for the effects of monsoon influences which along with their advance create for a time the conditions which determine the localisation of air-borne miasmata; and knowing from experience both of the cholera and malaria poison that a locality which has once been affected may, and in all probability will, retain the miasm for a certain number of weeks or months, they see in change to another situation the probability, not the certainty, of a degree of immunity which they could not expect in the place in which infection has actually occurred. Thus with the knowledge that the cantonment of Mecan Meer or Morar will on the occasion of an epidemic invasion almost certainly retain cholera from the middle or end of July to the last week of September, a Regiment may quit either station after being struck, with the assurance of throwing off the original cholera on or before the 12th day; without any guarantee, however, that up to the last week of September it shall not be struck anew if still remaining within the natural province invaded. Those who have felt the influence of epidemic malaria can well understand what is meant by such localisation; when the fever of October 1859 settled down for two months in the Gangetic Provinces, every individual included in the area was aware of the fact that he was throughout the period breathing an atmosphere impregnated with the fever poison.

The natural alliances of the miasm of cholera being with the miasm of malaria, the direction of the general measures should in either case be the same.

There is no respect in which the cholera miasm is more closely allied to that of malaria than in this, that the reception into the system of either poison is not followed of necessity by the diseases cholera or malarious fever. I believe that a susceptibility of the individual or class has more to do with the aspects of the outbreak as regards gravity or mildness than has ever been suspected. It is not alone the amount of the poison operating which fixes the ratio of attack, nor do the conditions of life alone determine that one body shall succumb while another escapes. The effects of race and of influences operating over and above the mere presence of the cholera miasm will be treated of in the paragraphs which follow; and all that is here written goes clearly to show, that the causes determining the ratio of attacks in the type with which we are more immediately concerned, namely, the British Soldier, cannot be duly estimated if the idea be maintained that the ratio of attack is merely a question of the local accumulation of a certain amount of the cholera miasm.

In a cholera-tainted atmosphere the highest play of functional activity is required for the maintenance of the balance, and we know that, as the rule, the balance is maintained, and that cholera is not universal because of the presence of an universally distributed cholera-bearing atmosphere. It is discordant with all theory to suppose that all affected by the cholera miasm succumb to cholera, and I believe that the law of the comparative exemption of certain classes, on occasions when the diffusion of cholera is universal, points to the grand principles on which the treatment of outbreaks will in the future be conducted. Predisposition to succumb may be owing to many causes interfering with due performance of function;—to the presence of the venereal taint in the system, to the poisons of malaria or alcohol, to the disturbance in the economy caused by the seasoning fever, to the effects of a barrack atmosphere tainted by overcrowding—to any cause, in short, which by its operation is known to destroy the just balance between health and disease.

Causes aggravating the ratio of attack by causing the derangement of the balance between health and disease.

We know that many a man would escape cholera, although thoroughly poisoned, were it not for the operation of immediately exciting causes. I have noted several instances corroborative of the belief which exists that when cholera is abroad the use of a simple purgative may determine an attack of deadly cholera; I know of no case more typical than that already quoted which occurred in Her Majesty's 87th Regiment at Ferozepore on the same evening on which Umballa was so heavily struck in the first week of September in 1852. Dr. W. Walker very well expresses what I wish to illustrate, in the following sentence:—"Let any medical man cast up in his memory the fatal cases of cholera which have occurred in his own practice amongst all classes of patients, and he will have it at once impressed upon him how many fell victims to a temporary lowering of their vital powers. In one case, it was the depression following the use of stimulants to excess that was the exciting cause; in another, the fatigue of a long journey, or of a shooting excursion; in a third, exposure to cold and wet; in a fourth, confinement and watching by a sick bed; in a fifth, mental depression from grief or fear of the disease itself; in a sixth, (and this perhaps is more frequent than any other cause,) temporary weakness caused by slight diarrhœa, the result of indiscretion in diet." *

Secondary causes immediately exciting the attack of an individual or community.

* Replies to Dr. Murray's queries, Appendix II, p. 7.

Statistics which profess to show that the temperate are attacked in an equal ratio with the intemperate misrepresent the actual state of matters. Dr. Murray is of opinion that Non-commissioned Officers and others accustomed to habitual indulgence, who have the opportunity of keeping up the stimulus throughout the outbreak, are not so liable to succumb as the Private, perhaps not habitually given to exceed his allowance, who during the outbreak has the opportunity but once to drink to excess before a check is put upon him. It is in the state of prostration following the excessive indulgence that the attack of cholera is imminent, just as in the case of the orderlies alluded to by Dr. Bruce, who fell into cholera after the death and burial of their comrades; lowering of nervous power from alcohol in a system which has been exposed to the influence of the cholera miasm implies loss of the ability to tide over the infection, and the result is cholera and death. We know how powerful is the effect of terror in regulating the ratio of attack from heat apoplexy. The disastrous retreat of the detachment of Her Majesty's 35th Regiment on the 22nd April 1858 from Jugdespore into Arrah is a case in point.* Very few men fell before the enemy, and fatigue and exposure might, even in the event of the expedition having been successful, have been the cause of some deaths; but the actual ratio of attack was due to the influence of terror, and not to the degree of fatigue, exposure or heat to which the men were subjected. So with the cholera outbreak, a certain number of men will, under any circumstances, succumb when the cholera miasm is abroad, and local and domestic causes will influence the ratio of attack; but we must not fail to recognise in causes affecting the integrity of the nervous system a very powerful means of multiplying the ratio. One of the very earliest cases on record pointed to this as a truth—the case of a woman at Musselburgh, in the first invasion of Scotland, who stood at her door while the funeral of a neighbour who had died of cholera was passing, who went into her house and was immediately seized with fatal cholera. Such cases can only be explained by the analogy between the miasmata of cholera and malaria, both showing the same phenomenon of latency in the system until certain circumstances determine the manifestation of its presence, or until the poison dies or is eliminated without its existence having been in any way indicated. What in the case of the malaria poison is shown as coldness, as rigor, or at the worst as blue collapse which yields to stimulants, is in the case of the cholera miasm represented by collapse and by death in the European Soldier, in from two-thirds to three-fourths of all cases in which collapse has supervened.

I think that it is quite essential that the varying aspect of the outbreak in different classes should be studied in this light. That it does vary is a sad truth. And indeed, as I shall show, taking the European and Native Armies as types, the outbreak of the former has no representative in the latter class.

Ratio of attack in the outbreaks of the European and Native Armies contrasted.

In a single sentence, the object to be aimed at in the management of the outbreaks of the European Army is to endeavour to make them what they are in the Native Army. That the ratio of attack or the death rate may be reduced in the European Army to that of the Native Army is the utmost that is to be hoped for; and all our efforts should be directed towards the attainment of this minimum. That it will ever be attained is too much to hope, for I cannot help coming to the conclusion that the influence of race and of personal habits is more powerful in determining the invasion of cholera in any body than are the influences of local or even of domestic conditions. In saying this, I do not overlook the fact that on the march, and especially when crowded in country boats, the outbreak in a Native Regiment loses the aspect which it presents in cantonments, and that under such conditions the outbreak of the two classes becomes assimilated (see page 192). But to my mind, the inevitable conclusion from the tabulated experience of twenty-four years is entitled to the value of a law, and this conclusion is, that what we term the outbreak, that is, a general manifestation of cholera in a certain body, is in the cantonments of our Presidency among Native Troops almost a thing unknown.

It is a mistake to suppose that Native Regiments in cantonments give no evidence of affection by cholera when the epidemic is abroad. Native Regiments are struck upon a given day just as the European Regiment is struck during the progress of cholera, and few bodies of Native Troops escape on the occasion of an invasion. To take an illustration: During the epidemic of 1867, there were in the Punjab forty-seven different Native Regiments, generally distributed over the province. The only cantonment which escaped altogether was that of Dera Ismail Khan, a district which was scarcely touched, only eighty-three deaths having been recorded among the population during the period of the prevalence of the epidemic. Out of the remaining forty-three Regiments only nine escaped infection; and yet the aggregate mortality of the thirty-four affected bodies was but eighty-four men, an average of 2·5 for each corps. The only corps which lost above six men was the 1st Sikh Regiment at Kohat, in which, at head quarters and in detachments, fifteen men were lost.

The table which follows gives all the examples of regimental outbreaks in cantonments of Native Regiments, which it has been possible to collect from the records of the past fifteen years, in which above ten men have been lost. Some even of these may not represent the

* Three Officers and 101 men were lost out of a force which started in the morning with 150 men and five Officers.

outbreak in a single body, since although appearing in one death roll various detachments affected during the same month may be included :—

FIFTEEN YEARS, 1854-68.

Regiments of the Native Army which have lost while in Cantonments above ten men on the occasion of an outbreak of Cholera.

1854	Benares	...	50th Native Infantry	Admissions	34	Deaths	19*
1856	Deyrah	...	Sirmoor Goorkhas ...	,,	32	,,	23
1856	Meean Meer	...	26th Native Infantry ...	,,	40	,,	21
1856	Agra	...	44th Native Infantry ...	,,	47	,,	18
1858	Furreedpore	...	Kamroop Regiment ...	,,	64	,,	36
1858	Abbottabad	...	Huzara Goorkhas ...	,,	19	,,	11
1858	Kohat	...	3rd Punjab Infantry ...	,,	35	,,	16
1859	Cawnpore	...	1st Jezailchee Regiment ...	,,	39	,,	15
1860	Gondah	...	18th Punjab Native Infantry ...	,,	16	,,	15
1860	Oraie	...	Shahjehanpore Levy	,,	20	,,	13
1860	Various Stations of Upper Assam	...	1st Assam Local Infantry ...	,,	72	,,	35†
1861	Umritsur	}	19th Native Infantry (Goorkhas)	,,	13	,,	11
	Ferozepore	}		,,	53	,,	34
1861	Meean Meer	...	15th Cavalry ...	,,	32	,,	11
1862	Bunnoo	...	1st Sikhs ...	,,	...	,,	12
1865	Kherwarrah	...	Meywar Bheels ...	,,	29	,,	16
1867	Kohat	...	3rd Sikhs ...	,,	22	,,	15

What this table teaches is very plain, and when it is read in connection with the table which follows, no one can, I think, doubt that it is to the solution of the problem which they offer that we must look if the death rate from cholera in the European Army of India is to be permanently diminished.

From the record of fifteen years, sixteen cases alone are capable of being selected, in which either outbreaks or manifestations similar to outbreaks occurred. Of these sixteen cases three only occurred among men representative of the Native Army as constituted before the mutiny of 1857. In the great epidemic of 1856, I find that two Regiments lost, the one eighteen men and the other twenty-one men; and in the epidemic of 1861, one Regiment lost eleven men at Meean Meer. Again, in 1860, we find two Regiments losing the one fifteen and the other thirteen men, but in both cases in temporary cantonments, in which the men were probably living much in the same manner as in the field. Add to these the loss of Frontier Regiments at Kohat and Bunnoo, and the catalogue is complete for all men of the plains—Hindoos, Sikhs, and Mussulmans. Kohat occurs twice in the list; in 1858, when the Regiment lost sixteen men, and again in 1867, when fifteen men died. In 1862, the 1st Sikhs lost ten men at Kohat, but this mortality was included in three outbreaks between the 8th June and 12th October. The persistence of cholera for so long in 1862, and the severity of the cholera of 1858 and 1867, point, I think, to the effects of the same geographical peculiarity which I have alluded to in speaking of the persistence of cholera in the Peshawur Valley, namely, the retention of cholera by the frontier hills and its consequent subsidence in great volume into the adjoining Kohat Valley.

Of the eight instances remaining out of the sixteen tabulated, the effect of race is shown as in the case of the European; four occur in Goorkha Regiments; two in the mixed races forming the Assam and Kamroop Local Regiments; one is the case of the Meywar Bheels; and the last, that of the Jezailchee Regiment, composed of frontier hillmen.

The following table shows the results of the great invasion of July 1856 in the Meerut Division; it illustrates the truth that the outbreak among Native Troops is but the shadow of what it is among Europeans. (For contrast, see table for 1856 in Appendix) :—

Native Army of the Meerut Division in July, August, and September 1856. *Strength* 12,340.
Loss from the invading cholera of the year.

Regiments of the Regular Native Army, Delhi, Meerut, Moradabad, Bareilly.

July	4th	1
,,	12th	2
,,	16th	1
,,	26th	1
,,	27th	1
,,	30th	1
,,	31st	1
Aug.	2nd	1
,,	4th	1
,,	7th	1
,,	10th	1
,,	21st	1
Sept.	1st	1
	8th	1
,,	17th	1
,,	19th	1

Kumaon Goorkha Battalion, Deyrah.

August	14th	1
	* *	*
,,	18th	7
,,	20th	2
,,	21st	3
,,	22nd	1
,,	23rd	3
,,	24th	1
,,	25th	1
,,	26th	1
,,	27th	1
,,	28th	1
,,	30th	1

The seventeen deaths of the Regular Regiments were spread over the entire period of the vitality of the reproduction, and over nine different corps. It will be observed that in the case of the Kumaon Goorkhas the outbreak has the facies of the type.

* A typical outbreak from 17th to 29th May; see note to page 42 of Appendix.

† Head-quarters and all out-posts suffered; this, therefore, does not represent a regimental outbreak. The constitution of the Local Assam Regiments is peculiar, from the large proportion of Goorkhas and men of races other than those which go to form the ordinary Native Regiments.

Comparative Statement of the Loss of the European and Native Regiments cantoned in the same Station in the Invading Cholera Epidemics of late years.

[It must be understood that there are no examples of the converse of what is shown in this statement, *viz.*, that Native Troops in cantonments have suffered severely while European Troops in the same cantonments have escaped with trifling loss.]

STATION.	Year and month of outbreaks.	Strength at date of the invasion.	Number of admissions and deaths.		Proportion relative to strength.		Affected per 1,000 of strength.	Died per 1,000 of strength.	Died out of each 100 affected.
			Treated.	Died.	Treated.	Died.			
Cawnpore... ...	June to September 1845 ...	European Troops ... 1,944	145	66	1 in 13	1 in 29	Europeans 74·58	Europeans 33·95	Europeans 45·52
		Native Troops ... 5,451	62	24	1 in 88	1 in 227	Natives ... 11·37	Natives ... 4·40	Natives ... 38·71
Meerut	August and September 1845	European Troops .. 2,954	143	85	1 in 21	1 in 35	Europeans 48·41	Europeans 28·77	Europeans 59·44
		Native Troops ... 8,274	7	4	1 in 1,182	1 in 2,069	Natives ... ·85	Natives ... ·48	Natives ... 57·14
Umballa ...	July to September 1845 ...	European Troops ... 2,439	385	204	1 in 6	1 in 12	Europeans 157·85	Europeans 83·64	Europeans 52·99
		Native Troops ... 7,358	111	62	1 in 66	1 in 119	Natives ... 15·09	Natives ... 8·43	Natives ... 55·86
Loodianah ...	July to September 1845 ...	European Troops ... 948	84	54	1 in 11	1 in 17	Europeans 88·61	Europeans 56·96	Europeans 64·28
		Native Troops ... 4,466	38	12	1 in 118	1 in 372	Natives ... 8·51	Natives ... 2·69	Natives ... 31·58
Ferozepore ...	June and July 1845 ...	European Troops ... 1,130	82	39	1 in 14	1 in 29	Europeans 72·57	Europeans 34·51	Europeans 47·56
		Native Troops ... 6,530	54	17	1 in 121	1 in 384	Natives ... 8·27	Natives ... 2·60	Natives ... 31·48
Umballa	September 1852 ...	European Troops ... 1,986	140	69	1 in 14	1 in 29	Europeans 70·49	Europeans 34·74	Europeans 49·29
		Native Troops ... 3,135	15	4	1 in 209	1 in 784	Natives ... 4·78	Natives ... 1·27	Natives ... 26·67
Cawnpore... ...	May to August 1853 ...	European Troops ... 1,009	280	195	1 in 4	1 in 5	Europeans 277·50	Europeans 193·26	Europeans 69·64
		Native Troops ... 2,626 (besides details).	57	25	1 in 46	1 in 105	Natives ... 21·71	Natives ... 9·52	Natives ... 43·86
Meean Meer ...	August and September 1856	European Troops ... 1,594	501	271	1 in 3	1 in 6	Europeans 314·30	Europeans 170.01	Europeans 54·09
		Native Troops ... 3,024	104	41	1 in 29	1 in 74	Natives ... 34·39	Natives ... 13·56	Natives ... 39·42
Ferozepore ...	August and September 1856	European Troops ... 1,013	200	134	1 in 5	1 in 8	Europeans 197·43	Europeans 132·28	Europeans 67·00
		Native Troops ... 2,120	37	17	1 in 58	1 in 125	Natives ... 17·45	Natives ... 8·02	Natives ... 45·95
Meerut	July and August 1856 ...	European Troops ... 1,600	79	43	1 in 20	1 in 37	Europeans 49·38	Europeans 26·87	Europeans 54·43
		Native Troops ... 2,598	20	10	1 in 130	1 in 260	Natives ... 7·70	Natives ... 3·85	Natives ... 50·00
Agra	June and July 1856 ...	European Troops ... 980	206	98	1 in 5	1 in 10	Europeans 210·20	Europeans 100·00	Europeans 47·57
		Native Troops ... 2,897	91	34	1 in 32	1 in 85	Natives ... 31·41	Natives ... 11·73	Natives ... 37·36
Lucknow	June and July 1856 ...	European Troops ... 905*	66	46	1 in 14	1 in 20	Europeans 72·93	Europeans 50·83	Europeans 69·70
		Native Troops ... 8,312*	1	1	...	...	Natives	Natives	Natives ... ...
Barrackpore ...	August 1859	European Troops ... 1,804	50	23	1 in 36	1 in 78	Europeans 27·71	Europeans 12·75	Europeans 46·00
		Native Troops ... 1,312	3	1	1 in 437	1 in 1,312	Natives ... 2·28	Natives ... ·76	Natives ... 33·33
Dum-Dum	August 1859	European Troops ... 1,623	113	70	1 in 14	1 in 23	Europeans 69·62	Europeans 43·13	Europeans 61·95
		Native Troops ... 236	...	...	...	...	Natives	Natives	Natives ... ...
Agra	August and September 1860	European Troops ... 1,237	113	59	1 in 11	1 in 21	Europeans 91·35	Europeans 47·70	Europeans 52·21
		Native Troops ... 570	7	5	1 in 81	1 in 114	Natives ... 12·28	Natives ... 8·77	Natives ... 71·43
Morar	August and September 1860	European Troops ... 1,083	155	77	1 in 7	1 in 14	Europeans 143·12	Europeans 71·10	Europeans 49·68
		Native Troops ... 1,412	10	6	1 in 141	1 in 235	Natives ... 7·08	Natives ... 4·25	Natives ... 60·00
Muttra	August and September 1860	European Troops... 380	50	24	1 in 8	1 in 16	Europeans 131·58	Europeans 63·16	Europeans 48·00
		Native Troops ... 560	3	1	1 in 187	1 in 560	Natives ... 5·36	Natives ... 1·79	Natives ... 33·33

* Onde Field Force.

Comparative Statement of the Loss of the European and Native Regiments cantoned in the same Station in the Invading Cholera Epidemics of late years,—continued.

STATION.	Year and month of outbreak.	Strength at date of the invasion.	Number of admissions and deaths.		Proportion relative to strength.		Affected per 1,000 of strength.	Died per 1,000 of strength.	Died out of each 100 affected.
			Treated.	Died.	Treated.	Died.			
Jhansi	August and September 1860	European Troops... 605	32	13	1 in 19	1 in 47	Europeans 52·90	Europeans 21·49	Europeans 40·62
		Native Troops ... 2,732	3	1	1 in 911	1 in 2,732	Natives ... 1·10	Natives ... .36	Natives ... 33·33
Meerut	July and August 1861 ...	European Troops... 2,751	117	86	1 in 24	1 in 32	Europeans 42·53	Europeans 31·26	Europeans 73·50
		Native Troops ... 623	4	2	1 in 156	1 in 311	Natives ... 6·42	Natives ... 3·21	Natives ... 50·00
Delhi	July 1861	European Troops... 1,267	120	52	1 in 11	1 in 24	Europeans 94·71	Europeans 41·04	Europeans 43·33
		Native Troops ... 1,175	28	9	1 in 42	1 in 131	Natives ... 23·83	Natives ... 7·66	Natives ... 32·14
Agra	July 1861	European Troops... 1,153	109	67	1 in 11	1 in 17	Europeans 94·54	Europeans 58·11	Europeans 61·47
		Native Troops ... 662	15	5	1 in 44	1 in 132	Natives ... 22·66	Natives ... 7·55	Natives ... 33·33
Morar	July and August 1861 ...	European Troops... 1,095	209	151	1 in 5	1 in 7	Europeans 190·87	Europeans 137·90	Europeans 72·25
		Native Troops ... 1,372	None.	None.	...	...	Natives	Natives	Natives ... ...
Umballa	July and August 1861 ...	European Troops... 1,770	71	52	1 in 25	1 in 34	Europeans 40·11	Europeans 29·38	Europeans 73·24
		Native Troops ... 720	4	2	1 in 180	1 in 360	Natives ... 5·56	Natives ... 2·78	Natives ... 50·00
Meean Meer ...	August and September 1861 ..	European Troops... 2,174	806	486	1 in 3	1 in 5	Europeans 370·74	Europeans 223·55	Europeans 60·30
		Native Troops ... 665	41	16	1 in 16	1 in 41	Natives ... 61·65	Natives ... 24·06	Natives ... 39·02
Agra	August 1862	European Troops ... 1,190	66	49	1 in 18	1 in 24	Europeans 55·46	Europeans 41·18	Europeans 74·24
		Native Troops ... 682	3	...	1 in 227	None.	Natives ... 4·40	Natives	Natives ... ...
Morar	July and August 1862 ...	European Troops ... 1,304	92	59	1 in 14	1 in 22	Europeans 70·55	Europeans 45·25	Europeans 64·13
		Native Troops ... 1,629	7	5	1 in 233	1 in 326	Natives ... 4·30	Natives ... 3·07	Natives ... 71·43
Jhansi	July and August 1862 ...	European Troops ... 728	51	37	1 in 14	1 in 20	Europeans 70·06	Europeans 50·82	Europeans 72·55
		Native Troops ... 795	2	1	1 in 397	1 in 795	Natives ... 2·52	Natives ... 1·26	Natives ... 50·00
Meerut	July and August 1862 ...	European Troops ... 2,061	52	32	1 in 40	1 in 64	Europeans 25·23	Europeans 15·52	Europeans 61·54
		Native Troops ... 1,103	7	2	1 in 158	1 in 551	Natives ... 6·35	Natives ... 1·81	Natives ... 28·57
Meean Meer ...	August and September 1862	European Troops ... 1,604	134	73	1 in 12	1 in 22	Europeans 83·54	Europeans 45·51	Europeans 54·48
		Native Troops ... 614	11	6	1 in 56	1 in 102	Natives ... 17·91	Natives ... 9·77	Natives ... 54·55
Umritsur	August and September 1862	European Troops ... 608	30	15	1 in 20	1 in 40	Europeans 49·34	Europeans 24·67	Europeans 50·00
		Native Troops ... 449	4	2	1 in 112	1 in 224	Natives ... 8·91	Natives ... 4·45	Natives ... 50·00
Peshawur ...	July to October 1862 ...	European Troops ... 1,848	168	97	1 in 11	1 in 19	Europeans 90·91	Europeans 52·49	Europeans 57·74
		Native Troops ... 2,908	38	22	1 in 76	1 in 132	Natives ... 13·07	Natives ... 7·56	Natives ... 57·90
Benares	July 1863	European Troops ... 1,007	30	23	1 in 33	1 in 44	Europeans 29·79	Europeans 22·84	Europeans 76·67
		Native Troops ... 563	4	3	1 in 141	1 in 187	Natives ... 7·10	Natives ... 5·33	Natives ... 75·00
Allahabad ...	July and August 1863 ...	European Troops ... 1,077	50	42	1 in 22	1 in 26	Europeans 46·43	Europeans 39·00	Europeans 84·00
		Native Troops ... 643	2	1	1 in 321	1 in 643	Natives ... 3·11	Natives ... 1·56	Natives ... 50·00
Cawnpore... ...	August and September 1863	European Troops ... 1,180	*	24	*	1 in 49	Europeans *	Europeans 20·34	Europeans *
		Native Troops ... 594	1	...	...	...	Natives	Natives	Natives ... ...
Lucknow	July and August 1863 ...	European Troops ... 2,550	38	18	1 in 67	1 in 142	Europeans 14·90	Europeans 7·06	Europeans 47·37
		Native Troops ... 1,717	8	2	1 in 215	1 in 858	Natives ... 4·66	Natives ... 1·17	Natives ... 25·00
Agra	July and August 1863 ...	European Troops ... 1,115	32	21	1 in 35	1 in 53	Europeans 28·70	Europeans 18·83	Europeans 65·62
		Native Troops ... 704	None.	None.	...	...	Natives	Natives	Natives ... ...

LUCKNOW	September 1864 ...	European Troops ...	2,586	55	39	1 in 47	1 in 66	Europeans	21·27	Europeans	15·09	Europeans	70·91
		Native Troops ...	1,527	1	1	...	...	Natives ...	·65	Natives ...	·65	Natives ...	...
ALLAHABAD ...	August 1867	European Troops ...	942	28	18	1 in 34	1 in 52	Europeans	29·72	Europeans	19·11	Europeans	64·28
		Native Troops ...	552	7	4	1 in 79	1 in 138	Natives ...	12·68	Natives ...	7·25	Natives	57·14
SHAHJEHANPORE ...	August 1867	European Troops ...	456	24	19	1 in 19	1 in 24	Europeans	52·63	Europeans	41·67	Europeans	79·17
		Native Troops ...	189	3	2	1 in 63	1 in 94	Natives ...	15·87	Natives ...	10·58	Natives ...	66·66
MEERUT	August and September 1867	European Troops ...	1,650	123	112	1 in 13	1 in 15	Europeans	74·55	Europeans	67·88	Europeans	91·06
		Native Troops ...	894	None.	None.	...	...	Natives ...	...	Natives ...	...	Natives ...	...
MORAR AND GWALIOR ...	July and August 1867 ...	European Troops ...	1,074	23	14	1 in 47	1 in 77	Europeans	21·42	Europeans	13·04	Europeans	60·87
		Native Troops ...	1,604	None.	None.†	...	...	Natives ...	...	Natives ...	...	Natives ...	...
UMBALLA	May 1867	European Troops ...	1,325	29	22	1 in 46	1 in 60	Europeans	21·89	Europeans	16·60	Europeans	75·86
		Native Troops ...	874	6	3	1 in 146	1 in 292	Natives ...	6·86	Natives ...	3·43	Natives ...	50·00
MEEAN MEER ...	July 1867	European Troops ...	1,122	86	52	1 in 13	1 in 22	Europeans	76·65	Europeans	46·35	Europeans	60·47
		Native Troops ...	1,379	13	5	1 in 106	1 in 276	Natives ...	9·43	Natives ...	3·63	Natives ...	38·46
PESHAWUR ...	May and June 1867 ...	European Troops ...	1,915	273	162	1 in 7	1 in 12	Europeans	142·56	Europeans	84·59	Europeans	59·34
		Native Troops ...	4,678	63	27	1 in 74	1 in 173	Natives ...	13·47	Natives ...	5.77	Natives ...	42·86
JUBBULPORE ...	May and June 1867 ...	European Troops ...	623	16	12	1 in 39	1 in 52	Europeans	25·68	Europeans	19·26	Europeans	75·00
		Native Troops ...	720	None.	None.	...	...	Natives ...	...	Natives ...	...	Natives ...	...
AGGREGATE OF THE ABOVE CASES ...	1845—68 ...	European Troops ...	63,409	5,656	3,404	1 in 11	1 in 19	Europeans	89·20	Europeans	53·68	Europeans	60·19
		Native Troops ...	93,648	895	385	1 in 105	1 in 243	Natives ...	9·56	Natives ...	4·11	Natives ...	43·02

* The number of admissions cannot be correctly estimated, as in the original Returns, in the commencement of the outbreak, all cases of cholera were entered as diarrhœa and those only which were fatal as cholera and choleraic diarrhœa.

Illustrations which show that the same comparative exemption does not hold good in the case of Goorkhas.

UMEITSUR	September 1861 ...	European Troops ...	541	50	41	1 in 11	1 in 13	Europeans	92·42	Europeans	75·79	Europeans	82·00
		Goorkhas ...	213	13	11	1 in 16	1 in 19	Goorkhas	61·03	Goorkhas	51·64	Goorkhas	84·62
FEROZEPORE ...	September 1861 ...	European Troops ...	967	2	1	1 in 483	1 in 967	Europeans	2·07	Europeans	1·04	Europeans	50·00
		Goorkhas ...	441	54	30	1 in 8	1 in 15	Goorkhas	122·45	Goorkhas	68·03	Goorkhas	55·56

This table requires no commentary. The fact that the risk of attack during the presence of epidemic cholera is 10 to 1, and the chance of death 13 to 1 in favour of the Native Soldier speaks for itself, and I claim for the grand deduction that it shall have the weight of a law and not of a mere fact, when its practical bearings fall to be considered.

Some will say that a fallacy lies at the very outset of the enquiry into the causes of the differing cholera ratios of European and Native Troops if the parallel between the cholera and malaria poison be at the same time insisted on, inasmuch as the effects of the malaria poison in the same localities are as apparent or more so in the case of the Native Soldier as in that of the European. But many contingent causes over and above the mere fact of the presence of cholera and the comparative strength or weakness of the miasm present, determine whether or not the individual shall fall into the collapse of cholera. The question cannot be viewed apart from that of the effects of all the other agencies which influence a body of a certain constitution for good or for evil. There are many circumstances which in the case of the Native Soldier operate to increase the ratio of the attack of malarious fever, such as the nature of his habitation, the insufficiency of his food, and his frequent exposure on outpost duties. In the case of the British Soldier, every effort is used to prevent the effects of the malaria miasm from showing themselves either in the locality or in the individual; but the tendency to deterioration and death from causes which are purely climatic remains, and disease due to such a cause has no counterpart in the case of the Native. What is written in the sequel must be read in connection, and a conclusion must be formed in relation to the facts which are shown in the table in which climatic disease is contrasted in the European and Native Soldier. It is not a chance that for the past twenty-five years, British Regiments have been decimated in almost every cantonment throughout the Presidency, while the Native Soldier has virtually escaped. The consistency of the phenomenon teaches clearly that infection in the case of the Native is seldom followed by cholera while the European as constantly succumbs; and this fact places the whole enquiry beyond the mere question of infection or non-infection. There is no reason to doubt that the amount of the cholera miasm present in the Native portion of an affected cantonment is as great as that diffused over the European portion; but the grand fact is, that the miasm present is powerless to affect the Native Regiments as bodies, and weak even in the worst epidemics in relation to individuals unless these be of some race foreign to the plains of India.

The fact stands as a fact, and we are compelled to face it as such, and to enquire whether it be the domestic, moral, or race distinctions that bring about the disparity, or how far the difference in ratio may be influenced by all combined.

I fear that all three tend to raise the ratio in the case of the British Soldier. While his domestic arrangements are in Upper India such as almost certainly ensure him against the attack of contagious diseases—such as typhus in all its forms, smallpox, erysipelas, or hospital infection, they are not as yet generally adapted to secure his exemption from air-conveyed miasmata. When true epidemic malaria is abroad in Upper India, it has always fared badly with our soldiers. In evidence we have the effects of the epidemic fevers of 1850 and 1851, of 1856, of 1859, 1860, and 1861, and of 1866. The teaching of one and all of these outbreaks is, that as the European Soldier lives in Upper India, he cannot escape when epidemic malaria assails him.

Belts of vegetation may prove in some measure protective against the cholera miasm.

It is against what is regarded as local malaria that sanitary measures have chiefly been directed hitherto, and in one instance at least not very judiciously, when we reflect that in the cantonments of Upper India the presence of a tree seems to have been resented as an intrusion and as likely to prove detrimental to the health of the soldiers. It is surely a wrong theory which sees in an unbroken expanse of plain the best situation for the barracks of the British Soldier. I see nothing to fear from the immediate presence of the most umbrageous groves, and much to dread from their absence. If a screen is not a thoroughly efficient protection against advancing miasmata, few will say that it affords no protection, and if we are to credit the statements in the document which follows, trees are calculated to afford not a little shelter against the effects of air-borne cholera.

The Officiating Commissioner of the Chutteesghur Division of the Central Provinces, in forwarding a recommendation to Government regarding the planting of trees on an extensive scale, urges as one of the chief advantages to be gained, the immunity from epidemic cholera which the jungle villages of the districts enjoy. He writes:—

"I will endeavour to show how, in another manner, the State will be a gainer by giving every encouragement in its power to the planting of trees and groves on this bare plain of Chutteesgurh."

"The Chief Commissioner is aware that the constant visitations we have in this division of a virulent type of cholera have closely occupied my attention, mainly that I might discover, if I possibly could, the cause of the disease assuming so much more deadly a form here than elsewhere, and the causes which bring it among us annually instead of only occasionally as in the more northern divisions of these provinces."

"I have discovered a very important fact, and that is, that villages out in the open plain suffer far more from cholera, and that the disease is more deadly than in villages which are well wooded. The further I progress into the denser foliage, the more rare the visitations of cholera seem to be, until at last I find that, among the inhabitants of the villages in the forest, the disease is scarcely known, and yet one would have supposed that these of all people

would have been its most likely victims; for they live upon the poorest of food, green jungle berries and roots, and are badly housed and ill clad. Again, if I turn towards the plain, I find, on emerging from the jungle, that the further I advance, the more frequent are the visitations of cholera known to be, until at last, when I arrive well out into the open, I learn that the dreaded 'dookee,' as the pestilence is called here, comes every year to carry off hundreds of victims."

"Now, this is a fact of which I have satisfied myself by close observation and careful enquiry during my recent circuit through the division; I have verified it till not a shadow of doubt remains in my mind."

"Raepore (I speak of those parts of it known as the Chutteesgurh plain) is so bare and void of foliage as (save for the cultivation) to remind one of the deserts of Egypt or Western India."

"The Sumbulpore District, again, is beautifully wooded. The cultivated portion is thickly studded with superb groves of mangoe trees, and there are countless numbers of mohwa trees all over the country; added to this, some of the village proprietors have reserved small ornamental patches of stunted sal jungle of a few acres in extent, and these stand up out of the cultivation as we see plantations at home. Further, the inhabitants of Sumbulpore, a far superior race to those of Chutteesgurh Proper, are much given to planting groves and single trees about their villages. Altogether Sumbulpore is as thickly wooded as probably any cultivated district in India, and in this respect it is the very opposite of Raepore."

"Now, it is well known that cholera rarely, in most instances never, visits any of the villages of Sumbulpore which are off the main line of communication, and if it does come, it is in the mildest form, and the reason of its ever showing itself in the villages on the main road is, that (as in the present year) * it is brought by pilgrims returning from Cuttack and Pooree."

"In Belaspore, cholera, when it does break out, is bad enough, but still its visitations are not so frequent, nor is it of that very deadly form which it assumes in the plain of Raepore, where, in the course of three or four days, it sweeps off sixty and seventy per cent. of the inhabitants of a village. Not even in the time of the great plague was there such fearful mortality as I have known here."

"The Sumbulpore Road runs through jungle (which about Petora and the Jonk River becomes very dense) for about sixty or sixty-five miles. Now, it is a remarkable fact, but no less a fact, that even on the main road, which is traversed by hundreds of travellers, carts, and pack bullocks, cholera rarely shows itself in the length of these sixty miles, and if it does show itself, it is very mild indeed; but if we take the section of the road from Arung westwards to the Chicholee bungalow, about ninety miles, which traverses a bare treeless plain in all its length, we find cholera present every year in its worst form,—the dying and the dead lying about the road, and convoys of carts with half their drivers gone."

"One more fact I would state as the result of my investigations, and that is, that in villages which are closed in with those large and magnificent groves we occasionally see, which stand in a low and probably a swampy situation, surrounded by hills, and which, owing to the quantity of decayed vegetable matter about, are especially feverish in September, October, and November, are rarely visited by cholera, and when it does come, there are but few deaths, while villages, which stand on high ground, or on what would be considered a fine bracing situation, which, being free from foliage and hills, are thoroughly ventilated, appear to suffer most from cholera."

"Why thick foliage round human dwellings should be a preventive or a partial preventive to cholera is a matter which I must leave to others to ascertain. I no longer doubt the fact; and being convinced, that it is a partial preventive, I avail myself of this opportunity to lay the result of my observations before the Chief Commissioner, who, I trust, will be pleased to support my recommendation to grant land revenue-free to agriculturists, who will plant groves in their villages."†

But the necessity for some measure adequate to cope with air-borne or soil-generated causes of disease is recognised in the fact of the general adoption throughout Upper India of lofty double-storied barracks, and it will be fortunate if the same results follow as have followed in the case of Fort William, where cholera has scarcely intruded during the past seven years.

Fort William, European Garrison, seven years, 1862-68.

	1862.	1863.	1864.	1865.	1866.	1867.	1868.	Died annually per 1,000, on the average of the seven years 1862-68, 3·36.
Strength ...	880	745	790	789	861	739	858	
Admitted ...	7	5	7	0	4	3	2	
Died ...	6‡	4	2	1	2	2	2§	

Until the new barracks of Upper India have been tested, it would be premature to conclude that their elevation will raise the occupants above the cholera-containing stratum

* This is the theory of the writer; in 1865 the same cholera was universal from Pooree to Abyssinia.

† Report dated May 23rd, 1865, Central Provinces' Gazette, December 22.

‡ Excluding the deaths after arrival of the Wing of the 92nd attacked in the Sunderbuns.

§ Besides these, three men were attacked in the General Hospital, a mile distant, under circumstances which showed that the cholera could not have been acquired in the fort.

of air. And while the results obtained in the case of Fort William are very hopeful, we must not forget that the cholera season in Upper India is not the cholera season in Lower Bengal. When the maximum of moisture is attained, cholera is generally nearly extinguished as an epidemic in Bengal, while it is in full career from south-east to north-west in the north. This broad-fronted cholera of the monsoon is not a ground-seeking and insidious miasm, and we are quite entitled to infer that the depth of the air stratum in which it is conveyed will be found in some degree proportionate to the width of its lateral extension. In the epidemic of malaria of the end of 1859, I found that the elevation of the fort of Buxar (about forty feet) sufficed not to prevent the attack of malarious fever, but to alter its type. Every case which occurred in the Naval Brigade occupying the fort (and every man suffered), was a case of purely intermittent fever, while in the detachment of Her Majesty's 6th Regiment, occupying temporary barracks on the ground level, every case, both in officers and men, assumed the remittent type, passing in several cases into continued fever and ending in death; and the type in the Ghazeepore cantonment, thirty miles distant, was the same. That elevation will mitigate, if it does not prevent the attack of cholera, is extremely probable; and no one will deny the expediency of providing the degree of elevation which it is designed generally to afford, whatever may be his theory. It is the diminution of the ratio of attack that is aimed at, the possibility of affording locally such conditions as shall place the soldier beyond the reach of the ground-seeking miasm altogether, or place him in a stratum of air so diffusely impregnated by the miasm as to be powerless to affect either the individual or the regiment as a body. This seems to have been attained in the case of Fort William, and the European Soldier, though given to frequent the cholera infected bazaars of Calcutta, appears to be now placed as regards liability to attack on a footing with the population of Chowringhee. In the Sanitary Report for 1867, attention was drawn to the fact that the circumstances of our prisoners while they laid them open to the invasion and spread of typhus did much to shield them from malaria and cholera; the high walls screen the enclosed buildings, and in place of night guards, we have the heavy damp night air shut out from the dormitories of the prisoners. When invasion of our great jails does take place in Northern India, the attack is too often adapted as regards its strength in relation to the very same conditions, and cholera spreads as if contagion were going on from man to man.

It is during the night, or in the early morning, that men seem to be infected, and hence night guards should be dispensed with as far as possible, when epidemic cholera is abroad. The effects of night air and damp encamping grounds was remarkably illustrated in the attack on Her Majesty's 79th Regiment, while marching in the end of 1866, from the Punjab towards Delhi and Roorkee. The intermittent was of a most pernicious type, nearly universal, fatal in itself, and serious in its sequelæ. I have called attention to the fact, that the women and children did not suffer, with the exception of a single family, the family of the Canteen Sergeant who preceded the Regiment daily in order to have coffee ready for the men at the end of the march; the exemption of the families was attributed to the fact of their following the Regiment after daybreak, and of their not arriving until the new encamping ground was thoroughly dried by the sun.

What are called good sanitary conditions are not of themselves calculated to ensure our men against cholera. If it be true that cholera is air-borne and conveyed in the purest of all aqueous media, the conditions requisite for human infection are produced at the same time with epidemic advance; and hence local measures can be only comparatively successful, and are not absolutely calculated to avert the consequences of invasion. I see no occasion to look to impurity of the aqueous medium as of supreme consequence, and the search after special contamination, when every foot of grass covered plain may retain the miasm, decoys the mind from the simple truth. Let us never lose sight of the plain truth, that the reproduction cannot be prolonged, and that the outbreak of a body has a normal limit in time which is only exceptionally prolonged. Let the results of our endeavours be read in this light, and we shall have less seldom occasion to dispute the assertions, that local measures have proved adequate to cope with an invading cholera. We know well that some stations are worse than others because of their natural disadvantages, but we know also that in the very best, general sanitation has not availed to prevent cholera.*

Had general sanitation been found efficient, the necessity for movement from our cantonments would never have been recognised. Not but that elevated situation and good drainage are very powerful in preventing the localisation of cholera. Cholera loves to abide in excavations, and for any given spot it is in the lowest stratum of air that the cholera miasm is to be found. When air-conveyed, cholera may

The manifestation of the effects of the miasms of malaria and cholera is developed parallel with the supply of moisture afforded.

* Our stations of exemption owe their exemption to their geographical situation or to their elevation. Rawulpindee, Campbellpore, Nowshera, and Sealkote are stations very nearly exempted in consequence of their position beyond primary influences. I cannot affirm that a genuine case of cholera has originated in the Rawulpindee cantonment in our time. No case of cholera has ever been returned from the Campbellpore cantonment since its occupation in 1858, and the nearest approach to the phenomenon of infection occurred in 1867, when nine men in one barrack were simultaneously affected with febrile symptoms which passed off with violent diarrhœa; I have very little hesitation in attributing these symptoms to the cholera miasm which was general throughout the Punjab at the time. Nowshera has had no violent outbreak of cholera since its occupation; it was, however, touched in the three years of secondary invasion, 1858, 1862, and 1867, but on each occasion two men only were lost. Sealkote lost ten men in the secondary invasion of 1862, and in 1867 some of the women and children were affected, but no man died. Of the comparative exemption of the hill stations and of Jullundur and Bareilly, I have spoken in the fifth chapter of the first section.

be on a level so far above the earth as to leave no trace of its progress in its advance, and may strike the hills while it leaves the plains untouched;* but whether it be on an elevated plateau, on the plains of Upper India, or in the swamps of Lower Bengal, it is the ground level that is to be dreaded, because upon it broods the cholera-bearing stratum of air. I have shown the enormous influence of moisture on the affection of a great provincial area. I have stated how in the nine years 1858-66, fourteen deaths only had occurred in the cantonments of the western area in the months from January to June inclusive; while the deaths of the three months, July, August, and September, were to be reckoned not by units but by thousands. The meaning of this is not to be questioned. Provide cholera with a vehicle of moisture and instantly it appears in epidemic life and endowed with locomotion; remove the vehicle and cholera is dormant and powerless. So it is with the malaria miasm; the phenomenon of repression is marked precisely as in the case of the cholera miasm. To the sound and acclimatised constitution no season is more healthy than the months when the hot west winds blow; for then, no country in the world is more free from malaria than are the plains of the north-west of India.

The disparity of ratio between the European and the Native Soldier is neither altogether due to domestic arrangements nor to race distinction.

Our Native Soldier does not live under sanitary conditions superior to those of the British Soldier. His hut is small and badly ventilated, and it is not raised above ground level; his water supply is from the nearest tank; and his night duties are more onerous, especially during the prevalence of the outbreak. It is on the domestic differences of the two classes that the theories regarding the disparity are founded. One traces exemption as due to resort to the plain, attributing the cholera of the British Soldier to the use of general latrines; another to the individualisation of the chance of infection by the sub-division of the aggregate body into as many separate bodies as there are sub-divisions in the regimental lines. From the experience of 1867, it was impossible to tell whether the use of general latrines by Native Regiments had any effect in determining the extent of infection; and it is remarked (Sanitary Report, p. 128), that, as the rule, in all stations, Native Soldiers are not now allowed to resort to the jungle.

The effect of the sub-division and of the massing of bodies in determining the facies of the outbreak and the ratio of attack.

The sub-division of the Native Regiment as a community into very numerous items, is probably one, although certainly not the sole, cause of the smallness of the ratio. The great disasters to Native Regiments on the march and on board boats when massed as a community, forbid us to conclude that the disparity of ratio is solely a race distinction; since they show that, under different conditions, the Regiment, an exempted body in cantonments, may succumb as a body. It may be the infected air stratum of an encamping ground that places the Native Regiment under one common influence; or the crowding on board boats may cause an artificial stratum of impure air over the occupants, of sufficient power to place those living within it in circumstances unfavorable for throwing off the miasm imbibed. Thus, when a Regiment moving by boats makes a halt below a river bank known to be infected, cholera does not blaze up suddenly (see table, p. 192). The men return on board, and for the whole twelve or thirteen days following there is a steady coming forward of the disease, sometimes in outline, sometimes in substance, according to the varying conditions. This seems to me the type of the outbreak in our European barracks and central jails. Liberal as is the allowance of cubic and superficial space in our European barracks it is not sufficient in the event of an epidemic; and sub-division cannot be carried to the same extent as in the case of the Native Troops,—an extent sufficient to individualise the chances of attack. This facies of the outbreak calls imperatively for the opening up and ventilation of every infected body, and where barrack accommodation with sufficient elevation cannot be given on a scale extravagant and uncalled for under ordinary circumstances, the alternative seems to be the use of temporary habitations. What is to be aimed at is the removal of the barrack atmosphere or the atmosphere which covers the sleeping body of prisoners within the walls of a great prison, since we fear that what from the fact of infection *must come forward in outline may be filled in in substance*, and that an outbreak which might have been represented by ten cases during the normal sixteen-day outbreak, may come to be multiplied by ten or twenty during the same period of typical prevalence. I do not coincide in the views of those who would assert that the phenomena characteristic of these outbreaks are due to contagion; but except in theory it matters little whether we regard this multiplication of ratio as due to infection from man to man, or not. While believing both causes to be efficient in increasing the ratio of attack, I feel inclined to attribute less to the increase of the miasm in impure and damp air, than to the deterioration of the economy of each individual, with increased liability to succumb from living under such conditions of community. It is as a community that the prisoners of the central jails of the North-Western Provinces suffer on occasion of nearly every invasion.

* I refer to the occurrence of cholera at Kussowlie and Dugshaie in the last week of May in 1865, which was indicative of the epidemic presence of cholera in Central India and south of the Jumna. Something very similar, perhaps identical, has happened in this year (1869); the appearance of cholera in the Agra and Morar Districts in the end of May was followed by the occurrence of several very suspicious cases at Simla early in June, and now (June 21st) the appearance of cholera is reported among the coolies working on the road in the interior of the hills twelve marches beyond.

Central Jails of the North-Western Provinces. A Statement to show the danger of community of infection.

Central Jails.	1856.			1860.			1861.			1862.			1863.			1865.		
	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.	Strength.	Admitted.	Died.
Agra	3,632	582	234	2,080	816	175	2,688	193	67	2,541	23	12	2,409	114	45	1,933	32	20
Meerut	941	148	90	No epidemic ...			2,189	670	335	1,342	None.		...	...	...	No epidemic.		
Bareilly	2,244	144	65				1,171	12	5	1,768	None.		...	...	...			
Lahore	2,454	484	244				2,101	1	...	2,109	91	41	...	...	...			

I would not have my views on this important subject misinterpreted, for I would sacrifice any theory rather than that the belief that cholera is incapable of increase in a community by multiplication in the moist air covering a body of sleeping men should be made the excuse for the neglect of practical measures which might seem to take their direction from such a theoretical basis. There is probably no nidus so favourable for increase as the moist air laden with the exhalations of human beings, and such examples as those above quoted seem to teach that the extent of infection is nearly always proportionate to the number aggregated and to the extent of overcrowding.

The phenomenon of infection of a community does not imply that the contagion is from one man to another, except in cases which in this country are exceptional. It is not the aggregation of a certain number of individuals affected with cholera that forms the cholera-bearing atmosphere. We have decisive evidence to the contrary in the records of our cholera hospitals. If a cholera-bearing atmosphere is anywhere locally formed, as within the walls of a great jail, the impregnation is caused by the increase in a suitable nidus of the invading germ—a nidus derived generally from the massing of individuals, and the artificial creation of a stagnant, moist, and impure atmosphere. But no conclusion can be justly formed regarding the alleged facts of local infection if what I have formerly urged be not recognised as true, that the air of a locality may be poisonous not from the fact of containing cholera poison, for it may contain none, but only in as far as its impurity interferes with due elimination, and hence causes the coming forward of the symptoms of cholera in cases in which we know that with better opportunities for the full exercise of vital function the effects of the imbibed miasm would never have become developed at all.* A body with a certain amount of cubic and superficial space might escape, while, with the half, cholera might become general throughout it. The case of the Artillery at Cawnpore in the great cholera of 1853 seems a case in point. While the cholera of the 70th Regiment was in progress the Battery escaped altogether; and when it was considered necessary to take up more room in barracks for the Regiment the Artillery Company was doubled up into half the space previously occupied. Cholera immediately broke out and twelve men died out of a strength of sixty.

The rarity of cholera in the European quarter of Calcutta, except where special conditions seem to have localised cholera,† shows how much the risk of attack is diminished when space is abundantly supplied both in and around the dwellings of Europeans. The following is an example of the converse. Surgeon Boyd, 90th Regiment, writing from Subathoo on 9th May 1867, remarks:—"The fact has particularly forced itself upon us that the cases which have hitherto occurred were brought from barracks, old, badly situated, ill ventilated, and already condemned."

The deadness of the atmosphere, so often observed in this country during the great outbreaks of the monsoon season, denotes probably that the constitution of the existing atmosphere is not altered by the substitution of a fresh atmosphere, and no condition can be more favourable to the local spread of such a pestilence as cholera among any population than that which is furnished by a dead moist atmosphere.

The following case was related to me by the officer who was the orderly officer of the day when the outbreak of 25th August 1862 occurred at Meean Meer. Being new to the station, in going the rounds during the night, he and his party deviated from the road, and while halting to determine their position, the stillness and deadness of the air was such that the perspiration from the horses could be heard dropping on the ground. He made the remark, that it was on such a night as this that the outburst of cholera, which had already given warning of its presence in the station by a death in the 19th Regiment on 14th August, was to be dreaded. On returning to their quarters they were informed of the outbreak, which within two hours was widely spread through the cantonment. At page 185, the effect of this outbreak in Her Majesty's 19th Regiment is tabulated. Upwards of fifty men were lost during the period of the typical outbreak; and 38 of these deaths occurred within the first five days.

* Dr. Wise made the observation that those of his men succumbed most readily to fever whose beds were most unfavourably placed in regard to the air supply; he observed that those who breathed during the night the air which was most vitiated were the men who were far more liable than others to yield to the effects of the fever poison.

† Macpherson. Cholera in its home, 1866, p. 22. The localities noticed have been twice affected since, in the epidemics of 1866 and 1868.

The ratio of attack during the outbreak in relation to the race of the body or community affected. The Goorkha.

Yet again there remains to be considered the effects of race. The distinction is a true one, putting aside any minor considerations regarding domestic relations. Whether the Goorkha be placed in his native hills, in Lower Bengal, or in Upper India, he suffers from cholera, and he suffers from smallpox, while the natives around him escape. His economy brings to maturity the miasm or the virus of infection, which is dissipated or wears itself out in the economy of the native of Hindostan. It is in our Goorkha Regiments alone that smallpox appears as an outbreak. Jameson did not trace to its true source the great cholera outbreak of the Sirmoor Goorkhas at Deyrah in 1819, when he attributed it to the fact of the medical officer in charge being seized at the same time. Out of a body of 900 men, the seizures were 113, and the deaths seventy-four; and in the lines seventy-three women and children were cut off. In the epidemic of 1856, the Kumaon Goorkha Battalion at Deyrah lost twenty-six men, and at Deyrah, Ferozepore, and Umritsur, it was the Goorkha Regiments alone which suffered in 1861.* It was a Goorkha Regiment (the 66th) which was struck in the Terai in March 1857, with a loss of fifty-six men; and in May of the same year, the Nusseeree Goorkha Battalion on the march had sixty-four attacks and twenty-six deaths. It was the Goorkha Company of the 9th Native Infantry which was selected for attack in December 1863 while the Regiment was marching from Fyzabad to Lucknow. It was the Goorkha Police Levies which suffered so much in Lower Bengal after the Police Force was formed; thus in 1859, we find the 3rd Police Battalion losing fifty-six out of seventy-nine men attacked. The fact is, in short, universally true, that the Goorkha constitution localises cholera as it localises smallpox. The Goorkha seems to succumb even when the danger to the population generally has passed. Thus Dr. Buckle, in his report on the outbreak in Huzara in 1858, writes:—"As far as concerned the station generally (Abbottabad) the attack of cholera was over before the end of July. Yet cases were constantly occurring in the Goorkha lines, especially on their being re-occupied by parties returning from duty on out-posts."

The questions well deserving of the deepest study are, the circumstances which localise cholera in the Goorkha, and how far the European is subject to the same influences. It is to no purpose to trace the distinction to peculiarities of lines or latrines, seeing that the ratio of attacks is equally excessive on the march. We know that the habits acquired in their native hills render the Goorkhas far less punctual in their ablutions than the men of Hindostan, and that the power of elimination in the Goorkha due to functional activity is not to be compared to that of the sepoy of the plains, whose system has acquired it by birth and retains it by daily habit. In his food also the Goorkha is not so scrupulously careful as the sepoy of the plains. In the case of the Goorkha Company of the 9th Native Infantry, the bad quality of the food was particularly remarked on. On this subject Dr. Brown, of the 4th Goorkha Regiment, writes in his report for 1861:—"Their diet is under no supervision; and, being Hindoos, their food must not be inspected by men of another sect; I hear them say of each other that the quality of their food is very inferior. The Goorkhas prefer fish and vegetables, but when they cannot get fish in the markets they will eat goat's flesh: generally speaking, however, it is the inferior parts of the animal only which they use, and in order to save the expense of vegetables they use but little. Wheat flour is their staple food, to which a little dâl is sometimes added; these, to begin with, are generally of inferior quality, and are made still more unwholesome by careless and imperfect cooking; they grudge the expense of the wood for the fire, and to save fuel the remains of the evening meal is eaten cold in the morning, and, in the meantime, the metallic flavour from the utensil in which it has been kept through the night, has penetrated the whole of the food."

All this, however, is probably secondary to the effect of race considered *per se*, and I should consider it as of little weight in determining the radical ground of distinction. Besides, from the great care bestowed on the food and water of the British Soldier, we have almost ceased to think of the outbreak in connexion with such possible sources of evil.

The loss of the different races in the Epidemic Area of 1861.

Stations.	Europeans. Strength 11,898.	Goorkhas. Strength 1,447.	Hindostanees. Strength 6,172.
Morar	159	...	...
Agra	69	...	3
Delhi	50	...	8
Meerut	87	...	3
Deyrah	...	7	...
Umballa	53	...	2
Ferozepore	1	34	...
Meean Meer	479	...	16
Umritsur	41	11	...
	939	52	32
Died per 1,000 ...	78·92	35·94	5·18

* The same 19th Goorkha Regiment lost sixty men from smallpox in the eighteen months preceding the cholera outbreak.

But looking at the preceding statement, we cannot affirm that the British Soldier is even on a footing with the Goorkha. I fear we must add to the physical defects of some of our stations, to that community which is apt to multiply the ratio of attack, and to the effects of race, the deterioration of the system by climatic influences and by personal habits.

The causes determining the ratio of attack in the case of the British Soldier.

It is the loss of the balance that makes the difference between exemption and the attack of cholera, and it is too true that the balance is apt to preponderate in many ways against the European Soldier. The European Soldier taken as an individual is not in this country a typically healthy individual as the sepoy in the plains of Upper India certainly is; nor is the British Army of India typically healthy as is the Native Army taken as a body. It is the rule that the European Soldier suffers from climatic disease from which the Native Soldier does not suffer at all, because his constitution has been for generations adapting itself to the circumstances of the climate. The acute dysentery, the hepatitis, the pure heat fevers, and the heat apoplexy of the European Army have no counterpart in the Native Army of Upper India; heat apoplexy or acute dysentery, such as we meet with it in the European Soldier, are almost as rare in the Native Army of Upper India as are the same diseases among the population of England. The causes which produce these affections operating through a series of years on the European Soldier implant upon his constitution a special tendency to yield to miasmatic influences. The very adaptation which undoubtedly occurs, implies that the internal organs have assumed an abnormal excess of function very little in advance of which lies disease. I cannot help coming to the conclusion that a very large portion of the cholera ratio must be ascribed to the climatic causes inimical to that even balance of health which is the most powerful preservative against the development of cholera in the system.

The loss of balance due to the same causes which originate climatic diseases.

When in this Presidency the European Soldier dies of fever, if we exclude certain instances in which the character of the fever has been specifically marked, we recognise the fact that the man dies not from the virulence of the fever poison, but from some collateral condition which in the majority of instances is absolutely personal. The man is old or of intemperate habits, or is the subject of some cachexy, and his fever takes on the deadly type because his system has not the resiliency requisite for tiding over the crisis. There is no denying the fact that the strongest soldiers may succumb to cholera; but these very same men would under extraordinary exposure succumb to dysentery or to heat influence. I do not think it unfair to conclude that the European Army, and especially its old and its unacclimatised Regiments, is not a material well fitted to throw off the cholera miasm, and that the ratio of attack is necessarily high; while in Upper India the sepoy typically healthy, as a rule in his native province or in a climate corresponding to that of his native province, and at the same time a careful liver, does not readily succumb to the cholera poison, but throws it off. It is by no fortuitous contingency that the Goorkha is singled out. His social habits may predispose to cholera, but over and above all this, the same personal condition which causes seventy-five per cent. of all Goorkhas attacked by smallpox to die, and which among these hillmen converts Relapsing Typhus into Bubo Plague, brings him down to a level, in regard to liability to cholera, with the European who suffers from what are called climatic diseases, diseases due to the non-adaptation of organs and functions to the altered conditions in which the European finds himself in India.

I cannot leave this paragraph without once more inviting earnest attention to the truth which is here asserted. If we are ever to reduce the mortality in the case of the British Soldier our aim must have a definite direction, and I feel convinced that the clear recognition of this truth will place us a step in advance. And there are collateral truths also which become exhibited in an aspect of great importance when once we divert our minds into this channel of investigation. Chief among these is the fact that young and newly arrived Regiments are liable to succumb as communities. The case of the Buffs was apparently of this nature. There were in this Regiment 195 young men below twenty-five years of age; of these fifty-three died in 1867 in their first year of Indian service. The old soldiers also suffered extremely; of twenty-five men, above thirty-five, twelve died in the first year. The cholera came upon this Regiment in the end of August, when the depression caused by the climate of the previous five months was at the maximum. I see no reason to doubt that the Artillery and Cavalry at Meerut were subjected to the very same degree of infection; and yet five men only succumbed out of a strength of 1,040, while 105 men of the Buffs were lost.

The cholera miasm was superadded to the effects of climatic influences, and the Regiment as a body had not the strength to bear up against it. Dyspepsia and a sense of nausea became general; and as panic naturally followed the rapid progress of the pestilence, the ratio of attack went on progressively increasing. It ought carefully to be impressed upon Commanding Officers that too much care cannot be taken to prevent fatigue or exposure in a case of this kind. The movement into camp has a bright and dark aspect; and the method in which it is carried out will often determine the aspect for good or for evil. The necessity for daily or often repeated movement is entirely secondary to the conservation of the general health of the men; and when we knew what the outbreak actually is, we can readily judge that the constant movement hither and thither because of the continued appearance of cholera in camp after leaving cantonments is in the very great majority of cases altogether uncalled for, and in bad weather likely to be followed by evil results.

CLIMATIC DISEASES IN THE EUROPEAN AND NATIVE ARMIES CONTRASTED; FIVE YEARS, 1864-68.

Average Strength of the European Army 35,590.

Average Strength of the Native Army 38,349.

YEAR.	NUMBER OF CASES.						RATIO PER 1,000 OF STRENGTH.					
	Remittent and Continued Fevers. (Admissions).		Heat Apoplexy. (Deaths).		Hepatitis. (Deaths).		Remittent and Continued Fevers. (Admissions).		Heat apoplexy. (Deaths).		Hepatitis. (Deaths)	
	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.
1864	4,348	747	59	5	119	4	108	20	1·46	·13	2·95	·10
1865	5,945	495	111	6	130	9	160	15	2·98	·19	3·49	·28
1866	4,312	633	55	8	95	6	123	17	1·57	·21	2·71	·16
1867	3,518	519	83	9	89	9	101	13	2·40	·23	2·57	·23
1868	4,465	417	88	7	108	7	141	10	2·78	·17	3·42	·17
Five years ...	22,588	2,811	396	35	541	35	127	15	2·23	·18	3·04	·18

I cannot enter into the wide subject of the aspects of disease caused by disparity of race. I have placed this table here that its contents may be looked at in relation to the table showing the disparity of the cholera ratios for the European and Native Soldier; and if the parallel be not perfect, inasmuch as non-specific disease is represented, the facts here shown cannot but go far towards habituating the mind to the doctrine which I wish to urge, namely, that the balance of health and disease is so equally poised in the case of the British Soldier that it takes but little to turn the scale.

Nor are the habits of the British Soldier those of the Native. The habitual stimulus of alcohol and occasional excess, predisposes the European to the invasion of disease, both climatic and epidemic, and thus function is paralysed, too often at the very time when the highest play is essential to ward off attack. The economy of the Native is, as the rule, unaffected by this cause of deterioration. I have already spoken of this, and of the opinion which Dr. Murray entertains in regard to it; but it is a truth which cannot be urged too strongly. In determining the ratio of attack such influences tell very powerfully against the British Soldier.

The powerful influence of the poison of alcohol in preventing the elimination of the cholera miasm.

Even in the earliest of our great outbreaks, the effects of dissipation were regarded as adding greatly to the power of the cholera miasm.

The outbreaks at Berhampore in 1828 and 1829, in which 430 cases of cholera were treated, appeared after the Regiments had indulged in great dissipation. I find from a manuscript report, that it was after the 14th and 47th Regiments had received the gratuity for Ava that the cholera appeared in 1828 and 1829; it appeared for the second time in the 14th, after the Regiment received the Bhurtpore prize money; and in the same year in the Buffs, at Boglipore, also after the volunteers from the 59th Regiment had received their prize money.

Dr. Cox, among his replies to Dr. Murray's queries, gives the following narrative:—

"There is during cholera epidemics a very general tendency to fly to the brandy bottle for solace. I was once at a station with an European Cavalry Regiment and a Troop of Horse Artillery, when cholera became epidemic. Both were as nearly as possible similarly circumstanced as regards barracks and hospitals. A panic seized the troop and the men took to excessive drinking, while the Regiment remained sober. I witnessed man after man of the Artillery brought into hospital drunk, and death followed within three or four hours. No such cases were to be seen in the Cavalry; and the result was (for the medical treatment was the same in both), that of eighteen seizures in the troop seventeen died, whilst out of thirty-two seizures in the Regiment there were only twelve deaths."

We find the same repeated in 1867.

In the first eleven days of the Peshawur outbreak, in the 42nd Highlanders, out of a strength of 674, 124 men were attacked, while in the 77th Regiment, out of a strength of 857, seventy-four only suffered during the month and three days that the outbreak lasted, and during which time the Regiment was confined to the valley. In explanation, the Major General Commanding the Division writes:—"There is one subject which in concluding this report I think it advisable to bring under the consideration of His Excellency the Commander-in-Chief. At the close of the volunteering from the 42nd to the 92nd Highlanders, a sum of no less than Rs. 6,430 had been, agreeably to the orders received, paid over by the Field Officer superintending the volunteering into the hands of the volunteers, and on the 20th May the outbreak of cholera took place in the Regiment; and it is possible, nay, according to my long experience as a regimental officer, very probable, that a considerable proportion of so very large a sum of money may have been expended in drink among comrades, and this may have more or less influenced or facilitated the inroad of the disease." He continues:—"The immunity of the Native Troops appears a subject deserving of very special consideration, as the tabular statement shows, that out of eight Native Regiments only twenty-nine men died, or an average of

scarcely four men per Regiment, and this notwithstanding that in consequence of the epidemic and the numerous camps out on the frontier, the duties fell heavier than usual on the Native Troops."

The following is from the report of the Assistant Quarter Master General Peshawur Division; it is singularly consistent with all that has been written above:—

"I have reason to believe that it could be proved that *nearly all* the soldiers who were attacked during the late epidemic at Peshawur were men of indifferent constitution —men who had recently undergone or were then undergoing treatment, men who were known to be in indifferent health, men who were addicted to drink or had been recently drinking heavily, men paralysed by fear, or men who had been undergoing unusual fatigue or exposure. If such can be proved to be the case, it goes far to confirm a theory which I understand to have been very generally entertained amongst medical men and others who were close observers during the late epidemic, namely, that cholera is contagious or infectious only to those whose conditions of body are such as to render them prone to the disease.* The steady men in strong health who have no fear of the epidemic are not liable to an attack, however much they may frequent cholera hospitals or minister to the wants of patients. It is a notorious fact that such men if in strong health, steady, and free from fear, are not more susceptible to an attack of cholera than those who keep aloof from such places." The remarks which I have made regarding the employment of European orderlies are in accordance with this observation; and I think the conclusion is warranted that the employment of European Soldiers as orderlies entails a certain and unnecessary waste of life, not from contagion, but from the depressing effects of contact with the sick acting on constitutions already infected by the cholera miasm. As I have already said, it is a recognised truth that it is on rare and exceptional occasions only that natives brought in contact with the sick suffer; and the ratio of attack is never commensurate with the gravity of an outbreak, or the aggregation of cholera stricken individuals.

Regarding Meean Meer in 1861 Strachey writes:—

"The exemption from attack of the medical establishments in the hospitals was remarkable. There were very few cases of cholera among them, and hardly any of the native menial servants appear to have suffered." In the case of the Buffs, which lost 138 individuals in 1867, only two of the native followers of the Regiment died.

Dr. Bruce, an excellent observer, adds the following testimony, from his experience at Cawnpore in 1848 and 1849. He writes:—"In 1848, I had cholera in the Fusiliers from May till September. During the whole of that time I may say the hospital was never free of some cases, and at times it was crowded. The whole establishment may be said to have lived in the wards; the coolies for hours together never left the beds of the patients, and the medical officers did nothing but minister to their wants; and yet not one man, European or Native, ever showed the least symptom of cholera. I took most particular care to have them mustered and looked at, but in that year there was not even a case of bowel complaint among them. I had often not less than 100 men thus exposed. In 1849, the result was exactly the same; not one man of the hospital establishment was attacked."†

Illustration of the effects of mental depression.

The moral effect produced by the breaking up of hospitals altogether, as far as possible, when an outbreak is imminent, is undoubtedly very great and a powerful auxiliary in keeping down the ratio of attack; and so also is the movement into camp under ordinary circumstances apart from any other theoretical advantage which it may possess. What is the extent of the actual benefit, and what the ratio determined by mental depression, cannot be shown statistically; but the omission to recognise it would be very dangerous, as diverting the mind from an aspect which calls for a remedy as powerful as any proposed in the way of antidote. I feel sure, that in very many cases in which calamities have been attributed to severity of choleraic infection, demoralisation and not the strength of the miasm *per se* fixed the ratio of attack and the mortality in relation to it. In the case of the Buffs it is well known that men sought the last consolations of their religion many days before cholera became developed in the same individuals.

The following case occurred at Deolee in the outbreak of 1867; it is, however, impossible to say whether fear alone determined the attack of cholera, or whether the dread was the indication of its development:—"Two sepoys lived in same hut. The one died of cholera on 11th July. The second man on going into his hut on 16th July fancied that the dead man was sitting on his bed; he rushed out in a state of great alarm calling out that Umur Singh's ghost was sitting on his bed and had asked him to smoke. A white cloth was found on the bed. The man was taken ill soon afterwards and died next day."

General conclusions regarding the outbreak.

Perhaps I have digressed too far from the simple statistical facts in thus trying to explain why it is that the European Soldier dies. But I regard it as of extreme importance for the application of a suitable remedy, that not only should the direction in which the statistical data point be clearly indicated, but also that the radical difference between the condition of the European and the Native—natural, domestic, and moral—should be weighed in

*I read this—"that those only succumb to the generally prevailing influence whose conditions of body are such as render them prone to the disease."

† Letter to Mackinnon, Indian Annals, October 1856, p. 140.

estimating the causes determining the disparity of the ratio of attack, in order that we may not be led into error in miscalculating the effects of the prophylactic or remedial measures employed. The fact of disparity stands plain and unmistakeable. Some will apportion differently the effects of different conditions; and my estimate may be in some respects inadequate and in others exaggerated. Under any circumstances the question demands the deepest study that the Sanitary Officer can give it. Before leaving it, I wish to remark once more, that the great truth is not to be passed over as a curious statistical fact, but that its teaching is to be weighed, holding that its value is that of a law and true for all time to come, and that in the study of this law we have the truest groundwork for the application of a remedy to what has come to be a great national misfortune.

In this shape I am compelled to leave the subject. There are many difficulties which I have not solved; and I have been able to give an answer only in general terms to the all-important question—how the life of the British Soldier in the cantonments of Upper India may be saved. I have tried to remove the whole question out of the province of conjecture and of misrepresentation of facts and their bearings; and from the facts as they are here systematically placed, it is open to all to endeavour to push on the enquiry to a solution of the problem. And to him who shall have demonstrated the sanitary conditions under which the mortality of the British Soldier is capable of being assimilated to that of the Hindostanee will be due the credit of having saved in the future a fourth of all lives that are now lost on Indian service.

I see no indication that the cholera miasm shall in our time fall into a state of decadence. From the great epidemic of 1845, the epidemics of Northern India have shown no tendency to decay; and when the Northern Provinces have escaped comparatively or altogether, I think it is evident that escape has been the result of chance diversions alone, upon which we have no grounds to reckon for prolongation of the interval between the epidemics of the future. Slight epidemics such as those of 1852 and 1865 will often be interposed between great epidemics such as those of 1845, 1856, 1860-61, and 1867, but comparative exemption will even in these cases be found to be but a provincial phenomenon compensated for by intensity in some other province of the epidemic area. We are not weakly to listen to the assertion that the great recurring periodical calamities are not to recur in the future, and that human agency will determine whether or not Northern India is to be ravaged or to escape. The epidemic is not under human control. It is upon the outbreak alone and upon the dependencies from outbreaks, that attention must be fixed when it is proposed to apply practical measures. It is the careful study of what cholera is as a natural object that must direct these measures; and while studying the relation of cholera to communities, the results of this study will be incomplete and inadequate to the protection of the types brought immediately before us, unless also the conditions of these types are studied in their relations to the miasm.

The history of cholera in India tells that there was a time when this miasm was insignificant even in the country of its birth. It is needless to speculate as to whether cholera is a thing capable of being created; or whether it was created before or after the appearance of man. It is sufficient to know that it has a natural history of its own, and that its place in nature is as fixed as that of any other existing species. That there have been previous to the modern period of fifty years during which in a continual succession of invading epidemics the miasm has displayed vigour and vitality, similar epidemic periods extending back to the remotest antiquity, even the imperfect data which exist enable us to infer. The history of our period shows that cholera which has once made its exit from the endemic basin in strength, plays a definite part, and may make the circuit of the globe before it finally decays. When, therefore, history has failed to record invasion, the inference is, that in the endemic soil the germ had for the time gone to decay, or survived in so debilitated a state as to throw off no swarm of sufficient strength to leave its impress on the population of the epidemic area. From what we know of the behaviour of the miasm in the endemic basin in every year, it would probably be found true did the grounds for forming a conclusion exist, that the epochal manifestations of epidemic cholera and the intervals of decadence have been caused by the geological changes connected with the rise and fall of the water level in the great tract between the Cuttack hills and the hills east of the Bhurmpooter. Be this as it may, I fear we must come to the conclusion that at present we are in the midst of an epoch in which not only are the different epidemics of extremely rapid recurrence, but in which each succeeding epidemic surpasses the other in the virulence of its effects on the human constitution.

Mr. H. Macpherson has called attention to this same fact, showing that while in the epidemic of 1818-21 the loss was 25·92 out of each 100 attacked by cholera, it was about 41·00 per cent. in the sixteen years ending with 1854.

The full significance of this truth is apparent from the table which I have placed below. The fact is notorious and not to be concealed, that for the past ten years two-thirds of all European Soldiers in whom the collapse of cholera has been manifested have died. Speaking generally, the loss in the ten years preceding was from fifty to sixty per cent. Between 1827 and 1840 the loss was in no year over one-third, the maximum being 33·42 in the epidemic of 1837. But from 1841 onwards this ratio has always been exceeded; between 1841 and 1852 the minimum was 38·46 in 1841, and the maximum 48·67 in the epidemic of 1845; and since 1853 the ratio has never fallen below fifty per cent. It would serve no purpose to enquire whether we now treat our patients with less skill than did our ancestors.

In the estimation of the epidemiologist, the question is elevated very far above any consideration of such secondary importance :—

European Army of Bengal—Died out of each 100 *treated for Cholera,* 1827-68.

1827	...	...	...	28·13	1846	...	...	
1828	...	...	...	29·77	1847	...	...	
1829	...	...	...	22·89	1848	...	...	
1830	...	...	...	26·13	1849	...	...	... 40·74*
1831	...	...	...	23·50	1850	...	...	
1832	...	...	...	21·12	1851	...	...	
1833	...	...	...	31·96	1852	...	...	
1834	...	...	...	32·31	1853	...	...	... 61·00
1835	...	...	...	26·04	1854	...	...	... 50·54
1836	...	...	...	16·17	1855	...	...	... 50·00
1837	...	...	...	33·42	1856	...	...	... 57·85
1838	...	...	...	27·70	1857	...	...	... ...
1839	...	...	...	18·50	1858	...	...	... 54·34
1840	...	...	...	31·25	1859	...	...	... 50·17
1841	...	...	...	38·46	1860	...	...	... 53·25
1842	...	...	...	43·46	1861	...	...	... 64·04
1843	...	...	...	39·77	1862	...	...	... 61·28
1844	...	...	...	44·81	1863	...	...	... 75·11
1845	...	...	...	48·67	1864	...	...	... 69·59
					1865	...	...	... 72·50
					1866	...	...	... 60·00
					1867	...	...	... 60·87
					1868	...	...	... 65·52

* Eight years ending 1853. Macpherson, Indian Annals, 1858, p. 250.

CHAPTER IV.

DEPENDENCIES OF OUTBREAKS.

HOW FAR THE NATURAL AND PRIMARY ASPECT OF THE EPIDEMIC, THE REPRODUCTION, AND THE OUTBREAK IS AFFECTED BY SECONDARY MANIFESTATIONS OF CHOLERA.

Many of the facts which would naturally have fallen into this chapter have been incidentally noticed. For reasons which I shall presently give, I do not propose to enter at length into the enquiry included under this head. Had I done so, the arrangement would have taken the form which follows:—

A.—The effect of human intercourse on the epidemic or reproduction, as regards its duration and its geography.

B.—The effect of human intercourse on the outbreak.

a.—Duration in relation to virulence.

b.—Multiplication in communities.

c.—Effects of pilgrimages in multiplying foci.

C.—Infection of individuals.

a.—By fomites.

b.—By attendance on the sick.

D.—Infection of localities from infected individuals.

Hospitals. } 1. Primary.
} 2. Secondary.

Latrines.

Water Supply.

E.—Question of the multiplication of the cholera germ in the human economy.

F.—The chances in favour of the efficacy of preventive measures based upon the facts of the secondary manifestations exhibited during the epidemic prevalence of cholera.

In the preceding chapters, I have tried carefully to distinguish between such truths as I conceive to be of primary importance and such as are secondary. It would be tedious to repeat why it is that I hold the distribution in space and time, that is, the geography and duration of the epidemic and its reproductions, to be uninfluenced by human agency. I have summed up the general conclusion in the assertion, that the statistical data prove distinctly that the duration of the reproduction is not lengthened nor its geography extended, by the gravest affection of the population of a province, and that the distribution in time and space would be the very same if the area affected were uninhabited; that, in short, the earth-generated and air-borne cholera miasm is a natural object which might play out its part unobserved were it not for the contingency that when it meets the human economy, it acts upon it as a poison.

The question of the possibility of the multiplication of cholera in the human economy, the affection of special localities from human emanations, the affection of individuals by fomites or by proximity to the sick, in short, of the secondary propagation of epidemic cholera in communities, stands widely apart from all this; so widely, that many good observers in India have allowed it no place at all in their calculations, in consequence of the minor facts having been altogether over-shadowed by the great and primary truths.

The evidence upon which the demonstration of the two aspects of epidemic cholera, the primary and the secondary, depends, is of a very different value in either case. The registration of the facts regarding the primary truths affords in its aggregate the basis for the reduction of the phenomena to a system, built upon a true because upon a natural and unalterable foundation. The minor details of this system may be erroneously read, but the tendency is not to the perpetuation of such error, but to its elimination from future experience, leaving the system itself the more complete as the erroneous deductions are one by one removed. The demonstration of the secondary truths or allegations rests on observation or experiment, and not upon a something which is absolute; and, consequently, room is left for fallacious deductions which spring from misdirected or imperfect observation and from an erroneous conception of the significance of what actually occurs.

From the latter, however, the attempt has been made to construct a system which aspires to be complete in itself and independent of the truths which I regard as fundamental, in which human agency alone, or human agency assisted and controlled in a secondary manner only by meteorological agencies, is made to play the part of the propagator and distributer of the epidemic cholera of Europe. I am naturally led to conclude that the construction of this system cannot be carried out into a perfect whole; and that since this is the case, the individual elements of the structure must be wrongly placed. These elements may be good and valuable in themselves, but the effort to put them together may be misdirected. It may be true that cholera is multiplied in the human economy, and that buildings, latrines, and the water-supply may become infected from the miasm thus multiplied, and it may be true that cholera is portable and capable of being transmitted by fomites; but it is no necessary sequence that cholera is never multiplied unless in the human economy and in localities infected from human emanations, and that cholera is never geographically distributed unless in districts into which it is conveyed by human agency. Very many narratives have been given of observations upon which it is sought to base this system. These tell how cholera appeared in a certain family in a certain town, possibly brought in contact with a recognisable source of

cholera infection, and how a certain number of individuals, necessarily or accidentally brought in contact with the first sufferers, were also affected. The invariable conclusion is, that from this time the disease spread, not locally, but universally; and it is distinctly implied that there was a necessary sequence between the first cases and those surrounding them, and the general infection of the province or kingdom. As I have shown, the progress of cholera is not continuously progressive; its advance is mapped out by the successive affection of natural provinces, and is made *per saltum* at definite seasons. At any time in the intervals between the epidemic leaps, importation into the countries beyond the already occupied area by human agency or by fomites, may occur. But we must carefully distinguish between importation and true epidemic advance, seeing that both undoubtedly occur; and we must not come to the conclusion that there is some subtile influence at work, diffusing the miasm imperceptibly from those already visibly affected by cholera, when we see a trifling local outbreak followed at an interval of weeks or months by the universal infection of the country. This is certainly not the method in which the gap is bridged over when true epidemic advance occurs; and it is a mistake to call the casual introduction of the forerunners of an epidemic the advance of epidemic cholera. At home, in anticipation of the actual cholera invasion, daily registers should be kept from the date of the occurrence of the premonitory cases or outbreaks, in order to time to a day the arrival of the air-borne epidemic, and to note its selected habitat. In our natural provinces of Upper India, we can note advance very readily, from knowing the seasons at which it is to be anticipated, and because of the invariable association of the miasm with its vehicle; and if the definition in space be more accurate and the occupation of the area covered be more complete than at home, it is to be remembered that in this country the limit of the geography of the epidemic advance is precisely at the point to which the special meteorological agencies extend, and that the vehicle is of universal distribution, while at home there is no phenomenon corresponding with the undeviating regularity of the Indian monsoons to define the position of any air-borne miasm in time and space.

It is suggested as contradictory of the alleged fact of the provincial distribution of cholera by aerial influences that, if it be true at all, the distribution of cholera within the provincial area must be universal or nearly so, and that hence every human being within it incurs the risk of death from the invading cholera. The case is not unfairly put. In theory this is exactly what does occur. Certain types of the population and certain localities suffer in different proportion, and in some portions of the area even the index of the presence of cholera may be wanting; but the universality of the liability viewed as a scientific truth holds good. Exceptions do not make the general proposition less true, that the entire population resident within an invaded natural area, incurs the risk of the attack of cholera on the occasion of an invasion. When an air-borne cholera sweeps over Calcutta, certain conditions peculiar to locality or connected with predisposition in individuals or classes, cause selection among the general population, but every resident in Calcutta on such occasions runs a risk of succumbing to cholera; and what is true in this case of a city is true of the natural areas of Upper India.

The comparative value of statistical data and of observation and experiment in support of a theory or as the basis of a system.

The dependencies of outbreaks are not to be classed in a systematic arrangement along with the outbreaks of the epidemic; and it remains simply to be considered how far observation and experiment have led to the record of facts which demonstrate to us the secondary truths regarding the affection of individuals or localities. In contrasting the primary and secondary truths the difficulty lies in duly apportioning to each the true value, and I repeat that it is infinitely more difficult to weigh the alleged results of observation than those for which we have the widest statistical data. So long as attention is confined to the tabulation of statistical facts, every figure represents a truth which invites us to place it in its position in a system; but when we come to weigh the results of observation, we have to deal no longer with a harmony but with a series of antagonisms. And even in experiment, the results are scarcely more satisfactory. So unsatisfactory indeed are they, that they are sustained more by the established reputation of the experimenters than by general assent to them as scientific truths. It is a safe maxim never to call in question what an observer of acknowledged reputation affirms that he has seen or done; and we have no right to deny his positive facts because others do not appear to coincide with them. We must not at the same time forget that observed facts are subject to different interpretations.

But notwithstanding the difficulties that meet the scientific observer at every turn in the collection and estimation of evidence from observation and experiment, others are less scrupulous in making use of results which he frequently puts forward by way of suggestion only, producing them as facts adapted for the furtherance of theoretical propositions far in advance of those in explanation of which the data have been brought together. And this misuse of evidence has seriously complicated all recent investigations regarding cholera.

The building up of a system from the results of observation contrasted with the structure having a natural basis.

What those who have sought to build up a system out of the secondary manifestations of cholera allege to be truths may be true or they may not. This we cannot pass over without remark, that when the different propositions are placed together and fairly looked at, they will be found leaning one on the other for support, having evidently been added one by one in each succeeding European epidemic, when it was felt that the prop had been struck out upon which the previous theory reckoned for its stability.

The facts of the first European invasion showed that aerial transmission did not account for all the phenomena observed, such as the transmission of cholera by fomites, and the occasional infection of attendants on the sick. Hence there was initiated *(a)* the doctrine that cholera might be propagated by human intercourse; and as the latest phase of this doctrine we find the confident assertion promulgated as a truth that cholera is always and not occasionally so propagated. To prop up this assertion, it was necessary to make a second assumption or theory. And hence arose the doctrine *(b)* that cholera is multiplied in the human economy. But this also must have stood alone and unsupported unless it could be shown how and where the multiplication took place. And this led on to the starting of the third theory *(c)*, which asserts that cholera is multiplied in, and is spread around by the intestinal evacuations of those already suffering from the disease. But even this, although urged in the most forcible manner, did not meet all difficulties; and there arose the demand that it should be supplemented by a fourth theory. In relation to this demand the latest theory *(d)* alleges that the evacuations of an individual in whom cholera has not become apparent, and never will appear, may be the means of spreading cholera around.

While it is very evident that the last of these theories may very readily be made antagonistic to the elimination of scientific truth, and while its general adoption should be resisted until the grounds upon which it rests are well substantiated, in accordance with what I have said regarding the methods and consequences of cholera infection, the doctrine is not one which I would rashly assert to be destitute of foundation. But I repeat once more, that the truths upon which the theories of this group depend for their construction, even granting that they were true to the full extent asserted, cannot be made the basis of a substantial and complete system which shall supersede every other.

The relative value of primary and secondary truths as estimated in India. Recorded evidence regarding the secondary manifestations of cholera.

I should be going out of my province were I to attempt to fix the relative value of the primary and secondary truths. It probably differs much in different countries and among different races. Secondary truths seem most to have appealed to the observers of Europe, while the primary truths are those which chiefly force themselves upon our notice in this country.

What then do we learn from the accumulation of facts in this country which demonstrate the share which the human being and his surrounding conditions have in the propagation and distribution of cholera?

If I am asked to what the sum of the recorded facts regarding the dependencies of outbreaks in India amounts, I fear I must answer that the collection of these facts is scarcely yet begun. A general conception that cholera may be transmissible from one man to another exists, and the record of cases, which are undoubtedly authentic, gives ground for the belief. We are only too willing and eager to put together any facts which seem to show, that human emanations are one source of the infection of communities; because we recognise that a thoroughly authenticated collection of such facts would justify the employment of practical measures in a definite direction. Not one of the theories above referred to has taken its origin in this country, for they can all be traced to an European source. We are called upon to corroborate these theories from the evidence afforded by the phenomena of the cholera of India. As might have been expected, the facts which have been brought forward in their support by Indian observers have frequently been open to question, and illustrations have often been erroneously applied as a result of local and limited experience. Looked at as standing alone, the great illustration of 1867, the Hurdwar outbreak and the spread of cholera over Northern India, gave great encouragement to those who highly estimate the effects of human intercourse in the propagation of cholera. The verdict of the European Conference was, that pilgrim assemblages were foci from which the epidemic cholera spread. The twelfth year had come when the great gathering was due. Measures were taken in anticipation of the probability of the outbreak. The outbreak took place as was anticipated. The appearance of cholera over Northern India was a true sequence; for, over the invaded area, the appearance of cholera among pilgrim travellers preceded the district outbreak in almost every instance, and many perfectly authenticated cases of the direct transmission of cholera from pilgrims to inhabitants were put upon record. No link in the chain seemed deficient, and yet the conclusion at which I have arrived is, that the Hurdwar outbreak played but a secondary and altogether unimportant part in the epidemic of 1867; and I had formed my anticipations of the same sequence from previous parallel history months before the event occurred. I need not enter into the facts of the secondary distribution of the Hurdwar cholera; they have been carefully detailed in the narrative of the Sanitary Commissioner for every district of Upper India, and in this the opinions of the civil and medical authorities are also given. The facts, generally, may be regarded as authentic, whatever interpretation we may attach to them, unless in cases in which the testimony of native agency is introduced, when, in every instance, the record may be regarded as trimmed according to the theory which the facts of 1867 were supposed to establish. The same tendency is, in a certain measure, clearly traceable in most of the reports of the civil authorities of districts, which have a distinct bias towards the prevailing theory of the hour.

In the midst of a mingled and confused mass of evidence, it is very satisfactory to pick out tangible facts, such as the following, given by Dr. Verchere, of Jullundur, which demonstrate the truth that the pilgrim stream was tainted by a cholera which it had the power to pass off to those brought into its current. The city of Jullundur escaped altogether, while a certain small section of its population, detached to a distance of two miles, for the purpose of turning aside

the pilgrims or taking care of their wants, suffered. The following cases occurred at the Beyn Chowkey, where the pilgrims were turned off on the road to Jullundur from Phillour :—

Dr. Verchere writes :—" On 25th April, out of a guard of twenty-one men, two sepoys of the 13th Native Infantry were attacked; and on the 26th, a chuprassee, two bunneahs, and a hospital servant. A third sepoy of the guard had a sharp attack of choleraic diarrhœa. Of these cases one sepoy, the chuprassee, one bunneah, and the hospital servant died." He continues :—" All the sepoys were perfectly well before they left the lines. This small detachment alone came into contact with the pilgrims. It appears to me as strong an example as any I have seen or read of, of the contagion of cholera. The lines of the Regiment are not more than two miles from the spot where the cholera camp was established, and not a case of cholera or even of bad diarrhœa occurred."

The shortness of the period of incubation is proved by the following case: we have seen the same in the case of Regiments attacked on the very first day after descending from hill stations to the plains :—

" A Goorkha sepoy, aged twenty-five, left the lines at sunset on 24th April, and arrived at the camp an hour afterwards. Early in the morning of the 25th he was attacked with diarrhœa; at 10 A. M. he was in deep collapse, and died at 3 P. M."

Such facts have very properly been used as an argument for diverting pilgrim streams from towns. They teach that pilgrim streams are sources of infection; and the exemption of the towns from which they have been diverted shows the efficacy of the measure. But here must be interposed the equally certain truth, that there is a cholera against which such quarantine is unavailing. He knows but half the truth who, judging from such local experience, concludes that perfect quarantine is invariably effective in keeping out cholera.

Applying the same to jails, we find such a case as the following :—During the prevalence of the invading cholera of 1863, a party of prisoners coming from the direction of Nagpore, was affected by cholera before reaching the Central Prison at Allahabad. On arrival they were placed in strict quarantine, and a cook was provided for them from among the resident prisoners. This cook was the only man selected from the jail at this time by cholera. The inference is, that he acquired it from the cholera-stricken gang to which he was attached, and that had others of the resident prisoners been brought into immediate contact with the same men, they might also have suffered. The conclusion is, that when cholera is abroad, quarantine is a proper precautionary measure; but we must not expect that the prison population is invariably to escape because quarantine has been enforced.

The narrative is thus given in the report of the Allahabad Jail for 1863 :—

" Among the European Troops cholera commenced on 19th April, and in the jail on 2nd May. After this outbreak, the jail continued free from cholera up to the 23rd July, and between this date and 5th September thirty-three cases occurred.

" But in the meantime, a party of prisoners from Nagpore marching towards Allahabad, met the epidemic a few days before reaching their destination, and brought it with them into the jail on 7th June. Out of seventy-one, two had died before reaching Allahabad. On the day of arrival five were admitted into hospital; on the 8th seven; on the 9th seven; on the 11th two; and on the 12th four; no other cases occurred until the 23rd, when another of the same party was attacked.* *The only other man attacked in jail during the period was a Brahmin cook, who was told off to cook for this party; he was seized two days after he began his duties.*"

A cholera-infected body does not necessarily infect a community with which it mingles; at the same time, it is not justifiable to mix up an infected with an uninfected body. The crews of ships, if drawn from separate sources and shipped immediately before sailing, have been observed to share in no community of attack, cholera being confined to those shipped from a definite quarter. In the case of a mail steamer, which was affected by cholera in 1868, it was observed that those only who slept on board on a certain night while the vessel was moored in the Hooghly were attacked. When the Rajghat Detachment of Her Majesty's 54th Regiment was moved to head quarters in 1863, cholera had showed itself by a single case only, and the outbreak which followed during the next seven days was confined to the men at the Rajghat Detachment. The Detachment of Her Majesty's 92nd Regiment, which arrived at Fort William by the Sunderbun route on 24th March 1862, had between that date and the 11th April seven fatal cases, while the other Wing remained unaffected.

The mixing up of an infected with an uninfected body is not necessarily followed by the appearance of cholera in the uninfected body.

Mr. Reilly, Apothecary to the General Hospital, sends to the Editor of the *Englishman* the following very interesting letter on the subject of hospital infection in reply to the remarks of a correspondent who suggests that the hospitals of Calcutta may be foci from which cholera spreads. It is published in the issue of 21st August of this year.

The cholera hospitals of Calcutta do not prove foci of contagion.

He writes :—" I am very glad to be able to reply at once to some of the remarks made, which tend to give the idea that cholera finds a centre in the Calcutta General Hospital, and that patients there treated run a considerable risk of contracting that very dangerous disorder.

" Doubtless men have been seized with cholera after having been admitted with other diseases. I have the proof before me in the hospital records, that during the last thirteen years, there have been eight men who, after being admitted, were so attacked. That is to say, in about twenty-four thousand Europeans, eight have been seized with cholera in the General

* This seems to have been a nearly typical outbreak.

Hospital. But as seven of these were admitted with diarrhœa or bowel complaints, it may be doubted whether these ought not really to be considered as cases of cholera in the first stage, which would, of course, reduce our average to one in twenty-four thousand, among whom eleven hundred cases of cholera are included.

"In the General Hospital for many years cholera patients have been admitted into a receiving room, where patients with cholera are alone treated; they are then moved into what was intended to be set apart as a cholera ward, where they remain till discharged. Unfortunately, from the increasing number of sick, we are unable to give up so much space to one class of patients. Other patients have been treated in that ward with men suffering from cholera; yet, out of the total of eight cholera admissions above referred to, seven occurred among the patients in the wards of the centre building where cholera was not treated, and only one among the sick who were received into what we call the cholera ward. It is evident that the fears expressed regarding the spread of cholera within the wards of this Institution are quite without foundation, and that the evils anticipated have, up to the present time, had no real existence."

The proof of the fact of the introduction of cholera by human intercourse is not always convincing even in cases where the evidence seems very clear.

Pilgrim cholera. The phenomena in relation to the epidemic. The necessity for carefully trying to avoid erroneous deductions.

The case which follows will illustrate the difficulties which present themselves in dealing with instances of alleged infection.

The Artillery from Benares were encamped for their annual practice at Sultanpore in January 1863; and they were attacked coincidently with the passing, through their camp, of a body of pilgrims from the fair at Allahabad. The morning following seven men were attacked, six Natives and one European: the European died, the six Natives recovered.

In this case there is no doubt of the fact of the coincidence of the cholera of the Artillery and the pilgrims; and the application of statistics on a limited scale would almost certainly have led even an accurate observer to conclude that the coincidence was more than suspicious. The tabulated experience of a series of years would have shown him nothing corresponding to this January cholera of 1863, and had he thence concluded that the cholera was localised in the pilgrim stream, few would say that his conclusion was illegitimate.

And yet when the statistical record is extended the parallel is not found to be wanting. Looking at the cholera history of 1863, and the two years following, we now know this to have been the first wave of the invasion of the epidemic of 1863-65 coming from the east; and we recognise as parallel the cholera of December 1817 and December 1868 preceding the manifestation in power of the spring cholera of 1818 and 1869.

At page 59 of the first Section will be found a table drawn up many months since, intended to represent my ideal of the relation to season of the cholera of the margins of the endemic basin; it shows the cholera of the jails of Cuttack, Pooree, and Midnapore in 1860. I find in the Report of the Jails of Bengal for 1868 the following table, and I have placed it here to show how true a long continued series of observations prove the type, as I have represented it, to be:—

Cholera admissions of the Pilgrim Hospital at Pooree in each month of the 25 *years from* 1842 *to* 1866.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1842 ...	36	5	47	1	...	1	7	1	...	...	6	2	106
1843 ...	7	...	35	...	...	164	25	...	...	...	2	1	234
1844 ...	...	3	...	...	2	200	...	...	...	1	...	...	206
1845 ...	1	2	3	1	...	2	57	2	...	1	...	...	69
1846 ...	2	...	14	1	...	72	1	...	1	3	4	1	99
1847 ...	...	1	14	...	1	4	29	1	...	...	1	...	51
1848 ...	1	5	3	3	...	2	47	...	...	...	...	...	61
1849 ...	...	...	...	...	1	107	4	1	...	...	1	...	114
1850 ...	1	37	11	1	...	...	2	...	...	...	5	1	58
1851 ...	...	...	1	...	2	39	28	...	...	...	...	...	70
1852 ...	...	5	4	...	...	104	2	1	...	1	3	3	123
1853 ...	2	2	10	1	1	6	26	2	1	...	...	...	51
1854 ...	...	6	48	...	...	129	18		...	1	7	1	210
1855 ...	...	2	1	...	2	...	156	3	...	...	2	1	167
1856 ...	1	3	2	...	...	...	...	...	1	2	1	...	10
1857 ...	...	8	43	11	1	66	2	...	...	...	4	...	135
1858 ...	...	2	3	1	1	1	9	...	...	...	...	...	17
1859 ...	...	7	8	...	...	...	47	...	...	...	9	...	71
1860 ...	1	8	19	1	2	96	4	...	...	1	...	...	132
1861 ...	...	...	12	3	...	3	27	...	...	4	...	1	50
1862 ...	2	5	6	...	...	91	20	...	...	1	3	...	128
1863 ...	...	...	1	...	1	93	2	...	...	...	...	2	99
1864 ...	1	3	...	1	...	1	12	1	...	...	4	...	23
1865 ...	...	1	2	2	1	74	13	...	2	...	...	...	95
1866 ...	1	22	26	1	...	...	...	1	...	...	1	...	52
Total ...	56	127	313	28	15	1,255	538	13	5	15	53	13	2,431

To the general results here shown, the question as to the numbers of pilgrims assembled in the different months and the influence which they may have had on the diffusion of cholera is altogether secondary. One glance at the facies of the table is sufficient to prove this. It is throughout and consistently a beautiful demonstration of the truth of the relationship which the vital object cholera bears to the influences of season. Here is seen the sprouting into vitality of the spring, the monsoon, and the November cholera. Note that the spring cholera of the extreme south-east is the cholera of February and March, not of April, as in the valley of the Ganges, nor of May, as in Cawnpore and in the western division of the epidemic area; and that the monsoon cholera of the extreme south-east is not a cholera of July, August, and September, as in Upper India, but of June and July. It is wonderful here to mark the minimum separating the spring from the monsoon reproduction; and such a demonstration is of all the more value when we reflect how difficult it is to define the line between the cholera of May and of the monsoon in Northern India. Fifteen admissions in 25 years mark the minimum of May in this pilgrim hospital; while the maximum of the monsoon is indicated by 1,793 admissions in June and July during the same period.

It must never be forgotten that the mere fact of the presence of cholera among pilgrim or other assemblages, especially in the epidemic province, is an index that epidemic cholera is abroad. No pilgrim body will develop or acquire cholera except where cholera exists and is ready for epidemic spread. Every manifestation that occurs has its place in an epidemic which is in progress. When I have spoken of the great pilgrim outbreaks of 1860, 1863, and 1867, I have done so merely as of a single outbreak in an epidemic involving half of India. We cannot be too careful in trying to avoid fallacy of deduction from the observation of the facts of pilgrim cholera. It has been recorded that the cholera of the Allahabad pilgrims of January, above referred to, was the origin of the universal cholera of Oude of 1863. But we know that this was not the case; we know this cholera to have been truly a portion of the cholera spreading at the time from Cachar to Bundelcund.

In connection with what I have written regarding the geography of epidemic cholera in 1867 and 1868, the absence of cholera from the pilgrim shrines of the Madras and Bombay Presidencies in these years was to be anticipated. I cannot, therefore, but regard as premature the conclusion that the sanitary precautions adopted during this period have been the means of preventing the outburst of cholera.* It is when cholera is due to appear because of its provincial distribution, that the effects of local sanitary measures in preventing or mitigating the outbreak will in the future be tested; and knowing how detrimental to the true advance of sanitation as a science is the holding out of expectations which are not realised when fairly put to the test, while recognising the propriety of the measures employed and acknowledging the benefit likely to be derived from them, we cannot be too cautious in our estimate formed from the results of a limited and local experience.

The introduction of the epidemic cholera of 1860 into Upper Assam. Effects of human intercourse.

The following case related by Mr. White, of Debrooghur, is one of those upon which the theory of the introduction of cholera by human agency is founded. The correctness of the observation, that the body of individuals in question spread cholera, seems to be beyond dispute; the deduction, that human agency introduced into Upper Assam the devastating cholera of 1860, portion of a great epidemic universal from Bombay to China, is incorrect.

This cholera was introduced from Lower Assam into Upper Assam, two months in advance of the true invading epidemic.

The history of the successive steps of advance in 1860 from south-east to north-west, from the Bay of Bengal to Lower Assam, is thus given by Dr. Thomson, Superintending Surgeon of the Dacca Circle; it is interesting to observe how, even in so general a statement, the normal dates of appearance from the sea-level upwards are recorded, and also the occurrence of the three reproductions, of the spring, the monsoon, and the cold season:—

"Cholera first appeared on the 29th February in the Backergunge District, and was rife in the adjacent zillahs of Dacca and Mymensing during the months of March and April. It broke out with great violence at Gowalparah on the 4th May, and terminated on the 19th; again it appeared on the 16th July; and thirdly, on the 9th October."

Along with the third appearance in Lower Assam, Upper Assam was invaded.

Out of a population, in the Debrooghur District, of 10,000, 1,250 cases of cholera were reported in October and November.

It was, however, coincidently with the second appearance of cholera in Lower Assam, in July and August, that the cooly gang, to which the following narrative relates, imported cholera into the Debrooghur District:—

On the 18th August, the river Steamer *Adjai* arrived at Debrooghur, having lost on the passage about a fourth of the cooly immigrants on board from cholera. Several died immediately after disembarkation, and the survivors were removed to the tea garden in which they were to be employed. Mr. White remarks:—

1*st*.—"There was no case of cholera in the province before the arrival of the *Adjai*."†

* Reviewing the Report of the Madras Government regarding the control of pilgrimages in the Madras Presidency, the Army Sanitary Commission remark:—"It is most satisfactory to know that an arrest can be put on cholera by these simple and easy measures of prevention, which have moreover the experience of all past epidemics in Europe to sustain them."

† I do not attach much value to this statement in as far as it may be regarded as conclusive against the existence of cholera in Upper Assam; it is far more consistent with experience to conclude that many warnings of the approach of the epidemic had by this time been given. I observe that in his monthly jail return for May Mr. White shows two cases of cholera among the prisoners.

2*nd*.—"The first case occurred at the tea garden to which the infected immigrants were removed from the *Adjai*."

3*rd*.—"The first case in the military lines occurred in a sepoy on his return home from the cooly lines of the same factory."

4*th*.—"The first case in the civil station occurred in a bazaar merchant who had been to the same factory on the day on which he was attacked."

Mr. White believes that he witnessed in the epidemic of October and November also, the same phenomenon of communicability. With experience of cholera both in England and America, he regarded this as something new to him; and, I believe, that he has not again, during eight years of further residence in Upper Assam, recognised a repetition of the phenomenon.

The inference from this is, not that the cholera miasm has two separate intimate characteristics under which it is communicable or incapable to be passed off to others from those affected, but that there are certain conditions which admit of cholera becoming communicable. And it must not be lost sight of, that so dense was the body of the Assam cholera of October and November, that, according to Mr. White's own statement, more than 12 per cent. of the whole population were attacked. And, besides, the atmosphere was stagnant and impregnated with moisture; for it had rained on one hundred consecutive days before the cholera appeared. The history of the Assam cholera of October and November must be read in connexion with what I have said regarding affection of locality and the attack of attendants as a consequence. Mr. White writes:—"The first convict attacked had been engaged the same day in removing the corpses of cholera patients. The second convict seized had been employed as an attendant in the cholera hospital for three days previously; he died in three hours. Two attendants besides, who had waited on the first five attacked in the jail, were next attacked."

"Four servants in the military hospital were seized while in actual attendance upon the sick, and also eight sepoys who were acting as supernumerary attendants."*

The possibility of the spread of cholera as a parasitic affection. Spread in fomites.

While now, as in all time past, it is denied, that those brought into immediate contact with the soiled or unsoiled bedding and hospital clothing of cholera patients are liable to the attack of cholera, as far at least as the experience of the Calcutta hospitals goes, and I have no statements, figured or written, in the records of the military hospitals of Upper India, which are capable of being used as contradictory of this experience, the possibility of the transmission of cholera by means of fomites is not open to question.

The apparent explanation of this antagonism of facts is, that the miasm has become parasitic upon the clothes or persons of those transmitting the cholera, while it is not increased in, nor passed off from, the excreta. It is the classes whose clothing is offensive to the sense of smell who thus transmit cholera. Dr. Stewart, of Pooree, writes:—"Pilgrims are a terror to the native population, and are avoided by all who see and know them. Natives fully believe pilgrims to be sources of infection." He adds, that the villagers can recognise them by the smell.

What seems to occur in the case of the unwashed pilgrim, is noticed also in the case of the unwashed Goorkha. The Nepaulese Durbar writes regarding the cholera of 1867:—"Cholera is a plague sent by God. It spreads by intercourse with pilgrims, and traders. It is a catching disease. It does not spread much in clean places, but it spreads much in unclean places."

The squalor of a famine-stricken population affords opportunity for the growth of such a cholera, as the loss of valuable lives in connection with the duties of presiding over famine kitchens in the North-Western Provinces in 1861 showed.

There is great difficulty in selecting individual cases of transmission by means of clothing, or other vehicles,† and there is always the danger, that the true explanation may be different from that suggested by the observer who records the circumstance. These remarks apply to such a case as the following:—A pilgrim from Hurdwar was taken ill on 28th April in a village of the Googaira District, and was immediately carried on by his companions to his village, nineteen miles distant, where he died. On the 30th, cholera broke out in the village in which his attack commenced, and twenty-seven people died.

The theory attached to this narrative is, that the spread of the cholera was due to the fact, that the man was taken ill at the village well, and that his clothes were washed in an adjacent pond. This explanation seems to be shaped in accordance with the home theory, and I do not accept it as satisfactory, since I consider that a more careful enquiry into the history of the affection of the district at the time was required to confirm its truth.

How long cholera may be kept alive in fomites, and spread primarily and secondarily, is an important subject for enquiry. The case of the *Renown* teaches how, at least three weeks after infection, fomites, or, at least, a locally existing cholera,‡ may give rise to secondary outbreaks, destined to last for a normal period beyond the date of commencement; and in the case of the *Gertrude* (see page 182) cholera did not appear until the twenty-fifth day after leaving Calcutta.

From all this, I regard it as essential, that we should clearly recognise the simulation of contagion by localised cholera and the aspect of cholera as a parasitic miasm, whatever import-

* It is worth while to note, that in the same building the sick of the detachment of the Naval Brigade (European Sailors) were treated, and that although they were separated from the natives only by a screen, no case of cholera occurred among this peculiarly susceptible body.

† Dr. Verchere thought that he could trace the importation of cholera into Jullundur and neighbouring villages through carts which had been to the Hurdwar fair of 1867.

‡ Emanations from the hold of the ship were believed to have determined the attack in this instance, as the men exposed to such influences chiefly suffered.

ance may be attached to it beyond this as a miasm multiplied in, and emanating from within the human economy.

In all investigations regarding secondary truths the fundamental basis must not be lost sight of.

The sum of all experience, and the lesson taught by the facts given in illustration of the secondary truths regarding epidemic cholera, is, that, while the aggregate of the outbreaks of soil-born cholera invariably through successive reproductions make up an epidemic, there is, in the history of the cholera of this Presidency, no evidence to show, that any aggregate of cases of cholera, derived secondarily from true outbreaks through human agency, has ever, by the combination, produced a reproduction or provincial manifestation of cholera, and consequently never can have given rise to an epidemic.

Snow wrote as follows :—

"If cholera cases were not connected one with another, there would be no reason why the few cases which happen in a village, should not be scattered over as long a period as the thousands which occur in a great metropolis."*

The statistical facts, as I have here recorded them, entirely invalidate the conclusion from the presumption that the cholera of rural districts has a shorter duration than that of cities. They show that the duration in time of the provincial reproduction is identically the same in the case of all classes of the population, and whether the numbers affected be large or small; typically the same, for example, for the sepoy as for the European Soldier, and for the cities of a province as for the villages.

Baly also sums up against Snow's view in the following terms :—"The theory, that cholera is propagated and diffused by means of human intercourse, receives no support from the facts relating to variations in the intensity of cholera epidemics, and the circumstances determining those variations. These facts tend, on the contrary, to establish the close resemblance borne by Asiatic cholera to the common summer cholera and diarrhœa of this country, and to remittent fever, which there are such good grounds for believing to be purely of malarious origin, and not to be in any way communicable." (p. 43).

Summary of conclusions. Baly.

It seems to me that the modern deviations from the verdict of the College of Physicians of London on the cholera of 1848 delivered through Baly's Report have been in the wrong direction, and that the conclusions of this classical memoir will be held in esteem in all time to come, when the natural history of epidemic cholera shall have been placed on a sounder footing than at present.

I have deviated little from the principles of this report. In this country, however, we have to deal with data more appreciable, and with a wider basis of recurring facts; and this admits of comparisons being made for which the data are wanting in Europe, owing to the short duration of epidemics and the eccentricities manifested during the period of their occurrence.

The conclusions are given in summary by Baly nearly as follows, (Report, p. 216, p. 224) :—

1*st*.—It is not proved that cholera is spread subsequent to its multiplication in the human economy :—

"No sufficient reasons have been found for adopting the theory, that the cholera poison is swallowed with the food or drink, is reproduced in the alimentary canal, and being discharged with the secretions of the stomach and intestinal canal, propagates the disease by finding access in the same vehicles to the stomachs of other persons." (p. 222).

2*nd*.—He assumes the controlling power of atmospheric and hygrometric influences :—

"This theory—of multiplication in the economy—has been found especially inconsistent with the great mass of evidence which establishes the influence of the different conditions of the atmosphere * * * ; and that theory alone (of the six theories previously enumerated) s supported by a large amount of evidence which regards the cause of cholera as a matter increasing by some process, whether chemical or organic, in impure or damp air, and assumes that, although, of course, diffused with the air, it is also distributed and diffused by means of human intercourse." (p. 223).

3*rd*.—He holds that cholera is not contagious in the sense in which we apply the term to the method of operation of other zymotic poisons; and that the theory of spread by contagion is opposed to conclusions drawn from well observed facts which place cholera in a different category—(p. 221). "These characteristics," he says, "suggest the belief, that the propagation of the disease cannot be maintained by any matter emanating from the bodies of the sick."

4*th*.—He attaches to human agency a share in the dissemination of cholera far above what I assign to it. But, be it remarked, Europe has supplied the theory, and yet Baly is compelled to fall back upon India for the data which have been produced in support of it; and the facts which he quotes are, in my estimate, valueless, since they have been misrepresented in their bearings, and are incapable of application to the points which they are supposed to prove. In many cases what are alleged to be facts are simply erroneous allegations, without any claim to the title of scientific or statistical truths. (p. 218).

5*th*.—The theory of the provincial distribution of cholera by a controlling aerial agency, is entirely in accordance with that of this report, although the full development of the idea is

* Baly, p. 50, quoting Snow.

curbed by the preceding consideration of the spread of cholera by human intercourse and by want of specific data, such as we possess in this country :—

"The facts, however, by no means sanction the belief that cholera is always propagated in this way. On the contrary, it is certain that the extension of the disease over large towns, if not over larger areas, may take place independently of communication between the sick and the healthy* * *. In cases where human agency cannot have been the means of diffusing cholera, the agent most likely to have conveyed the poison from one spot to another is the wind." (p. 219).

6*th*.—Cholera is recognised as a material substance, not of a gaseous nature, the area of the distribution of which is marked by the presence of the object cholera. Its relation to a vehicle of moisture, is also hinted at, and the phenomena of increase and decrease consequent on meteorological changes, inferred.

He instances the preference manifested by cholera for low and densely populated districts, especially the tracts of countries about the mouths of rivers, and the ill ventilated parts of towns; and remarks on its appearance at the commencement of an epidemic as a general rule in places in which impure and damp air will be found earliest and in the greatest abundance. (p. 216).

7*th*.—Baly recognises that, beyond all other conceptions of its relations, epidemic cholera presents certain phenomena which are inexplicable. These are such as are dependent on the attributes which I have assigned to cholera in viewing it as an object of natural history :—

"But there occur very remarkable variations in the intensity of the epidemic not referable to temperature, which show that some unknown conditions of atmosphere, though not the cause of cholera, exert a powerful influence over it, either by acting directly on the material cause of the disease, or by affecting other matters in the air, which enable it to exist or increase." (p. 218).

Finally, for want of evidence, Baly leaves open the question of poisoning by emanations from the sick, and of methods of dissemination other than those indicated.

Summary of Conclusions. Constantinople Conference.

The structure of the Constantinople Conference, which professes to stand complete, is a very different edifice from that which Baly constructed as the result of his study. I have spoken of the propositions leaning one on the other; the conclusions also appear to depend for their stability on the support which they derive from each other. In these the dependencies of outbreaks are exalted into the place of the epidemic. The conclusions are as follows :—

1*st*.—"No fact has hitherto been brought forward to prove that cholera is spread abroad by the atmosphere alone, whatever may be its condition."

2*nd*.—"The principle of cholera is regenerated in man, and accompanies him in all his peregrinations; it may thus be spread far and wide, from country to country, by successive regenerations, never reproducing itself spontaneously, except in the human frame."

3*rd*.—"The matter of choleraic dejections is incontestably the principal receptacle of the morbific agent. It follows, therefore, that everything contaminated by such dejections also becomes a receptacle whence the generating principle of cholera is evolved under the influence of favourable conditions. It also follows, that the choleraic germ very probably has its origin in the digestive canal, to the exclusion, perhaps, of every other part of the organism."

4*th*.—"Extension of cholera has always taken place in the direction of the human currents which have set out from a place where it was raging. Cholera has never, in its progress, preferentially taken, as believed by some, a direction from east to west; but on the contrary, it has radiated and radiates in India in every direction, to the south as to the north, to the east as to the west, spreading itself everywhere in consequence of the facility and multiplicity of the communications. Those who think otherwise have not studied the facts, and reason as the Chinese would do, who pretend that cholera invariably proceeds from west to east."

5*th*.—"The study of facts demonstrates that there is no proportion between the amount of cholera imported and the intensity of the epidemic consequent upon it, as a conflagration is not proportionate to the spark that gave rise to it. Man tainted with cholera is the principal propagating agent of the disease, and a single case of cholera may give rise to an epidemic."

Indian authorities have never favoured such views as these. Jameson (1819) sums up thus :—"Without going at large into the argument, it may be stated that the total exemption of the medical officers, notwithstanding their being in constant attendance upon the living, and frequently having to handle the dead, is hardly reconcilable with a belief in infection; and that the unaccountable rise and speedy diffusion of the disease, its rapid increase and equally rapid decline, the narrow bounds of its influence amid great and unrestricted intercourse, its limited duration, and, above all, its sudden and entire cessation, without a single precaution being taken against its further extension, are facts decidedly characteristic, not of contagion, but of pure epidemical influence."

Corbyn (1832) devotes an entire chapter of his work to illustrations tending to establish the non-contagious nature of cholera.

Mackinnon (1848) writes :—"After much thought and reading, I cannot believe that the disease is ever produced by contagion, and by contagion I mean any product of the human organism capable of exciting disease in another by direct contact, or through the medium of the atmosphere * * *. After large experience in this matter, I must express my total disbelief in the contagious nature of cholera, and I believe this to be the present opinion of

the immense majority of the medical service in India * * *. It has been remarked by Annesley, Irving, Mouat, Corbyn, Jameson and a host of others, that the attendants on the sick have not been observed to suffer from the disease more than others similarly exposed to the other influences, and this is entirely accordant with my own experience during twenty-one years."

Scriven (1863) comes to the same conclusion:—"It is scarcely conceivable if contagion were the usual mode of propagation of such a disease as cholera, whose diffusion is so wide and whose ravages are so extensive, that so many men of large experience in India and elsewhere, should not have had convincing evidence of its power of spreading in this way."*

The opinions of these observers as thus recorded, serve to show how little importance has during the past half century been attached to the secondary manifestations of epidemic cholera.

The apparent antagonism of the facts regarding cholera is in most cases to be attributed to the want of intelligent appreciation of their significance, and the less the whole truth is grasped, the stranger appears all that is put down to the inexplicable. If there be any truth in what has here been deduced from facts, there is no room for extreme views, especially for such as have most recently been put forth upon authority. While I have tried to hold the balance fairly between those who insist each on the acknowledgment of his own peculiar doctrines as representative of the whole truth, I have made no compromise tending to the undue exaltation of secondary phenomena. I should have liked further to have illustrated the secondary manifestations of cholera due to its individuality, but the illustrations are to be collected in the future. My experience furnishes none beyond those which I have given, and those incorporated in the Cholera Report of the Sanitary Commissioner for 1867. That it has given me greater satisfaction to frame into a system the isolated facts of outbreaks, and to find for these their place in the reproduction and in the epidemic, I will not deny. But it is the substantial value of such cases that I have chiefly looked to, recognising that they were tangibly part of a whole; and the same feeling of satisfaction is not imparted by the study of the phenomena of any aggregate of the cases which depend on secondary manifestations of the cholera miasm however interesting these may be in themselves.

Conclusion.

In concluding, I wish to repeat the caution which I gave at the commencement of this paper, that, clear as the laws appear to be, and perfect as the parallels seem, the demonstrations from the history of this period are but a small contribution towards the perfection of a system; they are given as the commencement of a study to be pursued in a certain direction, which it will take many years of research to elaborate. I would not have it concluded, when on any occasion in the future the parallels may not have fallen exactly as I have described them to occur during the present period, that the deductions from the facts as I have stated them are incorrect. Parallels do not fall except by the intervention of natural agencies, and it is these agencies which are to be studied as well as the part played before us by the object cholera. I do not insist upon the absolute stability of parallels, but upon the truth, that epidemic cholera shall play its part side by side with natural agencies; and if at any time it may appear that the order of things is broken, I think we shall do well if we mistrust our judgment and try to read the facts over again, under the conviction that it is far more likely that our data are deficient, or our appreciation of them wrong, than that the subordination of the epidemic cholera to natural laws has been removed. We have found the same truth persistent throughout this enquiry, not that the epidemic had a certain geography, a certain course, and a definite date of appearance in virtue of the fact that it was an invading epidemic; but we have found one and all of the manifestations of epidemics to vary precisely as they ought to have varied, to have been deferred and to have been accelerated, to have been repelled and to have been urged forward, to have left certain areas unoccupied and to have occupied others, under the guidance and control of an unerring agency. It is true that we shall for a long time to come recognise truths regarding cholera as an epidemic during or after the occurrence of the events as often as in anticipation of them; but the time may come when the anticipation of events will be the rule and failure to anticipate them the exception. The stability of the standard here attempted rests on the truth of the three assertions, that the cholera provinces are the natural provinces of this Presidency, and will remain so in all time to come; that cholera has a distinct existence as an organised object in subordination to which the phenomena of reproduction, dormancy, and final decay occur; and that the control of vital manifestations and also of epidemic progress is exercised by the meteorological agencies prevailing within geographical areas, which in this Presidency we can clearly recognise and define, but which for countries beyond Hindostan have yet to be framed. It is the special physical geography of Hindostan, the perfection of the regularity with which the seasons come forward year after year, and the normality of the limit of meteorological agencies in every year that causes its surface to become mapped out into natural areas. Limits there are of natural areas within the geographical limits of our Presidency, but its geographical boundaries are not the limits of the spread of aerial influences. The western limit to the province covered when our spring cholera is thrown over Eastern Africa, or the eastern limit of the air-borne cholera progressing beyond our north-eastern frontier, has never yet been defined; and I have shown that Persia is only a halting stage in the first year of their career for the epidemics of

* Report on the Punjab cholera of 1862, p. 30.

our North-Western Provinces traversing the northern epidemic highway leading out of the Bengal Presidency towards the west.

The history of cholera as an epidemic within the endemic area is yet to be written. The immediate channels through which it emanates require still to be traced with care; our knowledge is entirely deficient as to whether one breeding area supplies the pabulum for one geographical distribution of invading cholera and another for another, and as to whether exhaustion follows the throwing off an epidemic swarm in those localities from which we have reason to infer that it has issued. That cholera has a distinct provincial history as an epidemic over and above the fact of its reproduction and decay in each year in relation to the endemic area, is certain. I know of no enquiry of greater importance than that which shall teach us whether absolute prevalence over certain divisions of the endemic area is invariably the prelude to epidemic advance beyond the boundary limits, and whether the materies of an epidemic destined for far invasion is accumulated from the year of the throwing off of the one swarm up to the date of the exit of the swarm succeeding. Minor emanations do probably occur during these intervals, and these, no doubt, contribute to the perpetuation, from year to year, of the cholera which I have shown to exist in the shaded tract lying immediately beyond endemic limits. But the entire series of facts treated of in the first section, teaches, that there is held in reserve over and above the cholera of such casual emanations, a body of material sufficient, after the multiplication of a very few years, to constitute the material of the widest spreading epidemic.

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APPENDIX I.

TABLES SHOWING THE ADMISSIONS AND DEATHS FROM CHOLERA IN THE EUROPEAN AND NATIVE ARMIES DURING THE TWENTY-SEVEN YEARS FROM 1826 TO 1853.

EUROPEAN ARMY, 1826.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 47·13.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	7	...	2	1	15	7	39	28	65	45	7	2	3	1	9	6	4	1	...	...	5	...	2	2	158	93	
Fort William	603	2	...	...	...	1	...	21	14	49	26	7	2	...	1	2	2	2	1	...	...	...	...	...	...	84	46	
Dum-Dum	734	1	1	...	...	2	2	5	3	4	...	2	...	1	...	...	...	...	...	...	...	1	...	...	...	16	6	
Chinsurah Depôt	710	...	...	...	...	...	...	...	...	1	...	21	7	6	4	33	23	3	3	1	...	...	...	1	...	66	37	
Berhampore	1,341	3	...	4	...	6	1	6	1	23	14	5	...	2	...	4	...	4	1	2	1	2	...	1	...	62	18	
Dinapore	940	...	...	...	...	...	...	...	...	32	11	5	1	3	1	3	...	...	...	1	...	...	...	...	...	44	13	
Buxar	76	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	
Ghazeepore	569	...	...	...	...	...	...	...	...	1	...	...	...	3	...	...	...	1	...	1	...	1	...	...	...	7	...	
Benares	92	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	
Chunar	190	...	...	...	...	...	...	12	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12	6	
Allahabad	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cawnpore	1,763	...	...	...	...	1	...	1	1	1	...	2	...	18	7	14	10	1	...	3	2	3	2	1	...	45	22	
Meerut	2,002	...	...	...	...	...	...	...	...	...	...	2	...	2	...	1	...	...	...	...	...	...	...	6	1	11	1	
Agra	651	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Muttra	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Nusseerabad	95	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Saugor	108	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	58	...	...	...	...	...	...	...	...	...	...	...	...	3	1	...	...	1	1	...	...	...	...	...	...	4	2	
Bhurtpore Field Force	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	
Troops on the march	...	...	...	1	...	3	...	66	26	...	...	3	3	...	...	2	2	...	...	1	1	...	...	2	2	78	34	
BENGAL PRESIDENCY ...	10,080	14	2	7	1	28	10	150	79	179	96	54	15	41	15	68	43	16	7	9	4	13	2	13	5	592	279	

NATIVE ARMY, 1826.

Presidency Circle	8,774	2	...	6	1	19	2	33	7	49	16	9	2	7	1	12	8	...	...	1	...	2	...	...	...	140	37	
Barrackpore „		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	3	...	8	4	...	...	17	4	
Berhampore „	5,581	4	1	11	1	14	3	11	2	4	2	6	2	7	2	3	...	1	...	1	...	2	...	1	...	65	13	
Dinapore „	8,333	1	1	4	3	2	1	10	3	14	4	21	9	9	1	6	...	...	...	2	...	3	...	1	...	73	22	
Benares „	8,518	...	...	...	...	4	1	27	18	18	4	9	...	3	...	...	...	1	...	...	...	4	1	4	...	70	24	
Allahabad „	24,151	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cawnpore „		...	...	1	1	5	...	8	4	5	2	13	3	5	2	3	...	2	...	2	1	1	...	1	1	46	14	
Meerut „	27,316	...	...	...	...	...	...	...	...	3	...	...	...	4	1	1	1	...	...	5	...	13	4	9	2	35	8	
Agra „		...	...	...	...	3	...	2	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	
Nusseerabad „	12,596	1	1	...	...	...	...	1	...	1	...	4	2	...	...	...	...	...	...	1	1	...	...	...	...	8	4	
Saugor „	8,976	1	...	...	...	...	...	...	...	2	1	...	...	6	1	2	...	...	1	...	...	...	...	3	1	14	4	
Kurnaul* „	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	...	...	1	1	...	...	...	...	...	...	4	2	
BENGAL PRESIDENCY ...	104,245	9	3	22	6	47	7	92	34	101	29	62	18	44	9	27	9	11	2	15	2	33	9	19	4	475	132	

* Strength included with the Strength of the Meerut and Agra Circles.

Died per cent. of Treated 27·78.

EUROPEAN ARMY, 1827.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																								TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 30·56.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	1	...	...	...	...	...	7	6	149	54	...	1	4	...	7	3	3	3	6	4	5	6	8	3	190	80	
Fort William	901	2	...	3	2	2	1	7	2	14	8	2	1	...	...	...	...	3	1	1	...	6	2	...	1	40	18	
Dum-Dum	918	...	...	2	2	2	...	2	1	21	7	7	...	1	...	2	1	...	...	...	...	2	2	...	...	39	13	
Chinsurah Depôt	378	1	...	1	...	...	...	2	1	75	20	14	4	7	3	8	6	3	1	...	...	7	4	...	...	118	39	
Berhampore	1,738	...	...	...	...	3	2	3	2	1	...	1	...	...	...	2	...	4	...	1	...	3	1	11	...	29	5	
Dinapore	1,211	1	...	3	...	...	...	1	...	6	...	8	1	...	...	...	...	4	...	6	3	1	...	1	1	31	5	
Buxar	81	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	
Ghazeepore	942	2	...	...	...	...	...	2	1	1	...	...	...	1	...	3	...	3	1	2	...	2	...	1	...	17	2	
Benares	87	...	...	...	...	...	...	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	2	1	
Chunar	258	...	...	...	...	3	...	1	...	2	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	10	1	
Allahabad	85	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Cawnpore	1,988	2	1	...	...	...	...	12	1	8	...	6	1	2	...	4	1	3	1	2	1	4	...	1	...	44	6	
Meerut	1,892	1	...	...	...	...	...	...	...	...	...	2	...	7	1	6	2	1	...	4	2	...	...	1	...	22	5	
Agra	1,092	1	1	3	1	2	...	1	...	12	4	22	2	1	1	2	...	3	...	1	...	1	1	...	...	49	10	
Muttra	103	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	2	1	
Nusseerabad	126	...	...	...	...	...	...	...	...	19	4	3	...	...	...	...	...	...	...	...	...	...	...	...	...	22	4	
Saugor	112	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	183	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	
Troops on the march	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	7	...	
BENGAL PRESIDENCY ...	12,095	11	2	12	5	19	3	39	15	309	98	71	11	24	6	35	13	27	7	23	10	31	16	24	5	625	191	

NATIVE ARMY, 1827.

Presidency Circle	1,700	1	...	11	1	6	1	12	...	7	...	8	...	3	...	6	...	1	...	4	1	3	...	6	2	68	5	
Barrackpore ,, ...	15,203	5	...	8	2	21	5	29	5	31	12	15	4	9	2	8	1	4	3	13	2	6	2	4	...	153	38	
Berhampore ,, ...	2,488	1	1	2	...	2	1	1	1	1	...	...	...	2	...	3	1	1	1	6	3	4	...	1	...	24	8	
Dinapore ,, ...	6,594	1	1	1	...	2	...	4	...	5	2	...	...	...	...	2	1	3	2	19	9	26	2	...	...	63	17	
Benares ,, ...	7,434	1	...	1	...	...	...	2	1	1	...	2	1	1	...	13	...	...	...	2	2	...	...	...	...	23	4	
Allahabad ,, ...	8,101	...	...	1	...	...	...	...	...	4	...	...	...	...	...	4	3	6	5	1	1	1	1	1	1	18	11	
Cawnpore ,, ...	16,848	...	...	3	1	...	1	6	...	4	1	4	2	10	3	4	1	6	1	8	5	1	...	...	...	46	15	
Meerut ,, ...	16,185	...	...	...	...	...	...	2	1	17	5	37	13	16	4	39	16	11	3	2	...	2	1	1	...	127	43	
Agra ,, ...	12,938	...	...	1	1	5	...	2	...	36	14	53	8	23	...	27	5	12	2	4	...	1	...	...	...	164	30	
Nusseerabad ,, ...	11,202	...	...	...	...	...	...	8	...	124	23	7	2	...	...	...	...	...	...	5*	3	3	1	...	...	147	29	
Saugor ,, ...	8,077	...	1	1	...	1	1	1	...	8	...	15	6	12	3	5	1	...	...	...	...	...	...	...	...	43	12	
Kurnaul ,, ...	11,460	...	...	...	...	...	...	...	...	...	...	14	3	27	12	12	4	4	1	...	...	...	...	...	...	57	20	
BENGAL PRESIDENCY ...	117,930	9	3	29	5	37	9	67	8	238	57	155	39	103	24	123	33	48	18	64	26	47	7	13	3	933	232	

* At Neemuch.

EUROPEAN ARMY, 1828.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 29·77.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	1	1	3	3	17	15	25	12	12	7	22	9	7	...	1	...	1	...	...	...	...	...	7	3	96	50	
Fort William	925	16	7	...	...	1	1	7	4	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	26	13	
Dum-Dum	1,085	...	...	...	...	...	...	7	3	2	1	6	3	5	3	2	1	1	...	...	...	...	...	1	1	24	12	
Chinsurah Depôt	...	...	...	...	...	7	3	1	...	7	3	3	1	...	...	...	...	...	...	...	...	...	...	...	...	18	7	
Berhampore	1,692	7	...	...	...	135	31	70	12	6	2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	219	45	
Dinapore	1,605	3	...	...	...	...	...	34	11	51	10	14	4	17	3	7	1	4	...	2	...	...	...	...	...	132	29	
Buxar	75	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ghazeepore	968	2	...	...	...	4	1	3	...	19	5	24	10	11	4	5	2	7	1	3	...	3	...	...	...	81	23	
Benares	80	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	3	...	
Chunar	210	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Allahabad	105	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cawnpore	2,192	4	...	3	...	3	1	...	...	1	...	12	3	39	15	30	8	11	3	1	1	1	1	2	1	107	33	
Meerut	1,929	1	...	...	...	...	...	1	...	2	1	6	3	2	...	5	1	...	...	...	...	2	...	...	...	19	5	
Delhi	1,111	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	...	
Agra	96	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Nusseerabad	160	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Saugor	146	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	156	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
BENGAL PRESIDENCY ...	12,535	34	8	6	3	170	52	148	42	101	30	88	33	82	25	52	13	24	4	6	1	6	1	12	5	729	217	

NATIVE ARMY, 1828.

Presidency Circle	2,018	4	1	...	...	10	3	6	1	4	3	7	...	1	...	1	...	2	...	1	...	1	...	1	...	38	8	
Barrackpore „	10,273	3	...	9	1	11	3	25	13	20	9	28	12	12	6	8	...	4	1	1	...	3	1	4	...	128	46	
Berhampore „	6,930	...	...	...	...	2	...	12	6	5	3	3	...	3	...	3	...	1	1	2	...	11	5	9	4	51	19	
Dinapore „	6,478	2	...	...	...	5	1	9	4	9	2	21	11	4	...	2	1	...	...	1	...	2	1	9	...	64	20	
Benares „	7,797	...	...	...	...	2	...	4	...	6	3	1	...	9	3	9	1	...	...	...	...	...	...	...	...	31	7	
Allahabad „	7,832	...	...	1	...	1	...	...	...	7	4	5	1	11	1	26	10	12	2	2	1	...	...	...	...	65	19	
Cawnpore „	16,673	...	...	1	...	3	...	3	1	6	2	5	1	12	4	18	7	4	...	...	...	21	8	1	...	74	23	
Meerut „	15,788	...	...	...	...	3	...	3	1	12	5	19	11	4	1	1	...	2	...	1	...	...	...	1	1	46	19	
Agra „	10,134	2	1	...	...	2	...	10	...	9	2	2	...	5	...	3	...	3	1	...	...	...	...	...	...	36	4	
Nusseerabad „	11,813	...	...	...	...	...	...	...	...	...	...	4	2	...	...	3	3	...	...	...	...	...	...	1	...	8	5	
Saugor „	7,385	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	
Kurnaul „	9,275	1	...	...	...	...	...	1	1	...	...	1	...	2	...	2	...	...	...	...	...	...	...	...	...	7	1	
BENGAL PRESIDENCY ...	112,396	12	2	11	1	39	7	74	27	78	33	96	38	64	15	76	22	28	5	8	1	38	15	26	5	550	171	

Died per cent. of Treated 31·15.

EUROPEAN ARMY, 1829.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 22·89.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died			
Presidency Hospital	...	3	...	2	...	4	2	2	1	12	3	17	3	6	1	1	2	...	...	9	4	4	...	1	1	61	17	
Fort William	896	...	...	...	...	3	1	1	...	4	1	2	...	6	3	8	2	7	2	7	3	6	1	2	1	46	14	
Dum-Dum	1,037	...	...	1	...	1	1	4	...	...	...	...	...	1	1	1	...	2	1	...	...	...	...	...	...	10	3	
Chinsurah Depôt	...	...	...	...	...	1	...	1	...	5	...	17	6	...	...	2	...	...	...	...	...	...	...	1	...	27	6	
Berhampore	1,567	3	1	1	...	153	40	49	18	...	...	1	...	2	1	...	...	...	...	1	...	...	...	...	...	210	60	
Dinapore	1,864	...	...	...	...	71	17	72	9	34	1	30	4	4	1	4	1	2	...	6	2	...	...	...	...	223	35	
Buxar	74	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ghazeepore	948	1	...	...	...	...	...	...	...	9	3	2	3	...	...	1	...	...	...	...	...	...	...	...	...	13	6	
Benares	130	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	2	1	
Chunar	230	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Allahabad	117	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cawnpore	2,206	1	...	...	...	13	...	11	...	6	...	5	3	5	1	4	...	...	...	2	1	2	...	1	...	50	5	
Meerut	1,823	...	...	...	...	...	...	2	...	...	...	1	...	2	1	1	1	...	...	...	...	...	...	...	...	6	2	
Agra	1,032	...	...	...	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	4	...	
Muttra	102	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Nusseerabad	171	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	1	1	
Mhow (10 Months)	179	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	1	...	...	...	...	...	4	...	
Saugor	82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	293	...	...	...	...	...	..	...	...	3	1	...	...	...	...	2	...	...	...	...	...	...	...	...	...	5	1	
Troops on the march	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	
BENGAL PRESIDENCY ...	12,751	8	1	4	...	247	61	143	28	73	9	78	20	28	9	27	7	11	3	26	10	14	2	5	2	664	152	

NATIVE ARMY, 1829.

Presidency Circle	...	...	...	...	...	...	...	2	...	2	1	2	...	4	...	3	1	1	...	...	...	1	...	3	...	18	2	
Barrackpore ,, ...	...	4	3	1	...	1	...	2	...	1	..	2	...	10	2	3	...	2	...	1	...	5	...	2	...	34	5	
Berhampore ,, ...	...	3	...	2	...	34	16	14	4	4	1	3	2	3	...	7	3	4	...	7	1	1	...	9	5	91	32	
Dinapore ,, ...	...	...	...	1	...	42	1	2	...	4	1	2	1	1	1	1	1	1	...	5	1	2	...	1	...	62	6	
Benares ,, ...	...	...	...	...	...	...	...	1	...	2	2	2	1	1	...	4	...	...	1	...	...	...	...	1	1	11	5	
Allahabad ,, ...	...	1	...	...	...	...	...	2	...	...	...	1	...	1	...	5	1	...	...	1	...	1	...	...	...	12	1	
Cawnpore ,, ...	...	2	1	...	...	6	...	5	...	4	...	1	...	3	1	4	...	...	...	...	...	...	...	1	1	26	3	
Meerut ,, ...	...	2	...	...	...	2	...	3	1	1	...	3	1	1	...	1	...	1	1	...	...	...	...	1	...	15	3	
Agra ,, ...	...	2	1	...	...	1	...	2	1	1	...	2	...	1	...	2	...	...	...	...	...	1	1	...	...	12	3	
Nusseerabad ,, ...	...	...	...	...	...	3	...	2	...	3	1	4	...	7	...	2	...	3	...	2	...	...	...	2	...	28	1	
Saugor ,, ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	1	...	...	...	...	3	1	
Kurnaul ,, ...	...	...	...	...	...	2	...	...	...	...	...	1	...	...	...	2	...	1	...	1	...	2	1	1	...	10	1	
BENGAL PRESIDENCY ...	...	15	5	4	...	91	17	35	6	22	6	23	5	32	4	35	6	13	2	18	3	13	2	21	7	322	63	

Died per cent. of Treated 19·56.

EUROPEAN ARMY, 1830.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																								TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 26·13.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	1	...	...	...	2	...	2	1	9	5	16	6	5	...	2	...	...	...	21	10	23	17	4	2	85	41	
Fort William	1,068	1	...	9	1	2	...	5	...	6	1	3	1	1	...	1	...	1	...	4	2	14	4	10	2	57	11	
Dum-Dum	720	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	8	...	
Chinsurah	378	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	6	5	13	4	...	...	20	9	
Berhampore	1,227	...	...	...	...	2	...	5	1	...	...	1	...	1	...	1	...	2	...	1	...	2	1	12	3	27	5	
Dinapore	1,737	...	...	1	...	2	...	5	...	1	...	...	...	2	...	1	...	...	...	1	...	...	...	2	...	15	...	
Benares	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ghazeepore	902	...	...	...	...	1	...	6	2	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	9	2	
Chunar	211	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Buxar	68	...	...	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	
Cawnpore	2,031	...	...	1	...	2	...	3	...	3	...	6	1	4	...	4	1	...	...	3	1	...	...	...	...	26	3	
Allahabad	145	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	1,940	...	...	...	...	5	1	3	1	1	...	...	...	1	...	12	2	3	...	...	...	...	...	3	...	28	4	
Agra	1,366	...	...	...	...	1	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	4	...	
Saugor	89	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Mhow	193	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Nusseerabad	90	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	284	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Troops on the march	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
BENGAL PRESIDENCY ...	12,547	9	...	11	1	25	1	30	5	20	6	28	8	15	...	22	3	6	...	37	18	53	26	31	7	287	75	

NATIVE ARMY, 1830.

Presidency Circle	1,526	1	1	2	...	2	...	4	...	4	...	3	...	4	...	4	...	3	...	2	...	6	2	2	...	37	3	
Barrackpore „	1,446	1	...	4	...	2	...	5	1	3	...	3	...	3	1	2	...	4	...	3	1	3	2	5	1	38	6	
Berhampore „	5,865	2	...	1	...	...	...	4	...	5	1	2	...	1	1	4	...	1	...	3	2	5	4	2	1	30	9	
Dinapore „	4,626	3	...	...	...	3	...	1	1	1	...	...	...	1	...	1	...	1	...	1	1	...	...	1	...	13	2	
Benares „	5,176	...	...	3	...	1	...	4	...	1	...	...	...	...	...	2	1	...	...	...	...	...	...	1	1	12	2	
Cawnpore „	13,708	...	...	...	...	1	...	2	...	1	...	4	1	1	...	...	...	5	...	...	...	...	...	1	...	15	1	
Allahabad „	6,656	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	...	...	...	...	2	2	
Meerut „	12,868	...	...	...	...	6	2	3	...	3	...	1	...	1	...	2	1	3	2	...	...	2	...	...	...	21	5	
Agra „	6,972	...	...	...	...	1	...	2	2	4	1	...	...	2	...	...	...	1	...	1	...	2	...	...	...	13	3	
Saugor „	6,673	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...	3	...	
Neemuch „	14,489	...	...	1	...	4	2	1	...	6	...	3	1	4	1	5	2	16	4	1	1	2	1	1	...	44	12	
Kurnaul „	8,079	...	...	...	...	3	1	4	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	9	1	
BENGAL PRESIDENCY ...	88,084	7	1	11	...	23	5	30	4	28	2	16	2	18	3	21	4	36	7	12	6	21	9	14	3	237	46	

Died per cent. of Treated 19·41.

EUROPEAN ARMY, 1831.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 23·50.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died			
Fort William	843	3	...	...	...	2	1	3	1	4	1	1	1	1	...	...	...	1	...	1	...	...	...	1	...	17	4	
Presidency General Hospital ...	...	4	4	...	...	2		...	...	1	1	...	...	2	2	1	1	...	...	5	4	2	...	5	3	22	15	
Dum-Dum	780	1	...	1	...	1	1	...	...	...	...	1	...	1	...	...	...	1	...	1	...	...	...	2	...	9	1	
Chinsurah	1,108	...	...	...	...	1	...	2	1	4	4	2	...	...	...	...	...	...	...	1	...	...	...	...	...	10	5	
Berhampore	790	...	...	...	...	3	2	...	...	4	2	...	...	1	...	1	...	...	...	2	2	...	...	...	...	11	6	
Cherrapoonjee	37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Dinapore	914	...	...	...	...	...	...	...	...	67	9	...	...	2	...	...	...	1	1	1	...	...	...	...	...	71	10	
Ghazeepore	1,013	...	..	1	...	1	1	...	...	16	3	...	...	24	12	9	4	...	...	...	...	1	...	...	...	52	20	
Benares	126	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	...	1	...	...	...	3	1	
Chunar	229	...	...	...	...	...	...	...	...	1	1	...	...	...	...	2	...	...	...	...	...	...	...	...	...	3	1	
Buxar	58	...	...	...	...	...	...	...	...	4	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	3	
Cawnpore	2,039	...	...	...	...	4	...	2	...	11	1	11	1	1	...	1	...	1	...	...	...	...	...	...	...	31	2	
Allahabad	112	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Landour	186	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	1,889	...	...	...	...	...	...	...	...	...	...	3	1	3	...	2	...	1	...	1	...	2	...	...	...	12	1	
Muttra	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Agra	1,298	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	6	4	3	1	1	...	11	6	
Saugor	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	2	...	
Kurnaul	1,302	...	...	...	...	...	...	5	...	2	...	7	...	2	...	2	...	2	...	...	...	...	...	...	...	20	...	
Mhow	196	...	...	...	...	...	...	...	...	1	1	...	...	55	9	8	1	1	...	...	...	...	...	...	...	65	11	
Nusseerabad	112	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Troops on the march	...	...	...	...	...	7	...	11	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	23	...	
BENGAL PRESIDENCY ...	13,236	8	4	2	...	21	5	23	2	120	26	26	4	92	23	26	6	9	2	20	10	10	1	9	3	366	86	

NATIVE ARMY, 1831.

Presidency Circle	1,165	..	...	2	...	...	...	2	...	2	...	3	...	6	1	4	1	5	1	5	...	1	...	5	3	35	6	
Barrackpore ,, ...	8,159	2	...	1	1	10	8	7	1	6	2	3	...	1	...	1	...	4	...	3	...	2	1	10	5	50	18	
Berhampore ,, ...	4,914	3	1	...	...	3	...	5	...	2	...	2	...	...	...	...	...	1	...	4	...	...	...	1	...	21	1	
Dinapore ,, ...	4,160	...	...	...	...	1	...	...	...	9	3	5	2	8	2	3	...	6	2	1	1	4	1	...	...	37	11	
Benares ,, ...	4,965	...	...	...	...	1	...	1	...	...	...	5	1	4	1	5	3	1	...	1	...	...	...	...	...	18	5	
Cawnpore ,, ...	11,465	2	...	...	...	2	...	2	...	4	1	2	...	3	...	1	...	1	...	1	...	2	...	...	...	20	1	
Allahabad ,, ...	4,969	...	...	...	...	3	...	...	...	...	...	...	...	1	...	3	...	2	...	...	...	...	...	...	...	9	...	
Meerut ,, ...	10,914	3	1	...	...	1	...	6	1	4	2	...	...	2	1	...	...	2	...	...	...	...	...	...	...	18	5	
Agra ,, ...	6,081	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	4	2	4	2	...	...	11	4	
Saugor ,, ...	6,503	...	...	...	...	...	...	...	...	...	...	7	*7	1	...	1	...	...	...	1	...	...	...	...	...	10	7	
Kurnaul ,, ...	8,715	...	...	...	...	...	...	2	...	1	...	2	...	1	1	...	...	...	...	2	...	...	...	...	...	8	1	
Nusscerabad ,, ...	14,215	...	...	...	...	2	1	1	...	...	...	5	3	25	9	5	2	...	...	2	...	2·	...	4	1	46	16	
BENGAL PRESIDENCY ...	86,225	11	2	4	1	23	9	26	2	28	8	34	13	53	15	23	6	22	3	24	3	15	4	20	9	283	75	

* These deaths occurred in out-posts at Hoshungabad.

Died per cent. of Treated 26·50.

EUROPEAN ARMY, 1832.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 21·12.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Fort William	776	...	...	1	...	...	...	4	...	2	1	...	...	1	...	1	...	7	1	...	...	1	...	2	...	19	2	
Presidency General Hospital ...	...	3	2	1	1	1	2	...	...	2	1	1	1	1	1	3	...	...	...	...	...	...	...	4	1	16	9	
Dum-Dum...	733	...	...	...	...	...	...	1	...	1	1	2	1	1	1	...	...	1	...	1	1	5	3	2	1	14	8	
Chinsurah	585	...	...	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	3	2	
Berhampore	730	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	6	1	1	...	7	3	15	4	
Cherrapoonjee	36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Dinapore	1,163	...	...	...	...	3	...	4	...	4	...	1	...	1	1	...	...	...	...	...	...	...	...	...	...	13	1	
Ghazeepore	966	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	2	1	
Benares	95	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Chunar	194	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	2	1	
Buxar	60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cawnpore	1,945	1	...	1	...	1	...	4	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	10	...	
Allahabad	169	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Landour	142	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	1,711	...	...	...	...	...	...	...	...	...	...	1	...	22	1	1	...	...	...	...	...	...	...	...	...	24	1	
Muttra	107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Agra	968	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Saugor	85	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	
Kurnaul	1,178	...	...	...	...	1	...	5	...	3	1	2	...	4	...	8	...	8	2	...	...	1	...	1	...	33	3	
Mhow	179	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Nusseerabad	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	2	...	...	...	...	...	...	...	...	5	2	
BENGAL PRESIDENCY ...	11,931	5	2	3	1	8	2	19	...	15	5	12	3	32	4	18	2	16	3	8	3	9	4	16	5	161	34	

NATIVE ARMY, 1832.

Presidency Circle	1,109	3	...	1	...	4	1	3	1	2	...	1	...	1	...	6	1	4	1	4	1	1	...	...	...	30	5	
Barrackpore „	7,695	1	1	1	...	6	1	5	1	6	...	5	...	3	...	5	3	8	2	1	...	8	1	22	12	71	21	
Berhampore „	4,263	5	3	...	...	1	...	...	...	...	...	...	...	3	1	...	...	1	...	1	...	2	...	4	2	17	6	
Dinapore „	3,457	2	2	...	...	2	...	2	...	2	...	2	...	...	...	1	...	1	...	...	...	...	...	1	...	13	2	
Benares „	4,517	...	...	...	...	...	...	1	...	5	...	2	...	...	...	...	...	...	...	1	1	...	...	...	...	9	1	
Cawnpore „	10,768	2	...	1	...	2	1	8	2	3	1	...	...	...	...	...	...	2	...	2	...	1	1	...	...	21	5	
Allahabad „	4,615	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	2	1	
Meerut „	11,132	...	...	1	...	2	2	5	1	7	...	2	...	3	...	4	...	...	...	1	...	2	...	...	...	27	3	
Agra „	6,059	...	...	...	...	...	...	1	1	3	1	2	...	...	...	1	...	...	...	1	...	...	...	1	...	9	2	
Saugor „	6,538	1	...	1	...	3	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	...	8	1	
Kurnaul „	8,023	...	...	1	...	1	...	6	...	3	...	2	...	...	...	3	1	1	...	...	...	2	...	...	...	19	1	
Nusseerabad „	14,251	5	...	...	...	3	...	3	1	...	...	1	...	10	...	11	3	2	...	...	...	3	...	1	...	39	4	
BENGAL PRESIDENCY ...	82,427	19	6	6	...	24	5	35	7	32	2	17	...	20	1	33	10	19	3	11	2	19	2	30	14	265	52	

Died per cent. of Treated 19·62.

EUROPEAN ARMY, 1833.

STATIONS.	STRENGTH	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 31·96
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	...	1	...	...	...	...	4	4	2	1	8	4	1	1	3	2	...	...	2	2	3	...	1	...	24	15	
Fort William	685	1	...	3	2	2	...	1	...	2	...	...	...	1	1	1	...	...	...	1	...	7	2	1	...	20	5	
Dum-Dum...	770	...	...	...	...	4	2	...	...	...	...	1	...	2	..	3	...	...	...	...	...	2	1	...	...	12	3	
Chinsurah	550	...	...	...	...	5	1	...	...	2	1	3	1	3	3	...	...	...	...	...	...	2	1	2	...	17	7	
Berhampore	840	2	...	2	...	1	1	6	1	4	...	1	...	14	...	4	...	3	...	1	...	1	...	...	...	39	2	
Dinapore	957	...	...	...	...	...	...	2	...	8	2	7	3	2	...	...	...	1	...	...	...	...	...	...	...	20	5	
Buxar	61	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ghazeepore	908	...	...	...	...	...	...	...	...	...	...	1	...	22	10	3	2	...	...	...	...	6	4	...	...	32	16	
Benares	140	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	
Chunar	175	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	2	1	
Cawnpore	1,842	1	...	2	...	...	...	...	...	3	...	1	1	8	1	91	35	179	63	1	1	1	...	...	...	287	101	
Allahabad	94	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	...	
Meerut	1,848	...	...	...	...	...	...	10	1	1	...	...	...	...	...	3	...	1	...	8	1	...	...	2	...	25	2	
Landour	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	2	1	
Muttra	95	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	1	...	1	...	...	...	...	...	3	1	
Agra	938	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	
Saugor	87	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Nusseerabad	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Mhow	239	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	...	...	...	1	...	2	1	5	2	
Kurnaul	1,170	...	...	...	...	...	...	3	...	1	...	1	...	2	1	4	...	2	1	...	...	2	...	2	...	17	2	
BENGAL PRESIDENCY ...	11,612	4	1	8	2	12	4	27	6	24	5	24	10	56	17	114	40	191	64	15	5	25	8	10	1	510	163	

NATIVE ARMY, 1833.

Presidency Circle	1,324	...	...	1	...	...	...	4	1	1	...	11	3	5	...	1	...	2	...	1	...	2	1	1	1	29	6	
Barrackpore ,, ...	9,521	2	1	1	...	5	3	4	2	...	...	1	...	1	...	4	1	...	...	...	...	...	...	...	...	18	7	
Berhampore ,, ...	4,681	...	...	...	...	3	1	2	...	1	...	...	...	8	1	...	1	...	...	4	...	2	1	2	...	22	4	
Dinapore ,, ...	3,927	3	...	...	...	1	...	3	1	2	1	4	...	2	...	2	1	3	1	...	...	3	...	1	...	24	4	
Benares ,, ...	4,004	...	...	...	...	...	...	...	...	1	1	4	2	3	...	2	1	...	...	...	...	...	...	...	...	10	4	
Cawnpore ,, ...	11,490	...	...	2	...	2	...	8	2	3	...	4	2	2	1	48	11	27	11	11	3	1	...	...	1	108	31	
Allahabad ,, ...	4,802	...	...	...	...	1	...	1	...	...	...	2	2	...	...	14	9	5	1	...	...	...	...	...	...	23	12	
Meerut ,, ...	12,931	...	...	2	...	...	...	9	...	1	...	3	...	...	...	4	...	5	1	...	...	1	...	...	...	25	1	
Agra ,, ...	5,352	...	...	...	...	1	...	...	...	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	4	...	
Saugor ,, ...	5,568	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	2	2	2	...	6	2	
Nusseerabad ,, ...	11,575	...	...	...	...	2	...	3	1	4	1	3	...	2	...	...	...	3	1	7	1	6	3	...	...	30	7	
Kurnaul ,, ...	6,285	...	...	...	...	4	2	...	...	1	...	1	...	2	...	1	...	...	...	...	...	1	...	...	...	10	2	
BENGAL PRESIDENCY ...	81,460	5	1	6	...	19	6	34	7	15	3	34	9	25	2	78	24	46	15	23	4	18	7	6	2	309	80	

Died per cent. of Treated 25·90.

EUROPEAN ARMY, 1834.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 32·31.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	...	...	...	...	10	4	3	3	11	5	7	3	1	...	...	...	...	...	1	...	1	...	...	...	34	15	
Fort William	602	1	1	...	...	3	1	2	...	...	...	2	...	1	...	...	...	...	...	...	...	1	1	...	...	10	3	
Dum-Dum	593	1	...	...	...	...	...	2	...	2	2	2	...	...	...	...	...	...	...	6	3	1	...	2	...	16	5	
Chinsurah...	767	...	...	...	...	2	1	6	...	3	1	2	2	1	...	1	...	...	...	2	2	3	...	8	1	28	7	
Berhampore	836	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Cherra Depôt	99	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Dinapore...	811	...	...	...	...	2	1	...	...	1	...	...	...	7	5	3	...	...	...	...	...	2	...	...	...	15	6	
Benares	101	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	...	
Ghazeepore	641	...	...	1	...	3	...	6	...	5	2	7	3	...	...	...	...	...	...	...	...	...	...	1	...	23	5	
Chunar	180	...	...	...	...	...	...	3	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3	
Buxar	38	...	...	...	...	...	...	2	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	
Cawnpore	1,885	...	...	...	...	1	1	...	...	2	1	1	...	2	...	3	3	2	2	2	1	...	...	...	...	13	8	
Landour Depôt	178	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	1,779	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	...	...	9	1	...	...	...	...	12	2	
Muttra	96	...	...	1	1	1	...	...	...	...	...	1	...	1	...	23	8	1	...	...	...	...	...	...	...	28	9	
Agra	913	...	...	...	...	...	...	1	...	...	...	...	...	...	...	4	1	4	2	...	...	...	...	...	...	9	3	
Saugor	91	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Mhow	188	...	...	...	...	...	...	...	...	4	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	7	2	
Nusseerabad	101	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	1,163	1	...	...	...	...	...	7	...	2	2	2	2	...	...	6	...	3	...	...	...	1	...	1	...	23	4	
Troops on the march	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	
BENGAL PRESIDENCY ...	11,062	4	1	2	1	22	8	33	6	32	16	25	11	14	5	44	13	10	4	21	7	9	1	13	1	229	74	

NATIVE ARMY, 1834.

Presidency Circle	1,216	3	...	3	1	2	...	5	...	4	2	6	1	3	...	3	...	...	...	2	...	1	1	1	...	33	5	
Barrackpore „	7,251	1	...	1	1	7	1	8	4	4	1	15	7	...	...	2	...	...	...	3	1	5	4	7	4	53	23	
Berhampore „	4,723	...	...	4	1	6	3	3	1	4	...	4	1	9	5	5	1	1	...	2	1	1	...	...	...	39	13	
Dinapore „	3,806	1	...	2	...	3	...	1	1	1	...	1	...	6	2	3	...	10	5	...	1	5	4	...	...	33	13	
Benares „	4,546	...	...	...	...	4	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	2	
Cawnpore „	10,675	...	...	...	...	3	...	4	1	5	1	5	2	9	3	2	1	2	...	3	2	...	...	2	...	35	10	
Allahabad „	4,665	...	...	...	...	...	...	...	...	4	2	5	3	...	1	...	...	...	...	...	...	...	...	...	...	9	6	
Meerut „	13,486	1	...	1	...	...	...	1	...	1	1	...	...	4	...	1	...	4	...	4	1	2	...	2	3	21	5	
Agra „	4,966	...	...	...	...	...	...	...	...	...	...	...	...	5	2	12	5	4	1	...	...	2	1	...	...	23	9	
Saugor „	5,672	...	...	...	...	1	1	4	2	25	11	5	...	1	...	...	...	...	...	2	1	...	...	1	...	39	15	
Neemuch „	10,872	37	...	...	...	3	...	3	1	16	8	7	...	9	5	11	3	3	1	6	1	3	1	7	1	105	21	
Kurnaul „	5,441	...	...	...	...	1	...	1	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	5	...	
BENGAL PRESIDENCY ...	77,319	43	...	11	3	30	7	30	10	66	26	49	14	46	18	40	10	24	7	22	8	19	11	20	8	400	122	

Died per cent. of Treated 30·50.

EUROPEAN ARMY, 1835.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 26·04.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	...	...	...	...	...	...	3	1	3	2	...	1	2	...	...	...	2	1	5	3	14	8	6	2	35	18	
Fort William	738	2	...	...	...	2	...	...	...	5	...	3	...	...	...	3	...	...	...	...	...	...	...	...	...	15	...	
Dum-Dum	742	1	...	...	...	...	...	2	...	2	...	2	...	...	...	1	...	...	...	1	...	...	...	...	...	9	...	
Chinsurah	833	...	...	...	...	1	1	...	...	1	...	1	...	2	...	1	...	1	...	3	2	1	1	...	...	11	4	
Berhampore (for 2 months) * ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Hazareebaugh	597	...	...	...	...	...	...	1	...	21	7	11	3	1	...	...	...	1	...	...	...	...	...	1	...	36	10	
Dinapore	1,029	...	...	1	...	2	...	8	4	1	...	3	...	1	...	...	...	...	...	...	...	...	...	...	...	16	4	
Ghazeepore	650	1	1	...	...	1	...	3	1	1	...	1	...	1	...	...	...	3	...	2	...	...	...	...	...	13	2	
Benares	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3	1	1	...	...	1	1	...	...	5	5	
Chunar	179	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Buxar	38	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	
Cawnpore	1,905	...	...	...	...	...	...	...	...	1	...	...	...	3	...	2	...	...	...	...	...	...	...	...	...	6	...	
Landour	164	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	1,755	...	...	1	...	...	...	14	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	3	
Muttra	99	...	...	...	...	...	..	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Agra	983	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Saugor	96	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	
Mhow	205	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	1	...	...	...	...	3	1	
Nusseerabad	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	1,178	...	...	3	...	2	...	5	...	3	...	1	...	6	1	3	...	...	...	...	...	...	...	...	...	23	1	
BENGAL PRESIDENCY ...	11,410	5	1	6	...	8	1	37	8	38	10	23	5	18	1	13	3	8	2	12	6	17	11	7	2	192	50	

* The Cantonment of Berhampore was abandoned on 1st March 1835, and Hazareebaugh was occupied.

NATIVE ARMY, 1835.

Presidency Circle	1,412	1	...	...	...	...	...	2	...	6	1	5	...	2	...	...	...	1	...	...	...	3	...	5	1	25	2	
Barrackpore „	12,604	...	...	...	...	1	1	4	1	3	...	7	3	1	...	8	3	4	...	2	1	9	...	7	1	46	10	
Berhampore „ (2 months) ...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Dinapore „	3,034	...	...	...	...	...	...	4	1	2	...	1	...	8	1	4	2	2	2	1	...	1	...	...	...	23	6	
Benares „	4,978	14	9	5	...	...	1	...	...	3	3	2	...	...	...	4	1	3	2	...	...	...	...	...	...	31	16	
Cawnpore „	14,099	1	...	...	...	2	...	5	...	10	2	3	...	4	2	2	...	3	1	6	1	2	1	...	...	38	7	
Meerut „	13,662	...	...	1	...	1	...	3	1	1	...	3	2	...	...	...	...	1	...	...	...	2	1	...	...	12	4	
Agra „	3,840	...	...	3	...	...	...	2	...	3	...	6	...	1	...	3	...	...	...	1	...	...	...	...	...	19	...	
Saugor „	6,970	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	5	...	
Neemuch „	11,023	1	...	...	...	2	...	5	...	1	1	2	...	11	1	5	...	1	...	1	1	1	...	1	...	31	3	
Kurnaul „	6,576	1	...	1	...	...	...	...	...	2	...	...	...	...	...	1	...	...	...	...	...	...	...	1	1	6	1	
Troops on the march	...	18	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	12	
BENGAL PRESIDENCY ...	78,198	36	21	11	...	7	2	25	3	33	7	29	5	27	4	27	6	16	5	11	3	19	2	14	3	255	61	

Died per cent. of Treated 23·92.

EUROPEAN ARMY, 1836.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																								TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 16·17.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	...	...	...	...	2	2	1	1	2	1	3	1	...	...	3	...	...	...	...	...	2	1	6	1	19	7	
Fort William	732	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	5	...	7	...	
Dum-Dum	778	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	
Chinsurah	738	2	...	...	...	6	1	4	...	2	2	5	4	...	...	2	1	...	...	...	...	...	...	...	...	21	8	
Dinapore	972	...	...	...	...	9	...	9	...	4	...	1	...	3	...	4	2	4	1	2	...	4	1	1	...	41	4	
Hazarcebaugh	786	...	...	...	...	...	...	1	...	2	...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	9	...	
Benares	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	
Ghazeepore...	623	...	...	1	...	1	...	1	...	3	1	113	21	14	3	...	...	2	1	1	...	...	...	...	...	136	26	
Chunar	253	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Buxar	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cawnpore	2,059	...	...	...	...	2	...	...	...	7	...	6	...	6	...	12	1	7	1	1	...	1	...	3	...	45	2	
Landour Depôt	141	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Meerut	1,815	1	...	...	...	...	...	3	...	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	1	
Muttra	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	2	1	
Agra	989	...	...	...	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	4	...	
Saugor	105	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	
Nusseerabad	89	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Mhow	206	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	1,078	...	...	...	...	...	...	...	...	2	...	1	...	2	...	2	...	...	...	...	...	...	...	...	...	7	...	
Troops on the march	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
BENGAL PRESIDENCY ...	11,598	3	...	1	...	22	3	22	1	25	5	132	26	28	3	24	4	14	3	8	...	9	3	15	1	303	49	

NATIVE ARMY, 1836.

Presidency Circle	1,330	2	1	2	1	2	...	2	...	3	1	1	...	6	2	4	...	5	...	3	...	1	...	2	...	33	5	
Barrackpore „	12,492	3	2	3	1	3	1	8	3	8	1	4	2	4	1	5	...	2	...	1	1	9	4	1	...	51	16	
Dinapore „	3,169	...	...	...	...	2	...	3	1	1	1	1	...	1	...	6	4	6	1	..	...	2	1	2	2	24	10	
Benares „	3,930	1	...	...	...	1	...	1	...	...	...	2	1	...	...	...	...	2	1	1	1	1	1	1	1	10	5	
Cawnpore „	14,157	...	...	2	...	4	...	5	...	2	1	2	...	...	...	3	1	1	...	2	...	...	...	3	1	24	3	
Meerut „	13,568	2	...	...	...	3	2	5	2	6	2	5	...	7	2	4	...	1	1	...	...	1	...	...	...	34	9	
Agra „	4,424	1	...	...	...	...	...	3	...	4	...	1	...	...	...	1	...	2	...	1	...	...	...	1	...	14	...	
Saugor „	7,089	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	3	...	
Neemuch „	11,821	2	1	...	...	1	...	3	...	1	...	1	...	...	...	1	...	2	2	...	...	...	...	1	...	12	3	
Kurnaul „	6,344	...	...	...	...	...	...	2	...	2	...	...	...	3	...	4	1	1	...	...	...	...	...	1	1	13	2	
BENGAL PRESIDENCY ...	78,324	12	4	7	2	16	3	32	6	28	6	17	3	21	5	28	6	23	5	8	2	14	6	12	5	218	53	

EUROPEAN ARMY, 1837.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																								TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 33·42.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	1	...	...	...	...	...	...	...	...	...	4	2	1	1	1	1	...	...	...	...	...	...	...	...	7	4	
Fort William	663	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	3	...	2	1	...	...	...	...	7	1	
Dum-Dum	1,099	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Chinsurah	734	...	...	...	...	...	...	1	1	3	1	...	...	2	...	2	2	...	...	...	...	...	...	...	...	8	4	
Hazareebaugh	807	...	...	...	...	43	10	31	14	2	2	...	...	1	...	2	1	...	...	1	...	...	...	...	...	80	27	
Dinapore	934	...	...	3	...	3	...	47	10	4	1	4	1	1	...	2	1	3	1	...	...	2	...	1	...	70	14	
Buxar	30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ghazeepore	710	...	...	...	...	8	3	34	14	3	1	3	1	...	...	1	1	1	...	...	...	...	...	...	...	50	20	
Benares	97	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	2	1	
Chunar	179	...	...	...	...	12	7	8	4	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	21	12	
Cawnpore	2,049	..	...	...	...	1	...	...	...	2	...	4	3	10	5	79	23	1	...	3	1	2	...	...	...	102	32	
Meerut	1,758	1	...	...	...	...	...	1	...	3	1	1	...	1	...	2	...	2	...	...	...	1	...	...	...	12	1	
Landour	164	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Muttra	97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Agra	1,041	...	...	...	...	...	...	1	...	...	...	...	...	..	...	...	...	4	3	9	6	2	1	...	...	16	10	
Saugor	91	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	1	...	...	...	...	...	3	2	
Nusseerabad	98	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Mhow	204	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	
Kurnaul	1,085	...	...	...	...	1	...	...	...	2	...	...	...	...	...	4	...	8	4	...	...	...	...	...	...	15	4	
Troops on the march	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
BENGAL PRESIDENCY ...	11,840	4	1	3	...	68	20	123	43	19	6	17	7	16	6	96	31	23	9	17	8	7	1	2	...	395	132	

NATIVE ARMY, 1837.

Presidency Circle	1,270	3	1	1	..	2	...	2	...	3	...	...	...	...	...	1	...	2	...	3	1	2	...	1	...	20	2	
Barrackpore „	12,931	...	...	1	...	5	1	11	3	5	1	13	7	13	3	2	...	7	1	1	1	4	2	5	...	67	19	
Dinapore „	3,189	...	...	...	...	...	...	27	10	7	2	9	2	5	1	17	7	5	1	3	...	1	...	...	...	74	23	
Benares „	3,574	...	...	...	..	1	1	18	7	3	...	1	1	3	1	5	2	1	...	7	7	2	2	...	...	41	21	
Cawnpore „	14,175	...	...	1	...	18	4	7	2	10	5	24	9	37	12	16	5	13	3	6	3	1	...	19	2	152	45	
Meerut „	13,847	...	...	...	...	...	...	3	1	5	4	5	...	5	...	3	...	3	2	1	...	4	...	1	...	30	7	
Agra „	4,297	...	...	...	...	1	...	...	...	1	...	1	...	4	...	1	...	2	...	7	2	3	...	...	...	20	2	
Saugor „	7,291	...	...	...	...	1	1	1	...	...	...	2	1	23	3	32	7	3	1	3	...	1	...	...	...	66	13	
Nusseerabad „	10,857	...	...	...	...	1	1	1	...	...	...	...	...	1	...	3	2	...	...	...	...	57	21	4	...	67	24	
Kurnaul „	6,929	...	...	...	...	2	...	...	...	...	...	2	...	1	...	1	...	...	...	1	...	...	...	...	...	7	...	
BENGAL PRESIDENCY ...	78,360	3	1	3	...	31	8	70	23	34	12	57	20	92	20	81	23	36	8	32	14	75	25	30	2	544	156	

Died per cent. of Treated 28·68.

EUROPEAN ARMY, .31 8

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																								TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 27·70.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died	Ad.	Died.			
Presidency General Hospital ...	...	...	...	...	...	6	3	3	1	2	...	...	...	...	...	...	...	1	1	...	...	...	...	2	2	14	7	
Fort William	623	...	...	...	...	20	3	57	5	18	...	3	...	10	...	10	...	4	...	2	...	1	...	1	...	126	8	
Dum-Dum... ...	903	...	...	...	...	2	...	7	1	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	12	1	
Chinsurah	717	...	...	...	...	2	2	5	3	9	4	2	...	1	1	...	...	5	2	3	...	...	...	...	...	27	12	
Hazareebaugh ...	779	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	
Dinapore	845	...	...	...	...	4	1	2	...	4	1	2	1	6	1	2	...	...	...	...	...	...	...	...	...	20	4	
Ghazeepore	618	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...	1	...	1	...	3	...	8	...	
Benares	90	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Chunar	184	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	
Buxar	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cawnpore	1,890	1	...	...	...	9	1	13	4	10	4	32	13	38	9	25	6	7	2	3	1	3	1	4	1	145	42	
Landour Depôt	170	...	...	...	...	...	...	1	...	...	...	...	...	2	...	3	2	...	...	...	...	...	...	...	...	6	2	
Meerut	1,751	...	...	...	...	...	...	...	...	...	...	2	1	20	9	10	4	2	1	...	...	...	...	...	...	34	15	
Muttra	112	...	...	...	...	...	...	15	4	...	...	...	...	...	...	1	1	...	...	...	...	1	...	...	...	17	5	
Agra	925	...	...	...	...	4	2	2	1	3	2	...	...	2	1	...	...	...	...	...	...	...	...	...	...	11	6	
Saugor	90	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Mhow	212	...	...	...	...	1	...	1	...	10	5	2	1	1	1	...	...	...	...	...	...	...	...	...	...	15	7	
Nusseerabad	104	.	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	
Kurnaul	1,062	...	...	...	...	1	...	...	...	1	...	...	...	30	14	49	17	3	1	2	1	...	...	1	1	87	34	
Troops on the march	...	1	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10*	3	...	...	13	4	
Afghanistan Field Force ...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
BENGAL PRESIDENCY ...	11,107	2	...	...	...	51	13	106	19	61	17	43	16	112	37	101	30	24	7	11	2	16	4	11	4	538	149	

* These admissions and deaths occurred in Her Majesty's 16th Lancers in camp at Delhi, while marching to join the Afghanistan Field Force.

NATIVE ARMY, 1838.

																												Died per cent. of Treated 29·93.
Presidency Circle	1,146	2	...	4	1	2	1	6	2	5	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...	22	4	
Barrackpore „	15,253	2	2	1	...	5	1	9	2	19	3	21	5	2	...	1	...	7	4	5	3	13	1	2	...	87	21	
Dinapore „	3,560	3	2	1	...	3	...	2	...	2	1	4	1	5	...	...	...	1	...	1	...	...	...	...	...	22	4	
Benares „	4,106	2	...	...	...	5	1	5	3	4	...	1	...	...	...	...	...	...	...	...	...	...	...	20	7	37	11	
Cawnpore „	12,768	1	...	5	5	22	10	27	15	55	27	46	24	12	4	12	6	5	1	6	3	2	...	1	...	194	95	
Meerut „	13,526	1	1	...	...	2	2	6	...	8	2	11	3	21	8	12	5	1	1	1	1	11	3	...	...	74	26	
Agra „	4,471	1	...	1	...	27	9	41	19	14	8	35	11	4	...	3	1	5	1	1	2	...	...	11	...	143	51	
Saugor „	7,790	1	...	...	...	...	...	...	...	5	1	4	1	2	1	...	...	1	1	3	2	2	1	3	...	21	7	
Neemuch „	12,694	1	1	1	...	2	1	1	...	9	3	32	6	...	...	14	1	4	1	1	...	2	...	2	...	69	13	
Kurnaul „	6,246	...	...	...	...	2	1	1	...	2	...	1	...	3	1	5	2	9	5	2	...	6	3	1	1	32	13	
Afghanistan Field Force ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	3	14	7	2	1	21	11	
BENGAL PRESIDENCY ...	81,560	14	6	13	6	70	26	98	41	123	45	156	51	49	14	47	15	33	14	25	14	51	15	43	9	722	256	

NATIVE ARMY, 1839.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																								TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 18·50.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	1	...	...	...	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	5	...	10	1	
Fort William	667	...	...	1	...	3	...	...	...	...	...	1	...	1	1	...	...	1	...	2	1	...	...	...	...	9	2	
Dum-Dum	632	...	...	1	1	1	1	...	...	...	...	...	...	...	...	2	1	...	..	...	...	...	...	...	...	4	3	
Chinsurah	414	...	...	...	...	...	...	...	...	8	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	3	
Hazareebaugh	704	...	...	...	...	...	...	1	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	4	...	
Dinapore	748	...	...	...	...	1	..	...	...	...	...	2	1	...	...	1	...	2	...	1	1	1	...	...	...	8	2	
Ghazeepore	671	2	...	...	...	4	1	2	...	7	...	22	...	3	...	5	...	3	1	1	1	2	1	...	...	51	4	
Benares	90	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	
Chunar	230	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	1	
Buxar	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	
Cawnpore	1,277	1	...	...	...	1	...	3	...	9	...	5	2	5	...	9	3	4	2	3	1	1	...	...	...	41	8	
Landour Depôt	159	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	
Meerut	1,437	...	...	...	...	...	...	1	...	...	...	4	...	1	...	4	1	...	...	...	...	...	...	1	...	11	1	
Muttra	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	1	...	2	1	
Agra	277	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Saugor	99	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	
Mhow	109	...	...	...	...	...	...	...	...	...	...	1	...	5	2	...	...	...	...	...	...	...	...	1	...	7	2	
Nusseerabad	105	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	
Kurnaul	829	...		...	...	...	...	...	...	...	...	1	...	1	...	2	1	17	7	...	...	...	...	...	...	21	8	
Loodianah and Ferozepore ...	213	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Troops on the march	...	...	...	..	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	
Afghanistan Field Force ...	1,820	1	...	..	...	...	...	1	...	5	...	3	...	3	...	1	...	1	...	...	...	...	...	...	...	15	...	
BENGAL PRESIDENCY ...	10,609	5	...	2	1	15	2	9	1	31	4	39	3	22	3	25	6	29	11	8	4	6	2	9	...	200	37	

EUROPEAN ARMY, 1839.

Presidency Circle	1,142	2	...	...	...	1	...	1	...	...	...	1	...	4	2	...	...	...	...	1	...	1	...	2	2	13	4	
Barrackpore ,, ...	17,209	5	...	1	...	27	4	15	7	33	15	22	8	10	2	9	3	20	8	33	10	28	12	13	6	216	75	
Dinapore ,, ...	4,560	2	1	...	...	2	...	7	...	...	..	9	3	7	4	3	..	2	2	1	1	..	...	2	2	35	13	
Benares ,, ...	5,160	...	...	...	...	4	...	2	2	3	3	2	...	4	2	1	1	3	3	5	3	1	1	1	...	26	15	
Cawnpore ,, ...	13,684	1	1	...	...	3	1	5	...	6	1	6	2	5	...	8	2	8	3	1	4	5	3	1	1	49	18	
Meerut ,, ...	13,418	...	...	1	...	7	3	3	...	4	...	5	...	1	...	1	...	4	...	...	...	...	...	...	...	26	3	
Agra ,, ...	3,677	1	...	...	...	...	...	2	...	..	...	1	...	1	1	1	...	...	...	...	...	3	...	1	...	10	1	
Saugor ,, ...	6,846	1	...	1	...	1	1	2	...	1	...	1	...	1	...	1	...	...	...	1	...	...	...	...	...	10	1	
Neemuch ,, ...	11,558	3	...	...	...	...	...	3	...	12	3	21	10	37	10	33	13	25	1	194	71	4	2	1	...	333	110	
Kurnaul ,, ...	9,963	1	1	...	...	1	...	2	...	...	...	...	...	...	...	1	...	12	6	1	...	1	...	...	...	19	7	
Afghanistan Field Force ...	7,601	...	..	...	...	...	...	1	1	...	...	...	...	...	...	70	39	5	...	1	...	...	...	...	...	77	40	
BENGAL PRESIDENCY ...	94,818	16	3	3	...	46	9	43	10	59	22	68	23	70	21	128	58	79	23	238	89	43	18	21	11	814	287	

EUROPEAN ARMY, 1840.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 31·25.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Fort William	733	1	1	7	1	1	1	6	3	1	...	5	2	4	2	4	2	2	1	3	3	1	1	2	...	37	17	
Presidency Hospital	...	5	..	6	6	4	2	4	2	2	...	4	1	...	...	2	...	3	...	5	...	12	7	3	...	50	18	
Dum-Dum	712	...	...	1	...	...	...	...	...	..	...	3	...	...	...	1	...	2	...	1	...	...	...	...	...	8	...	
Chinsurah	571	1	...	3	1	...	...	6	2	4	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	6	
Berhampore	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	
Hazareebaugh	895	...	...	...	...	1	...	7	2	...	...	...	...	1	...	...	...	...	...	...	...	49*	17	...	...	58	19	
Dinapore	741	...	...	3	...	1	...	3	...	4	...	3	2	10	2	2	1	1	...	...	...	1	1	...	...	28	6	
Ghazeepore	691	...	...	3	...	7	4	5	4	8	1	12	5	6	1	10	5	9	7	...	...	...	...	...	...	60	27	
Benares	85	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	2	1	...	...	...	...	...	...	6	3	
Chunar	228	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	4	...	
Buxar	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cawnpore	1,271	1	...	1	...	1	...	1	...	6	...	7	...	3	...	2	...	2	...	1	...	...	...	2	...	27	...	
Landour Depôt	205	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	1,670	...	...	...	...	1	...	...	...	...	...	1	...	1	...	...	...	1	...	1	...	...	...	...	...	5	...	
Muttra	105	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Agra	981	...	...	...	...	1	...	...	...	1	...	...	...	...	...	1	...	2	1	1	...	1	...	3	...	10	1	
Saugor	89	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	4	3	...	...	7	3	
Mhow	104	...	...	...	...	...	...	1	...	...	...	...	...	2	...	3	1	1	...	...	...	...	...	...	...	7	1	
Nusseerabad	101	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	1,118	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	1	...	...	...	4	1	
Loodianah and Ferozepore ...	202	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Afghanistan Field Force ...	1,022	...	...	...	...	...	...	...	...	...	...	...	...	2	1	1	...	...	...	...	...	...	...	...	...	3	1	
Troops on the march	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	1	...	...	...	...	...	...	7	1	
BENGAL PRESIDENCY ...	11,551	10	1	26	8	19	7	33	13	26	4	36	10	29	6	32	12	30	11	13	3	69	29	13	1	336	105	

* Cholera appeared while the Regiment was moving from Fort William to Hazareebaugh.

NATIVE ARMY, 1840.

Presidency Circle	1,251	...	...	3	2	2	1	7	3	3	...	2	1	2	...	...	...	3	...	1	...	2	1	1	1	26	9	
Barrackpore „	14,137	5	3	2	1	16	8	18	5	12	4	9	3	17	7	4	4	7	3	6	1	10	2	5	3	111	44	
Dinapore „	4,673	...	...	1	...	3	...	3	1	8	3	2	...	1	...	18	7	7	3	6	3	8	1	1	1	58	19	
Benares „	7,563	2	...	...	...	5	1	5	3	6	3	3	2	1	1	1	...	2	1	1	...	1	...	...	...	27	11	
Cawnpore „	16,147	2	2	3	...	9	1	2	1	8	3	6	2	2	...	1	...	5	2	...	...	2	...	...	...	40	11	
Meerut „	14,882	...	...	...	...	6	2	3	...	3	1	4	1	...	...	5	...	1	...	...	...	...	...	1	1	23	5	
Agra „	4,272	...	...	1	...	2	2	4	...	3	2	1	...	...	...	2	...	...	...	...	...	...	...	...	...	13	4	
Saugor „	5,508	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Neemuch „	8,741	1	...	...	...	2	1	...	...	...	...	1	...	...	...	3	...	3	1	...	...	...	...	...	...	10	2	
Sirhind „	12,318	1	1	...	...	5	...	4	1	4	...	1	...	1	1	1	...	1	...	...	...	...	...	...	...	18	3	
Afghanistan Field Force ...	6,713	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...	...	...	1	...	...	...	...	...	4	...	
Troops on the march	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
BENGAL PRESIDENCY ...	96,205	11	6	10	3	50	16	46	14	48	16	29	9	25	9	36	11	29	10	15	4	23	4	8	6	330	108	

Died per cent. of Treated 32·73.

EUROPEAN ARMY, 1841.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 38·46.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Fort William	692	...	...	2	...	9	2	15	3	37	14	6	4	...	...	...	...	...	...	...	...	...	...	...	...	69	23	
Presidency Hospital	...	2	1	...	...	10	7	7	5	5	2	4	3	4	4	1	...	3	1	13	4	2	1	7	...	58	28	
Dum-Dum	718	...	...	1	1	...	...	3	...	...	...	...	...	...	...	...	...	2	...	1	1	2	1	1	...	10	3	
Chinsurah	248	...	...	...	...	1	...	17	8	7	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	25	10	
Berhampore	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...	...	...	3	...	
Hazareebaugh	792	...	...	...	...	9	3	1	...	3	...	1	...	10	6	4	3	...	...	...	...	...	...	...	...	28	12	
Dinapore	922	3	1	...	...	7	1	19	9	29	21	1	...	1	...	...	...	1	...	1	...	3	...	...	...	65	32	
Ghazeepore	878	1	...	...	1	...	...	1	...	47	20	47	13	12	8	7	7	...	...	8	4	1	...	...	...	124	53	
Benares	95	...	...	...	...	...	...	...	...	...	...	...	...	1	1	..	...	...	...	...	...	...	...	...	...	1	1	
Chunar	439	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Buxar	18	...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	...	...	...	...	...	...	...	...	2	2	
Cawnpore	1,336	1	...	...	...	...	...	...	...	1	...	17	5	49	5	11	3	2	1	1	1	...	...	...	...	82	15	
Landour Depôt	179	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	1,758	...	...	...	...	1	...	...	...	1	...	1	...	1	1	1	...	1	...	1	1	1	...	...	...	8	2	
Muttra	91	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	
Agra	1,138	...	...	1	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	
Saugor	74	...	...	...	...	...	...	...	...	...	...	...	...	9	6	5	3	...	1	1	1	...	...	...	...	15	11	
Nusseerabad	107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	2,080	...	...	...	...	...	...	2	...	...	...	1	...	...	...	7	1	...	...	...	...	...	...	...	...	10	1	
Loodianah	111	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	..	...	...	...	...	...	...	...	2	1	
Ferozepore	89	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Afghanistan Field Force ...	1,460	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
BENGAL PRESIDENCY ...	13,334	7	2	4	3	38	13	65	25	130	59	80	25	89	32	39	19	9	3	27	12	11	2	8	...	507	195	

NATIVE ARMY, 1841.

Presidency Circle	1,229	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	2	2	3	...	1	...	...	...	7	3	
Barrackpore „	7,346	...	...	...	...	...	...	10	7	3	...	8	3	2	1	2	...	2	...	8	6	59	23	41	20	135	60	
Dacca „	6,105	1	...	3	2	2	1	3	2	39	18	16	6	5	1	2	1	2	...	...	...	2	...	1	...	76	31	
Dinapore „	6,123	...	...	43	29*	26	14*	45	34	6	1	17	12	26	14	2	1	3	2	1	1	6	3	1	...	176	111	
Benares „	5,679	...	...	2	...	...	...	3	3	1	1	5	4	6	2	5	2	1	...	2	...	...	...	...	...	25	12	
Cawnpore „	16,438	1	1	...	...	...	...	3	...	1	...	13	6	33	9	12	4	1	1	6	1	9	4	2	1	81	27	
Meerut „	15,519	...	...	...	...	1	1	2	...	14	3	17	4	16	1	6	...	4	...	2	...	2	...	...	...	64	9	
Agra „	3,821	...	...	...	...	...	...	...	...	...	...	6	1	2	...	4	1	..	...	...	...	...	...	...	...	12	2	
Saugor „	4,356	...	...	...	...	...	...	...	...	...	...	1	...	12	7	1	1	1	...	...	...	...	...	...	...	15	8	
Neemuch „	7,731	1	1	1	...	...	...	...	...	...	...	...	...	...	...	1	1	3	...	2	...	1	...	...	...	9	2	
Sirhind „	14,195	...	...	...	...	...	...	12	5	16	6	10	1	8	1	12	4	5	3	3	1	1	1	...	...	67	22	
Afghanistan Field Force ...	10,495	...	...	...	...	2	...	2	1	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	3	
Troops on the march ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
BENGAL PRESIDENCY ...	99,037	3	2	49	31	31	16	80	52	84	31	93	37	111	37	47	15	24	8	27	9	81	31	45	21	675	290	

* These Deaths from Cholera occurred in the 15th Regiment Native Infantry, while in progress to Dinapore by water, on the river near Rampore Beauleah.

EUROPEAN ARMY, 1842.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 43·46.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency General Hospital ...	...	6	1	23	16	12	6	22	13	6	2	1	1	3	1	1	...	...	...	13	7	14	5	11	4	112	56	
Fort William	954	2	1	13	6	15	5	66	32	5	5	...	...	1	...	...	...	2	1	3	1	8	6	3	2	118	59	
Dum-Dum... ...	927	...	...	1	1	10	2	7	1	6	...	5	...	5	...	...	...	...	...	...	...	...	...	...	...	34	4	
Chinsurah	911	5	...	29	11	13	2	59	29	28	12	...	...	1	1	3	...	1	...	...	...	...	...	...	...	139	55	
Berhampore ...	530	...	...	...	...	...	...	27	7	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	33	7	
Dinapore	938	...	...	1	...	...	...	13	3	2	...	5	4	7	6	...	...	3	3	...	...	5	3	2	...	38	19	
Ghazeepore ...	206	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	
Benares	82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Chunar	436	...	...	...	...	...	...	27	18	3	3	...	...	1	1	...	...	...	...	...	...	...	...	2	...	33	22	
Buxar	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Cawnpore	1,583	...	...	...	...	...	...	...	...	...	...	...	...	2	...	104	57	2	2	...	...	...	...	18	2	126	61	
Landour	168	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	1,726	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	
Muttra	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Agra	943	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Kurnaul	1,362	...	...	...	...	...	...	...	...	...	...	2	1	6	...	11	5	2	2	1	...	...	...	...	...	22	8	
Loodianah and Ferozepore ...	191	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Afghanistan Field Force ...	3,115	...	...	...	...	...	...	3	...	3	...	3	1	12	1	1	...	1	...	...	...	...	...	...	...	23	2	
Saugor	76	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	4	3	1	...	...	...	...	...	...	8	5	
Nusseerabad	96	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
BENGAL PRESIDENCY ...	14,370	13	2	68	35	50	15	224	103	59	22	16	7	38	10	125	66	14	9	17	8	27	14	37	8	688	299	

NATIVE ARMY, 1842.

Presidency Circle	1,142	1	1	5	4	...	...	10	6	...	...	2	1	...	...	...	...	...	...	1	1	...	...	2	2	21	15	
Barrackpore „	6,639	31	17	15	6	5	...	30	14	34	16	5	1	3	...	2	1	4	1	3	1	6	2	3	...	141	59	
Dacca „	6,300	...	...	1	...	1	..	2	...	2	...	9	1	5	...	2	2	2	...	...	...	11	6	8	4	43	13	
Dinapore „	5,280	1	...	1	1	14	5	16	8	14	4	21	16	5	3	3	2	3	3	...	...	2	1	1	...	81	43	
Benares „	7,346	...	...	2	2	1	...	36	18	9	2	5	5	...	...	2	1	3	3	...	...	...	...	...	...	58	31	
Cawnpore „	19,886	...	...	...	...	6	1	7	2	8	1	13	3	29	13	46	17	12	8	3	1	...	...	...	...	124	46	
Meerut „	16,328	...	...	...	...	4	1	...	...	1	...	1	...	2	...	1	...	...	...	2	...	1	1	1	...	13	2	
Agra „	4178	...	...	...	...	...	...	3	1	1	1	...	...	...	...	...	...	...	...	..	...	...	...	...	...	4	2	
Saugor „	4,478	...	...	...	...	...	...	...	...	...	...	...	...	7	5	13	7	3	1	...	...	2	1	3	...	28	14	
Nusseerabad „	7,724	1	...	...	...	...	..	5	...	8	5	4	2	8	2	4	4	3	...	1	...	...	...	...	...	34	13	
Kurnaul „	12,853	...	...	...	...	4	...	7	...	...	...	1	...	5	3	3	...	5	2	...	...	...	...	...	...	25	5	
Afghanistan Field Force ...	9,822	1	...	...	...	...	...	...	...	...	...	10	3	9	3	16	5	5	...	1	...	...	...	1	...	43	11	
BENGAL PRESIDENCY ...	101,976	35	18	24	13	35	7	116	49	77	29	71	32	73	29	92	39	40	18	11	3	22	11	19	6	615	254	

EUROPEAN ARMY, 1843.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 39·77.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	6	4	...	...	...	...	9	3	2	1	1	1	2	2	1	...	...	...	...	...	1	...	2	1	24	12	
Fort William	1,014	1	...	...	...	10	9	7	3	4	2	1	...	...	...	...	...	...	...	...	...	...	...	1	1	24	15	
Dum-Dum	532	1	...	12	3	4	1	...	...	...	...	...	...	2	1	1	...	...	...	...	...	13	4	1	1	34	10	
Dinapore	895	...	...	...	...	3	1	...	...	1	...	...	...	7	6	3	2	...	...	2	...	1	...	1	...	18	9	
Buxar	33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Ghazeepore...	940	...	...	...	...	5	5	4	3	30	19	...	2	2	...	...	...	...	...	...	...	...	...	...	...	41	29	
Benares	135	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Chunar	394	2	...	1	...	1	...	2	...	3	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	10	1	
Cawnpore	1,966	2	...	...	...	1	...	4	...	3	...	10	9	14	2	11	7	...	...	1	1	...	...	...	...	46	19	
Allahabad	837	...	...	...	...	...	...	...	...	17	8	5	2	...	...	...	...	...	...	...	...	...	...	...	...	22	10	
Landour	134	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	
Meerut	2,796	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	3	...	
Muttra	108	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	3	1	...	1	1	...	...	...	...	15	4	
Agra	1,195	...	...	...	...	1	...	...	...	...	...	...	...	...	...	142	48	11	7	...	...	...	...	...	...	154	55	
Saugor	76	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	3	...	
Nusseerabad	68	...	...	...	...	...	...	...	...	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	
Kurnaul	1,026	2	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	1	1	4	2	2	...	...	...	12	3	
Umballa	856	...	...	...	...	1	1	...	...	...	...	...	...	3	1	5	1	3	1	2	...	1	1	1	...	16	5	
Kussowlie, 9 months	989	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Subathoo, 9 months	816	...	...	...	...	...	...	...	...	2	...	1	...	3	...	...	...	...	...	2	...	...	...	...	...	8	...	
Loodianah	111	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	
Troops on the march	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	2	...	...	...	...	...	...	...	...	3	2	
BENGAL PRESIDENCY ...	14,921	14	4	14	3	26	17	26	9	65	31	21	14	37	13	180	63	17	9	14	4	18	5	7	3	439	175	

NATIVE ARMY, 1843.

Presidency Circle	945	...	...	1	...	...	...	...	...	4	1	1	1	...	...	2	...	1	...	4	1	1	...	...	...	14	3	
Barrackpore „	8,711	1	...	3	1	24	6	12	1	13	2	12	4	2	...	...	...	...	...	...	...	10	7	2	1	79	22	
Dinapore „	5,898	...		2	2	2	1	...	...	1	1	2	1	12	8	2	...	1	...	2	1	4	2	...	...	28	16	
Benares „	7,512	...	...	...	...	1	...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	1	1	5	2	10	4	
Cawnpore „	16,824	2	2	7	3	2	...	7	3	10	6	7	4	19	7	17	5	5	2	5	2	...	...	2	...	83	34	
Meerut „	14,786	...	...	3	2	...	...	...	...	1	...	1	...	...	...	5	...	3	...	..	...	.	...	1	...	14	2	
Agra „	5,148	...	...	...	...	...	...	...	...	1	...	...	...	...	...	39	19	1	...	1	..	...	...	...	..	42	19	
Saugor „	10,939	...	...	...	...	...	...	...	...	1	...	1	1	2	...	1	...	...	...	1	1	..	...	...	.	6	2	
Nusseerabad „	8,819	...	...	...	...	1	1	2	...	17	11	7	1	7	4	4	1	6	3	14	...	3	.	...	...	61	21	
Kurnaul „	15,182	3	2	...	...	2	...	1	...	2	2	2	...	...	..	2	...	...	...	1	...	...	...	...	...	13	4	
BENGAL PRESIDENCY ...	94,764*	6	4	16	8	32	8	24	5	51	23	33	12	42	19	72	25	17	5	28	5	19	10	10	3	350	127	

Died per cent. of Treated 36·29.

* Dacca Circle wanting.

EUROPEAN ARMY, 1844.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																								TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 44·81.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	...	2	1	17	13	31	18	16	12	6	2	7	5	...	...	...	...	2	1	4	2	8	2	4	3	97	59	
Fort William	506	1	1	...	...	...	...	4	...	1	1	2	2	...	...	...	...	...	...	2	...	5	3	...	...	15	7	
Dum-Dum...	851	3	1	2	2	11	4	10	4	12	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	40	14	
Chinsurah	439	...	...	6	3	8	3	5	3	...	...	2	2	1	...	...	...	...	...	...	...	25	15	8	3	55	29	
Dinapore	904	...	...	...	...	...	...	...	...	2	1	1	...	2	1	1	...	1	...	1	1	...	...	...	...	8	3	
Ghazeepore	661	...	...	...	...	2	...	2	...	50	24	17	3	...	...	...	...	...	...	...	...	...	...	...	...	71	27	
Benares	125	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Chunar	408	...	...	...	...	2	...	...	...	1	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	5	2	
Buxar	23	...	...	...	...	1	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	1	...	
Cawnpore	2,297	...	...	...	...	4	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	7	...	
Allahabad	908	...	...	...	...	...	...	...	...	2	2	...	...	2	2	21	9	36	17	...	...	...	...	...	...	61	30	
Landour Depôt	149	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	2	...	
Meerut	2,304	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...	3	1	
Muttra	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Agra	1,089	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	
Saugor	85	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Nusseerabad	92	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Umballa	1,356	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	2	...	...	...	4	...	
Kussowlie	978	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	1	1	1	...	...	...	...	...	...	5	2	
Subathoo	870	...	...	...	...	...	...	2	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...	...	...	5	...	
Loodianah	750	...	...	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	
Ferozepore	378	...	...	...	...	...	...	...	...	5	2	...	...	...	...	2	...	...	...	...	...	...	...	...	...	7	2	
Sukkur	889	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Troops on the march	...	...	...	...	...	1	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	
BENGAL PRESIDENCY ...	16,161	7	3	27	18	60	25	42	20	84	36	33	12	9	4	32	11	42	19	7	3	40	20	12	6	395	177	

NATIVE ARMY, 1844.

Presidency Circle	1,038	...	...	4	2	2	...	5	2	...	...	3	...	...	...	2	...	1	...	...	...	1	...	...	...	18	4	
Barrackpore „	7,271	1	...	4	3	9	4	19	7	8	1	5	1	4	1	...	...	1	...	2	...	...	...	1	...	54	17	
Dacca „	6,743	7	...	10	8	9	4	25	11	6	4	4	1	5	1	8	1	2	1	1	1	1	...	1	...	79	32	
Dinapore „	6,313	5	1	...	...	5	...	5	...	9	4	4	1	1	1	6	4	3	1	1	1	7	3	1	1	47	17	
Benares „	6,303	1	...	...	...	13	3	3	1	4	...	3	...	1	...	...	...	1	...	1	...	1	1	1	...	29	5	
Cawnpore „	16,539	...	...	2	...	3	...	10	3	2	...	1	1	...	...	1	...	5	3	...	...	...	...	...	...	24	7	
Meerut „	17,382	...	...	...	...	...	...	...	...	2	1	6	1	...	...	1	...	2	2	5	...	...	...	1	1	17	5	
Agra „	6,856	...	...	...	...	3	1	...	...	2	...	4	...	2	...	...	...	...	...	...	...	...	...	...	...	11	1	
Saugor „	11,031	...	...	...	...	...	...	...	...	4	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...	5	2	
Neemuch „	7,603	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Sirhind „	18,804	...	...	...	...	1	...	4	2	1	...	2	3	3	...	3	...	2	1	1	...	1	1	...	...	18	7	
BENGAL PRESIDENCY ...	105,883	14	1	20	13	45	12	71	26	38	11	32	8	16	3	21	5	17	8	12	3	11	5	5	2	302	97	

Died per cent. of Treated 32·12.

EUROPEAN ARMY, 1845.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 4867.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	125	13	8	1	1	23	12	17	11	8	6	6	4	8	4	4	4	...	...	2	...	...	...	...	...	82	50	
Fort William	457	4	4	...	...	10	4	13	5	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29	14	
Dum-Dum	346	...	...	...	...	1	1	...	...	...	...	1	...	...	...	...	...	...	...	8	4	13	6	...	...	23	11	
Chinsurah	471	1	...	5	3	2	...	9	8	3	2	...	...	1	1	3	1	1	...	...	...	...	...	...	...	25	15	
Dinapore...	1,107	...	...	...	...	...	...	18	10	12	9	...	...	3	1	5	4	...	...	2	...	...	...	...	...	40	24	
Benares	140	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	
Chunar	356	...	...	...	...	1	1	8	2	3	...	1	...	3	3	1	...	1	...	1	1	...	...	...	...	19	7	
Cawnpore	1,944	...	...	...	...	5	...	4	...	...	...	100	44	15	7	8	4	22	11	1	1	1	1	...	...	156	68	
Allahabad	248	...	...	...	...	...	...	...	...	...	...	2	2	9	6	1	..	...	...	...	...	...	...	...	...	12	8	
Muttra	93	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	3	1	...	...	...	..	...	...	4	1	
Agra	1,063	...	...	...	...	...	...	4	1	6	1	1	1	...	...	1	...	4	1	...	...	...	...	...	...	16	4	
Meerut	2,954	...	...	...	...	...	...	2	...	2	1	...	...	2	1	29	9	114	76	4	3	2	2	...	...	155	92	
Landour	141	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Umballa	2,439	...	...	1	...	1	...	3	...	3	...	2	1	123	57	227	130	35	17	2	...	1	...	...	...	398	205	
Kussowlie	1,045	...	...	...	..	...	...	...	...	1	...	1	...	2	...	120	34	12	4	1	...	...	...	...	...	137	38	
Subathoo	817	...	...	...	...	...	...	2	...	...	...	2	1	...	...	108	38	21	3	...	...	...	...	...	...	133	42	
Loodianah	948	...	...	...	...	...	...	3	1	2	...	2	1	11	10	57	39	16	5	...	...	...	...	...	...	91	56	
Ferozepore...	1,130	...	...	...	...	...	...	...	...	2	..	36	19	46	20	2	...	14	6	...	...	1	...	...	...	101	45	
Sukkur	851	...	...	...	...	...	...	3	1	...	...	18	9	7	7	...	...	...	...	...	...	...	...	...	...	28	17	
Troops on the march	...	...	...	1	...	33	20	..	...	...	...	...	...	...	...	...	...	...	...	4	2	5	5	...	...	43	27	
Troops on river	...	...	...	3	2	4	1	11	9	1	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19	12	
BENGAL PRESIDENCY ...	16,675	18	12	11	6	80	39	97	48	45	20	172	82	231	117	566	263	243	124	26	11	23	14	...	...	1512	736	

NATIVE ARMY, 1845.

STATIONS.	Strength of the Army in July.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.	Died per cent. of Treated 35·71.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.			
Calcutta	1,007	1	1	3	5	3	3	1	1	1	3	...	1	23	10	
Barrackpore	3,747	...	8	12	16	4	6	4	3	1	10	4	1	69	16	
Dum-Dum	812	...	...	6	5	2	...	...	1	...	1	...	1	16	...	
Berhampore	841	...	1	1	...	...	...	...	...	...	...	...	...	2	1	
Dacca	964	...	1	1	...	...	...	...	...	...	...	...	1	3	2	
Cheerapoonjee ...	720	...	...	1	...	...	...	...	...	...	...	...	...	1	...	
Sylhet	960	...	...	2	...	...	...	...	...	...	1	...	1	4	1	
Cachar	289	...	1	...	...	...	...	...	...	...	...	...	...	1	...	
Gowhatty	574	...	...	1	2	1	1	...	...	...	1	...	...	6	1	
Jeypore (Assam) ...	1,104	...	...	1	...	..	1	...	...	...	...	...	...	2	1	
Chittagong	248	...	...	...	...	3	...	...	...	...	...	...	...	3	...	
Segowlie	781	...	...	...	...	...	...	...	...	...	...	...	1	1	...	
Dinapore	2,362	...	...	12	10	7	24	7	12	8	2	4	1	87	27	
Dorundah	751	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Chyebassa	225	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Bhaugulpore	474	1	...	...	2	1	...	...	...	...	...	...	...	4	1	
Benares	1,695	...	1	21	2	4	7	...	...	1	...	...	1	37	20	
Ghazeepore	212	...	...	...	...	...	...	1	1	...	...	...	...	2	1	
Mirzapore	372	...	...	...	2	1	...	...	...	...	...	...	...	3	2	
Azimghur	186	...	...	...	...	...	1	1	...	1	...	...	...	3	...	
Jounpore	470	...	...	...	1	...	...	...	...	...	...	...	...	1	...	
Goruckpore	807	...	...	...	...	...	1	...	1	...	...	...	...	2	...	
Allahabad	2,326	...	...	...	...	1	1	4	4	1	1	...	...	12	4	
Cawnpore	5,451	...	1	3	10	2	33	19	6	4	3	...	...	81	30	
Lucknow	3,285	...	...	10	2	2	6	10	...	2	...	...	...	32	6	
Sultanpore	941	...	...	...	...	1	1	...	...	1	...	...	1	4	1	
Seetapore	940	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Futtehghur	1,442	...	..	...	...	...	...	...	...	...	...	1	...	1	...	
Shahjehanpore ...	1,048	...	...	...	...	...	...	...	...	1	...	...	...	1	...	
Mynpoorie	1,027	...	...	...	...	...	...	...	...	...	1	4	...	5	...	
Etawah	998	...	...	...	...	3	...	...	...	...	4	...	...	7	1	
Agra	4,805	...	...	5	11	4	1	...	...	...	1	...	...	22	5	
Muttra	1,208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Allyghur	1,159	...	...	...	...	...	1	...	...	1	1	...	...	3	1	
Meerut	8,274	1	...	6	6	2	1	4	1	6	1	3	...	31	10	
Delhi	3,558	...	1	...	3	1	1	...	...	2	1	5	4	18	10	
Moradabad	1,051	...	...	2	...	4	...	...	...	...	...	3	...	9	2	
Bareilly	2,972	...	...	2	1	...	...	...	1	...	...	...	...	4	...	
Deyrah	1,049	...	...	...	...	1	1	...	...	1	4	5	...	12	10	
Almorah	679	...	...	...	...	...	...	...	...	...	1	1	...	2	...	
Hawulbagh	319	...	...	...	...	..	...	...	...	...	...	...	...	...	...	
Luhooghat	591	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Petoraghur	469	.	...	...	...	...	...	1	...	...	...	...	...	1	1	
Hansi	1,065	...	..	...	...	...	...	2	8	8	...	...	...	18	3	
Kythul	488	...	...	...	...	...	...	...	1	4	...	...	...	5	2	
Umballa	7,358	...	2	...	12	1	2	7	79	25	4	1	...	133	71	
Jutog, Simla	1,113	...	...	...	...	...	...	...	1	4	...	...	...	5	2	
Loodianah	4,466	...	1	2	3	...	2	3	30	5	2	1	...	49	16	
Ferozepore	6,530	1	...	4	3	...	25	29	9	...	1	...	1	73	21	
Sukkur	1,773	...	...	...	...	1	21	...	...	...	...	...	...	22	10	
Shikarpore	454	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Troops on march ...	...	2	3	3	...	...	...	...	...	...	7	32	...	47	20	
On the river... ...	...	...	...	..	...	...	...	...	...	...	1	...	...	1	1	
Bengal Presidency ...	86,440	6	21	98	96	49	140	93	159	77	51	64	14	868	310	

EUROPEAN ARMY, 1846.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																								TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 44·33.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	113	1	1	2	2	13	7	14	7	14	4	24	14	6	1	...	...	1	...	17	5	5	4	2	...	99	45	
Fort William	467	1	1	...	...	7	7	5	4	14	8	4	1	...	...	...	...	...	...	...	...	...	...	...	...	31	21	
Dum-Dum	649	1	...	1	1	2	2	8	7	2	...	7	3	...	...	...	...	...	...	1	...	...	...	...	...	22	13	
Chinsurah Depôt	160	...	...	...	...	...	...	...	...	...	...	...	...	4	2	...	...	4	1	25	10	...	...	...	...	33	13	
Dinapore	712	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	5	1	
Ghazeepore	122	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	4	...	
Benares	130	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	1	1	
Chunar	309	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	
Cawnpore	1,487	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	
Allahabad	490	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	1	1	...	...	...	...	...	...	3	2	
Landour Depôt	275	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	2,108	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...	3	1	
Agra	1,127	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Saugor and Mhow	155	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Nusseerabad	80	...	...	...	...	...	...	...	...	...	...	...	...	23	11*	...	...	...	...	...	...	...	...	...	...	23	11	
Umballa	2,521	...	...	...	...	...	...	2	...	5	3	2	1	4	1	...	...	1	...	...	...	...	...	...	...	14	5	
Kussowlie	793	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Subathoo	1,418	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	2	...	
Loodianah and Jullundur ...	1,216	...	...	...	...	1	...	...	...	...	...	...	...	3	...	2	...	...	...	...	...	...	...	...	...	6	...	
Ferozepore	1,023	...	...	...	...	1	...	4	...	1	1	1	...	2	...	9	4	2	1	...	...	1	...	...	...	21	6	
Lahore	1,121	...	...	...	...	...	...	...	...	1	...	2	...	...	...	2	...	...	...	...	...	...	...	...	...	5	...	
Troops on the march	...	...	...	1	...	...	...	5†	4	7‡	4	...	...	...	...	...	...	...	...	...	...	...	...	2§	2	15	10	
BENGAL PRESIDENCY ...	16,476	3	2	4	3	28	16	39	22	47	20	42	20	44	15	16	6	9	3	45	16	6	4	8	2	291	129	

* Between 26th July and 9th August. † Artillery Drafts proceeding to Cawnpore. ‡ Her Majesty's 16th Lancers while coming to the Presidency, on the river. § Her Majesty's 98th Regiment proceeding to Dinapore, on the river.

NATIVE ARMY, 1846.

Presidency Circle	937	...	...	2	...	4	2	4	2	8	2	2	1	1	...	1	...	1	...	1	...	...	...	1	...	25	7	
Barrackpore „	6,631	3	1	2	...	3	2	27	9	14	3	47	12	2	...	3	2	1	...	3	...	3	1	5	..	113	30	
Dacca „	5,282	1	...	...	...	2	1	7	2	8	2	3	1	1	1	7	1	1	1	2	1	10	5	6	2	48	17	
Dinapore „	6,277	4	...	2	...	3	1	7	...	8	...	38	10	8	2	5	...	3	...	3	...	2	1	..	...	83	14	
Benares „	6,302	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	
Cawnpore „	12,626	...	...	...	...	3	...	5	1	2	...	3	1	5	...	2	...	1	1	1	1	1	1	...	...	23	5	
Meerut „	13,958	...	...	...	...	1	...	2	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	4	1	
Agra „	3,582	...	...	...	...	...	...	1	1	1	...	1	...	2	...	...	...	1	...	...	...	...	...	...	...	6	1	
Saugor „	3,433	...	...	...	...	...	...	7	1	12	4	25	9	12	3	7	...	2	...	1	...	1	1	...	...	67	18	
Neemuch „	9,832	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	194*	79*	
Sirhind „	5,972	1	1	2	2	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	1	1	...	...	...	6	4	
Punjab Field Force	35,721	...	...	...	...	6	4	10	5	20	...	16	1	4	...	2	...	3	...	2	...	2	...	5	3	70	13	
BENGAL PRESIDENCY ...	110,553	9	2	10	2	22	10	71	22	73	11	136	35	35	6	27	3	14	2	14	3	20	9	17	5	642	189	

* The months in which these cases occurred cannot be specified with accuracy. The history of this cholera and the season of its prevalence is treated of in Chap. VI. of Report.

Died per cent. of Treated 29·44.

EUROPEAN ARMY, 1847.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 37·93.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died	Ad.	Died	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Presidency Hospital	167	7	5	1	1	5	4	15	7	3	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...	33	21	
Fort William	557	...	...	...	...	5	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	2	
Dum-Dum	370	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	...	...	4	2	
Chinsurah	66	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Dinapore	974	4	2	1	...	...	...	5	2	105	38	...	...	2	1	1	1	...	...	...	...	...	...	...	...	118	44	
Benares	107	...	...	...	...	...	...	...	...	...	...	...	...	2	2	3	1	...	...	...	...	...	...	...	...	5	3	
Chunar	331	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	
Cawnpore	1,102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	5	3	3	...	...	...	...	...	...	8	8	
Meerut	2,847	...	...	...	...	...	...	2	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	5	...	
Agra	1,047	...	...	...	...	...	...	4	...	1	...	10	1	6	1	1	...	1	...	...	...	...	...	...	...	23	2	
Saugor, Mhow, and Nusseerabad ...	237	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Umballa	2,593	...	...	...	...	...	...	4	...	...	...	2	...	3	...	...	...	3	1	...	...	...	...	2	...	14	1	
Kussowlie	881	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	
Subathoo	1,225	...	...	...	...	...	...	2	...	...	...	1	...	1	...	...	...	1	...	1	...	...	...	...	...	6	...	
Ferozepore...	1,206	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	...	...	1	1	...	...	5	3	
Loodianah, Hoshiarpore, and Jullundur	673	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	
Lahore	1,226	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Troops on the march	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	
BENGAL PRESIDENCY ...	15,609	11	7	3	1	10	6	33	10	112	41	16	3	15	4	10	7	12	6	1	...	5	3	4	...	232	88	

NATIVE ARMY, 1847.

Presidency Circle	965	3	...	...	...	2	...	...	1	2	1	2	...	2	...	...	...	...	...	...	...	...	...	...	...	11	2	
Barrackpore „	6,318	2	...	2	1	10	5	9	1	26	15	2	...	2	...	3	...	...	...	15	5	9	5	...	...	80	32	
Dacca „	4,869	3	...	2	3	7	3	20	7	49	20	15	3	3	...	...	...	2	1	2	...	1	1	3	...	107	38	
Dinapore „	5,596	...	...	...	...	...	...	10	4	23	7	4	...	8	2	18	4	14	5	3	...	10	5	2	...	92	27	
Benares „	4,804	...	...	...	...	3	...	12	7	10	1	...	...	2	...	2	1	1	...	...	...	1	...	1	...	32	9	
Cawnpore „	10,452	...	...	...	...	3	2	6	1	5	...	4	...	3	...	2	...	2	2	3	...	6	2	1	...	35	7	
Meerut „	13,487	...	...	...	...	...	...	3	...	4	...	2	...	3	...	1	...	...	...	1	...	...	...	...	...	14	...	
Agra „	3,471	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	3	...	
Saugor „	3,469	...	...	...	...	...	...	1	...	1	...	...	...	2	...	1	...	...	...	1	...	1	...	1	1	8	1	
Neemuch „	10,014	...	...	...	...	...	...	1	...	...	...	...	...	1	...	2	...	...	...	1	...	...	...	...	...	5	...	
Sirhind „	8,902	1	1	...	...	...	...	1	...	3	...	1	...	2	1	5	2	3	1	1	1	3	...	...	...	20	6	
Punjab Field Force	31,078	...	...	1	1	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	
BENGAL PRESIDENCY ...	103,425	9	1	5	5	27	11	64	21	124	44	31	3	28	3	34	7	23	9	27	6	31	13	8	1	411	124	

EUROPEAN ARMY, 1848.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 30·89.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Fort William	758	...	...	...	...	1	...	4	3	2	2	1	1	...	...	1	...	1	...	...	1	2	2	...	...	12	9	
Presidency Hospital	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	3	1	
Dum-Dum	713	...	...	1	...	...	...	..	...	3	...	1	...	1	...	...	...	...	..	...	...	3	...	1	...	10	...	
Darjeeling	96	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	2	...	2	...	
Dinapore	1,063	...	...	...	...	...	...	1	...	13	3	9	1	1	...	1	...	...	...	1	...	...	...	...	...	26	4	
Benares	159	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	
Chunar	338	...	...	...	...	1	1	...	...	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	
Cawnpore	789	...	...	...	...	1	...	2	...	31	7	28	7	49	23	63	27	7	3	...	...	...	...	...	...	181	67	
Allahabad	182	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Meerut	954	...	...	1	...	...	...	...	...	1	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	5	...	
Landour Depôt	143	...	...	...	.	...	...	...	...	...	..	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	
Agra	1,269	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	2	2	3	2	...	...	1	...	8	4	
Saugor, Mhow and Nusseerabad ...	239	...	...	...	..	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Umballa	1,881	...	...	...	...	2	...	4	1	...	...	3	...	...	...	2	...	...	...	...	...	...	...	1	...	12	1	
Kussowlie	1,129	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Subathoo	1,294	...	...	...	...	...	...	1	...	...	...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	10	...	
Loodianah	179	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
Jullundur	1,173	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	...	...	1	...	5	...	
Ferozepore	1,647	...	...	...	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	3	...	
Hoshiarpore	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Lahore	2,534	...	...	...	...	1	...	6	...	...	...	5	1	2	1	2	...	1	...	...	...	1	1	...	...	18	3	
Punjab Field Force	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	4	...	...	2	...	10	4	
BENGAL PRESIDENCY ...	16,666	...	...	3	...	8	1	20	5	54	13	49	10	68	25	70	27	13	5	12	7	6	3	10	1	313	97	

NATIVE ARMY, 1848.

Presidency Circle	1,011	...	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	
Barrackpore ,, ...	5,801	...	...	...	...	...	...	7	2	7	...	1	...	3	...	2	...	...	...	...	...	...	...	2	...	22	2	
Dacca ,, ...	4,542	...	...	4	1	10	3	4	1	2	1	3	...	2	2	1	...	...	...	2	2	1	...	1	...	30	10	
Dinapore ,, ...	5,106	...	1	1	...	3	...	25	2	6	...	11	...	15	16	13	...	4	...	1	...	11	5	4	...	94	24	
Benares ,, ...	5,346	...	...	...	...	...	...	...	...	4	1	3	2	5	1	1	...	1	...	...	...	2	...	1	...	17	4	
Cawnpore ,, ...	11,268	2	...	...	...	15	...	11	3	19	6	30	10	24	8	19	8	11	4	3	...	...	...	...	...	134	39	
Meerut ,, ...	12,618	...	...	1	1	3	...	6	2	...	...	1	...	3	...	2	1	1	1	...	...	...	...	...	...	17	5	
Agra ,, ...	3,798	...	...	...	...	1	...	1	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	5	...	
Saugor ,, ...	4,523	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	
Neemuch ,, ...	9,529	1	...	...	...	1	...	...	...	...	...	1	...	2	...	1	...	...	...	...	...	...	...	1	...	7	...	
Sirhind ,, ...	14,830	...	...	...	...	2	...	...	...	4	1	4	...	...	...	4	1	1	...	3	...	...	...	...	...	18	2	
Punjab ,, ...	21,745	...	...	...	...	...	...	5	1	...	1	5	2	6	1	4	...	1	...	...	...	...	...	...	...	21	5	
Punjab Field Force	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	2	...	4	...	5	3	11	3	
BENGAL PRESIDENCY ...	100,117	4	1	6	2	35	3	61	11	44	10	60	14	60	28	49	10	19	5	11	2	18	5	14	3	381	94	

Died per cent. of Treated 24·67.

EUROPEAN ARMY, 1849.

STATIONS.	STRENGTH.	NUMBER OF ADMISSIONS AND DEATHS FROM CHOLERA IN EACH MONTH.																						TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.	Died per cent. of Treated 43·88.
		JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.		JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.				
		Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.	Ad.	Died.			
Fort William	883	...	...	1	...	...	...	1	1	*	*	*	*	*	*	*	*	2	2	1	1	*	*	*	*	5	4	
Presidency Hospital	...	3	1	1	1	1	1	10	6	*	*	*	*	*	*	7	3	...	...	...	...	*	*	*	*	22	12	
Dum-Dum	910	...	...	2	2	...	...	*	...	73	17	12	8	6	4	18	15	19	13	5	5	5	5	...	...	140	69	
Chinsurah	590	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	3	36	11	6	2	3	2	2	2	65	20	
Berhampore	410	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16	5	13	10	...	...	...	...	29	15	
Dinapore	1,028	...	...	...	...	1	...	2	...	3	2	...	...	...	...	1	...	...	...	...	...	5	3	...	...	12	5	
Benares	161	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2	1	...	...	1	...	...	...	4	2	
Ghazeepore	385	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	3	2	1	...	...	...	...	3	1	10	5	
Chunar	304	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	2	1	
Cawnpore	786	...	...	...	...	...	...	...	...	...	...	...	...	80	31	2	1	1	1	...	...	...	...	...	...	83	33	
Allahabad	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	..	32	26	2	...	...	...	...	...	34	26	
Meerut	487	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1	...	...	4	1	
Agra	498	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	1	...	...	1	1	...	...	...	...	5	2	
Mhow	73	..	...	...	...	...	.	...	...	...	...	...	...	...	...	..	..	...	...	...	...	...	...	...	...	...	...	
Nusseerabad	71	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	
Umballa	1,505	...	...	...	...	...	...	3	...	4	...	...	...	3	...	..	...	2	...	2	...	1	...	...	...	15	...	
Subathoo	46	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	.	1	...	
Loodianah	263	..	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	
Jullundur	1,390	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	3	...	
Ferozepore	355	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	2	..	
Lahore	2,867	...	...	...	...	...	...	1	...	...	...	3	1	...	...	3	...	...	...	1	...	*	*	1	...	9	1	
Wuzeerabad	2,306	...	...	...	...	...	...	1	...	...	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	4	..	
Rawulpindee	882	...	...	...	...	...	...	1	...	...	...	1	..	1	...	1	...	...	...	2	...	3	...	1	1	10	1	
Peshawur	1,191	...	...	...	...	...	...	3	1	2	...	...	...	.	...	1	1	1	...	1	...	...	...	2	...	10	2	
Punjab Field Force	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	..	...	...	...	...	1	...	
Troops on the march	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16	13	2	2	...		18	15	
APPROXIMATE STRENGTH ...	17,467	3	1	5	3	2	1	24	8	82	19	18	10	95	35	60	28	113	60	52	32	26	13	10	5	490	215	

* Returns wanting.

NATIVE ARMY, 1849.

Presidency Circle	1,063	*	*	*	*	*	*	1	*	*	*	2	*	*	*	*	*	*	*	*	*	*	*	*	*	3	*	
Barrackpore „	5,800	1	*	4	*	3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	8	*	
Dacca „	3,560	1	..	...	...	12	4	13	9	18	3	5	...	6	2	3	1	5	1	8	2	1	...	4	3	76	25	
Dinapore „	5,319	1	...	...	...	2	...	44	14	19	5	2	...	30	6	8	1	4	...	4	...	5	1	1	4	120	31	
Benares „	5,405	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	3	...	1	1	2	...	...	...	7	1	
Cawnpore „	13,974	9	1	...	...	3	1	...	...	29	13	30	14	74	19	12	7	3	2	2	1	5	1	...	...	167	59	
Meerut „	13,657	...	...	1	...	...	...	8	...	3	1	2	1	2	...	...	...	1	1	1	...	...	...	...	...	18	3	
Agra „	3,980	..	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	3	1	1	...	...	...	6	1	
Saugor „	3,004	...	...	...	...	...	...	...	...	1	...	18	7	5	3	2	...	...	...	...	...	...	...	...	...	26	10	
Neemuch „	6,090	...	..	...	...	...	...	...	...	...	...	...	...	3	...	...	...	2	1	3	...	...	...	...	...	8	1	
Sirhind „	11,924	...	..	1	...	...	...	11	2	4	1	4	...	3	1	1	...	...	...	1	...	1	...	1	...	27	4	
Punjab „	23,400	...	...	...	...	...	...	16	3	5	2	1	1	...	...	2	...	3	1	2	...	...	...	1	...	30	7	
Punjab Field Force	* * *	9	3	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	3	
Trans-Ravee „	14,365	...	...	...	...	...	...	6	5	5	1	4	1	1	1	6	2	1	...	1	1	...	...	...	...	24	11	
BENGAL PRESIDENCY ...	111,541	21	4	7	...	21	5	99	33	84	26	68	24	124	32	37	11	22	6	26	6	15	2	7	7	531	156	

* The average of the three months, January to March was 20,650; from April, the Army of the Punjab was broken up.

Died per cent. of Treated 29·38.

NATIVE ARMY, 1850.

STATIONS.	Strength of July.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
Stations of Presidency Circle ...	7,162	*	*	*	*	*	*	*	*	*	*	*	*	*	*
„ Barrackpore Circle ...															
„ Dacca Circle ...	3,558	2	1	...	6	1	2	...	1	1	2	2	...	18	6
„ Dinapore Circle ...	4,514	*	*	*	*	*	*	*	*	*	*	*	*	*	*
„ Benares Circle ...	8,456	*	*	*	*	*	*	*	*	*	*	*	*	*	*
„ Cawnpore Circle ...	11,940	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Army of the Western Division of the Epidemic Area.*															
Nimar	412	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirdarpore	380	...	...	...	...	...	...	...	...	...	1	...	...	1	...
Mehidpore	1,580	...	...	...	8	19	3	...	...	...	...	...	...	30	8
Erinpoorah	1,230	...	...	...	...	...	...	...	5	...	...	...	...	5	1
Kherwarrah	1,009	...	...	...	...	...	...	...	1	...	...	...	...	1	1
Ajmere	918	...	...	...	...	...	1	...	...	3	...	...	...	4	2
Beaur	650	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Muttra	515	...	...	...	...	3	1	...	...	...	...	1	...	5	...
Agra	3,325	...	...	...	1	...	1	...	2	1	...	2	...	7	1
Allyghur	960	...	...	...	1	...	...	...	...	...	...	1	...	2	1
Shahjehanpore	992	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly	2,667	...	...	...	1	...	...	...	1	...	...	...	...	2	2
Almorah	953	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad	900	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut	2,456	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi	3,075	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deyrah	1,320	...	...	...	...	...	1	2	1	...	...	...	...	4	1
Umballa	3,472	...	...	...	...	1	1	...	...	...	...	...	...	2	1
Hoshiarpore	3,747	...	...	...	...	...	1	...	...	...	...	...	...	1	...
Lahore	5,132	1	...	1	5	1	1	...	...	...	...	...	...	9	1
Phillour	1,091	...	...	...	...	1	...	...	...	...	...	...	...	1	...
Wuzeerabad	3,427	...	...	...	2	1	...	...	...	...	...	...	...	3	...
Jhelum	2,439	...	...	...	1	...	...	...	...	...	...	...	...	1	...
Rawulpindee	2,377	...	...	...	...	3	...	...	...	...	...	...	...	3	1
Other Stations of the Punjab ...	33,858	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
Bengal Presidency ...	114,515	1	...	1	19	29	10	2	10	4	1	4	...	81	20

* The Monthly Returns for the Circles of the Eastern Division, with the exception of those of the Dacca Circle, are too imperfect to admit of their being tabulated.

DEATH TABLE FOR THE EUROPEAN ARMY OF THE PRESIDENCY, 1850.

STRENGTH 21,063.

PLACE OF DEATH.	Cholera Deaths of the Army in each Month.												Total Deaths of the Year.
	Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
Calcutta	...	...	...	1	2	1	1	1	...	...	...	...	6
Dinapore	...	...	...	1	...	...	...	...	...	...	...	2	3
Cawnpore	...	...	...	1	5	2	...	...	...	...	...	...	8
Umballa	...	...	...	...	...	...	...	...	1	...	...	...	1
Jullundur	...	...	...	...	1	1	...	...	...	...	...	...	2
Wuzeerabad	...	...	...	...	...	1	...	...	...	1	1	...	3
Peshawur	...	...	...	...	...	2	1	...	...	1	1	...	5
On the Ganges ...	...	...	...	...	...	...	...	...	...	1	2	1	4
Bengal Presidency ...	*	*	*	3	8	7	2	1	1	3	4	3	32

NATIVE ARMY, 1851.

STATIONS.	STRENGTH OF JULY.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
Stations of Lower Bengal ...	5,985	4	1	...	9	7	13	5	2	...	3	7	3	54	19
„ of Eastern Bengal and Assam	3,897	...	...	...	1	1	...	2	2	...	...	...	...	6	...
„ of Dinapore Circle ...	5,656	...	1	*	7	10	*	8	2	2	...	...	...	30	8
Ghazeepore	229	...	...	...	...	...	...	...	...	1	...	...	...	1	...
Benares	2,968	1	2	...	1	2	4	...	2	1	1	...	...	14	6
Chunar	299	2	...	...	...	1	3	1	3	...	...	...	...	10	2
Mirzapore	643	...	...	...	2	...	...	...	..	...	...	...	...	2	1
Goruckpore	944	...	...	...	1	...	...	...	...	...	...	...	...	1	1
Azimghur	234	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Jounpore	194	...	...	...	1	...	...	...	...	...	...	...	...	1	1
Sultanpore	940	...	...	...	...	1	...	1	...	...	...	...	...	2	1
Lucknow	2,910	...	...	1	1	5	...	6	7	2	...	...	...	22	1
Seetapore	942	...		1	...	1	...	...	...	...	...	...	...	2	...
Allahabad	2,105	1	1	...	...	...	1	4	1	...	...	...	...	8	2
Cawnpore	2,711	...	1	11	14	4	4	6	18	1	2	...	7	68	21
Futtehghur	1,064	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Banda	918	...	...	...	...	3	...	7	1	...	...	...	...	11	4
Nowgong	1,057	1	...	...	...	...	...	...	...	...	...	...	...	1	1
Jhansi	861	...	...	...	...	...	1	...	...	...	...	...	...	1	...
Erinpoorah	1,232	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kherwarrah	1,031	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beaur	666	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Muttra	508	...	...	...	...	...	1	...	...	...	...	...	...	1	...
Agra	3,118	...	...	...	...	...	...	...	1	...	...	...	...	1	1
Mynpoorie	579	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur	972	...	...	...	1	...	...	...	1	1	...	...	...	3	...
Etawah	529	...	...	...	...	...	1	...	...	...	...	...	...	1	...
Shahjehanpore	1,041	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly	2,575	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Almorah	1,015	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad	900	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Meerut	2,257	..	...	...	...	...	...	...	...	...	...	2	...	2	2
Deyrah	638	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi	3,043	...	...	...	2	2	...	...	1	...	...	...	...	5	...
Umballa	4,073	...	...	2	4	...	...	...	...	...	...	1	1	8	3
Loodianah	4,040	...	...	...	3	...	...	...	...	...	...	...	2	5	2
Jullundur	3,429	1	...	...	...	...	...	1	1	...	...	...	...	3	1
Ferozepore	3,249	...	...	1	3	...	...	...	...	...	...	...	...	4	1
Lahore	5,677	...	1	1	2	1	1	...	1	...	...	1	...	8	1
Jhelum ...	2,113	...	...	...	...	...	...	...	...	...	...	...	1	1	...
Rawulpindee	2,225	...	...	..	...	...	1	...	...	...	...	...	...	1	...
Peshawur	6,649	...	...	1	...	2	1	...	2	...	...	...	...	6	4
Kohat	2,387	...	...	...	...	...	...	...	2	...	...	...	...	2	2
Other Stations of the Punjab ...	26,313	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
On board boats on Bhurmpooter ...	...	...	...	...	...	...	...	...	...	...	...	...	16	16	16
BENGAL PRESIDENCY ...	114,816	10	7	18	52	40	31	41	47	8	6	11	30	301	101

* Monthly Return wanting.

DEATH TABLE FOR THE EUROPEAN ARMY OF THE PRESIDENCY, 1851.

STRENGTH 20,710.

PLACE OF DEATH.	CHOLERA DEATHS OF THE ARMY IN EACH MONTH.												TOTAL DEATHS OF THE YEAR.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
Calcutta	...	...	...	6	3	...	...	...	...	1	..	10	20
Dum-Dum	...	...	...	...	...	...	...	...	...	...	2	...	2
Dinapore	...	3	2	...	1	2	12	...	...	...	...	...	20
Benares	...	...	3	...	...	...	...	...	...	...	...	..	3
Cawnpore	...	...	...	...	...	...	...	5	2	..	...	...	7
Agra	...	...	..	...	...	...	...	6	2	...	...	...	8
Meerut	...	...	...	...	...	...	...	...	...	...	1	...	1
Wuzeerabad	...	...	...	...	...	...	...	...	1	...	...	...	1
Rawulpindee	...	...	...	...	...	...	...	1	...	...	...	...	1
Peshawur	...	..	...	...	...	...	2	...	...	...	1	...	3
On march in the Punjab ...	...	...	1	...	...	...	...	...	...	...	...	...	1
BENGAL PRESIDENCY ...	...	3	6	6	4	2	14	12	5	1	4	10	67

NATIVE ARMY, 1852.

STATIONS.	STRENGTH OF JULY.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS OF THE YEAR.	TOTAL DEATHS OF THE YEAR.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
Calcutta	1,253	...	...	3	2	2	...	4	2	3	2	...	2	20	6
Dum-Dum	243	...	...	1	...	1	...	...	...	...	...	...	...	2	...
Barrackpore	3,313	...	...	2	7	68	1	2	2	1	106	9	1	199	101
Berhampore	648	...	7	...	2	...	...	...	...	1	25	3	4	42	28
Midnapore	294	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Stations of Eastern Bengal ...	2,368	...	...	...	...	2	...	...	...	...	3	1	10	16	10
„ of Assam	2,305	...	...	1	...	9	2	5	5	3	5	4	7	41	9
„ of Dinapore Circle ...	5,173	...	2	*	*	3	5	1	1	...	...	...	...	12	3
„ of Benares Circle ...	10,503	...	1	2	27	3	3	1	3	...	...	...	...	40	4†
„ of Cawnpore Circle ...	9,662	...	...	2	3	4	2	2	2	1	...	1	1	18	1
WESTERN DIVISION.															
Erinpoorah	1,038	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Kherwarrah	1,031	...	...	...	...	...	...	...	..	...	...	..	...	...	...
Beaur	666	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi	854	...	1	...	...	...	...	...	...	...	1	...	...	2	2
Muttra	472	...	...	1	...	...	...	...	...	...	...	...	...	1	...
Agra	2,040	...	...	...	...	1	...	...	...	...	...	...	...	1	1
Allyghur	972	...	...	1	1	...	...	...	...	...	...	...	...	2	...
Shahjehanpore	1,024	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Bareilly	2,691	...	...	1	1	...	...	...	...	...	...	...	...	2	...
Almorah	812	...	...	...	1	1	...	1	...	...	...	...	1	4	1
Moradabad	900	...	...	...	...	4	...	1	...	...	...	...	...	5	3
Meerut	3,571	...	1	1	4	3	...	...	...	...	...	...	...	9	...
Delhi	1,931	...	...	1	1	2	2	1	...	1	1	...	...	9	...
Deyrah	564	...	...	...	...	...	...	41	16	1	...	...	...	58	33‡
Hansi	735	...	...	...	...	...	...	...	...	...	...	...	1	1	...
Umballa	3,971	1	...	...	1	1	...	2	13	13	2	...	...	33	15
Jutog	774	..	...	...	...	...	...	...	1	...	...	...	...	1	...
Phillour	1,067	..	1	...	1	...	...	...	...	...	...	...	...	2	...
Loodianah	1,588	...	2	...	1	...	...	...	1	1	...	...	...	5	1
Jullundur	3,406	...	...	1	...	...	...	...	...	...	...	...	...	1	...
Noorpore	547	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Kangra	1,225	...	...	...	...	...	...	1	...	...	...	...	...	1	...
Umritsur	1,135	...	...	1,	...	...	...	1	...	1	...	2	...	5	1
Lahore	6,829	...	...	...	1	...	...	1	...	1	1	...	...	4	2
Ferozepore	3,984	...	...	1	3	...	...	1	...	...	...	...	...	5	...
Mooltan	2,467	...	...	...	1	...	..	1	1	1	...	1	...	5	4
Rawulpindee	2,740	...	...	...	...	...	...	...	...	...	1	...	...	1	...
Peshawur	7,563	1	...	...	...	3	...	...	1	...	...	3	...	8	2
Kohat	1,964	...	...	...	...	...	...	1	...	1	3	...	...	5	3
Bharookote	900	...	...	1	1	...	...	...	2	...	4	...	...	8	...
Other Stations of the Punjab ...	21,448	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
BENGAL PRESIDENCY ...	116,671	2	15	20	58	107	15	67	50	29	154	26	27	570	230

* Monthly Return wanting.
† All in the Station of Benares.
‡ Goorkhas.

DEATH TABLE FOR THE EUROPEAN ARMY OF THE PRESIDENCY, 1852.

STRENGTH 20,865.

PLACE OF DEATH.	CHOLERA DEATHS OF THE ARMY IN EACH MONTH.												TOTAL DEATHS OF THE YEAR.
	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
Burmah*	...	...	1	39	2	2	1	...	1	10	2	29	87
Calcutta	...	...	1	8	1	...	...	...	...	...	10	...	20
Chinsurah	...	...	...	...	...	...	...	...	2	...	...	...	2
Dinapore	...	...	...	...	2	...	...	...	...	...	...	1	3
Benares	...	...	...	...	...	...	...	...	2	...	...	...	2
Chunar	...	...	...	2	...	1	...	...	...	...	...	...	3
Cawnpore	...	...	...	...	...	...	1	1	...	...	...	...	2
Kussowlie†	...	...	...	...	...	...	...	...	...	...	...	...	...
Subathoo†	...	...	...	...	...	...	...	...	...	...	...	...	...
Dugshaie†	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa	...	...	...	...	...	...	1	...	67	5	...	...	73
Ferozepore† ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meean Meer	...	...	...	...	...	...	...	...	...	1	...	...	1
Rawulpindee	...	...	...	...	...	...	...	...	1	...	...	...	1
Peshawur	...	...	...	..	1	...	1	...	...	...	1	...	3
On the Ganges ...	...	...	...	2	...	...	...	5	...	3	1	...	11
On march	1	...	...	...	...	...	...	...	...	...	1	...	2
BENGAL PRESIDENCY ...	1	...	1	12	4	1	3	6	72	9	13	1	123

* Regiments on the strength of the Army of the Bengal Presidency.
† Each of these Stations afforded one or two cholera admissions, which occurred simultaneously with the outbreak at Umballa, but no deaths.

NATIVE ARMY, 1853.

STATIONS.	Strength of July.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
Calcutta	1,236	2	2	9	2	5	1	2	...	...	...	...	...	23	13
Dum-Dum	212	...	...	2	6	...	...	..	2	...	...	...	...	10	3
Barrackpore	5,341	6	8	20	4	9	1	6	...	1	4	2	...	61	27
Berhampore	875	1	5	2	...	...	...	...	4	...	...	3	...	15	10
Midnapore	860	2	...	3	..	...	3	...	...	...	...	1	1	10	4
Stations of Eastern Bengal ...	2,275	...	...	...	3	1	1	17	2	...	1	7	4	36	10
„ of Assam	2,903	9	4	7	22	23	7	3	1	2	1	2	...	81	27
Dinapore	2,134	...	...	5	5	16	3	16	*	...	*	...	...	45	9
Other Stations of the Dinapore Circle	2,146	...	...	1	...	1	...	3	*	1	*	...	1	7	2
Goruckpore	888	...	...	...	...	...	...	*	4	...	...	...	...	4	4
Jounpore	237	...	...	...	...	...	2	*	...	...	...	...	...	2	...
Benares	2,847	...	...	2	4	8	19	*	8	...	1	...	...	42	13
Chunar	293	...	...	...	..	8	1	*	...	...	...	...	...	9	4
Mirzapore	579	...	...	1	3	5	...	*	1	...	1	...	...	11	1
Allahabad	2,076	...	...	...	...	...	...	11	8	1	...	...	...	20	7
Cawnpore	2,626	...	...	...	13	15	6	3	35	2	...	...	...	74	31
Futtehghur	877	...	...	...	...	...	...	...	1	..	...	1	...	2	2
Banda	731	...	...	...	...	...	...	...	1	..	...	...	...	1	...
Nowgong	1,080	...	...	...	...	...	...	...	1	..	...	...	...	1	...
Lucknow	3,412	...	...	4	2	...	1	*	8	1	...	...	...	16	3
Seetapore	942	...	...	1	...	...	...	*	...	...	...	...	...	1	...
Shahjehanpore	963	...	...	...	...	...	...	...	5	...	...	...	...	5	2
Other Stations of the East ...	1,402	...	...	...	...	...	...	...	..	...	...	...	...	None.	None.
Stations of Agra and Central India	9,359	...	...	..	...	...	...	...	...	...	...	...	...	None.	None.
Bareilly	1,591	...	...	1	...	...	...	...	...	...	...	...	...	1	...
Almorah	830	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad	1,088	...	...	1	...	...	...	...	...	...	...	...	...	1	...
Meerut	4,194	...	...	...	1	1	...	...	...	...	...	...	...	2	...
Delhi	3,125	...	...	2	...	...	...	1	2	1	1	1	...	8	2
Deyrah	755	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Umballa	2,160	...	...	...	...	...	3	...	3	...	...	...	...	6	1
Phillour	572	...	...	...	...	1	...	...	...	...	...	...	...	1	...
Hoshiarpore	1,666	...	..	...	...	...	...	...	...	...	...	1	...	1	1
Kangra	1,311	..	...	...	...	...	...	...	1	...	...	...	...	1	...
Jullundur	3,486	...	...	...	...	...	...	...	1	...	...	...	...	1	...
Meean Meer	6,926	...	...	...	...	2	...	...	...	...	...	...	...	2	...
Ferozepore	2,233	...	...	1	...	...	1	...	...	..	...	...	...	2	...
Mooltan	3,464	...	...	...	...	...	...	...	...	...	...	1	...	1	1
Sealcote	2,814	...	...	...	...	1	...	...	1	...	...	...	1	3	...
Jhelum	2,481	...	...	1	1	2	...	...	...	...	...	...	...	4	1
Huzara	1,374	...	...	...	4	7	...	...	...	...	1	...	...	12	1
Rawulpindee	2,850	1	...	..	...	1	1	1	...	...	...	...	...	4	...
Peshawur	6,765	1	...	...	...	2	1	...	...	...	...	1	1	6	...
Kohat	2,331	...	1	...	...	1	...	...	...	...	...	...	...	2	1
Other Stations of the Punjab ...	14,968	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
Bengal Presidency ...	113,278	22	20	63	70	109	51	63	89	9	10	20	8	534	180

* Monthly Return wanting.

DEATH TABLE FOR THE EUROPEAN ARMY OF THE PRESIDENCY, 1853.

PLACE OF DEATH.	Strength at date of the outbreak.	Cholera Deaths of the Army in each Month.												Total Deaths of the Year.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
Burmah		3	5	67	...	2	1	1	...	...	...	1	1	81
Calcutta		1	6	4	1	...	...	...	...	...	...	1	...	13
Dum-Dum		...	...	2	...	...	..	...	...	...	...	...	...	2
Dinapore ...	993	...	...	...	...	10	8	7	...	...	...	...	...	25
Benares ...	78	...	...	...	...	...	...	3	1	...	...	...	...	4
Chunar ...	182	...	...	...	...	...	1	10		...	..	...	...	11
Cawnpore ...	981	...	...	...	...	4	30	64	97	...	...	...	...	195
Meerut		...	...	...	...	...	...	...	1	...	...	...	...	1
Meean Meer		...	...	...	1	...	...	...	...	...	...	...	...	1
Peshawur		...	...	...	...	...	...	...	...	...	3	2	...	5
On the Ganges		...	...	...	...	...	...	...	...	...	...	1	2	3
Bengal Presidency	21,505	1	6	6	2	14	39	84	99	...	3	4	2	260

APPENDIX II.

TABLE SHOWING THE NUMBER OF DEATHS FROM CHOLERA IN EACH JAIL OF THE BENGAL PRESIDENCY, IN EACH YEAR FROM 1833 TO 1868.

NUMBER OF DEATHS FROM CHOLERA IN EACH JAIL OF THE BENGAL PRESIDENCY, 1833-68.

The Returns for the Punjab, Nagpore, and Oude commence from the period at which these States were annexed to the British Territory; from the independent Native States no Jail Returns are received. Many Jails have been opened for the first time in recent years, and others have been abolished; an asterisk marks the years for which there are no returns.

JAIL STATIONS.	1833.	1834.	1835.	1836.	1837.	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.
Bengal Proper and Eastern Bengal—																																				
Alipore	34	18	8	6	9	17	...	12	12	27	...	17	10	...	5	4	...	...	2	19	21	8	6	7	24	60	30	42	11	13	13	17	25	24	20	12
Baraset	...	1	...	...	3	...	...	2	...	...	1	...	1	1	...	...	...	2	...	...	10	...	...	...	1	...	...	...	1	...	1	...	3	...	...	...
Jessore	15	15	1	4	2	3	1	4	50	19	10	28	6	11	1	4	17	7	...	3	19	...	16	...	...	17	...	...	2	...	...	22	...	...	2	1
Kishnaghur	6	...	2	...	1	1	5	8	6	3	4	1	2	1	...	...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	3	1	2	...	...
Moorshedabad	18	14	5	12	11	15	5	20	27	15	12	9	17	5	4	6	17	1	3	2	9	1	...	75	...	...	...	...	1	1	1	...	...	...	...	2
Howrah	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	...	..	...	...	*	...	...	1	...	...	...	1	1	7	1	1
Hooghly	8	5	2	9	3	5	4	12	12	7	6	12	34	36	12	6	12	5	8	38	29	27	15	12	12	35	16	87	15	19	28	7	6	17	5	2
Burdwan	11	53	80	29	10	18	5	14	2	11	16	2	12	4	...	...	1	2	...	30	19	...	10	3	5	13	25	3	3	5	...	4	...	6	...	...
Bancoorah	9	...	7	...	...	...	...	1	...	5	1	...	14	2	3	...	11	1	...	17	2	1	17	...	2	1	3	11	2	...	...	16	8	3	...	2
Purulea	*	*	*	*	*	*	*	*	*	*	*	...	46	2	29	...	57	23	...	54	31	...	...	...	...	1	...	12	9	...	1	...	...	7	1	...	...
Raneegunge	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	...	...	...	...	1	...	8	...	...
Scoree	2	3	...	...	20	3	12	...	10	14	4	...	29	2	.	2	20	...	...	2	2	...	9	5	4	...	...	1	17	...	1	...	...	1	1	...
Rajmehal and Pakour ...	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3	9	1	14	4	6	2	4
Deoghur	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	...	1	1	...	1	3	1	...
Malda	3	3	1	2	10	2	6	8	1	9	4	2	14	1	...	1	1	10	10	...	3	...	2	...	...	...	...	...	...	1	1	...	...	1	...	3
Dinagepore	79	4	2	...	10	4	50	40	14	1	17	...	18	5	13	16	4	7	1	19	3	3	31	25	5	2	4	17	1	...	1	37	2	1	1	1
Rajshahye	34	8	30	6	28	45	1	1	40	2	9	6	17	...	6	...	2	18	2	15	33	...	48	3	57	28	15	4	3	5	...	18	...	1	2	37
Rungpore	...	7	...	2	3	6	33	1	1	3	3	2	2	...	...	4	...	...	22	...	...	...	1	1	...	2	9	2	1	...	...	1	...	3	...	...
Bograh	*	*	*	*	*	*	*	*	4	1	...	1	6	...	3	5	1	...	4	13	1	...	...	...	...	...	2	...	...	...	1	1	2	...	...	8
Mymensing	15	11	...	5	...	20	17	2	21	4	10	...	3	1	...	2	...	...	...	4	8	...	1	11	8	...	...	18	27	...	11	...	...	...	...	...
Pubna	*	*	*	*	*	3	1	2	7	1	3	5	3	2	3	...	...	...	1	10	1	...	4	...	...	3	...	6	3	1	...	10	3	7	...	1
Furreedpore	1	17	8	2	...	...	...	6	6	4	14	1	2	2	...	...	...	...	...	...	...	...	...	...	...	9	2	2	1	3	1	1	...	...	...	1
Backergunge	31	31	7	15	11	23	16	31	49	12	19	10	22	2	5	10	4	9	13	33	35	7	19	11	2	9	22	12	8	8	51	17	1	5	5	19
Noacolly	3	*	...	6	23	9	...	...	7	1	1	19	...	1	...	2	2	...	...	13	...	...	...	...	...	...	2	...	...	...	...	2	...	...	...	...
Chittagong	12	1	10	4	34	1	12	17	36	...	...	32	9	25	1	2	12	2	...	32	...	1	...	2	1	...	...	1	...	...	4	...	2	1	...	4
Tipperah	4	...	3	3	1	6	7	2	5	5	10	11	...	...	4	9	...	45	...	5	9	...	...	8	...	...	...	...	1	...	1	1	...	...	1	1
Dacca	18	8	2	4	1	9	4	8	10	1	11	1	23	3	...	3	4	...	...	...	3	...	10	16	3	5	6	9	6	2	1	1	...	5	...	5
Sylhet	12	33	...	3	1	1	73	3	8	9	...	17	67	...	1	2	20	46	3	4	...	9	...	24	1	1	1	...	...	27	7	...	3	4	...	...
Cherrapoonjee	...	*	*	*	*	*	*	*	*	*	1	2	...	1	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...	...	...
Cachar	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2	1	...	...	4	...	...	...	...	...	...	6	...	...	6	5	7	24	6	16	2
Stations South and West of the Hooghly—																																				
Midnapore	31	15	29	57	26	49	4	14	3	1	9	5	3	3	3	3	38	1	11	...	11	...	2	1	68	43	...	93	5	...	...	4	...	23	1	...
Balasore	4	12	...	11	4	4	...	1	24	1	1	...	1	7	...	4	...	3	...	1	5	1	2	3	...	2	1	1	...	2	...	...	...	37	1	...
Cuttack	20	4	...	12	99	11	1	34	62	9	5	1	...	...	1	...	5	...	...	...	2	...	...	...	10	9	4	4	...	1	3	3	...	113	1	1
Pooree	11	22	...	8	11	...	...	3	23	7	2	1	1	...	1	...	3	1	...	...	...	...	...	...	...	...	1	2	...	1	...	...	3	12	...	...
Assam—																																				
Gowalparah	...	11	1	...	...	2	7	9	1	...	9	1	3	28	6	1	...	...	2	...	11	...	...	4	12	...	8	43	6	5	2	2	...	3	1	...
Gowhatty	...	66	1	2	1	49	22	17	1	3	28	4	...	10	10	1	...	...	22	8	4	...	...	...	10	...	1	20	...	4	12	2	11	2	1	...
Seebsaugor	*	*	*	*	*	*	*	*	*	...	...	...	...	...	5	...	...	...	...	4	2	...	...	...	...	...	...	3	...	...	...	...	...	1	...	...
Nowgong	*	*	*	1	...	7	1	3	...	...	20	...	...	...	1	...	...	...	14	...	6	...	...	...	...	...	5	3	...	..	5	...	...	...	...	...
Tezpore	*	*	*	*	...	*	6	*	*	...	8	...	...	...	8	3	...	...	...	5	7	...	...	...	2	2	...	...	...	...	1	...	9	...	...	...
Debrooghur	*	*	*	*	*	*	*	*	*	1	1	...	...	...	1	1	...	...	...	1	1	...	...	...	...	...	...	...	10	5	7	...	...	...	2	...	1

CHOTA-NAGPORE AND BEHAR PROVINCES—																																				
Chyebassa	*	*	*	*	*	*	1	*	*	*	*	*	*	*	*	*	...	...	1	67	...	...	...	...	...	...	3	...	8	...	...	...	...	84	...	...
Ranchee	*	*	*	*	*	*	*	*	6	7	5	109	5	5	6	4	...	...	1	...	...	...	...	...	...	3	5	33	12	...	...	...	9	1	...	1
Hazareebaugh	*	*	*	1	24	1	...	1	7	5	...	5	1	...	...	...	...	...	1	14	15	...	13	10	4	4	...	30	2	...	15	...	...	76	...	...
Gyah	93	2	4	2	4	8	7	17	18	54	11	15	22	17	17	6	...	7	5	...	30	2	...	...	22	7	...	37	4	1	9	1	...	12	...	...
Patna	2	25	1	2	*	7	6	18	22	29	35	32	63	6	22	5	...	...	27	1	4	3	...	...	20	...	25	14	14	3	19	8	14	18	25	6
Deegah	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	...	60	7	*	*	11	*	*	*	13	...	1	...	15	28	26	4
Arrah	3	2	...	4	8	5	10	10	14	43	7	...	18	...	31	...	...	12	15	21	25	...	42	...	...	...	4	48	3	...	10	3	...	32	3	...
Chumparun	*	*	*	*	*	*	6	...	13	1	1	3	32	...	...	...	...	...	4	...	15	...	3	1	16	...	1	...	...	...	...	3	...	14	...	1
Mozufferpore	4	1	...	4	8	7	7	5	133	85	...	54	48	1	27	36	33	...	3	...	8	38	4	13	6	...	5	20	10	...	16	1	1	17	6	1
Chupra	1	4	1	14	32	15	2	9	9	20	...	4	6	...	3	...	...	...	...	2	40	4	1	...	16	...	11	26	7	...	13	1	24	19	1	...
Monghyr	9	4	...	2	8	2	3	31	16	23	23	5	27	...	2	14	...	...	33	4	1	15	11	54	3	...	18	19	8	14	39	...	6	6	8	...
Bhaugulpore	13	3	8	2	40	...	6	4	16	20	18	29	29	3	11	5	26	4	53	...	36	47	119	42	26	40	39	30	14	11	10	10	1	16	5	1
Purneah	23	1	18	...	*	2	20	16	3	1	27	...	43	3	4	36	...	...	2	68	2	22	1	50	...	1	60	20	...	...	81	...	23	1	43	...
Darjeeling	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	...	...	...	...	...	...	...	1	...	...	...	1	1	...	...	2	...	...	...	...
BENARES, OUDE, CAWNPORE AND BUNDELCUND—																																				
Ghazeepore	1	2	2	5	8	7	3	4	2	8	...	...	1	3	4	...	2	2	4	6	3	...	4	1	5	1	...	...	...	...	2	3	...	...	...	...
Benares	2	2	4	17	8	3	6	4	5	4	...	9	4	7	6	...	5	...	...	...	19	2	54	7	58	...	3	19	...	1	44	26	1	...	...	1
Mirzapore	...	9	...	1	12	5	9	11	9	11	...	3	8	1	3	1	1	...	...	...	3	4	6	...	5	1	1	7	11	...	4	1	...	...	...	1
Azimghur	2	...	1	...	6	7	1	...	3	1	...	...	...	1	2	...	1	...	1	...	3	5	2	3	1	...	...	1	...	1	2	1	1	...	...	...
Jounpore	7	...	...	...	2	5	3	2	14	12	...	2	4	1	9	9	1	4	10	...	12	...	1	2	3	...	...	...	...	...	5	...	...	...	...	...
Goruckpore	3	...	1	...	25	1	4	2	1	2	...	2	1	...	6	2	1	...	5	...	34	...	...	2	54	...	1	7	...	...	44	19	2	...	5	5
Gondah																										...	...	1	...	...	...	...	...	...	...	...
Baraitch																											...	...	3	1	1	...	...	...	1	...
Fyzabad																											...	3	...	...	9	19	1	...	...	...
Sultanpore																											...	2	...	...	1	18	1	...	...	...
Rae Bareilly																											...	...	...	...	6	...	1	...	...	...
Pertabghur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
Hurdui																											...	...	...	...	...	...	...	...	...	...
Luckimpore																											...	...	...	...	...	...	...	...	...	...
Lucknow																											7	4	20	...	153	...	...	...	1	...
Seetapore																											...	...	...	2	2	1	11	...	13	...
Oonao																											...	...	...	..	3	...	...	...	1	...
Bareilly	...	...	...	...	4	10	...	7	...	1	7	2	...	...	1	1	...	...	1	...	12	...	...	65	*	...	...	1	5	...	...	...	1	...	...	...
Shahjehanpore	10	2	...	...	1	7	3	1	...	...	...	1	1	...	...	...	...	...	2	...	28	...	...	29	*	...	...	...	...	...	...	...	...	...	6	...
Etah	*	*	*	*	*	*	*	*	*	*	*	*	...	*	*	*	*	*	*	*	*	*	*	*	*	...	...	...	...	...	...	...	...	...	1	...
Oraie (Jaloun)	*	*	*	*	*	*	*	*	*	*	*	*	...	*	*	*	*	...	...	...	...	...	...	...	*	...	...	...	...	...	...	...	...	...	...	...
Humeerpore	4	3	...	...	...	2	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	*	...	...	...	...	...	...	...	...	...	...	...
Banda	13	5	1	...	5	4	2	...	12	1	...	1	6	12	1	...	42	11	...	...	...	...	...	9	9	...	...	...	...	...	...	3	...	...	...	...
Futtehghur	1	5	...	...	1	21	1	...	...	...	...	1	1	...	2	...	...	...	...	...	...	...	...	36	*	...	...	...	22	...	3	...	...	1	...	...
Cawnpore	...	7	3	...	8	6	...	...	3	1	1	...	2	2	...	4	10	...	...	...	4	13	3	...	*	...	1	...	...	...	...	...	...	...	...	...
Futtehpore	7	1	...	...	...	...	...	1	2	...	...	2	8	...	...	1	*	*	*	*	1	*	5	*	*	...	...	...	...	...	...	...	...	...	...	...
Allahabad	5	...	1	...	1	16	5	9	14	16	...	3	67	1	2	11	38	...	...	...	14	4	33	19	*	1	49	8	26	1	5	28	2	...	14	2
Nagode	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	7	...	1	...	2	...	...	...	1	...	...	...
CENTRAL PROVINCES—																																				
Sumbulpore	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3	...	17	...	...	1	...	...	9	2	1	1	46	...	...	...	...
Belaspore ...																							*	*	*	...	...	...	...	...	...	3	1	...	...	...
Raepore ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	*	...	...	10	7	11	11	23	40	44	...	...
Bandhara ...																							...	1	*	...	...	11	...	...	9	...	26	2	...	...

NUMBER OF DEATHS FROM CHOLERA IN EACH JAIL OF THE BENGAL PRESIDENCY, 1833-68.

JAIL STATIONS.	1833.	1834.	1835.	1836.	1837.	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.
CENTRAL PROVINCES—*continued*—																																				
Chanda ...																							...	9	*	...	...	15	...	...	...	5	3	2	...	...
Nagpore ...																							...	18	*	...	...	15	...	...	8	9	54	2	...	2
Wurdah ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*	*	...	...	...	...	...	...	...	...	...	...	...
Sironcha ...																							*	*	*	...	...	...	...	...	...	...	...	4	...	...
Chindwarra ...																							*	*	*	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	5	...	...	...	...	1	2	...	1	1	...	...	...	1	...	..	...	12	...	...	...	...	...	4	6	...	...	3	...	...	14	6	5	...	...	2
Mundla ...	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	...	...	9	...	3	7	..	..	1	...	1
Jubbulpore ...	1	4	...	..	2	..	1	*	4	16	1	5	5	...	1	1	29	37	5	...	...	...	...	61	44	...	...	...	1	...	8	...	2	2	...	...
Dumoh ...	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	...	...	...	...	2	...	...	5	*	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	...	6	...	...	...	...	...	...	10	10	1	...	1	3	1	...	21	8	...	...	1	...	...	36	8	...	...	6	...	...	...	16	...	...	...	...
Lullutpore ...	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	...	...	...	...	*	...	...	...	1	...	...	...	...	...	...	...
Jhansi ...	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1	...	*	...	...	...	...	...	...	...	...	...	...	...
Sehore ...	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	...	*	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	3	...	...	...	...	*	*	*	*	*	...	...	6	...	...	...	38	...	...	...	1	...	...	...	3	...	...	1	...	...	2	...	3	...	..	1
Hoshungabad ...	2	...	...	...	...	1	...	...	...	1	...	...	...	3	...	...	...	3	...	...	...	15	...	...	...	...	...	1	...	...	...	...	8	...	...	...
Nimar ...	...	4	...	...	...	...	...	...	7	2	...	...	...	...	...	1	1	...	6	...	...	6	...	...	*	...	...	8	...	...	..	1	1	...	...	...
Baitool ...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2	...	...	...	2	...	1	...	1	...	2	...	...	...	...	...	...	...	...
RAJPOOTANA, AGRA, MEERUT AND ROHILCUND—																																				
Ajmere ...	...	2	...	...	...	4	...	...	...	1	5	...	...	1	...	...	...	4	...	...	...	...	...	12	...	...	1	...	3	11	...	...	...	...	...	...
Beaur ...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...
Muttra ...	*	...	...	...	...	19	1	...	...	...	5	...	...	...	...	..	...	...	1	1	...	...	...	1	*	1	...	...	1	...	...	...	...	...	2	...
Agra ...	...	5	...	1	4	71	2	1	...	1	30	5	5	...	1	3	...	...	67	...	...	1	...	232	*	...	...	175	67	12	45	...	20	1	1	...
Etawah ...	...	...	...	...	...	84	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	*	...	...	...	...	...	...	...	1	...	...	...
Mynpoorie ...	...	10	...	...	1	12	2	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	1	*	...	...	...	1	...	...	...	...	...	...	...
Allyghur ...	3	1	...	...	16	36	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*	...	...	...	...	1	...	...	...	1	...
Bolundshuhur ...	...	6	2	1	...	49	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	*	...	...	...	3	...	...	...	...	...	...	...
Budaon ...	*	*	*	*	*	*	...	...	...	1	...	...	2	1	4	...	...	...	1	1	...	...	...	10	*	...	...	...	...	...	...	...	...	*	...	...
Seharunpore ...	...	...	...	...	...	6	1	1	...	...	...	...	16	2	1	...	...	...	1	...	...	...	...	...	16	...	...	...	...	...	...	...	..	...	...
Bijnour ...	...	1	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	*	..	...	...	3	...	...	...	...	...	...
Deyrah ...	...	...	...	1	...	10	...	1	...	...	...	...	1	...	...	...	...	...	...	10	..	...	...	1	...	...	...	...	6	...	...	...	...	...	2	...
Almorah ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9	...	...	...	1	...	1	...	...	...	5	...	...	...	1	...
Mozuffernuggur ...	...	...	...	...	...	...	2	1	...	...	...	...	12	...	...	...	...	...	...	...	2	...	...	20	...	1	...	...	...	...	...	...	...	...	...
Moradabad ...	...	...	...	1	...	2	3	1	4	1	9	3	8	2	9	1	...	...	1	36	...	...	...	6	...	1	..	1	1	...	...	...	...	...	...	...
Meerut ...	...	...	...	...	4	3	...	2	2	...	2	2	5	...	...	...	...	...	1	...	...	...	...	90	...	2	...	...	335	...	...	...	...	...	...	...
PUNJAB—																																				
Goorgaon ...	...	1	...	...	...	6	...	1	...	2	...	1	...	...	...	...	...	...	...	*	*	*	*	*	*	*	...	1	3	...	...	*	*	*	*	*
Delhi ...	...	2	...	2	1	12	...	...	...	...	2	2	46	4	1	...	...	...	...	...	...	...	...	18	*	12	...	...	18	...	...	...	...	...	...	...
Rohtuck ...	...	...	...	...	...	9	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	*	...	...	...	24	...	...	...	...	...	...	...
Hissar ...	...	...	...	...	...	3	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...	9	*	...	...	...	..	2	...	...	1	...	...	...
Sirsa ...	*	*	*	*	*	*	2	...	5	1	1	...	...	...	...	...	...	...	1	...	...	...	...	1	*	...	...	...	...	1	...	...	...	...	...	...
Paniput and Kurnaul ...	...	...	1	1	1	1	...	...	...	1	...	...	1	...	...	...	...	...	...	*	*	*	*	4	*	1	1	...	...	...	...	...	...	...	..	...
Khytul ...	*	*	*	*	*	*	*	*	*	*	...	...	7	...	1	...	...	..	...	...	...	...	...	...	*	...	...	...	...	...	...	...	...	...	...	...
Thanessur ...	*	*	*	*	*	*	*	*	*	*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	-	...	5	...	...	..	...	...	...	...
Subathoo ...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa ...	...	...	...	...	...	...	...	...	...	1	...	...	7	1	...	...	...	...	...	...	...	...	...	27	5	1	...	...	18	...	...	1	...	...	1	...
Loodianah ...	*	*	*	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Jullundur ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...

Ferozepore ...	...	*	*	*	*	*	*	*	*	*	*	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...																			...	...	...	...	...	...	...	2	17	...	...	...	...	...	...	...	...	...	4	...
Lahore ...																			...	...	...	1	...	...	...	244	...	...	...	...	...	41	...	...	...	...	9	...
Lahore Female Jail...																			*	*	*	*	*	*	*	*	*	...	...	...	...	...	...	...	...	...	...	...
Hoshiarpore ...																			*	*	*	...	...	...	...	...	1	6	...	...	...	...	...	...	...	...	...	...
Sealkote ...																			*	*	...	...	...	...	...	...	...	...	...	...	...	10	...	...	1	...	...	...
Kangra ...																			1	*	*	*	*	*	*	*	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...																			*	*	*	*	*	...	...	9	8	...	...	...	...	2	...	...	...	...	7	...
Goordaspore ...																			*	*	*	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwallah ...																			*	*	...	...	...	...	...	...	...	...	...	...	...	13	...	...	...	...	4	...
Goojrat ...																			*	*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...																			*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*	*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira and Montgomery																			*	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...																			*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leia ...																			*	*	*	*	*	*	*	*	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ...																			*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan																			*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
Dera-Ismael-Khan																			*	*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...																			*	*	*	*	*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...																			*	*	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...																			*	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	9*	...
Hurreepore ...																			*	*	*	*	*	*	*	*	...	2	*	*	*	*	*	*	*	*	*	*
Peshawur ...																			*	...	...	...	...	...	...	...	...	4	...	...	1	23	...	...	...	...	5	...

* Sohan Bridge Gang.

The importance and value of this Table depends on the fact, that every individual outbreak or case occurring in the Epidemic Area is an index of the geographical distribution of an invading cholera. In looking at these deaths in their distribution by provinces, the succession of the different invading epidemics is in almost every case perfectly defined; and so true is this, that Chapter VI of the first Section may be regarded as a commentary on the facts of invasion as here exhibited. The results even for individual jails in the provincial group prove what I have in various places of this report illustrated, namely, that the epidemic history of a long series of years may be accurately read in the records of a single locality.

APPENDIX III.

TABLES SHOWING THE ADMISSIONS AND DEATHS FROM CHOLERA IN THE EUROPEAN AND NATIVE ARMIES AND AMONG THE JAIL POPULATION OF THE BENGAL PRESIDENCY, DURING THE FIFTEEN YEARS FROM 1854 TO 1868.

APPENDIX III.

TABLE OF CONTENTS.

INTERVAL PRECEDING THE EPIDEMIC OF 1855-58.

CHOLERA OF 1854.

General indications of distribution afforded by the Tables of 1854.

Except in the valley of the Nerbudda and in Western Malwa, the cholera of 1854 had nowhere the aspect of an invading epidemic. The invasion was limited to the province of the south-west monsoon proper. It is illustrated both on the case of the Native Army and of the Jail Population.

Among the Native Troops in the western division of the epidemic area, out of a strength of upwards of 85,000, four deaths only were attributed to cholera in 1854; and in three of these cases, which occurred at Peshawur, the diagnosis may be considered as doubtful. The devitalised condition of the cholera occupying the western division is shown by the fact that the four deaths recorded occurred out of a total of 56 admissions; I have noted the same phenomenon in the cholera of the same area of 1859, following the death of the epidemic of 1856-58.

In the valley of the Ganges, and throughout the eastern division, the spring cholera of April and May was generally revitalised, but the monsoon cholera is scarcely represented in either of the types.

The Death Table for the European Army has been placed in the body of the Report, at page 15. The strength for the areas occupied by cholera in 1854 is too small to be representative, and therefore the Admission Table has been omitted in the Appendix.

CHOLERA OF THE NATIVE ARMY OF 1854.

Those Stations only are noted at which cases of Cholera were returned during the Year.

Strength of Circles of Superintendence for July.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
...	Regiments marching ...	...	14	...	4	...	...	...	...	...	...	...	...	18	8
	Presidency and Barrackpore—														
7,965	Fort William	...	2	3	1	...	1	1	...	1	1	1	2	13	5
	Midnapore	1	...	2	...	...	...	1	...	...	...	...	1	5	...
	Sumbulpore	...	...	...	...	...	1	3	...	...	...	...	...	4	1
	Dum-Dum	...	...	...	...	...	1	...	...	...	...	...	...	1	...
	Barrackpore	1	2	4	...	5	2	1	...	5	2	3	7	32	10
	Berhampore	...	...	...	...	...	...	...	1	...	2	...	...	3	...
	Dacca—														
4,857	Dacca	1	2	1	...	...	...	...	...	...	...	...	...	4	2
	Sylhet	...	1	...	...	...	1	...	1	...	...	...	...	3	...
	Chittagong	...	...	2	...	1	...	...	...	...	...	1	...	4	1
	Gowhatty	...	...	...	1	...	...	...	...	...	...	...	...	1	1
	Outposts of Debrooghur ...	...	...	...	...	...	1	...	...	...	...	...	...	1	1
	Dinapore—														
4,960	Chyebassa	...	...	...	...	...	...	1	...	...	...	...	...	1	...
	Bhaugulpore	...	1	1	2	2	1	...	...	...	...	2	3	12	1
	Dinapore	...	...	9	10	18	1	1	...	...	...	...	...	39	15
	Benares—														
9,748	Ghazeepore	...	...	...	...	2	..	...	...	...	...	...	...	2	1
	Benares	1	...	1	6	42	...	1	1	...	...	...	...	52	27
	Chunar	...	1	...	...	1	...	...	...	...	...	...	...	2	...
	Mirzapore	...	...	...	...	2	...	...	1	1	1	...	...	5	...
	Lucknow	...	...	...	1	1	...	...	...	...	...	...	1	3	...
	Seetapore	...	...	1	1	...	...	...	...	...	...	...	...	2	...
	Cawnpore—														
10,800	Allahabad	...	...	1	2	3	...	...	...	...	...	1	...	7	3
	Cawnpore	2	...	1	3	6	4	4	...	...	...	...	...	20	3
	Mynpoorie	...	...	...	1	...	...	...	...	...	...	...	...	1	...
	Oraie	...	...	...	...	...	...	1	...	...	...	...	...	1	...
	Nowgong	...	...	1	1	...	...	...	...	...	...	1	...	3	...
	Gwalior—														
10,280	Bhooranpore	†	...	...	...	1	1	...	...	...	...	...	...	2	...
	Mundlaisir	...	...	...	...	...	1	...	...	...	...	...	...	1	1
	Sehore	...	...	...	...	1	2	2	...	...	...	...	...	5	2
	Sirdarpore	...	...	...	...	...	1	1	2	...	...	1	...	5	2
	Mehidpore	...	...	...	...	...	4	3	2	...	...	...	...	9	2
	Agra—														
7,652	Agra	2	...	3	7	...	...	...	...	...	...	...	...	12	1
	Meerut—														
12,302	Almorah	1	...	1	...	...	...	...	...	...	...	...	...	2	...
	Delhi	...	...	...	...	...	...	...	...	...	...	2	...	2	...
	Sirhind—														
9,686	Hansi	...	...	...	...	...	...	...	1	1	...	...	...	2	...
	Umballa	...	...	...	...	...	...	1	...	...	...	...	...	1	...
	Jutog	...	...	...	...	...	...	1	...	...	...	...	...	1	...
	Phillour	...	...	1	...	...	...	...	...	...	...	...	...	1	...
	Loodianah	...	...	...	...	...	...	1	...	...	...	...	...	1	...
	Jullundur	...	...	...	...	3	...	...	1	...	...	...	...	4	...
	Lahore—														
12,913	Mecan Meer	1	...	1	...	...	1	1	...	...	...	...	...	4	...
	Umritsur	...	...	...	...	...	1	3	...	...	1	...	...	5	...
	Sealkote—														
17,533	Sealkote	...	...	...	1	1	...	...	...	...	...	...	...	2	...
	Jhelum	...	...	...	...	1	...	...	...	...	...	...	...	1	...
	Mooltan	...	...	...	...	...	...	...	...	...	...	1	...	1	...
	Peshawur—														
18,015	Bunnoo	...	...	...	...	...	...	1	...	1	...	...	...	2	...
	Kohat	...	...	...	...	...	...	...	1	...	...	1	...	2	...
	Rawulpindee	...	...	...	...	...	2	...	...	1	...	...	...	3	...
	Peshawur	...	...	...	...	1	2	4	1	1	...	1	...	10	3
126,711	Army of the Presidency ...	10	23	33	41	91	28	32	12	11	7	15	14	317	90

* The cholera of the 50th Native Infantry, which chiefly suffered in this outbreak, had the aspect which I have described as typical for a body affected on a known date. The 19 deaths of this Regiment were from the admissions of the days noted as under, May 15th, 1; 17th, 1; 18th, 6; 20th, 4; 25th, 2; 27th, 2; 28th, 2; 29th, 1.

† Stations of the extreme south-west only affected, namely, those of Nimar, Malwa, and Bhopal—See the parallel in the case of the Jail Population.

CHOLERA OF THE JAIL POPULATION OF 1854.

JAIL STATIONS.	Average Strength during the Year.	Cholera Admissions of each Month.												Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,287	1	12	...	2	...	1	1	1	2	...	1	2	23	...	8	...
Baraset ...	259	...	...	3	...	...	...	...	...	...	...	...	...	3	...	1	...
Jessore ...	686	...	...	2	...	1	4	1	...	...	2	...	...	10	...	1	...
Kishnaghur ...	449	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moorshedabad ...	472	2	...	2	1	...	..	...	...	...	..	...	...	5	...	1	...
Howrah ...	224	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hooghly ...	494	...	...	5	58	...	...	...	...	...	...	...	12	75	...	27	...
Burdwan ...	384	...	...	2	...	...	...	...	...	...	...	...	...	2	...	...	...
Bancoorah ...	308	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
Purulea ...	186	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sooree ...	337	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Malda ...	99	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1	...
Dinagepore ...	677	...	...	...	1	...	...	1	1	...	...	...	...	3	...	3	...
Rampore Bauleah ...	700	...	...	4	...	...	...	...	...	...	...	...	...	4	...	...	...
Rungpore ...	549	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Bograh ...	105	...	...	...	...	...	...	...	...	...	1	1	...	2	...	...	...
Mymensing ...	386	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pubna ...	289	...	...	...	1	...	...	...	...	1	...	...	...	2	...	...	...
Furreedpore ...	431	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Backergunge ...	584	3	...	...	2	6	...	1	...	...	...	...	1	13	...	7	...
Noacolly ...	217	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Chittagong ...	312	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...
Tipperah ...	450	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dacca ...	806	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sylhet ...	474	2	11	3	...	...	...	...	...	...	1	...	...	17	...	9	...
Cherrapoonjee ...	54	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gowalparah ...	141	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Gowhatty ...	161	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seebsaugor ...	115	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Nowgong ...	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Tezpore ...	137	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debrooghur ...	62	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Midnapore ...	596	...	...	...	3	1	...	...	...	...	...	...	...	4	...	...	...
Balasore ...	163	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cuttack ...	237	...	...	...	...	1	...	3	...	...	...	...	...	4	...	...	...
Pooree ...	88	...	...	...	...	1	1	6	...	...	...	...	...	8	...	1	...
Sumbulpore ...	101	...	...	...	...	4	4	17	...	...	...	...	...	25	...	17	...
Chyebassa ...	430	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	220	...	1	...	...	...	1	...	1	1	...	...	...	4	...	2	...
Hazareebaugh ..	839	...	...	1	1	...	...	...	...	...	...	...	...	2	...	...	...
Monghyr ...	888	...	...	...	1	5	26	...	4	3	...	1	...	40	...	15	...
Bhaugulpore ...	430	1	1	...	1	12	50	1	1	...	10	9	...	86	...	47	...
Purneah ...	421	...	...	...	...	14	17	2	...	...	2	...	...	35	...	22	...
Darjeeling ...	46	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	16,423	9	26	23	71	45	104	34	10	8	17	12	15	374	2·22	165	10·05
Gyah ...	608	...	...	2	...	...	1	1	...	1	...	...	...	5	...	2	...
Patna ...	659	1	2	3	1	...	...	1	...	...	...	...	1	9	...	3	...
Deegah ...	316	1	2	5	3	7	5	...	...	...	...	...	...	23	...	7	...
Arrah ...	608	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Mozufferpore ...	469	...	...	...	1	87	...	1	...	...	...	...	...	89	...	38	...
Chumparun ...	278	...	...	1	2	...	...	...	1	...	...	...	...	4	...	...	...
Chupra ...	567	...	2	2	1	9	1	1	...	...	...	...	...	16	...	4	...
Ghazeepore ...	773	...	...	...	1	1	...	...	...	...	...	...	1	3	...	..	...
Benares ...	1,234	...	...	...	3	5	1	...	...	...	...	...	...	9	...	2	...
Mirzapore ...	752	...	...	1	...	5	...	...	...	...	...	...	...	6	...	4	...
Azimghur ...	1,249	1	1	...	...	7	...	...	...	...	...	...	...	9	...	5	...
Jounpore ...	811	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Goruckpore ...	1,225	...	...	1	...	...	2	2		...	...	...	...	5	...	...	...
Jails of Oude* ...	...	...	...	...	...	...	...	...	...	...	...	...	...	No	returns	No	returns
Etah ...	420	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Humeerpore ...	236	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Oraie ...	322	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	882	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Banda ...	548	...	...	...	...	...	1	...	1	...	...	...	...	2	...	...	...
Cawnpore ...	876	...	...	...	1	1	41	26	...	...	...	...	...	69	...	13	...
Futtehpore ...	425	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad ...	874	...	...	2	...	...	6	...	1	...	...	...	...	9	...	4	...
Total ...	14,132	3	7	18	14	122	58	33	3	1	...	...	2	261	1·85	82	5·80

* Oude was not annexed until 1856; the Jail Returns for this Province were furnished from 1859 after the conclusion of the war.

CHOLERA OF THE JAIL POPULATION OF 1854—*continued.*

JAIL STATIONS.	Average Strength during the Year.	Admissions from Cholera in each Month.												Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Jails of Nagpore ...	*	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore	1,461	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dumoh	320	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	..
Saugor	507	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Lullutpore	111	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	328	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee	272	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baitool	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	203	...	...	...	...	...	...	6	15	...	...	...	...	21	...	15	...
Mundlaisir	225	...	...	...	...	...	17†	...	...	...	...	...	...	17	...	6	...
Neemuch	125	...	...	...	...	...	...	...	18	...	...	...	...	18	...	5	...
TOTAL ...	3,736	...	...	1	...	...	17	6	33	...	...	...	...	57	1·52	26	6·96
Ajmere	200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beaur	128	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Muttra	71	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra	3,521	...	...	...	...	...	...	5	1	2	...	...	...	8	...	1	...
Etawah	327	...	...	...	...	...	...	1	2	...	...	...	...	3	...	1	...
Mynpoorie	468	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur	362	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	310	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	831	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly	2,063	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Budaon	442	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scharunpore ...	388	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bijnour	337	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deyrah	54	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Almorah	118	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozuffernuggur ...	260	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	643	..	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Meerut ...	521	..	...	...	...	...	...	...	..	..	...	...	...	...	...	...	...
TOTAL ...	11,044	...	...	...	...	...	...	6	3	2	...	...	...	11	·10	2	·18
Delhi	593	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goorgaon ...	266	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rhotuck ...	274	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hissar	202	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Sirsa	237	...	..	...	...	.	...	...	...	...	...	...	...	...	...	...	...
Kurnaul ...	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thunesur ...	274	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa ...	638	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Simla	52	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshiarpore ...	201	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Loodianah ...	548	1	..	...	...	...	...	...	...	...	..	...	...	1	...	1	...
Jullundur ...	353	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	360	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	837	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore	2,506	...	...	.	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	451	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...	209	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goordaspore ...	241	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	444	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojrat ...	337	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	331	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	264	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira ...	268	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	830	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferghur ...	349	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung	299	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leia	440	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan ...	331	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismail-Khan ...	226	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat	105	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	114	...	..	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Hurreepore ...	97	..	...	...	...	...	...	...	..	...	...	..	...	...	...	...	...
Rawulpindee ...	712	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Peshawur ...	494	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	14,016	1	...	...	...	...	...	...	...	1	...	...	...	2	·02	2	·14
JAILS OF THE PRESIDENCY ...	59,351	13	33	42	85	167	179	79	49	12	17	12	17	705	1·19	277	4·67

* No returns for the jails of Nagpore were received before 1855.
† At the same time two fatal cases occurred in the outgangs of the Nimar District.

EPIDEMIC OF 1855-58.

First Year, 1855.—Cholera epidemic from the east, occupying and confined to the eastern division of the epidemic area.

Second Year, 1856.—Cholera universally reproduced over the area invaded in 1855; in the south, invading the Nagpore territories in March; occupying the districts lying south of the Jumna in May; covering the western division of the epidemic area, and attaining the epidemic limit of the year in July and the first week of August, reaching Ajmere on 26th July and Meean Meer on 7th August.

Third Year, 1857.—Cholera universally reproduced over and confined to the areas covered in 1855 and 1856.

Fourth and last Year, 1858.—Cholera extinct or at a minimum throughout the eastern division of the epidemic area and in Central India: generally revitalised in Rohilcund and the Punjab within the cholera area of 1856 and 1857; and between May and November, occupying the exempted area of 1856 and 1857 in the north of the Punjab.

EPIDEMIC OF 1855-58.

CHOLERA OF 1855.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1855.

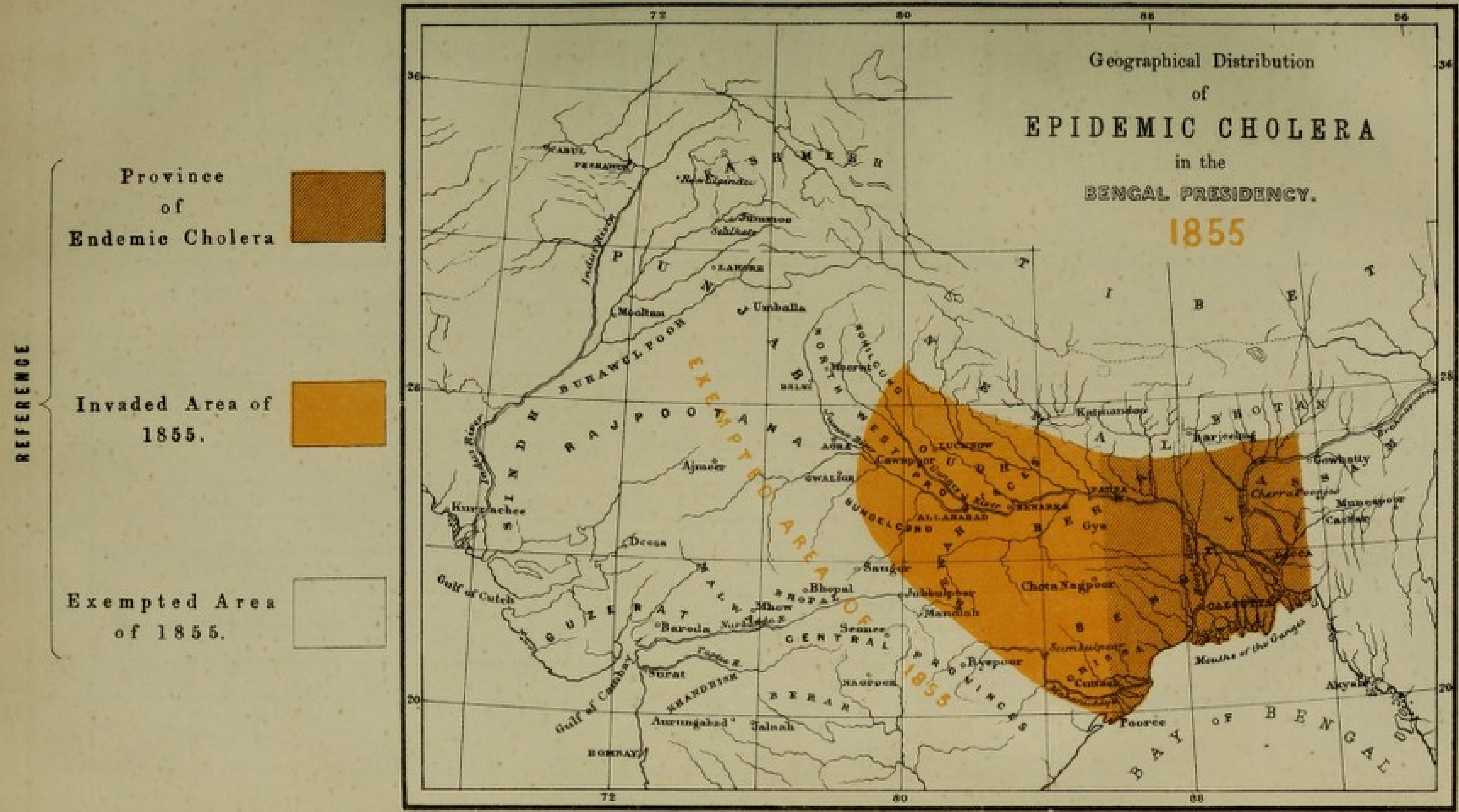
See Map of 1855.

Cholera epidemic from the east, occupied and was confined to the eastern division of the epidemic area.

Within the eastern division, the epidemic area of 1855, the strength of British Troops was too small to be representative. The Death Table of the year has been included in the body of the Report, at page 15.

In the Native Army, taken as a type, the exemption of the western division is shown by the occurrence of two fatal cases only (excluding three doubtful cases returned from Peshawur), out of a strength of 80,000. The fatal case at Moradabad in August, and at Hansi in December, may be regarded as true fore-runners of the invasion of 1856. From Cawnpore eastward to the margin of the endemic area, the invading cholera of 1855 was universal; this is thoroughly illustrated in the Tables for the Native Army and for the Jail Population.

The Table for the Jail Population exhibits the western division entirely free from cholera with the exception of a single fatal case which occurred at Jhansi. Jhansi was the western limit reached by the cholera of 1855 invading south of the Jumna; this case, therefore, affords a true indication of the extent of epidemic spread to the west in 1855.


Geographical Distribution
of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1855
REFERENCE
Province of Endemic Cholera
Invaded Area of 1855.
Exempted Area of 1855.
EXEMPTED AREA OF 1855
BAY OF BENGAL
TIBET
PUNJAB
RAJPOOTANA
CENTRAL PROVINCES
BERAR
GUZERAT
Calcutta
Lucknow
Cawnpoor
Allahabad
Benares
Patna
Gya
Chota Nagpoor
Cuttack
Pooree
Dacca
Kurrachee
Mooltan
Umballa
Ajmeer
Bhopal
Saugur
Jubbulpoor
Surat
Bombay
Gulf of Cutch
Gulf of Cambay
Mouths of the Ganges
Litho: at the Survr. Genl's Office Calcutta Septr. 1869.
H.A.D. Lawrence Lithographer.

NATIVE ARMY IN THE EPIDEMIC OF 1855-58.

CHOLERA OF 1855.

Those Stations only are noted at which cases of Cholera were returned during the Year.

Strength of Circles of Superintendence for July.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
	Regiments marching in Bengal Proper and in the Eastern Division	27	8	5	21	...	...	...	...	...	...	...	...	61	30
	Presidency and Barrackpore—														
7,619	Fort William	...	...	1	2	1	1	2	1	1	...	1	2	12	4
	Midnapore	...	...	4	2	...	2	2	...	...	1	...	...	11	3
	Cuttack	2	...	6	...	...	...	5	...	...	1	1	...	15	7
	Barrackpore	...	...	3	4	5	1	1	1	...	3	...	1	19	10
	Berhampore	...	...	...	...	...	8	...	...	...	...	...	...	8	3
	Dacca—														
4,434	Dacca	...	1	4	...	...	...	...	2	...	3	...	2	12	6
	Sylhet	2	...	...	...	1	...	...	...	...	...	...	...	3	...
	Chittagong	...	...	...	1	...	...	...	...	...	...	...	...	1	...
	Gowalparah	...	...	...	...	...	...	...	...	...	1	...	...	1	...
	Gowhatty	...	...	1	...	...	...	...	...	...	...	...	...	1	..
	Dinapore—														
4,877	Dorundah	...	...	...	...	...	...	1	...	...	...	1	...	2	1
	Hazareebaugh	...	...	...	...	...	5	1	...	...	...	...	...	6	5
	Camps in the Sonthal Districts	...	...	...	..	...	...	3	41	...	10	6	2	62	24
	Bhaugulpore	...	...	...	1	...	...	1	...	3	1	7	4	17	5
	Dinapore	...	...	...	6	50	3	...	...	...	...	...	...	59	14
	Benares—														
10,158	Benares	...	...	2	2	4	6	...	...	...	...	...	...	14	5
	Goruckpore	...	...	...	...	...	1	...	...	...	...	...	...	1	...
	Jounpore	...	...	1	...	...	1	...	...	...	...	...	...	2	...
	Sultanpore	...	...	...	...	...	...	...	1	...	...	...	1	2	...
	Lucknow	...	...	...	...	...	...	...	1	2	2	4	...	9	2
	Seetapore	...	...	...	...	...	...	...	...	2	...	...	...	2	2
	Cawnpore—														
8,987	Allahabad	...	1	1	...	...	...	1	3	1	...	1	...	8	2
	Cawnpore	...	...	...	...	2	...	1	7	7	1	1	...	19	7
	On Ganges near Cawnpore* ...	...	...	...	...	...	...	...	6	79	...	...	...	85	40
	Mynpoorie	...	...	...	...	...	...	1	...	...	...	...	...	1	1
	Banda	...	...	1	...	1	...	...	...	...	...	..	...	2	...
	Oraie	...	...	...	...	...	...	1	...	...	...	...	...	1	...
	Jhansi	...	...	...	...	...	1	...	1	...	...	...	...	2	...
	Agra—														
7,788	Agra	...	...	...	2	2	...	1	...	...	...	...	...	5	...
	Meerut—														
13,003	Moradabad	...	...	...	...	...	...	...	3	...	...	...	...	3	1
	Deyrah	...	...	...	1	...	2	...	..	...	...	...	...	3	...
	Sirhind—														
9,853	Hansi	...	...	...	...	...	...	...	...	...	...	...	1	1	1
17,017	Sealkote	...	...	...	..	...	...	...	...	...	...	...	...	None	None
13,161	Lahore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
	Peshawur—														
18,486	Peshawur	...	...	...	...	1	1	...	...	...	...	...	1	3†	3†
115,383	Army of the Presidency ...	31	10	29	42	67	32	21	67	95	23	22	14	453	176

* 8th Native Infantry in boats, attacked on the day after leaving Cawnpore.
† Probably choleroid fever.

JAIL POPULATION IN THE EPIDEMIC OF 1855-58.

CHOLERA OF 1855.

Cholera Epidemic from the East, limited to the Eastern Division of the Epidemic Area.

JAIL STATIONS.	Average Strength of Prisoners during the Year.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Strength.	Total Deaths.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,279	...	1	1	...	1	1	1	2	1	...	2	...	10	...	6	...
Baraset ...	203	...	...	1	...	...	...	...	...	..	...	...	1	2	...	1	...
Jessore ...	572	1	46	...	..	...	...	...	...	1	...	...	...	48	...	16	...
Kishnaghur ...	428	...	...	...	1	1	...	...	...	1	1	...	...	4	...	1	...
Moorshedabad ...	418	4	...	...	1	...	2	1	...	1	...	...	...	9	...	4	...
Howrah ...	192	...	...	...	..	...	...	...	...	...	...	...	...	..	...	...	...
Hooghly ...	422	10	...	...	3	2	4	...	...	1	2	...	...	22	...	15	...
Burdwan ...	422	...	...	...	1	...	...	...	...	...	19	...	...	20	...	10	...
Bancoorah ...	264	...	...	11	20	...	...	...	...	...	...	...	...	31	...	17	...
Purulea ...	190	...	...	...	3	...	...	..	...	...	...	...	...	3	...	...	...
Sooree ...	364	...	...	1	...	1	...	1	...	...	...	12	1	16	...	9	...
Malda ...	83	...	...	...	1	3	...	...	...	...	...	1	...	5	...	2	...
Dinagepore ...	795	...	...	...	...	46	2	...	...	...	...	...	...	48	...	31	...
Rampore Bauleah ...	662	1	...	...	7	28	1	10	1	...	...	37	...	85	...	48	...
Rungpore ...	437	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
Bograh ...	72	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymensing ...	420	1	...	...	..	1	..	1	...	...	...	...	...	3	...	1	...
Pubna ...	323	...	...	...	3	2	..	...	...	...	...	1	...	6	...	2	...
Furreedpore ...	275	...	...	1	...	...	...	...	...	...	...	2	...	3	...	...	...
Backergunge ...	544	...	..	...	17	1	...	...	7	...	2	16	5	48	...	19	...
Noacolly ...	254	...	...	..	...	...	...	...	...	...	...	..	...	...	...	...	...
Chittagong ...	257	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...
Tipperah ...	220	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Dacca ...	796	...	...	4	4	1	1	...	2	...	2	1	1	16	...	10	...
Sylhet ...	529	...	...	...	...	2	1	...	...	...	...	...	...	3	...	...	...
Cherrapoonjee ...	40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	37	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Gowalparah ...	185	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gowhatty ...	182	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Seebsaugor ...	112	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Nowgong ...	109	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Tezpore ...	175	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debrooghur ...	61	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Midnapore ...	598	...	...	...	...	...	...	2	.	...	...	...	...	2	...	2	...
Balasore ...	126	...	1	1	1	...	...	...	...	...	...	...	...	3	...	2	...
Cuttack ...	242	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...
Pooree ...	93	...	...	...	...	...	1	1	...	...	...	...	...	2	...	1	...
Sumbulpore ...	126	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Chyebassa ...	113	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	182	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	913	...	...	...	...	...	21	1	1	...	...	...	...	23	...	13	...
Monghyr ...	870	...	...	2	13	3	1	3	1	2	3	...	2	30	...	11	...
Bhaugulpore ...	520	...	...	1	2	1	...	1	107	45	32	10	...	199	...	119	...
Purneah ...	444	...	...	...	1	...	...	...	...	...	1	...	...	2	...	1	...
Darjeeling ...	38	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	15,587	17	49	23	78	93	35	23	121	52	62	82	11	646	4·14	341	21·88
Gyah ...	630	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patna ...	595	...	1	11	2	3	3	3	3	...	1	2	...	29	...	...	...
Arrah ...	537	...	...	1	4	2	45	45	12	6	1	2	...	118	...	42	...
Chumparun ...	269	...	...	...	...	...	...	...	...	...	...	4	...	4	...	3	...
Mozufferpore ...	†488	...	...	...	1	2	1	...	...	...	2	1	...	7	...	4	...
Chupra ...	520	..	...	1	...	...	...	...	...	...	1	...	...	2	...	1	...
Ghazeepore ...	872	...	...	...	...	...	...	...	...	...	...	...	...	(21)	...	(4)*	...
Benares ...	1,316	..	...	...	...	6	23	8	57	19	1	...	...	114	...	54	...
Mirzapore ...	716	1	...	4	2	4	8	6	3	3	...	...	1	32	...	6	...
Azimghur ..	1,648	...	...	...	...	...	...	...	...	...	...	...	...	(9)	...	(2)*	...
Jounpore ...	882	...	...	...	...	...	...	..	...	...	...	...	...	(4)	...	(1)	*
Goruckpore ...	1,181	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad ...	1,384	...	...	...	...	...	...	26	38	...	...	...	...	64	...	33	...
Futtehpore ...	417	...	...	...	...	...	...	...	4	5	...	...	...	9†	...	5	...
Cawnpore ...	674	...	...	...	...	...	...	...	50	22	.	...	...	72	...	3	...
Etah ...	420	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Humeerpore ...	157	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	186	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	970	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	584	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Total ...	14,446	1	1	17	9	17	80	88	167	55	6	9	1	485	3·36	158	10·94

* A true epidemic in October and November.
† The monthly details for the jails cannot be procured.
‡ Stated to have been cases of genuine choleraic disease; compare Etah jail on the occasion of epidemic advance from the east in July 1863.

CHOLERA OF THE JAIL POPULATION OF 1855—*continued.*

JAIL STATIONS.	Average Strength of Prisoners during the Year.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Strength.	Total Deaths.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Raipore ...	150	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chanda ...	96	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Nagpore ...	No record	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore ...	1,608	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dumoh ...	265	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	527	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	348	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lullutpore ...	134	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	119	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	...
Seonee ...	223	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baitool ...	176	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bhopawur ...	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	249	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Mundlaisir ...	190	..	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	4,269	...	...	...	...	...	...	...	...	..	...	...	1	1	·02	1	·22
Ajmere ...	205	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Beaur ...	128	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra ...	3,062	...	...	...	...	...	...	...	...	...	...	...	.	...	...	...	...
Etawah ...	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	335	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	152	...	...	...	...	...	...	..	...	...	...	...	..	...	...	..	...
Bolundshuhur ...	244	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	813	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	2,303	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Budaon ...	179	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seharunpore ...	402	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Bijnore ...	366	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Deyrah ...	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
Almorah ...	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozuffernuggur ...	263	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	595	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	570	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Muttra ...	64	..	...	...	...	..	...	...	...	...	..	...	...	...	...	...	...
TOTAL ...	10,570	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi ...	505	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goorgaon ...	251	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rhotuk ...	230	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hissar ...	188	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Sirsa ...	160	...	...	...	...		..	...	...	...	...	...		...	...	...	...
Thanesur ...	206	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Paniput ...	135	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa ...	596	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshiarpore ...	266	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Loodianah ...	253	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	345	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Ferozepore ...	439	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	799	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore ...	2,495	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	462	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...	162	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goordaspore ...	290	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwallah ...	567	..	..	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Goojrat ...	390	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	236	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	278	...	...	...	...	...	...	...	...	...	...	...	...	(1)*	...	...	...
Googaira ...	371	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	832	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferghur ...	406	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Leia ...	530	..	...	...	...	...	...	...	...	...	...	...	.	...	...	...	...
Jhung ...	506	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Dera-Ghazee-Khan...	385	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismail-Khan ...	268	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	181	...	...	...	...	...	...	.	...	...	...	...	..	...	...	..	...
Bunnoo ...	85	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Rawulpindee ...	703	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Huzara ...	111	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	446	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	14,077	...	...	...	...	...	...	...	1	...	...	...	...	2	...	...	...
BENGAL PRESIDENCY	58,849	18	50	40	87	110	115	111	289	107	68	91	13	1,134	1·92	500	8·48

* The monthly details for this Jail cannot be procured.

EPIDEMIC OF 1855-58.

CHOLERA OF 1856.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1856.

See Map of 1856.

Cholera universally reproduced over the area invaded in 1855: in the south, invading the Nagpore territories in March; occupying the districts lying south of the Jumna in May: covering the western division of the epidemic area, and attaining the epidemic limit of the year in July and the first week of August, reaching Ajmere on 26th July, and Meean Meer on 7th August.

The history of the invasion of the Western Division is accurately depicted in the statistics of the European Army, the invasion is seen to commence in the south-east in June, when the Agra District showed the presence of the epidemic; next is seen the advance of July and August, and the persistence of this cholera up to the first week of October. The absolute exemption of all stations lying to the north-west beyond the limits of the epidemic influence of the year is also to be noted.

The Table for the Native Army shows the Jhelum to have been the north-western limit reached in the invasion. The occupied areas and the exempted areas are the same shown in the case of the European Army. The universality of the epidemic of 1856 is well illustrated in the cholera statistics of the Native Army. The great loss in boat voyages on the Ganges is an indication of the extreme severity of the cholera prevailing all along the banks of the river; and throughout the entire Eastern Division the cholera of 1856 existed in equal intensity.

The Table for the Jail Population gives also a perfect picture of the invasion of the year, and is thoroughly illustrative of the history of the invading cholera from March to October. This history is capable of being read in the second page from left to right, where it begins at Nagpore in March, and ends at Dhurmsalla in the Punjab in November.


REFERENCE.
Province of Endemic Cholera
Invaded Area of 1855
Invaded Area of 1856
Exempted Area of 1856
Geographical Distribution of EPIDEMIC CHOLERA in the BENGAL PRESIDENCY. 1856
EXEMPTED AREA OF 1856
KASHMEER
PUNJAB
RAJPOOTANA
SINDH
BUHAWULPOOR
GUZERAT
CENTRAL PROVINCES
BERAR
NORTH WEST PROVINCES
OUDH
BENGAL
BEHAR
NEPAL
BHOTAN
TIBET
ASSAM
BAY OF BENGAL
Gulf of Cutch
Gulf of Cambay
Kurrachee
Mooltan
Umballa
Meerut
Ajmeer
Deesa
Baroda
Surat
Aurungabad
Jalnah
BOMBAY
Mhow
Bhopal
Saugor
Jubbulpoor
Mandlah
Seonee
Ryepoor
NAGPOOR
Cuttack
Pooree
Chota Nagpoor
Gya
PATNA
BENARES
ALLAHABAD
LUCKNOW
Cawnpoor
AGRA
GWALIOR
DELHI
LAHORE
PESHAWUR
CABUL
Rawulpindee
Jummoo
Sealkote
Katmandoo
Darjeeling
Cherra Poonjee
Gowhatty
Munneepoor
Cachar
DACCA
CALCUTTA
Mouths of the Ganges
Akyab
72
80
88
96
36
28
20

EUROPEAN ARMY IN THE EPIDEMIC OF 1855-58.

CHOLERA OF 1856.

Strength of June 1856.	Stations.	January. Ad.	January. Died.	February. Ad.	February. Died.	March. Ad.	March. Died.	April. Ad.	April. Died.	May. Ad.	May. Died.	June. Ad.	June. Died.	July. Ad.	July. Died.	August. Ad.	August. Died.	September. Ad.	September. Died.	October. Ad.	October. Died.	November. Ad.	November. Died.	December. Ad.	December. Died.	Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
1,646	Burmah and Pegu	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	1	...	1	...
...	Troops on the march	2	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	2	...
...	On board River Steamers	...	...	...	...	...	...	1	1	1	1	...	...	...	...	...	...	...	...	...	...	3	3	...	...	5	...	5	...
543	Calcutta	1	...	8	5	10	6	4	3	...	...	...	...	...	...	9	4	34	23	...	...	...	...	...	...	66	...	41	...
678	Dum-Dum	...	1	...	...	1	1	6	6	4	4	...	...	...	...	...	...	...	...	...	...	1	1	...	...	11	...	12	...
...	Chinsurah Depôt	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
918	Dinapore	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	3	...	...	...	...	...	...	6	...	3	...
73	Benares	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
905	Lucknow	...	...	...	...	...	...	...	...	...	...	35	24	31	22	...	...	...	...	...	...	...	...	...	...	66	...	46	...
479	Cawnpore	...	...	...	...	...	...	...	...	...	...	...	...	6	2	...	...	...	...	...	...	...	...	...	...	6	...	2	...
	Newly Invaded area of the Year—																												
69	Saugor	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
924	Agra	...	...	...	...	...	...	...	...	...	...	160	76	45	21	1	1	...	...	...	...	...	...	...	...	206	...	98	...
1,610	Meerut	...	...	...	...	...	...	...	...	...	...	...	...	6	3	73	40	...	...	...	...	...	...	...	...	79	...	43	...
31	Roorkee	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
807	Umballa	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	4	...	...	...	...	...	...	6	...	4	...
...	,, on the march near	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	64	44†	...	...	64	...	44	...
1,054	Jullundur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1,025	Ferozepore	...	...	...	...	...	...	...	...	...	...	...	...	...	...	165	107	35	24	...	...	...	...	...	...	200	...	131	...
80	Mooltan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	...	...	5	2	...	...	...	...	8	...	3	...
73	Umritsur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	5	1	1	...	...	...	...	9	...	6	...
1,576	Meean Meer	...	...	...	...	...	...	...	...	...	...	...	...	...	...	435	221	65	51	1	1	...	...	...	...	501	...	273	...
996*	Wuzeerabad	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1,095*	Sealkote	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
918*	Rawulpindee	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2,590*	Peshawur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hill Stations and Hill Depôts—																												
419	Dugshaie	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
834	Subathoo	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
901	Kussowlie	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
84	Darjeeling Depôt	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
64	Landour Depôt	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
108	Murree Depôt	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20,500	Bengal Presidency	3	2	8	5	12	8	11	10	5	5	195	100	88	48	686	374	154	110	8	5	68	48	...	...	1,238	6·04	715	34·88

* Stations lying to the north and north-west beyond the epidemic influence of the year; the Jullundur Doab was also an exempted area. The exemption of the hill stations and depôts is also to be noted.
† H. M.'s 32nd Regiment was struck on the 31st October, the day on which the Regiment descended into the plains from Kussowlie, its station for the year.

NATIVE ARMY IN THE EPIDEMIC OF 1855-58.

CHOLERA OF 1856.

Strength of July 1856.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
	Bengal Proper and Assam—														
1,725	Calcutta	...	2	11	6	5	2	3	...	2	3	...	1	35	14
751	Midnapore	...	...	2	...	...	...	...	...	...	...	...	2	4	None.
876	Cuttack	1	...	1	...	...	...	..	...	1	...	...	...	3	2
198	Dum-Dum	...	...	3	1	..	...	...	1	1	...	2	...	8	1
3,038	Barrackpore	...	4	5	...	5	.	...	1	...	7	...	...	22	6
1,281	Berhampore	...	1	7	...	...	...	...	...	...	...	3	...	11	3
535	Jamalpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
232	Dacca	...	...	2	...	...	...	1	...	1	...	1	1	6	3
285	Chittagong	...	...	...	1	...	...	...	...	...	...	...	...	1	None.
197	Sylhet	1	...	1	1	...	...	...	1	...	...	...	...	4	4
227	Cachar	...	.	...	2	1	...	...	...	...	...	...	...	3	3
341	Cherrapoonjee	...	...	...	2	...	...	...	2	1	...	...	...	5	4
186	Gowalparah	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
546	Gowhatty	...	...	...	3	1	...	...	...	...	...	...	...	4	None.
75	Nowgong	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
181	Tezpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1,014	Debrooghur	...	...	...	...	1	...	...	...	...	...	...	...	1	1
	Behar, Benares, Oude and Cawnpore—														
	Camps in the Sonthal Districts	3	1	8	20	3	...	1	...	1	...	2	...	39	19
	Dorundah	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
6,192	Hazarcebaugh	...	...	1	1	..	...	...	...	...	...	...	...	2	1
	Bhaugulpore	...	...	2	3	3	...	...	..	...	...	...	...	8	2
	Dinapore	...	...	1	1	...	..	...	1	...	4	...	...	7	3
	Segowlie	...	...	...	...	...	1	2	2	...	...	...	...	5	1
3,173	Benares	...	...	...	11	5	...	4	1	...	...	...	...	21	11
173	Chunar	...	...	...	5	5	2	...	...	...	...	...	...	12	2
233	Azimghur	...	...	...	...	1	...	...	...	...	...	...	...	1	1
831	Goruckpore	...	...	...	1	...	...	...	...	...	2	...	...	3	None.
232	Jounpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
10,443	Oude Field Force... ...	1	...	6	10	20	5	...	1	1	...	4	...	48	14
	Lucknow														
634	Mirzapore	...	..	...	..	...	...	...	...	...	...	...	1	1	1
2,025	Allahabad	...	...	1	2	4	3	2	...	...	...	...	...	12	6
4,560	Cawnpore	...	...	2	5	11	3	9	7	1	1	...	...	39	17
1,137	Futtehghur	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
	Banda	...	...	...	...	...	...	.	3	...	...	...	...	3	1
1,107	Nowgong	...	...	...	...	...	...	...	1	2	...	...	...	3	2
90	Oraie	...	...	1	2	1	3	...	...	...	...	...	...	7	3
1,085	Jhansi	...	...	...	...	...	...	...	3	...	...	...	...	3	3
	Central India, Agra, Meerut, and Rohilcund—														
...	Ajmere*	...	...	...	...	...	...	...	...	...	...	...	...	...*	...*
3,560	Gwalior†	...	...	...	...	...	...	21	...	...	...	...	...	21†	4†
2,897	Agra	...	...	1	1	1	38	53	...	...	...	...	...	94	34
1,360	Hansi	..	...	...	...	1	...	...	1	2	...	...	...	4	2
3,012	Delhi	...	...	1	1	...	...	...	4	...	...	...	...	6	4
...	Allyghur	...	...	...	1	12	2	...	...	...	...	...	...	15	6
2,598	Meerut	...	...	...	...	1	...	9	8	3	...	...	...	21	11
963	Moradabad	...	...	1	3	...	...	...	8	...	...	...	...	12	2
1,033	Shahjehanpore	...	...	...	2	...	...	...	...	...	...	...	...	2	None.
2,616	Bareilly	...	...	...	1	...	...	6	...	1	...	...	...	8	4
837	Almorah	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
587	Roorkee	...	...	...	...	..	...	...	1	...	...	...	...	1	None.
755	Deyrah	...	...	...	...	...	...	...	32	...	...	...	...	32‡	23‡
	Punjab—														
2,985	Umballa	...	...	...	...	...	...	...	...	...	...	1	...	1	None.
762	Jutog	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
731	Phillour	...	..	...	...	...	1	...	...	...		...	...	1	None.
2,247	Jullundur	...	...	.	...	...	1	...	...	...	...	...	...	1	None.
1,223	Hoshiarpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
295	Loodianah	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
448	Goordaspore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
430	Noorpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1,874	Sealkote	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
357	Wuzeerabad	...	...		1	...	...	...	1	...	...	...	...	2	1
509	Kangra	...	...	...	1	...	...	...	...	...	...	...	...	1	1
910	On march from Dhurmsala§ ...	...	...	...	...	...	...	...	...	...	...	55	...	55	32
2,017	Umritsur	...	...	...	...	...	...	1	...	2	...	...	...	3	1
	Carried over ...	6	8	57	88	81	61	112	79	19	17	68	5	601	253

* Records wanting. Cholera appeared at Ajmere on 26th July.
† The Records of the Office of the Superintending Surgeon of the Gwalior Circle were destroyed in 1857. The Monthly Return for July 1856 is the latest available for reference.
‡ Kumaon Goorkha Battalion.
§ Cholera prevailed at Dhurmsalla when the Regiment (2nd Sikhs) marched.

CHOLERA OF THE NATIVE ARMY OF 1856—*continued.*

Strength of July 1856.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
	Brought forward ...	6	8	57	88	81	61	112	79	19	17	68	5	601	253
3,024	Meean Meer	...	...	...	...	...	1	..	51	53	...	...	...	105	42
1,459	Jhelum	...	...	...	...	...	...	...	2	9	...	1	...	12	8
2,120	Ferozepore	...	...	...	...	...	...	...	11	26	...	...	...	37	17
3,239	Mooltan	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1,146	Asnee	...	...	...	...	...	...	...	1	...	...	...	...	1	None.
1,577	Dera-Ghazee-Khan ...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
2,532	Dera-Ismail-Khan ...	...	...	...	...	...	...	...	...		...	...	...	None.	None.
119	Shahpore	...	...	...	...	...	..	...	...	...	...	...	..	None.	None.
3,770	Rawulpindee	...	...	...	...	...	...	2	...	...	...	1	...	3	None.
	On march in Rawulpindee District*	...	...	...	...	...	...	...	...	...	14	...	...	14	9
1,823	Hazara	...	.	...	...	...	...	...	...	...	...	1	...	1	None.
720	Nowshera	...	...	...	1	1	...	...	...	...	...	...	...	2	None.
876	Murdan	...	...	...	...	...	...	...	...	1	...	...	...	1	None.
7,632	Peshawur and outposts ...	...	...	...	1	...	4	1	1	...	1	...	1	9	4
3,268	Kohat	...	...	...	...	1	...	...	...	...	...	...	...	1	None.
2,088	Bunnoo	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
	Regiments on march and in boats in Bengal and Behar—														
	19th N. I. G. T. Road marching above Raneegunge ...	...	...	...	46	...	...	...	...	...	...	...	...	46	30
	In Boats—														
	32nd N. I. near Dinapore ...	...	...	...	...	...	...	...	...	...	...	130	...	130	75
	34th N. I. below Cawnpore ...	...	...	...	70	...	...	...	...	...	...	...	..	70	30
	34th N. I. below Dinapore ...	...	...	...	...	...	...	...	...	...	...	52	...	52	33
	73rd N. I. below Dinapore ...	...	...	...		...	...	...	...	...	...	50	9	59	37
	43rd N. I. on Matabanga ...	64	...	...	...	...	...	...	...	...	...	...	...	64	30
	70th N. I. on the Ganges ...	...	...	...	...	...	...	...	...	...	...	...	15	15	10
... 114,002 ...	Army of the Presidency ...	70	8	57	206	83	66	115	145	108	32	303	30	1,223	578

* (1st Sikhs)

JAIL POPULATION IN THE EPIDEMIC OF 1855-58.

CHOLERA OF 1856.

JAIL STATIONS.	Average Strength of Prisoners during the Year.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Strength.	Total Deaths.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,552	2	4	7	...	...	...	...	...	1	...	5	1	20	...	7	...
Baraset ...	205	...	...	...	...	...	...	...	...	...	3	2	2	7	...	...	...
Jessore ...	552	...	...	...	3	...	...	...	...	...	...	...	...	3	...	1	...
Kishnaghur ...	427	...	...	1	...	...	1	...	...	...	...	...	...	2	...	...	...
Moorshedabad ...	211	...	19	107	...	2	...	...	...	...	...	1	...	129	...	75	...
Hooghly ...	537	...	1	...	...	2	2	...	4	10	...	...	3	22	...	13	...
Burdwan	473	...	...	...	...	...	...	...	...	1	...	...	3	4	...	3	...
Bancoorah ...	316	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Purulea ...	183	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sooree ...	346	1	2	1	1	1	1	1	1	...	...	1	7	17	...	5	...
Malda ...	75	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dinagepore ...	922	...	...	...	...	...	...	...	...	...	...	42	1	43	...	25	...
Rampore Bauleah ...	716	...	1	4	...	...	...	...	1	...	1	1	...	8	...	3	...
Rungpore ...	394	1	...	2	2	...	...	...	...	...	...	1	2	8	...	2	...
Bograh ...	112	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymensing ...	515	...	...	...	2	1	...	...	...	...	...	...	1	4	...	4	...
Pubna ...	167	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Furreedpore ...	266	...	...	1	1	...	...	...	...	1	...	1	...	4	...	1	...
Backergunge ...	397	2	...	...	6	8	3	1	...	...	14	4	2	40	...	17	...
Noacolly ...	194	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittagong ...	239	1	...	...	2	1	2	...	...	...	...	...	...	6	...	4	...
Tipperah ...	409	...	...	17	7	...	...	...	...	...	...	...	...	24	...	8	...
Dacca ...	682	...	...	9	9	...	1	3	1	...	3	9	...	35	...	16	...
Sylhet ...	572	...	...	7	2	1	...	...	...	15	24	...	1	50	...	26	...
Cherrapoonjee ...	37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	35	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Gowalparah ...	170	...	...	...	...	1	...	...	1	...	...	...	5	7	...	6	...
Gowhatty ...	165	...	...	...	3	...	...	...	...	...	...	...	...	3	...	...	...
Seebsaugor ...	123	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	110	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tezpore ...	153	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Debrooghur ...	61	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Midnapore ...	624	...	...		...	...	...	...	...	...	1	...	...	1	...	1	...
Balasore ...	116	1	...	2	...	...	...	...	...	...	...	...	...	3	...	3	...
Cuttack ...	261	...	...	1	...	...	1	...	...		...	...	...	2	...	...	...
Pooree ...	98	...	...	...	...		...	...	...	...	...	1	...	1	...	...	...
Sumbulpore ...	155	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chyebassa ...	140	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	203	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	934	...	...	1	17	4	...	...	...	...	...	...	...	22	...	10	...
Monghyr ...	660	...	1	35	89	...	1	10	1	1	...	2	2	142	...	56	...
Bhaugulpore ...	434	...	...	4	38	...	...	1	1	...	...	16	...	60	...	38	...
Purneah ...	412	...	...	3	73	1	...	...	...	...	...	...	...	77	...	50	...
Darjeeling ...	36	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
TOTAL ...	15,389	9	28	202	256	24	12	16	10	30	46	86	30	749	4·87	375	24·37
Gyah ...	809	...	...	2	2	1	6	9	1	2	...	...	...	23	...	8	...
Patna ...	644	...	1	8	16	1	...	...	1	1	1	2	...	31	...	5	...
Arrah ...	399	...	...	...	1	...	...	1	...	...	...	1	...	3	...	...	...
Chumparun ...	205	...	...	...	...	...	...	1	1	...	...	2	...	4	...	3	...
Mozufferpore ...	500	...	3	4	1	1	8	3	...	15	9	...	...	44	...	13	...
Chupra ...	373	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ghazeepore ...	771	...	1	1	2	2	...	1	...	...	...	...	...	7	...	1	...
Benares ...	1,003	...	...	4	4	10	1	...	...	...	...	...	...	19	...	7	...
Mirzapore ...	639	...	...	...	...	42	...	...	...	...	...	...	...	42	...	17	...
Azimghur ...	1,012	...	...	2	...	...	1	...	...	...	...	1	2	6	...	3	...
Jounpore ...	436	...	...	...	...	...	...	...	...	4	...	...	...	4	...	2	...
Goruckpore ...	1,125	...	1	2	5	1	...	...	...	...	...	...	...	9	...	3	...
Jails of Oude ...	No Records.	...	...	...	...	...	...	...	...	...	...	...	...	No Records		No Records	
Etah ...	362	...	1	...	...	...	...	8	20	1	...	...	...	30	...	14	...
Humeerpore ...	158	...	...	...	...	...	3	...	...	...	...	...	...	3	...	1	...
Oraie ...	154	...	...	...	...	...	...	4	...	...	...	...	...	4	...	1	...
Futtehghur ...	949	...	...	1	...	...	56	3	...	...	...	...	...	60	...	36	...
Cawnpore ...	546	...	...	...	...	1	...	2	...	...	...	...	...	3	...	2	...
Banda ...	709	...	...	...	...	...	17	4	...	...	...	...	...	21	...	8	...
Futtehpore ...	419	...	...	1	...	...	...	4	...	...	...	...	...	5	...	...	...
Allahabad ...	2,039	...	...	...	1	29	...	...	...	...	...	...	...	30	...	19	...
TOTAL ...	13,252	...	7	25	32	88	92	40	23	23	10	6	2	348	2·63	143	10·79
Raepore ...	170	...	...	...	...	...	...	14	...	...	...	...	...	14	...	2	...
Bandhara ...	...	...	...	...	...	5	...	...	...	...	...	...	...	5	...	1	...
Chanda ...	124	...	...	...	...	...	12	9	2	...	...	...	...	23	...	9	...
Nagpore ...	570	...	...	24	6	13	...	2	2	...	...	...	...	47	...	18	...
Jubbulpore ...	1,733	...	...	1	...	...	51	49	...	...	...	...	...	101	...	61	...
Carried over ...	2,597	...	...	25	6	18	63	74	4	...	...	...	...	190	...	91	...

CHOLERA OF THE JAIL POPULATION OF 1856 —*continued.*

JAIL STATIONS.	Average Strength of Prisoners during the Year.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Strength.	Total Deaths.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Brought forward ...	2,597	...	...	25	6	18	63	74	4	...	...	...	...	190	...	91	...
Dumoh ...	353	...	...	...	...	...	...	...	6	1	...	...	...	7	...	5	...
Saugor ...	770	...	...	...	...	...	...	...	...	29	32	...	...	61	...	36	...
Nursingpore ...	387	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lullutpore ...	No Return.																
Jhansi ...	166	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	245	...	...	...	...	...	5	2	...	...	...	...	...	7	...	4	...
Baitool ...	152	...	...	...	...	...	...	...	2	...	...	...	...	2	...	1	...
Hoshungabad ...	273	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundlaisir ...	No Return.																
Ajmere ...	182	...	...	...	...	...	...	...	20	2	...	...	...	22	...	12	...
Beaur ...	134	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Neemuch ...	137	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
TOTAL ...	5,396	...	...	25	6	18	68	76	32	32	32	...	...	289	5·36	149	27·61
Agra ...	3,632	...	1	2	...	3	442	132	...	...	...	2	...	582	...	234	...
Etawah ...	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	411	...	...	...	...	...	...	2	...	...	...	...	...	2	...	1	...
Allyghur ...	179	...	...	...	...	...	3	3	...	...	...	...	...	6	...	...	...
Bolundshuhur ...	112	...	...	...	...	...	..	...	...	1	1	...	...	2	...	1	...
Shahjehanpore ...	770	...	...	...	...	1	102	19	...	...	1	...	...	123	...	29	...
Bareilly ...	2,244	...	...	...	1	1	...	131	...	...	...	11	...	144	...	65	...
Budaon ...	185	..	...	...	...	...	...	21	14	...	...	...	...	35	...	10	...
Seharunpore ...	264	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Bijnour ...	333	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Deyrah ...	39	...	...	...	...	...	...	...	1	...	1	...	...	2	...	1	...
Almorah ...	114	...	...	...	...	...	...	...	3	...	...	...	...	3	...	1	...
Muzuffernuggur ...	226	...	...	...	...	...	...	...	16	12	...	...	...	28	...	20	...
Moradabad ...	603	...	...	...	...	...	...	3	11	...	...	...	...	14	...	6	...
Meerut ...	941	...	...	...	...	...	...	72	75	...	...	1	...	148	...	90	...
Muttra ...	93	...	...	...	...	...	...	1	1	...	...	...	...	2	...	1	...
TOTAL ...	10,250	...	1	2	1	5	547	384	122	13	3	14	...	1,092	10·66	459	44·78
Delhi ...	502	...	...	...	...	...	...	33	6	...	...	...	...	39	...	18	...
Goorgaon ...	275	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rhotuk ...	308	...	...	2	...	...	...	1	5	2	2	...	...	12	...	2	...
Hissar ...	233	...	...	1	1	...	...	...	25	...	...	...	...	27	...	9	...
Sirsa ...	168	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Thanesur ...	324	...	...	...	...	...	2	...	...	...	...	...	...	2	...	1	...
Kurnaul ...	154	...	...	...	...	...	...	3	4	1	2	...	...	10	...	4	...
Umballa ...	470	...	...	...	...	...	...	...	...	...	29	16	...	45	...	27	...
Hoshiarpore ...	432	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Loodianah ...	275	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Jullundur ...	367	...	...	...	...	1	..	...	...	...	...	...	...	1	...	...	...
Ferozepore ...	495	...	...	...	...	...	...	...	...	8	...	...	...	8	...	2	...
Umritsur ...	787	...	...	...	...	...	...	...	...	3	3	...	...	6	...	2	...
Lahore ...	2,454	...	...	...	...	...	...	1	302	181	...	...	...	484	...	244	...
Sealkote ...	401	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsalla ...	155	...	...	...	...	...	...	...	1	...	16	8	...	25	...	9	...
Goordaspore ...	445	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
Goojranwalla ...	485	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojrat ...	268	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	273	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	267	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Googaira ...	467	...	...	...	...	...	...	...	...	2	...	...	...	2	...	1	...
Mooltan ...	710	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferghur ...	357	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leia ...	518	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ...	532	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan ...	381	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismail-Khan ...	251	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	129	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	74	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	649	...	...	...	...	1	...	...	1	...	...	...	...	2	...	1	...
Hazara ...	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	395	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	14,134	...	...	3	1	2	3	38	344	199	52	24	...	666	4·71	322	22·78
BENGAL PRESIDENCY	58,421	9	36	257	296	137	722	554	531	297	143	130	32	3,144	5·38	1,448	24·78

EPIDEMIC OF 1855-58.

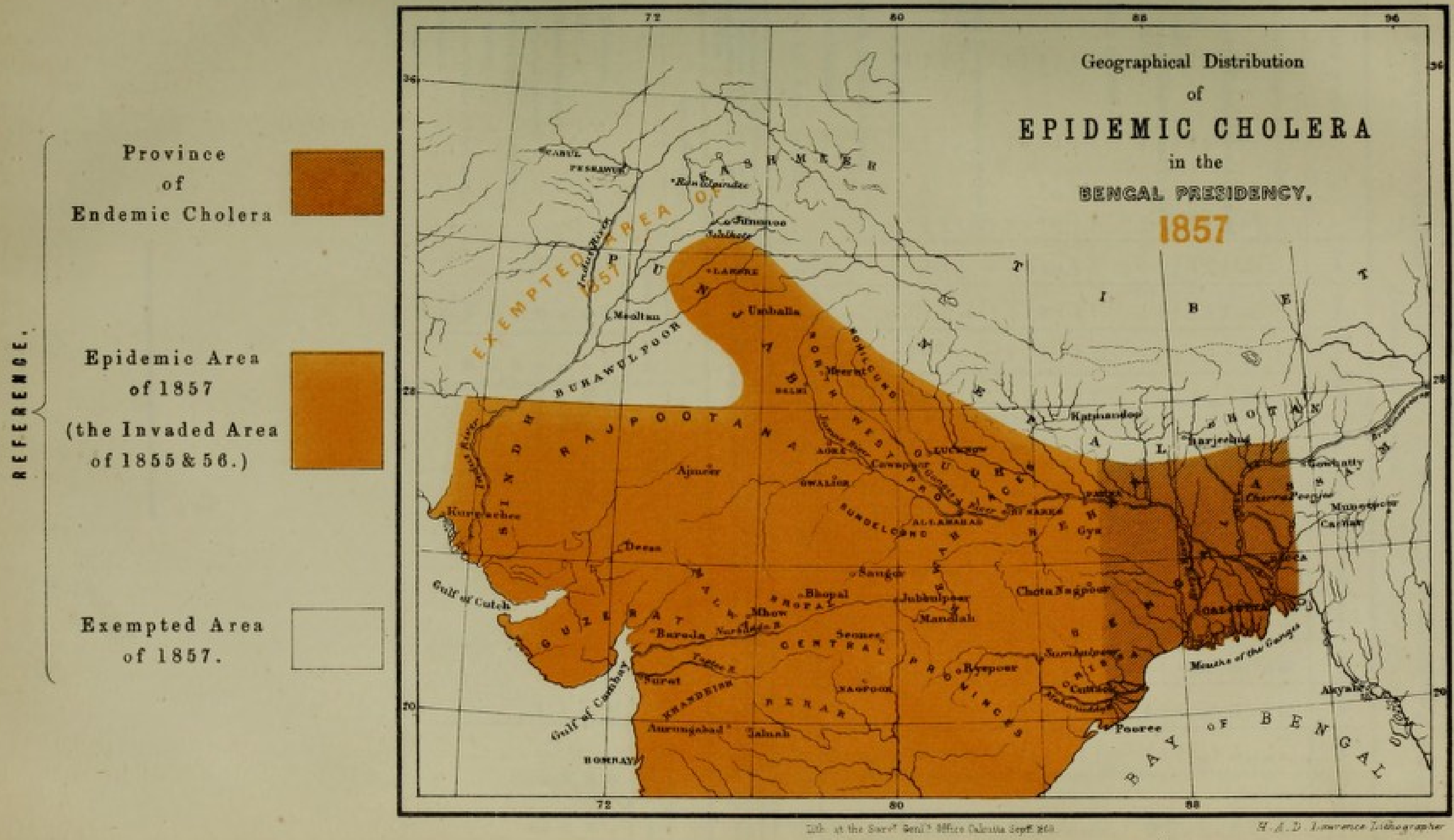
CHOLERA OF 1857.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1857.

See Map of 1857.

Cholera universally reproduced over and confined to the areas covered in 1855 and 1856.

The exempted area of the year was the exempted area of 1856, namely, the north of the Punjab lying beyond the Jhelum. From this north-western limit to Nagpore in the south the epidemic prevailed in every district; and from Nagpore westward to Bombay cholera still occupied the epidemic highway. The great sufferings of the Armies in the field both in the western and eastern divisions show the continued vitality and the great power of the invading epidemic of 1855-56. Even up to the margin of the endemic basin its epidemic vigour was maintained, and few of the many detachments marching towards the north-west along the Grand Trunk Road leading out of Bengal Proper escaped an attack of cholera.


Geographical Distribution
of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1857
REFERENCE.
Province of Endemic Cholera
Epidemic Area of 1857 (the Invaded Area of 1855 & 56.)
Exempted Area of 1857.
EXEMPTED AREA OF 1857
RAJPOOTANA
CENTRAL PROVINCES
BAY OF BENGAL
Gulf of Cutch
Gulf of Cambay
Mouths of the Ganges
CALCUTTA
Lith. at the Surv. Genl's Office Calcutta Sept. 1868.
H. A. D. Lawrence Lithographer

EUROPEAN ARMY IN THE EPIDEMIC OF 1855-58.

CHOLERA DEATHS OF 1857.

This Table is constructed from the Death Rolls of the year; the materials for the construction of a Table of Admissions do not exist.

PLACE OF DEATH.	JAN.	FEB.	MAR.	APRIL.	MAY.	JUNE.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL DEATHS OF THE YEAR.
Fort William, and Hospitals in Calcutta ...	...	...	...	1	1	31	2	5	1	9	16	7	73
Dum-Dum	...	...	...	1	...	1	...	...	...	4	...	1	7
Chinsurah	1	1	1	21	...	1	3	...	...	...	...	1	29
Raneegunge, and G. T. Road below Allahabad	...	...	...	...	...	11	8	...	...	6	11	7	43
Dinapore	...	...	...	2	...	...	...	2	...	..	...	...	4
Benares Depôt	...	...	...	...	...	4	1	26	...	4	3	2	40
Allahabad Depôt	...	...	...	...	...	...	2	3	...	1	...	...	6
Camps in Cawnpore District, and in Oude*	...	...		...	...	...	14	37	3	...	...	...	54*
Lucknow Residency	...	...	...	...	...	14	18	9	4	...	...	...	45
AREA INVADED IN 1856—													
Mhow	...	...	1	...	...	...	...	...	...	...	...	...	1
Saugor	...	...	...	...	...	...	3	...	...	...	...	...	3
Agra	..	...	..	...	...	2	1	2	...	...	...	...	5
Meerut	...	...	...	...	...	...	...	1	6	...	...	...	7
Roorkee	...	...	...	2	...	...	...	..	...	...	...	...	2
Dugshaie	...	...	...	..	6	6	...	...	...	...	...	...	12
Subathoo	...	...	...	2	...	...	...	...	...	...	...	...	2
Umballa, and Troops marching to join the Delhi Field Force	...	1	...	...	62	22	...	1	1	...	...	...	87
Camp before Delhi	..	...	...	...	...	49	133	54	119	19	...	...	374
Lahore	...	...	...	...	...	...	...	...	1	...	...	...	1
Umritsur	...	...	...	...	...	...	...	26	...	1	...	...	27
Stations north-west of Lahore ...	...	...	...	...	...	...	...	...	...	...	...	...	None.
In the field with detached columns ...	...	...	...	...	...	...	...	2	...	3	...	1	6
On board River Steamers	...	...	...	...	...	...	...	6	...	...	...	...	6
LOSS OF THE ARMY IN 1857 ...	1	2	2	29	69	141	185	174	135	47	30	19	834

* The loss here shown in the Cawnpore District is that of a portion of the force only. The records of the Madras and Bombay Presidencies give further details for the Regiments which they furnished to Bengal on the emergency. In June 1857, the Madras Fusiliers lost at Allahabad 52 men, and 40 men in the Cawnpore District between the 25th July and 3rd August. The 64th and 78th Regiments, furnished by the Bombay Presidency, give the following as their loss from cholera in 1857:—

64TH REGIMENT.				78TH REGIMENT.			
		ADMITTED.	DIED.			ADMITTED.	DIED.
June ...	Berhampore	28	19	June ...	Station not mentioned	13	4
„ ...	Gya	8	4	July ...	Ditto ditto	22	17
„ ...	Steamer *Berhampooter*	5	2	August ...	Cawnpore	21	16
July ...	Station not mentioned	38	8	September ...	Lucknow	6	2
„ ...	Various Stations of Upper India... ...	87	38				
August ...	Cawnpore	43	7				
„ ...	Various Stations of Upper India... ...	120	42				
September ...	Cawnpore	14	6				
October ...	Cawnpore...	1	...				

JAIL POPULATION IN THE EPIDEMIC OF 1855-58.

CHOLERA OF 1857.

From June 1857 Civil authority was in abeyance in the North-Western Provinces and in Central India; consequently the Jail Population is not represented for the last six months of the year in these Provinces.

JAIL STATIONS.	Average Strength of Prisoners during the Year.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Strength.	Total Deaths.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,674	1	...	17	12	1	2	5	...	...	1	2	1	42	...	24	...
Baraset ...	178	...	...	...	4	...	...	...	...	...	...	...	...	4	...	1	...
Jessore ...	550	...	1	3	6	...	...	...	...	...	...	...	...	10	...	2	...
Kishnaghur ...	418	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moorshedabad ...	135	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Howrah ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hooghly ...	674	...	2	2	5	9	...	13	1	2	...	...	...	34	...	12	...
Burdwan ...	497	...	...	...	...	...	...	9	...	...	...	...	...	9	...	5	...
Bancoorah ...	357	...	...	6	2	1	...	...	...	...	...	...	...	9	...	2	...
Purulea ...	254	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Soorce ...	357	...	...	...	...	...	4	5	...	1	...	1	4	15	...	4	...
Malda ...	57	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Dinagepore ...	908	...	...	...	1	1	4	...	1	1	...	...	...	8	...	5	...
Rampore Bauleah ...	515	...	...	2	95	12	...	...	...	...	...	...	...	109	...	57	...
Rungpore ...	395	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...
Bograh ...	89	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymensing ...	584	...	...	1	2	5	5	...	...	1	1	...	...	15	...	8	...
Pubna ...	167	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Furreedpore ...	354	...	...	1	...	...	...	...	1	...	1	2	...	5	...	...	...
Backergunge ...	461	1	1	...	5	...	...	...	...	...	...	7	1	15	...	2	...
Noacolly ...	241	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittagong ...	192	...	...	...	2	...	...	...	...	...	...	...	...	2	...	1	...
Tipperah ...	457	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dacca ...	721	...	...	1	2	...	1	1	...	...	...	1	...	6	...	3	...
Sylhet ...	582	...	...	...	1	...	...	...	...	...	...	...	1	2	...	1	...
Cherrapoonjee ...	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gowalparah ...	132	19	...	3	...	...	...	..	...	...	...	1	...	23	...	12	...
Gowhatty ...	156	...	...	16	...	...	1	...	...	...	...	...	...	17	...	10	...
Seebsaugor ...	119	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tezpore ...	119	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debrooghur ...	50	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Midnapore ...	708	...	...	4	5	1	103	4	...	...	...	...	...	117	...	68	..
Balasore ...	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cuttack ...	304	...	2	...	1	...	1	8	1	...	1	...	...	14	...	10	...
Poorce ...	88	...	...	1	7	...	...	4	...	...	...	...	...	12	...	6	...
Sumbulpore ...	68	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Chyebassa ...	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazarcebaugh ...	...	...	...	...	1	1	5	...	...	...	...	...	...	7	...	4	...
Monghyr ...	635	...	...	2	...	...	1	1	...	...	...	1	...	5	...	3	...
Bhaugulpore ...	408	...	1	...	4	4	16	15	7	10	1	...	...	58	...	26	...
Purneah ...	400	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Darjeeling ...	39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	14,415	22	8	59	155	36	143	65	11	16	6	16	7	544	3·77	268	18·59
Gya ...	486	...	1	2	...	...	...	48	...	...	...	...	...	51	...	22	...
Patna ...	692	1	...	2	...	2	...	...	25	19	...	...	...	49	...	20	...
Deegah ...	249	...	...	...	...	3	5	4	18	2	...	1	...	33	...	11	...
Arrah ...	285	...	1	1	1	3	1	...	...	...	...	...	...	7	...	...	...
Chumparun ...	276	...	...	...	3	...	...	1	26	4	...	...	...	34	...	16	...
Mozufferpore ...	449	...	...	...	...	...	9	8	1	...	...	...	...	18	...	6	...
Chupra ...	460	...	...	...	...	...	2	41	3	..	...	...	...	46	...	16	...
Ghazeepore ...	643	...	...	1	...	5	...	...	3	2	2	...	...	13	...	5	...
Benares ...	950	...	...	...	2	1	1	10	80	13	12	1	...	120	...	58	...
Mirzapore ...	556	...	...	1	3	2	1	...	3	...	...	...	...	10	...	5	...
Azimghur ...	566	1	...	...	1	...	...	...	...	1	...	...	...	3	...	1	...
Jounpore ...	212	...	...	...	7	1	...	...	...	...	...	...	...	8	...	3	...
Goruckpore ...	650	...	...	5	3	...	...	100	...	...	...	...	...	108	...	54	...
Etah ...	...	...	...	...	...	...	...	...	...	...	...	..	...	..	...	...	...
Humeerpore ...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Banda ...	...	...	...	...	...	31	..	...	...	...	...	...	...	31	...	9	...
Futtehpore ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad ...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Nagode ...	...	...	...	...	...	2	15	...	1	...	...	...	...	18	...	7	...
TOTAL ...	6,474	2	2	12	20	50	34	212	160	41	14	2	...	549	...	233	...

CHOLERA OF THE JAIL POPULATION OF 1857 —*continued.*

JAIL STATIONS.	Average Strength of Prisoners during the Year.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Strength.	Total Deaths.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Raepore ...	No Return	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bandhara ...	,,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chanda ...	,,	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Nagpore ...	,,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chindwara ...	,,	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Jubbulpore ...	1,307	...	...	...	6	36	1	3	18	3	...	...	...	67	...	44	...
Mundla ...	No Return	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dumoh ...	..	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Saugor ...	588	...	...	...	...	2	1	9	8	...	...	...	...	20	...	8	...
Nursingpore ...	316	...	...	...	...	...	9	...	...	...	...	...	...	9	...	3	...
Lullutpore ...	No Return	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	275	...	...	...	...	...	...	1	11	...	1	...	...	13	...	6	...
Baitool ...	194	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jeypore ...	No Return	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	280	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundlaisir ...	No Return	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Ajmere ...	173	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beaur ...	106	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	...	...	...	...	6	39	11	13	37	3	1	...	...	110	...	61	...
Agra ...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Etawah ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	...	1	3	6	...	...	...	...	...	...	...	...	...	10	...	2	...
Budaon ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seharunpore ...	...	...	...	1	...	...	...	...	2	25	...	...	...	28	...	16	...
Bijnour ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deyrah ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Almorah ...	...	...	...	...	...	..	...	1	...	...	...	...	...	1	...	...	...
Mozuffernuggur ...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Moradabad ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
Muttra ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	...	1	3	7	1	...	...	1	2	25	...	...	...	40	...	18	...
Delhi ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goorgaon ...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Rhotuk ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hissar ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa ...	56	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thanesur ...	284	...	...	...	...	...	11	...	...	1	...	...	...	12	...	4	..
Kurnal ...	92	...	...	...	...	...	...	...	...	..	...	...	...	..	...	...	...
Umballa ...	594	...	...	...	...	3	4	...	...	2	...	...	...	9	...	5	...
Hoshiarpore ...	163	...	...	...	...	...	...	...	3	...	...	...	...	3	...	1	...
Loodianah ...	290	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	350	...	...	...	...	...	...	...	4	16	...	...	...	20	...	5	...
Ferozepore ...	433	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	720	...	...	3	1	...	...	...	30	14	...	1	...	49	...	17	...
Lahore ...	2,406	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	297	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...	148	...	...	...	...	...	...	...	15	...	..	...	...	15	...	8	...
Goordaspore ...	394	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	504	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojrat ...	273	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	371	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	273	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira ...	416	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	658	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferghur ...	315	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leia ...	451	...	...	...	...	...	...	...	...	...	.	...	.	...	...	...	...
Jhung ...	420	..	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Dera-Ghazee-Khan ...	148	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismail-Khan ...	303	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	53	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	886	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Hazara ...	161	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	545	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	12,125	...	...	3	1	3	15	...	52	34	...	1	...	109	...	41	...
BENGAL PRESIDENCY ...	...	25	13	81	183	128	203	291	262	119	21	19	7	1,352	...	621	...

EPIDEMIC OF 1855-58.

CHOLERA OF 1858.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1858.

See Map of 1858.

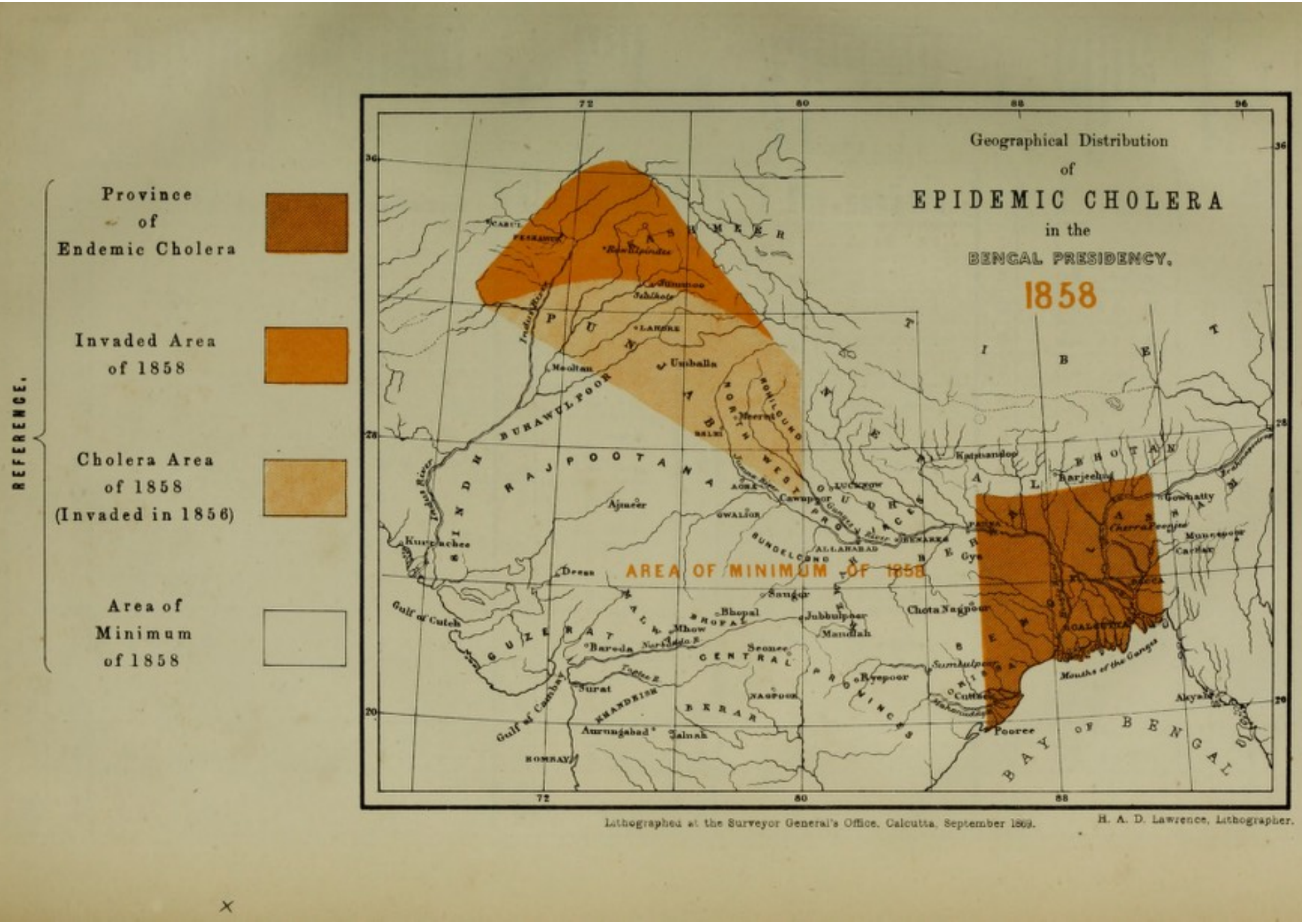
Cholera extinct or at a minimum throughout the eastern division of the epidemic area and in Central India: generally revitalised in Rohilcund and the Punjab, within the cholera area of 1856 and 1857; and between May and November occupying the exempted area of 1856 and 1857 in the north of the Punjab.

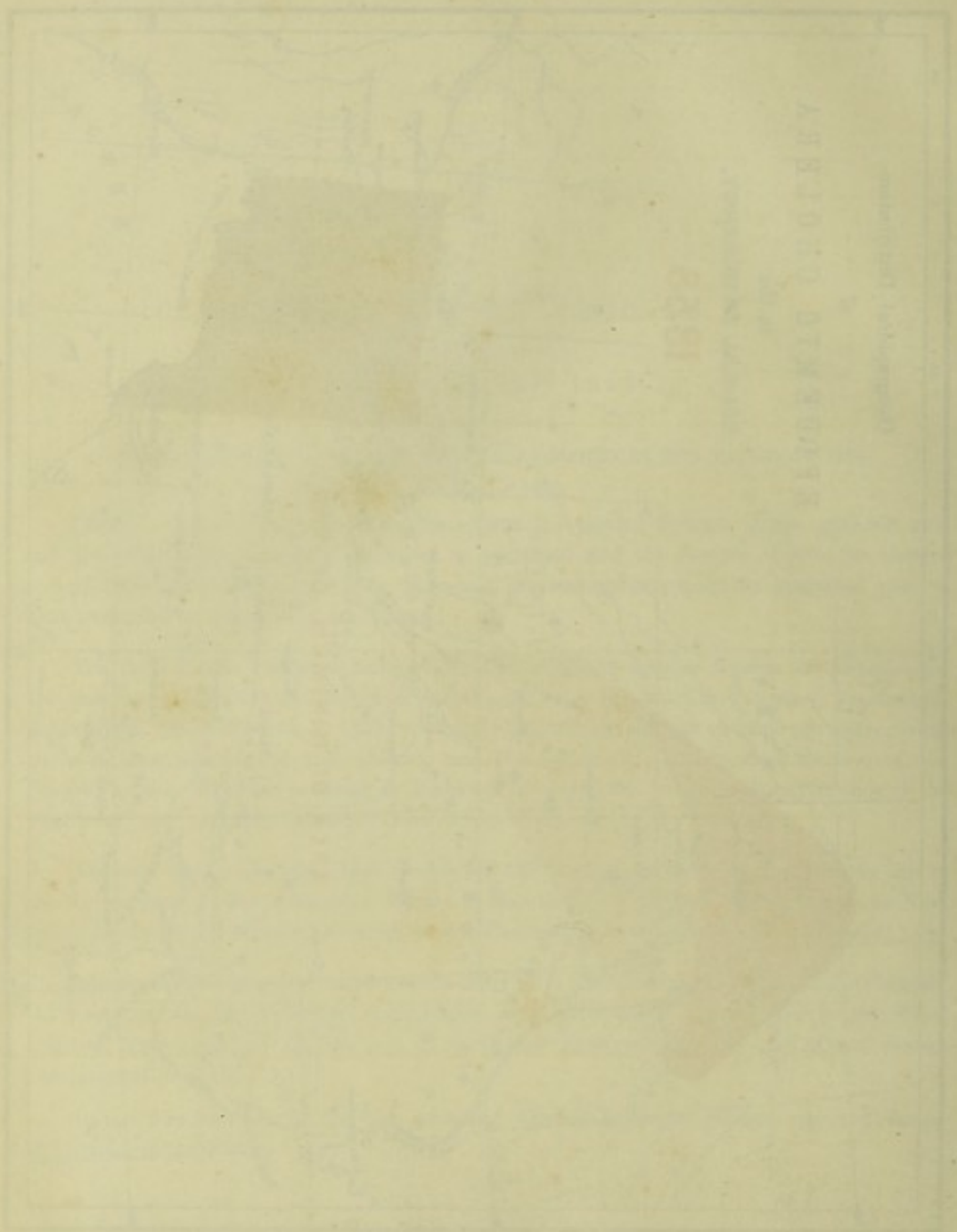
The Table for the European Army shows that, while the eastern division of the epidemic area was nearly free from cholera (see remarks, page 21 of Report), the cholera of the succeeding epidemic (1859-62) was, in 1858, powerfully epidemic within the endemic province, giving warning that invasion of the epidemic area was imminent. The general affection of the Punjab, ending with the outbreak at Peshawur in November, indicates the persistence of the vitality of the invading cholera of 1856 in the north-west of the Presidency.

Absolute exemption from fatal cholera in the eastern division is shown in the case of the Native Army. The invasion of Hazara in May and the vitality of the cholera up to November on the North-Western Frontier, is well illustrated in the Table for Native Troops.

Among the Jail Population three deaths mark the minimum of the valley of the Ganges; the occupied area, from Rohilcund to Peshawur, is the same shown in the Table for the European and Native Armies. In the jails of the Central Provinces only one fatal case of cholera was returned in 1858.

In the War Provinces of the year, including Central India, no cholera appeared among the Armies in the Field.


REFERENCE.
Province of Endemic Cholera
Invaded Area of 1858
Cholera Area of 1858 (Invaded in 1856)
Area of Minimum of 1858
Geographical Distribution of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1858
AREA OF MINIMUM OF 1858
Lithographed at the Surveyor General's Office, Calcutta, September 1869.
H. A. D. Lawrence, Lithographer.



EUROPEAN ARMY IN THE EPIDEMIC OF 1855-58.

CHOLERA OF 1858.

STATIONS.	Average Strength for 12 Months.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Presidency Hospitals	...	...	5	23	51	2	35	32	13	...	4	3	1	169	...	101	...
Fort William ...	770	1	2	12	19	5	11	20	14	...	4	4	...	92	...	55	...
Dum-Dum ...	745	1	...	..	...	...	8	13	18	1	3	2	...	46	...	30	...
Barrackpore ...	1,272	...	2	...	...	3	2	5	2	...	...	...	...	14	...	5	...
Chinsurah Depôt ...	...	5	...	...	...	1	20	32	1	1	...	...	...	60	...	45	...
Raneegunge & Grand Trunk Road ...	...	1	36	3	1	5	...	3	1	...	...	11	...	61	...	30	...
Berhampore ...	281	...	...	...	3	...	...	...	7	5	...	1	...	16	...	7	...
TOTAL ...	...	8	40	15	23	14	41	73	43	7	7	18	...	289	...	172	...
Darjeeling ...	137	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	211	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Dinapore ...	877	...	...	1	3	...	2	...	2		...	...	2	10	...	1*	...
Shahabad ...	1,352	...	...	...	1	3	...	...	11	2	...	...	...	17	...	5	...
Sasseram ...	340	...	...	...	2	1	...	...	...	...	...	...	...	3	...	...	...
Ghazeepore ...	435	...	...	1	2	3	1	...	...	...	...	...	...	7	...	3	...
Benares ...	511	1	...	7	1	3	5	4	...	...	...	...	...	21	...	7	...
Chunar ...	46	...	...	...	...	...	...	...	...	...	...	..	1	1	...	...	...
Azimghur ...	504	...	...	...	...	2	...	2	...	...	...	...	...	4	...	...	...
Goruckpore District	1,077	...	...	2	...	...	1	1	...	...	...	...	...	4	...	...	...
Oude ...	12,158	...	1	5	6	5	2	...	3	2	1	...	2	27	...	5	...
Allahabad and Cawnpore Districts ...	4,788	4	1	5	2	1	2	2	...	...	4	2	...	23	...	11	...
TOTAL ...	22,436	5	2	21	17	18	13	10	16	4	5	2	5	118	·53	32	1·43
Rohilcund ...	3,285	...	...	...	...	...	...	5	2	...	...	...	...	7	...	1	...
Meerut ...	1,528	...	...	...	...	...	...	3	1	...	..	...	...	4	...	3	...
Delhi ...	1,411	...	...	...	...	...	...	1	...	11	...	...	...	12	...	1	...
Agra ...	883	...	...	...	...	...	1	...	2	5	...	...	...	8	...	3	...
Agra District ...	420	...	...	1	...	...	...	...	..	..	...	...	...	1	...	1	...
TOTAL ...	7,527	...	...	1	...	...	1	9	5	16	...	...	...	32	·43	9	1·20
Umballa ...	941	...	...	...	...	2	1	...	...	...	...	...	...	3	...	1	...
Dugshaie ...	176	...	...	...	...	2	1	1	...	...	...	...	...	4	...	1	...
Subathoo ...	59	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kussowlie ...	46	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Phillour ...	110	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	898	...	...	...	...	...		...	23	11	...	...	...	34	...	22	...
Ferozepore ...	740	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meean Meer ...	1,317	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Camp Kamolcee ...	...	...	...	...	...	...	...	...	...	24	...	...	...	24	...	15	...
Lahore Citadel ...	64	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	361	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Govindghur ...	123	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	273	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	148	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kangra ...	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	896	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsalla ...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee District	1,039	...	...	...	...	4	...	2	6	...	...	...	...	12	...	8	...
Attock ...	196	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowshera ...	412	...	...	...	...	...	...	...	2	...	...	...	...	2	...	2	...
Campbellpore ...	319	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	2,027	...	...	...	...	...	...	...	...	...	4	3	...	7	...	7	...
Murree ...	114	...	...	...	...	...	...	40	4	...	...	...	...	44	...	31	...
TOTAL ...	10,244	...	...	...	...	8	2	43	35	35	4	3	...	130	1·27	87	8·50
BENGAL PRESIDENCY	43,771	13	47	60	91	42	92	167	112	62	20	26	6	738	1·68	401	9·16

* This man actually died on board a River Steamer; the case should not have been taken with Dinapore.

NATIVE ARMY IN THE EPIDEMIC OF 1855-58.

CHOLERA OF 1858.

[Those stations only are noted at which cases of cholera were returned during the year.]

Strength of August 1858.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
1,503	Calcutta	1	3	5	9	9	7	...	1	4	...	4	1	44	20
	Barrackpore Circle ...	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Eastern Bengal and Assam—														
	Sylhet	...	...	3	...	...	...	...	...	...	...	...	...	3	2
	Jamalpore	...	...	...	...	...	...	...	...	...	...	5	...	5	5
5,070	Furreedpore	...	...	...	...	...	...	...	...	...	19†	45†	...	64	36
	Gowhatty	...	2	...	3	1	3	...	...	1	...	...	...	10	3
	Debrooghur	...	...	...	...	...	...	...	...	...	...	...	1	1	1
	War Provinces of 1858— Behar, Benares, Oude and Cawnpore—														
	Dorundah	...	...	...	...	...	1	...	...	...	...	...	...	1	None.
	Chyebassa	...	...	...	...	1	...	1	...	...	...	...	...	2	None.
	Bhaugulpore	...	...	...	...	1	...	...	...	...	...	...	...	1	None.
27,763	Arrah	...	...	...	...	...	...	1	...	...	...	...	...	1	None.
	Lucknow	...	1	...	...	2	...	...	...	...	...	...	...	3	None.
	Cawnpore	...	...	...	...	...	...	1	...	...	...	...	...	1	None.
3,395	Nagpore Territories ...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1,478	Saugor District	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
	Agra and Meerut—														
	Ajmere	...	...	...	...	...	...	3	...	...	...	...	...	3	None.
	Agra	...	...	...	...	1	...	...	...	...	...	...	...	1	None.
11,017	Roorkee	...	...	...	...	...	1	...	...	...	...	...	...	1	None.
	Petoraghur	...	...	...	...	1	...	...	...	...	...	...	...	1	None.
	Almorah	...	...	...	...	...	...	2	...	...	...	...	...	2	None.
	Deyrah	...	...	...	...	...	...	2	...	1	...	...	...	3	1
	Punjab—														
	Noorpore	...	...	...	...	...	...	...	...	1	...	...	...	1	1
	Umritsur	...	...	...	...	1	...	...	...	...	...	...	...	1	1
	Meean Meer	...	...	...	...	3	1	...	2	...	...	...	...	6	1
	Ferozepore	...	...	...	...	...	1	...	...	...	...	...	...	1	None.
	Dera Ismael Khan ...	...	...	...	...	1	...	...	...	...	...	1	...	2	1
	Bunnoo	...	...	...	...	...	...	...	...	...	...	...	1	1	None.
45,021	Kohat	...	...	...	...	...	...	...	...	...	21	18	...	39	18
	Peshawur	1	...	...	...	2	...	2	2	...	7	7	1	22	14
	Attock	...	...	...	...	...	...	...	...	1	...	...	...	1	None.
	Campbellpore	...	...	...	...	...	...	1	...	...	...	...	...	1	None.
	Abbottabad	...	...	...	...	4	...	18	12	...	...	...	...	34	17
	Rawulpindee	...	...	...	...	1	5	1	...	1	...	...	...	8	4
	Camps in the Punjab ...	...	...	...	...	...	...	16	...	...	...	18	...	34	19
	On the Berhampooter ...	...	...	...	...	3	...	...	...	...	...	...	...	3	2
	On the march	...	...	...	1	...	...	...	3	...	...	...	...	4	None.
95,247	Army of the Presidency ...	2	6	8	13	31	19	48	20	9	47	98	4	305	146

* The Monthly Returns of the Barrackpore Circle for 1858 are wanting.
† Kamroop Regiment.

JAIL POPULATION IN THE EPIDEMIC OF 1855-58.

CHOLERA OF 1858.

JAIL STATIONS.	Average Strength for the Year.	Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,824	...	3	63	14	8	9	19	5	1	4	2	1	129	...	60	...
Baraset ...	202	...	...	...	...	...	...	2	1	...	...	...	...	3	...	...	...
Jessore ...	510	...	...	28	23	...	...	...	...	...	...	...	...	51	...	17	...
Kishnaghur ...	494	...	...	6	...	...	...	...	...	...	...	...	...	6	...	...	...
Moorshedabad ...	225	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Howrah ...	58	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hooghly ...	810	32	5	6	4	1	1	17	23	18	8	...	1	116	...	35	...
Burdwan ...	562	...	...	...	...	...	23	...	..	...	...	...	...	23	...	13	...
Bancoorah ...	473	...	..	1	1	...	...	...	1	...	...	...	...	3	...	1	...
Purulea ...	389	...	3	...	...	...	...	...	...	...	...	...	..	3	...	1	...
Sooree ...	438	...	...	1	...	...	...	1	...	...	...	...	...	2	...	...	...
Malda ...	46	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dinagepore ...	812	...	...	3	...	3	1	1	...	...	1	...	..	9	...	2	...
Rampore Bauleah ...	441	...	...	26	30	...	...	...	...	...	...	...	...	56	...	28	...
Rungpore ...	412	...	...	...	...	...	...	1	...	1	...	...	...	2	...	2	...
Bograh ...	137	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Mymeusing ...	513	...	...	1	..	1	...	...	...	1	...	...	...	3	...	...	...
Pubna ...	211	...	...	...	2	1	...	...	...	...	...	...	...	3	...	3	...
Furreedpore ...	313	...	...	...	...	1	...	...	..	...	10	17	...	28	...	9	...
Backergunge ...	433	...	...	...	1	5	...	...	...	...	...	8	3	17	...	9	...
Noacolly ...	276	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Chittagong ...	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tipperah ...	522	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dacca ...	663	...	1	2	2	2	...	...	...	...	2	4	1	14	...	5	...
Sylhet ...	405	1	...	...	2	...	...	...	...	...	...	..	...	3	...	1	...
Cherrapoonjee ...	22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gowalpara ...	135	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Gowhatty ...	180	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Seebsaugor ...	109	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Nowgong ...	75	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tezpore ...	165	...	...	..	...	...	...	...	3	...	...	...	...	3	...	2	...
Debrooghur ...	46	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Midnapore ...	832	...	...	49	57	...	...	...	1	...	...	...	...	107	...	43	...
Balasore ...	91	...	...	3	...	...	...	1	...	...	...	...	...	4	...	2	...
Cuttack ...	322	2	2	...	...	...	8	1	...	...	...	...	...	13	...	9	...
Pooree ...	94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sumbulpore ...	249	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chyebassa ...	115	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	320	...	...	...	3	...	...	1	...	...	...	...	...	4	...	3	...
Hazareebaugh ...	414	...	...	2	4	6	3	...	...	...	...	...	...	15	...	4	...
Monghyr ...	762	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Bhaugulpore ...	609	...	...	...	...	...	63	3	2	...	2	...	...	70	...	40	...
Purneah ...	337	...	...	1	1	...	...	...	...	...	...	...	...	2	...	1	...
Darjeeling ...	34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	16,344	35	14	193	144	29	108	48	37	21	27	31	6	693	4·24	290	17·80
Gya ...	400	...	...	...	..	...	...	...	10	...	...	...	...	10	...	7	...
Patna ...	750	...	...	1	1	...	...	...	...	...	...	...	...	2	...	...	...
Arrah ...	139	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chumparun ...	270	...	1	...	1	1	1	4	2	1	2	...	...	13	...	...	...
Mozufferpore ...	416	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Chuprah ...	365	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ghazeepore ...	637	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Benares ...	1,447	...	...	...	1	...	...	...	...	...	...	...	...	1	..	...	...
Mirzapore ...	446	...	...	...	...	1	...	...	...	...	...	...	...	1	..	1	...
Azimghur ...	259	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jounpore ...	175	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore ...	417	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Lucknow* ...	666	...	...	...	...	...	...	...	...	...	...	...	...	(2)	...	...	...
Etah ...	147	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Humeerpore ...	92	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	247	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	275	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Banda ...	353	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagode ...	57	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad ...	635	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
TOTAL ...	8,193	...	1	1	3	3	1	6	13	1	2	...	...	31	·38	10	1·22

* This was the only jail of Oude occupied in 1858, excepting Fyzabad, which was open for a few months only. The months in which these two admissions occurred cannot now be traced.

CHOLERA OF THE JAIL POPULATION OF 1858—*continued.*

JAIL STATIONS.	Average Strength for the Year.	Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Raepore ...	266	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bandhara ...	238	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Chanda ...	110	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagpore ...	605	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Chindwara ...	135	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore ...	1,287	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Mundla ...	...	...	...	...	...	...	...	...	2	...	...	...	...	2	...	...	...
Dumoh ...	243	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Saugor ...	575	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	316	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	234	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Baitool ...	187	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...
Sehore ...	70	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	366	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundlaisir ...	337	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ajmere ...	188	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beaur ...	135	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	5,292	...	...	3	2	...	...	...	3	...	...	...	...	8	·15	1	·19
Agra ...	989	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Etawah ...	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	266	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	524	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	378	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Budaon ...	354	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	563	...	...	...	...	...	...	2	1	...	...	...	...	3	...	...	...
Seharunpore ...	363	...	...	...	...	...	...	2	...	...	...	...	1	3	...	...	...
Bijnour ...	155	...	...	...	...	...	1	1	...	1	...	...	...	3	...	...	...
Deyrah ...	79	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Almorah ...	150	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Mozuffernuggur ...	563	...	...	...	...	...	1	1	...	...	...	1	...	3	...	1	...
Moradabad ...	681	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Meerut ...	1,005	...	...	...	...	...	...	...	4	1	...	...	...	5	...	2	...
Muttra ...	193	...	...	...	...	1	...	...	...	...	1	...	...	2	...	1	...
TOTAL ...	6,366	...	...	...	1	1	2	7	5	2	1	1	1	21	·33	6	·94
Delhi ...	646	...	...	...	...	...	...	...	17	...	...	...	...	17	...	12	...
Rhotuk ...	312	...	...	...	...	...	1	1	...	...	...	...	...	2	...	...	...
Hissar ...	270	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa ...	179	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnaul ...	400	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Umballa ...	632	...	...	...	1	...	...	...	1	...	...	...	...	2	...	1	...
Hoshiarpore ...	100	...	...	...	...	...	...	...	...	12	...	...	...	12	...	6	...
Loodianah ...	302	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	345	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	450	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	647	...	...	...	...	2	...	1	...	...	...	...	...	3	...	...	...
Lahore ...	2,363	...	...	...	...	...	...	...	2	...	...	...	...	2	...	...	...
Sealkote ...	385	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...	174	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goordaspore ...	307	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	489	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojrat ...	311	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	451	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	285	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira ...	222	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	668	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ...	409	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera Ghazee Khan ...	119	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera Ismael Khan ...	332	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	110	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	935	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	420	...	...	...	...	...	...	...	...	...	...	6	...	6	...	4	...
Attock (a gang) ...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...
Hazara ...	180	...	...	...	...	1	...	11	...	...	...	...	...	12	...	2	...
TOTAL ...	12,486	1	...	...	1	3	1	13	20	12	...	7	...	58	·47	26	2·08
BENGAL PRESIDENCY	48,681	36	15	197	151	36	112	74	78	36	30	39	7	811	1·67	334	6·86

EPIDEMIC OF 1859-62.

First Year, 1859.—Cholera epidemic from the east, occupying and confined to the eastern division of the epidemic area: cholera extinct within the western division.

Second Year, 1860.—Cholera universally reproduced over the eastern division: in the south, invading Nagpore and the Central Provinces generally in March: extending with the monsoon to the north and west, but cut short in its advance along the line which formed the southern boundary of the famine tract of 1861, the country to the south of this line being the cholera tract of 1860: Meerut, Rohilcund, and the Punjab still an exempted province as in 1859; for the cholera of the east made no progress across the Doab from east to west, and, as noted above, the cholera advancing from the south-west and south was also prevented from entering this area.

Third Year, 1861.—Cholera generally reproduced over the eastern division of the epidemic area, but having no longer the aspect of a moving cholera: universally reproduced in April and May over the portion of the western area invaded in 1860; and from this tract invading with the monsoon from south-east to north-west the area exempted in 1859 and 1860, the limit of the year being reached in the same week as in the parallel invasion of 1856: limited in its north-western extension to the same area of primary invasion as in 1856, the north of the Punjab still remaining an exempted tract.

Fourth Year, 1862.—Cholera extinct or at a minimum over the eastern division of the epidemic area: generally manifested both in the spring and in the monsoon season over the portion of the western division covered in 1860-61: invading the exempted tracts of 1861, with the exception of the Doab between the Jhelum and the Indus: appearing on the frontier in April, and persisting until the first week in November, when the epidemic of 1859-62 became extinct in Northern India.

EPIDEMIC OF 1859-62.

CHOLERA OF 1859.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1859.

See Map of 1859.

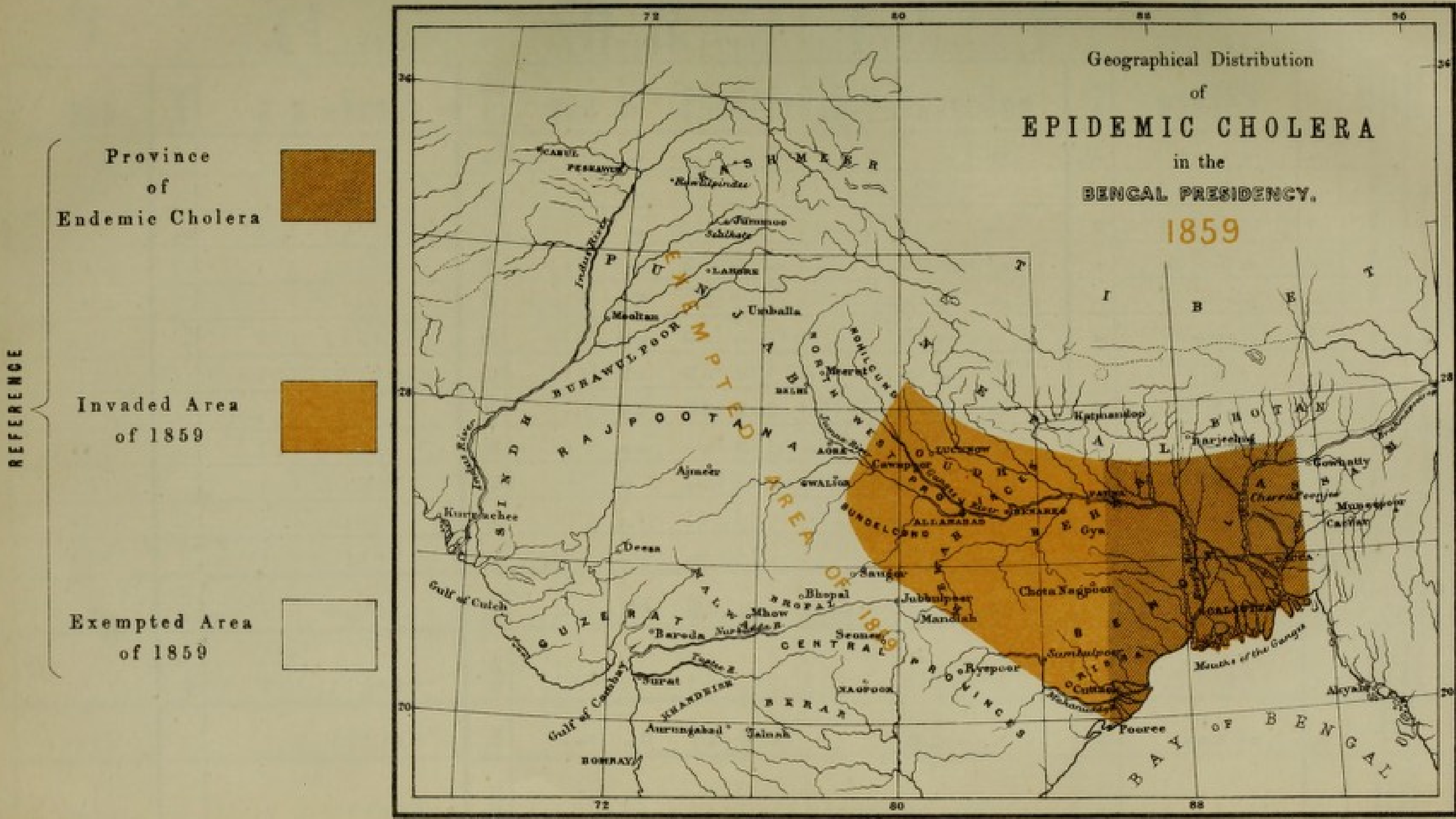
Cholera epidemic from the east, occupying and confined to the eastern division of the epidemic area: cholera extinct within the western division.

The Table for the European Army shows the universality of the invading epidemic in the eastern division, and also in the endemic province. No fatal case of cholera was reported from any station to the west or north of Bareilly.

The Table for the Native Army also indicates the universal occupation of the division of the epidemic area exempted in 1858; and only two fatal cases are noted in the western division out of a force of 46,236.

The Jail Table shows a distribution exactly parallel. Of two fatal cases recorded in the western division, the one is not authenticated as a case of cholera; the other, which occurred at Ajmere in October, was probably a precursor of the invasion of 1860, having its representative in the October cholera of Rajpootana of October 1866 preceding the invasion of 1867.*

* The cases at Ajmere were indicative of the movement of the invading cholera of the year on the northern epidemic highway. The cases returned from the jails of Central India evidently mark the progress of the same invading cholera on the southern epidemic highway; and although our indices are so trifling, it is certain that this was the same cholera which reached Bombay in May, (see Table, page 115,) as in 1818, and which was widely spread throughout the Bombay Presidency towards the end of 1859, as in 1868. The movement of May was universal from the east as far as to Humeerpore and Jaloun, and I find that premonitory cases were thrown out beyond this western limit into the Gwalior District, for two admissions and a death occurred at Gwalior on May 6th among the men of the Bombay Artillery. This was the northern margin of the tract occupied in the movement of May, and we may infer that the cholera moving from the east in this month covered as an aura, or in substance, the entire epidemic tract between Chota Nagpore and Bombay; the very early appearance of cholera as far west as Nimar in the first days of March 1860, causes me to conclude that this cholera was revitalised from the cholera of December 1859, and was not a cholera primarily invading from the east in that month.



Geographical Distribution
of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1859
REFERENCE
Province of Endemic Cholera
Invaded Area of 1859
Exempted Area of 1859
EXEMPTED AREA OF 1859
KASHMEER
PUNJAB
RAJPOOTANA
SINDH
BUHAWULPOOR
GUZERAT
MALWA
BHOPAL
CENTRAL PROVINCES
BERAR
KHANDEISH
NORTH WEST PROVINCES
OUDH
BUNDELCUND
BEHAR
BENGAL
ASSAM
BHOTAN
NEPAL
TIBET
BAY OF BENGAL
Gulf of Cutch
Gulf of Cambay
Mouths of the Ganges
Indus River
CABUL
PESHAWUR
LAHORE
Umballa
Mooltan
Ajmeer
Deesa
Kurrachee
Baroda
Mhow
Surat
BOMBAY
Aurungabad
Jalnah
NAGPOOR
Seonee
Saugor
Bhopal
Jubbulpoor
Mundlah
Ryepoor
Sumbulpoor
Cuttack
Pooree
Chota Nagpoor
Gya
ALLAHABAD
BENARES
Cawnpoor
LUCKNOW
AGRA
GWALIOR
DELHI
Meerut
Katmandoo
Darjeeling
Gowhatty
Cherra Poonjee
Munneepoor
Cachar
CALCUTTA
Akyab
72
80
88
96
20
28
36

Lith. at the Surv^r. Genl's Office Calcutta Sept^r. 1869.

H. A. D. Lawrence Lithographer

EUROPEAN ARMY IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1859.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Presidency Hospital	...	1	1	...	1	2	...	1	5	...	...	...	1	12	...	5	...
Fort William ...	1,311	1	...	...	2	5	1	...	2	2	...	...	1	14	...	9	...
Dum-Dum ...	1,611	...	...	...	...	1	2	...	113	1	13	...	...	130	...	77	...
Barrackpore ...	1,428		1	8	1	...	2	4	50	2	10	1	...	79	...	36	...
Chinsurah Depôt ...	425	1	...	...	...	1	1	...	...	4	2	...	...	9	...	3	...
Raneegunge ...	506	2	...	...	...	...	...	...	1	...	...	...	...	3	...	2	...
Berhampore ...	466	...	...	10	3	...	...	...	...	...	2	...	...	15	...	8	...
Total ...	5,747	4	1	18	6	7	6	4	166	9	27	1	1	250	4·35	135	23·49
Darjeeling Depôt (9 months) ...	108	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	370	...	...	1	5	...	...	...	...	...	...	...	...	6	...	1	...
Dinapore ...	1,518	1	1	2	1	2	9	3	7	...	...	3	1	30	...	8	...
Shahabad District ...	815	...	...	...	...	...	1	...	...	...	...	...	1	2	...	...	...
Sasseram ...	350	...	...	...	1	...	...	...	...	...	...	...	1	2	...	1	...
Ghazeepore ...	790	...	...	...	1	3	3	5	1	...	...	...	...	13	...	9	...
Benares Hospital ...	95	...	...	...	...	1	...	...	1	...	...	...	...	2	...	2	...
Benares ...	1,315	...	...	...	1	3	11	9	18	1	2	1	...	46	...	26	...
Azimghur ...	427	...	...	...	...	3	...	...	1	...	2	1	...	7	...	4	...
Goruckpore ...	670	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore District	930	...	...	1	...	1	...	...	...	...	...	...	...	2	...	...	...
Oude District ...	1,905	...	...	1	...	1	...	...	...	...	...	...	...	2	...	...	...
Gondah ...	919	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Fyzabad ...	1,342	...	...	...	...	...	...	3	...	1	...	...	...	4	...	3	...
Sultanpore ...	666	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rae Bareilly ...	1,011	...	...	...	1	...	...	...	...	...	1	...	...	2	...	1	...
Seetapore ...	947	...	...	2	...	...	...	...	1	...	...	...	...	3	...	...	...
Lucknow ...	3,320	...	...	1	3	...	1	3	44	22	1	...	...	75	...	42	...
Futtehgurh ...	808	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Cawnpore ...	1,372	...	...	...	...	12	1	2	44	4	2	...	...	65	...	54	...
Allahabad ...	2,504	1	...	...	38	111	13	18	52	1	3	...	1	238	...	129	...
Allahabad and Cawnpore General Hospitals	...	1	1	2	7	54	6	2	24	5	...	...	1	103	...	47	...
Banda District ...	838	...	...	...	...	1	2	26	1	2	2	...	...	34	...	9	...
Calpee, Oraie, and other Detachment Stations	737	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	688	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
Bareilly ...	823	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Total ...	25,255	3	2	10	59	193	47	71	195	37	13	5	5	640	2·53	338	13·38
Moradabad ...	440	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	2,146	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Allyghur ...	216	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Muttra ...	405	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi ...	1,400	...	1	1	...	...	...	...	...	1	...	...	...	3	...	...	...
Roorkee ...	37	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Landour Depôt (8 months) ...	106	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nynee Tal Depôt (10 months) ...	332	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	5,009	...	1	1	...	...	1	...	...	1	...	...	...	4	·08	...	...
Agra ...	1,293	...	..	...	1	1	...	...	3	...	...	...	...	5	...	...	...
Gwalior and Morar...	1,198	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gwalior District ...	598	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Total ...	3,089	...	...	...	1	1	...	...	3	...	1	...	...	6	·20	...	...

CHOLERA OF THE EUROPEAN ARMY OF 1859—*continued.*

STATIONS.	AVERAGE STRENGTH DURING THE PERIOD OF OCCUPATION.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS DURING THE YEAR.	ADMITTED PER CENT. OF AVERAGE STRENGTH.	NUMBER OF DEATHS.	DIED PER 1,000 OF AVERAGE STRENGTH.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Umballa ...	1,581	...	...	2	...	...	...	...	...	...	...	...	...	2	...	...	...
Dugshaie (7 months)	566	...	...	...	...	1	...	1	...	...	...	...	...	2	...	...	...
Subathoo (8 months)	938	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Kussowlie Depôt (8 months) ...	202	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillour ...	139	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	934	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	1,070	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meean Meer ...	2,044	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Lahore Citadel ...	170	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	407	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Govindghur ...	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan (10 months)	1,030	...	1	1	...	...	...	...	...	...	...	...	...	2	...	...	...
Dera Ismael Khan ...	221	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kangra ...	83	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Sealkote ...	1,600	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum (6 months) ..	532	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawul Pindee ...	1,467	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Attock (9 months) ...	199	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowshera (9 months)	771	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Campbellpore ...	347	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	2,640	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murree Depôt (6 months) ...	270	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	16,004	1	2	3	...	3	1	1	1	...	...	...	...	12	·07	...	...
BENGAL PRESIDENCY	55,104	9	7	32	67	206	55	77	370	47	41	6	7	924	1·68	478	8·67

NATIVE ARMY IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1859.

Strength of July 1859.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
	Bengal Proper—														
1,689	Calcutta	...	3	12	1	5	...	5	5	2	...	8	2	43	11
231	Dum-Dum	...	1	...	...	...	...	1	...	...	...	...	...	2	None.
1,322	Barrackpore	...	...	...	...	...	...	...	3	5	...	5	...	13	5
859	Berhampore	...	...	...	...	1	...	...	...	1	...	...	2	4	2
618	Julpigoree	...	...	...	...	...	..	...	...	...	...	...	...	None.	None.
	Eastern Bengal and Assam—														
923	Furreedpore	...	...	...	6	...	...	...	...	...	...	1	...	7	5
242	Sylhet	...	...	...	...	2	...	...	...	...	...	...	...	2	1
235	Cachar	...	...	...	1	1	...	...	...	...	...	...	...	2	None.
398	Cherrapoonjee	...	...	...	...	...	...	...	...	2	...	...	...	2	1
163	Gowalparah	...	...	...		...	...	...	...	...	...	...	...	None.	None.
565	Gowhatty	...	...	...	1	...	...	...	...	...	...	...	1	2	None.
176	Tezpore	...	...	...	...	1	...		...	...	...	1	...	2	1
48	Nowgong	...	...	...	..	...	...	...	...	..	...	3	1	4	2
1,008	Stations of Upper Assam ...	...	...	...	.	...	...	...	...	...	...	...	...	None.	None.
	Eastern Division of the Epidemic Area—Behar, Benares, Oude, and Cawnpore—														
779	Dorundah	..	...	...	...	...	1	...	...	...	...	...	...	1	None.
220	Darjeeling	...	...	...	...	...	1	...	...	...	...	...	...	1	None.
766	Bhaugulpore	...	...	...	...	...	...	...	1	2	...	...	5	8	2
654	Dinapore	...	...	...	...	...	17	1	...	...	...	...	...	18	8
786	Benares	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
8,297	Camps in Benares and Oude...	...	...	...	1	9	9	4	...	...	...	1	...	24	13
1,233	Fyzabad	...	...	...	...	...	...	1	...	1	...	...	...	2	1
797	Rae Bareilly	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1,355	Lucknow	...	...	...	...	1	...	...	35	10	...	...	...	46	16
1,779	Seetapore	...	...	...	...	..	...	...	...	...	..	...	...	None.	None.
946	Shahjehanpore	...	...	...	...	...	...	...	1	...	...	...	...	1	1
1,321	Bareilly	...	...	...	...	..	..	1	...	...	..	...	...	1	1
1,127	Futtehghur	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
475	Banda	...	...	...	...	...	...	..	..	...	...	...	...	None.	None.
3,722	Cawnpore	...	...	...	...	...	...	13	42	...	...	...	...	55	23
...	Camps, Cawnpore District ...	...	...	...	..	...	...	...	36	11	...	...	...	47	14
783	Allahabad	...	1	...	1	...	...	...	...	...	..	...	...	2	1
9,546	Western Division of the Epidemic Area—Agra and Central India ...	...	...	...	...	...	...	...	...	...	...	...	1†	1	1
12,509	Meerut and Western Rohilcund	...	1*	...	...	...	...	1	...	...	...	...	...	2	1
24,181	Punjab	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
79,753	Army of the Presidency ...	...	6	12	11	20	28	27	123	34	...	19	12	292	110

* A fatal case of Deyrah; probably belonging to the cholera of the previous year.
† A fatal case at Seronge in Central India; probably a true forerunner of the invasion of 1860.

JAIL POPULATION IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1859.

JAIL STATIONS.	Average Strength for the Year.	Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,766	5	1	3	5	2	5	34	2	...	1	13	3	74	...	30	...
Barraset ...	248	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jessore ...	554	...	3	...	...	1	...	...	...	...	...	1	...	5	...	...	...
Kishnaghur ...	332	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moorshedabad ...	161	...	...	...	...	..	...	...	..	..	...	..	...	...	...	...	...
Howrah ...	69	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Hooghly ...	776	4	5	3	4	...	1	1	2	...	33	1	...	54	...	16	...
Burdwan ...	632	...	...	...	1	7	41	6	...	..	2	...	...	57	...	25	...
Bancoorah ...	474	...	5	1	...	1	...	...	...	...	...	...	...	7	...	3	...
Purulea ...	351	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Raneegunge ...	8	...		...	...	...	...	...	...	..	...	...	...	...	...	...	...
Sooree ...	413	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Malda ...	48	...	...	...	...	...	...	1	1	...	...	...		2	...	...	...
Dinagepore ...	730	...	...	...	...	...	...	...	...	...	...	9	3	12	...	4	...
Rampore Bauleah ...	529	...	...	4	3	24	...	...	...	...	...	...	...	31	...	15	...
Rungpore ...	360	1	1	15	...	2	...	...	...	...	...	...	...	19	...	9	...
Bograh ...	163	4	...	...	1	...	...	...	...	...	...	...	...	5	...	2	...
Mymensing ...	487	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pubna ...	150	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...
Furreedpore ...	393	...	1	2	...	...	...	...	...	...	...	1	1	5	...	2	...
Backergunge ...	459	...	...	...	9	..	1	...	...	...	...	22	1	33	...	22	...
Noacolly ...	313	...	...	...	...	2	..	...	...	...	...	...	...	2	...	2	...
Chittagong ...	248	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tipperah ...	445	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dacca ...	671	...	1	...	4	...	...	...	...	2	...	1	1	9	...	6	...
Sylhet ...	386	...	...	...	1	1	...	...	...	...	...	...	...	2	...	1	...
Cherrapoonjee ...	38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	78	...	...	12	3	...	1	...	...	...	...	...	...	16	...	6	...
Gowalparah ...	113	...	...	...	...	...	...	...	...	...	4	3	3	10	...	8	...
Gowhatty ...	166	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1	...
Seebsaugor ...	104	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Nowgong ...	68	...	...	...	...	...	...	...	...	...	8	2	...	10	...	5	...
Tezpore ...	140	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debrooghur ...	65	...	...	...	..	...	..	...	...	...	...	...	...	...	...	...	...
Midnapore ...	739	..	...	...	10	...	1	...	...	...	...	...	1	12	...	...	...
Balasore ...	100	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...
Cuttack ...	285	...	...	...	...	4	2	...	...	...	...	..	...	6	...	4	...
Pooree ...	101	...	2	1	...	...	...	...	...	...	...	...	...	3	...	1	...
Sumbulpore ...	160	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chyebassa ...	154	...	...	...	...	...	...	...	...	...	...	2	2	4	...	3	...
Ranchee ...	310	...	...	1	1	3	...	...	...	...	...	1	...	6	...	5	...
Hazareebaugh ...	295	...	...	...	...	...	...	...	...	.	...	1	...	1	...	...	—
Monghyr ...	444	...	...	...	12	...	...	21	2	1	...	...	...	36	...	18	...
Bhaugulpore ...	481	...	...	...	...	39	1	7	36	9	...	...	...	92	...	39	...
Purneah ...	314	...	...	1	90	18	...	...	..	...	...	..	...	109	...	60	...
Darjeeling ...	38	...	...	..	...	...	...	...	2	...	...	...	...	2	...	...	...
Total ...	15,359	14	19	44	144	104	53	70	45	12	50	57	16	628	4·09	288	18·75
Gya ...	472	...	...	...	1	...	1	...	...	...	...	...	...	2	...	...	...
Patna ...	723	...	...	..	...	...	...	1	...	1	18	25	2	47	...	25	...
Arrah ...	214	...	...	1	...	...	...	1	2	1	...	...	1	6	...	4	...
Mozufferpore ...	353	...	...	...	...	...	1	1	2	...	...	3	...	7	...	5	...
Chumparun ...	226	...	1	3	2	...	...	...	1	...	...	...	...	7	...	1	...
Chuprah ...	322	...	..	...	...	...	...	13	2	...	1	9	3	28	...	11	...
Ghazeepore ...	644	...	...	...	...	...	1	1	...	...	...	..	...	2	...	...	...
Benares ...	1,104	...	...	...	5	2	1	...	...	...	...	...	...	8	...	3	...
Mirzapore ...	379	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Azimghur ...	277	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Jounpore ...	251	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore ...	594	...	...	1	...	...	1	...	...	...	...	...	...	2	...	1	...
Baraitch* ...	114	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fyzabad* ...	142	...	...	...	...	...	...	...	...	...	...	1	...	1	..	...	...
Sultanpore* ...	97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rae Bareilly* ...	54	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Luckhimpore* ...	39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow ...	469	...	...	...	...	...	...	1	8	1	...	...	...	10	...	7	...
Oonao ...	40	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Seetapore ...	43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Etah ...	151	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Humeerpore ...	91	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	48	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Futtehghur ...	278	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	75	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Banda ...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Nagode ...	66	...	...	...	...	...	...	3	...	...	...	...	...	3	...	1	...
Allahabad ...	1,459	...	...	...	...	20	26	6	14	13	...	...	...	79	...	49	...
Total ...	8,725	...	1	5	8	22	32	29	30	17	19	38	6	207	2·37	109	12·49

* Many of these jails were occupied for a few months only.

CHOLERA OF THE JAIL POPULATION OF 1859—*continued.*

JAIL STATIONS.	Average Strength for the Year.	Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Raepore ...	275	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bandhara ...	225	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Chandah ...	141	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagpore ...	490	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Chindwarra ...	252	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Jubbulpore ...	1,156	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dumoh ...	135	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	317	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	303	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	211	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	237	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Baitool ...	200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sehore ...	66	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	230	...	...	...	...	...	...	...	...	...	...	..	...	...	..	...	...
Mundlaisir ...	299	...	...	...	...	...	...	1	...	...	...	...	...	1	..	...	..
Ajmere ...	220	...	...	...	...	...	...	...	...	...	2	...	...	2	...	1	...
Beaur ...	87	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	4,844	...	...	...	...	...	...	1	...	...	3	...	...	4	·08	1	·21
Muttra ...	108	...	...	...	...	...	...	...	...	...	...	...	...	..	...	..	...
Agra ...	1,911	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Etawah ...	159	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	177	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	224	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	155	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Shahjehanpore ...	304	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...
Bareilly ...	567	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Budaon ...	285	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seharunpore ...	138	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Bijnour ...	176	...	1	1	1	...	...	...	2	...	...	...	...	5	...	...	...
Deyrah ...	63	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...
Almorah ...	157	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Mozuffernuggur ...	222	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	360	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	1,413	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Delhi ...	484	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goorgaon ...	142	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
TOTAL ...	7,045	...	1	1	1	1	...	...	2	1	...	1	...	8	·11	...	...
Rhotuk ...	193	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hissar ...	177	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa ...	208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnau ...	219	...	...	...	...	...	...	1	...	2	...	...	...	3	...	1	...
Thanesur ...	249	...	...	...	..	...	..	...	...	...	...	...	...	...	...	...	...
Umballa ...	594	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Simla ...	68	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshiarpore ...	148	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Loodianah ...	316	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	330	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	360	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	408	...	...	...	...	...	...	...	...	...	...	...	...	(1)	...	...	...
Lahore Central ...	2,167	...	...	...	...	...	...	...	...	...	...	...	...	(2)	...	...	...
Sealkote ...	352	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...	164	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goordaspore ...	212	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	435	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Goojrat ...	258	...	...	...	...	...	...	...	...	...	...	...	...	(1)	...	...	...
Shahpore ...	373	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	195	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira ...	306	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	447	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferghur ...	261	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Jhung ...	345	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leia ...	210	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan...	97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismail-Khan ...	228	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	55	...	...	..	...	...	...	..	...	...	...	...	...	...	...	...	...
Hurreepore ...	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	720	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	421	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	10,729	...	...	...	...	...	...	1	...	2	...	...	...	7	·07	1	·09
BENGAL PRESIDENCY	46,702	14	21	50	153	127	85	101	77	32	72	96	22	854	1·83	399	8·54

EPIDEMIC OF 1859-62.

CHOLERA OF 1860.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1860.

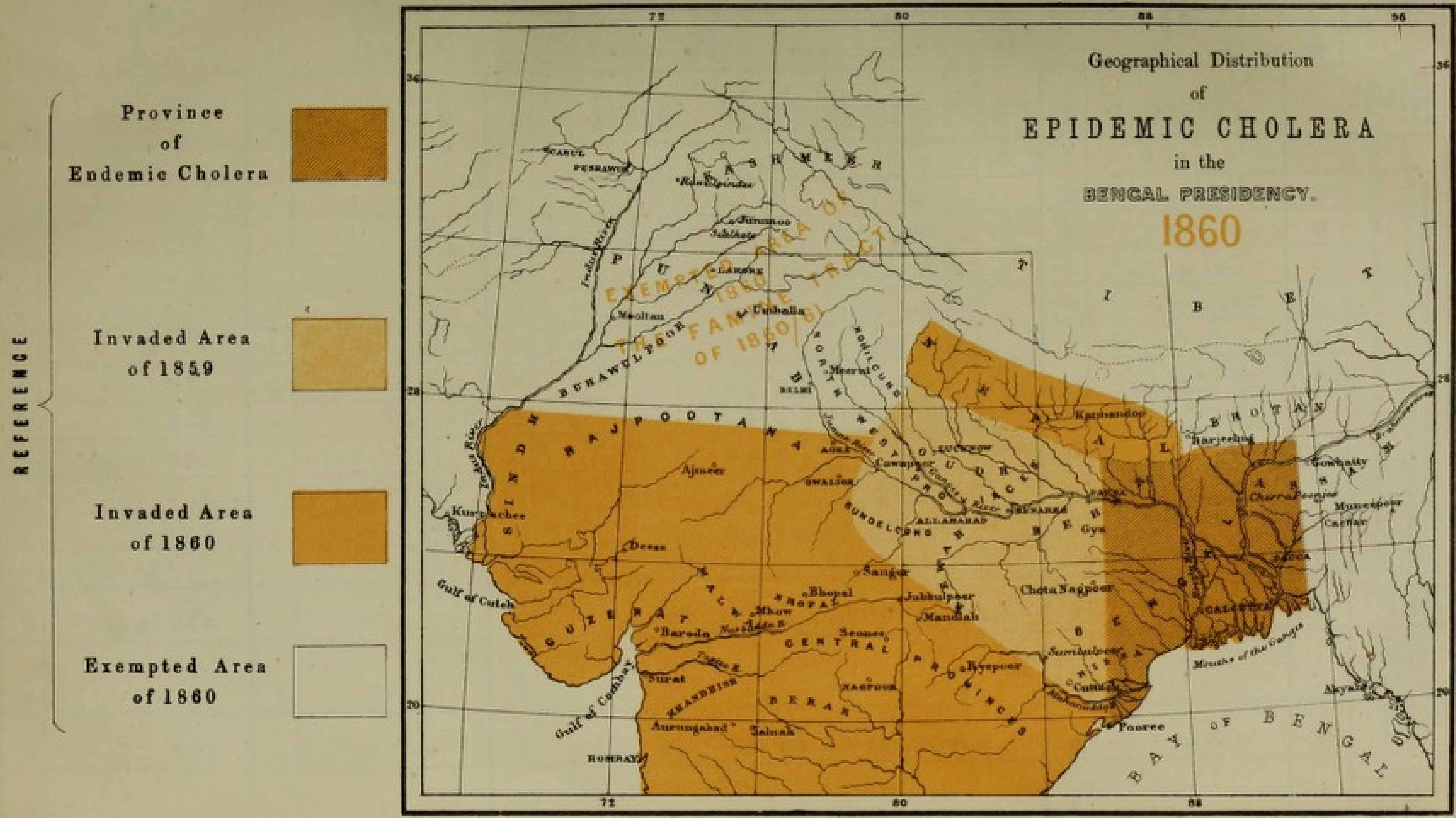
See Map of 1860.

Cholera universally reproduced over the eastern division: invading in the south, Nagpore and the Central Provinces generally, in March: extending with the monsoon to the north and west, but cut short in its advance along the line which formed the southern boundary of the famine tract of 1861, the country to the south of this line being the cholera tract of 1860: Meerut, Rohilcund, and the Punjab still are exempted provinces as in 1859; for the cholera of the east made no progress across the Doab from east to west, and, as noted above, the cholera advancing from the south-east and south was also prevented from entering this area.

Notwithstanding the explanations given in connexion with the occurrence of the four fatal cases among the European Troops in the exempted tract of the year, which occurred at Delhi, Ferozepore, and Meean Meer, these ought probably to be reckoned as genuine cases of cholera, and true precursors of the invasion of 1861. Two parallel cases are noted among Native Troops, occurring the one at Meerut and the other at Deyrah. The distribution to the east and south of the lines limiting the exempted tract is typically displayed in the Table for the European Army.

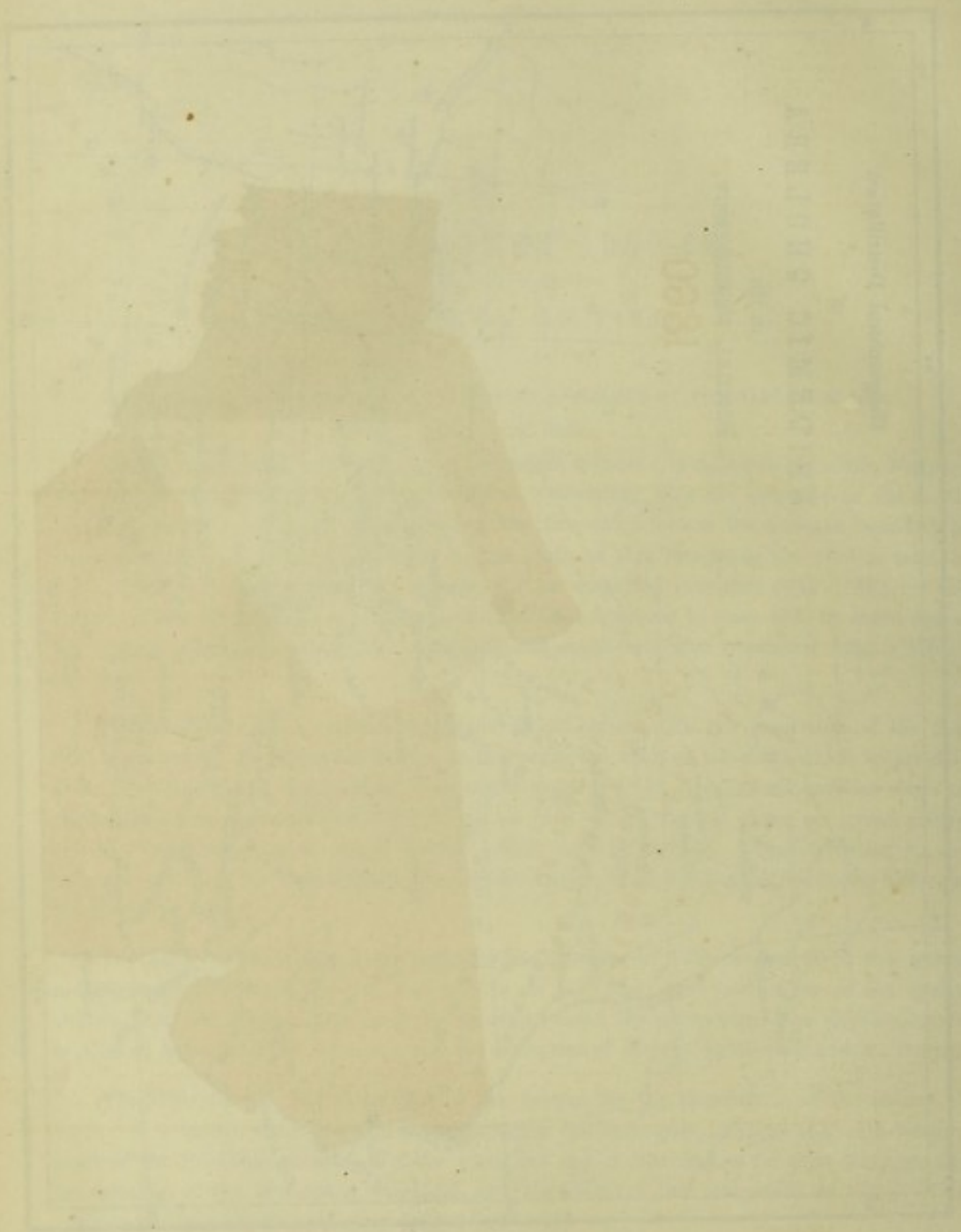
The Table for the Native Army indicates the invasion of Eastern Bengal in the spring months, and of Assam in the last four months of the year; the universality of the spring cholera over the eastern division of the epidemic area; the occupation of a limited portion of Central India with the monsoon; and the exemption of Meerut, Rohilcund, and the Punjab.

The Table for the Jail Population is also typical for the distribution of the cholera of 1860. A fatal case which occurred in the Goorgaon Jail in August, indicates the north-western limit of the invading cholera. To the south and east of this limit as far as to Nagpore, the universality of the invasion is displayed, and the dates of the occupation of the different stations on the southern epidemic highway indicated.


Geographical Distribution
of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1860
REFERENCE
Province of Endemic Cholera
Invaded Area of 1859
Invaded Area of 1860
Exempted Area of 1860
EXEMPTED AREA OF 1860
THE FAMINE TRACT OF 1860/61
CABUL
PESHAWUR
KASHMEER
PUNJAB
Lahore
Mooltan
Umballa
Meerut
DELHI
ROHILCUND
NORTH WEST PROVINCES
RAJPOOTANA
Ajmeer
AGRA
GWALIOR
Cawnpoor
LUCKNOW
ALLAHABAD
BENARES
BUNDELCUND
Saugor
Bhopal
Jubbulpoor
Mundlah
Chota Nagpoor
NEPAL
Katmandoo
Darjeeling
BHOTAN
ASSAM
Gowhatty
Munneepoor
Cachar
Cherra Poonjee
DACCA
PATNA
Gya
BEHAR
BENGAL
CALCUTTA
Mouths of the Ganges
Sumbulpoor
ORISSA
Cuttack
Pooree
Ryepoor
CENTRAL PROVINCES
NAGPOOR
BERAR
KHANDEISH
Aurungabad
Jalnah
Surat
Baroda
MALWA
Mhow
GUZERAT
Deesa
SINDH
Kurrachee
Indus River
Gulf of Cutch
Gulf of Cambay
BOMBAY
BAY OF BENGAL
Akyab
TIBET
72
80
88
96
36
28
20

Litho: at the Surv! Genl's Office Calcutta Sept! 1868

H.A.D. Lawrence Lithographer



EUROPEAN ARMY IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1860.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Presidency Hospitals	...	...	16	22	3	...	2	...	...	1	...	...	...	44	...	25	...
Fort William ...	1,198	...	11	8	3	20	13	2	1	1	...	...	...	59	...	40	...
Dum-Dum ...	1,242	...	5	...	1	6	..	...	1	1	...	...	...	14	...	6	...
Barrackpore ...	1,501	...	4	4	7	1	1	...	...	...	...	...	2	19	...	12	...
Chinsurah Depôt ...	117	...	3	...	2	...	...	2	...	...	1	1	...	9	...	1	...
Raneegunge Depôt ..	308	...	2	16	...	...	...	...	...	...	...	10	...	28	...	10	...
Berhampore ...	270	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	4,636	...	25	28	13	27	14	4	2	2	1	11	2	129	2·78	69	14·88
Darjeeling, on march to ...	131	...	...	...	3	...	...	...	...	...	...	...	...	3	..	2	...
Hazareebaugh ...	663	...		...	...	...	...	4	1	...	...	...	...	5	...	1	...
Dinapore ...	887	...	1	2	8	7	3	...	...	...	2	...	...	23	...	8	...
Dehree ...	230	...	1	..	1	7	9	4	5	...	...	...	...	27	...	20	...
Ghazeepore ...	555	...	..	21	115	2	...	1	2	...	...	1	...	142	...	69	...
Benares ...	1,447	...	2	28	6	1	1	7	...	...	1	1	...	47	...	33	...
Azimghur ...	248	...	...	4	6	...	...	...	..	...	...	...	...	10	...	6	...
Goruckpore ...	698	..	...	...	4	...	11	.	...	...	...	...	...	15	...	10	...
Gondah ...	965	...	...	12	10	...	...	...	...	..	...	...	...	22	...	18	...
Fyzabad ...	1,054	...	...	1	27	...	...	...	...	...	...	1	...	29	...	20	...
Sultanpore ...	257	...	...	...	2	...	...	...	...	1	...	1	...	4	...	1	...
Rae Bareilly ...	876	...	...	...	3	...	...	...	...	...	...	...	...	3	...	1	..
Seetapore ...	1,018	...	...	...	...	4	...	...	...	...	...	...	...	4	...	3	...
Lucknow ...	2,216	...	...	1	7	1	...	1	9	16	...	...	...	35	...	22	...
Futtehgurh ...	386	...	...	1	..	..	...	...	...	...	...	...	...	1	...	...	...
Cawnpore ...	1,228	...	...	5	12	1	...	2	19	4	...	...	...	43	...	24	...
Allahabad ...	2,460	...	2	20	19	2	...	2	2	1	1	5	...	54	...	27	...
Allahabad and Cawnpore General Hospitals ...	...	...	10	12	3	...	3	...	...	...	...	...	...	28	...	11	...
Nagode ...	225	...	...	...	26	...	...	...	...	...	...	...	...	26	...	15	...
Humeerpore ...	101	..	...	...	...	...	...	...	...	...	...	...	...	...	...	..	..
Oraie ...	205	...	...	...	...	...	4	...	..	...	2	...	...	6	...	4	...
Shahjehanpore ...	510	...	...	1	3	...	...	...	...	...	...	...	...	4	...	3	...
Bareilly ...	1,008	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...
TOTAL ...	17,368	...	16	109	255	25	31	21	38	22	6	9	...	532	3·06	299	17·22
Moradabad ...	463	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Meerut ...	2,317	...	..	...	...	...	1	1	..	...	...	...	..	2	...	...	...
Delhi ...	1,071	...	...	1*	...	...	...	...	1	...	...	...	...	2	...	1	...
Roorkee ...	443	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Landour Depôt ...	155	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nynee Tal Depôt ...	326	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	4,775	...	...	1	...	...	1	1	1	...	...	...	...	4	·08	1	·21
Muttra ...	358	...	..	...	...	...	...	...	42	8	...	...	...	50	...	24	...
Agra	1,238	...	...	...	...	1	...		77	36	1	...	...	115	...	59	...
Morar ...	1,279	...	...	...	2	...	...	15	130	25	1	1	...	174	...	87	...
Gwalior District ...	526	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Jhansi (11 months)	583	...	...	...	...	...	...	...	31	1	...	...	...	32	...	13	..
Saugor ...	968	...	1	...	1	...	.	7	1	...	1	...	...	11	...	4	...
Jubbulpore ...	805	...	...	...	...	1	...	3	1	1	1	...	1	8	...	5	...
TOTAL ...	5,708	...	1	...	3	2	...	25	282	71	4	1	1	390	6·83	192	33·64

* Probably a case of true cholera, but described as a typical case of cholera bilious.

CHOLERA OF THE EUROPEAN ARMY OF 1860 —*continued.*

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Umballa ...	1,892	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dugshaie (7 months)	1,014	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Subathoo (9 months)	990	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kussowlie Depôt ...	145	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillour ...	147	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	816	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	1,086	...	...	...	...	...	...	...		1	...	...	...	1	...	1	...
Meean Meer ...	2,036	...	...	...	...	...	3	...	...	...	...	1	...	4	...	2	...
Lahore Citadel ...	236	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...
Umritsur ...	470	...	...	...	...	...	...	...		...	1	...	...	1	...	...	...
Govindghur ...	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	836	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	109	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Kangra ...	103	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	1,387	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	120	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	1,945	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Attock (9 months) ...	169	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowshera ...	812	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Campbellpore ...	146	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	2,400	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murree Depôt ...	166	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	16,414	...	1	...	...	...	3	...	...	1	1	1	...	7	·04	3	·18
Bengal Presidency	48,901	...	59	160	274	54	51	51	323	97	12	22	3	1,106	2·26	589	12·04

NATIVE ARMY IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1860.

Strength of July 1860.	Stations.	Number of Admissions from Cholera in each Month.											Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
	Bengal Proper—													
800	Calcutta	...	1	5	7	8	2	1	...	...	..	...	1	25	11
1,730	Barrackpore	...	...	1	1	7	...	2	...	...	16	1	...	28	10
320	Berhampore	1	1	...	...	...	...	...	...	...	...	1	...	3	None.
577	Julpigoree	...	...	1	..	1	11	5	1	...	...	...	...	19	6
	Eastern Bengal and Assam—													
418	Furreedpore	...	...	...	2	...	...	...	...	...	...	.	...	2	1
416	Dacca	...	...	2	...	3	...	...	...	...	...	1	...	6	2
331	Sylhet	...	..	2	1	...	..	...	...	...	1	...	...	4	1
280	Cachar	...	...	...	2	...	1	...	...	...	...	...	...	3	1
668	Cherrapoonjee	...	...	...	1	...	...	1	...	...	1	...	...	3	1
202	Gowalparah	...	1	...	..	..	...	1	...		1	...	1	4	4
797	Gowhatty	...	...	...	1	1	...	...	..	10	4	8	...	24	10
147	Texpore	...	...	...	...	...	...	...	...	2	3	1	2	8	3
...	Nowgong	.	...	...	...	...	...	...	...	...	...	8	...	8	3
1,105	Stations of Upper Assam	...	...	...	...	...	.	...	.	6	27	38	1	72	35
	Behar, Benares, Oude, and Cawnpore—													
1,010	Dorundah	...	...	...	..	4	1		...	3	...	...	1	...	9	3
231	Darjeeling	...	...	...	...	...	...	1	...	...	...	...	...	.	1	1
590	Bhaugulpore	...	...	2	11	...	...	...	...	...	...	...	...	...	13	6
489	Dehree Ghât	...	3	1	10		9		...	...	...	...	...	..	23	17
873	Dinapore	...	1	...	...	6	5	1	1	...	1	1	...	...	16	7
313	Segowlie	...	...	...	...	...	1	...	...	...	...	...	...	...	1	1
1,250	Benares	...	..	5	10	3	16	13	..	...	...	...	...	..	47	24
574	Jounpore	...	.	...	...		...	...	...	...	...	...	...	...	None.	None.
894	Goruckpore	...	...	...	...	10	2	3	..	...	...	...	...	..	15	4
1,180	Gondah	...	...	...	19	18	...	...	...	...	...	...	...	..	37	21
769	Baraitch	...	...	...	1	4	2	...	...	...	...	...	...	...	7	3
527	Fyzabad	...	...	-	2	9	...	...	...	...	...	...	...	...	11	3
572	Rae Bareilly	...	...	...	...	...	...	1	...	...	...	...	...	...	1	1
1,308	Lucknow	...	...	2	25	6	1	1	...	3		...	...	...	38	17
1,277	Seetapore	...	...	...	...	1	...	...	...	...	1	...	...	...	2	None.
381	Futtehghur	...	...	...	1	..	...	...	...	...	...	...	...	...	1	None.
736	Humeerpore	...	...	...	...	...	1	20	1	...	...	...	...	...	22	13
1,024	Cawnpore	...	...	...	4	7	4	2	2	3	...	1	...	...	23	6
706	Allahabad	..	...	..	3	8	8	1	2	...	...	...	...	...	22	14
650	Nagode	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Agra and Central India—													
608	Nowgong	...	...	...	...	...	...	...	...	1	..	...	...	1	1	
1,620	Jhansi	...	...	...	...	...	...	...	2	...	...	..	...	2	None.	
729	Agra	...	...	...	...	...	1	...	5	2	...	...	...	8	5	
1,823	Morar	...	...	...	...	...	...	...	6	5	...	...	...	11	6	
456	Goonah	...	...	...	...	...	...	1	7	...	...	..	...	8	5	
311	Augur	...	...	...	...	...	4	1	...	...	...	...	...	5	3	
9,392	Stations of Central India, south and west of the above group	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.	
8,399	Meerut and Rohilcund	...	...	...	1	...	1	1	1	1	...	...	...	5	2*	
25,913	Punjab	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.	
	Regiments marching or in Camp—													
	Camp Calcutta	2	...	85	13	...	...	...	...	...	...	...	...	100	36	
	„ Grand Trunk Road	...	...	...	...	...	...	...	...	...	...	20	...	20	17	
	„ Raneegunge	...	2	...	...	...	...	...	...	...	...	...	...	2	1	
	„ Gwalior District	...	...	...	...	...	...	...	...	...	...	4	...	4	3	
	„ near Agra	...	...	...	...	...	...	...	...	...	...	...	3	3	1	
	Army of the Presidency	4	15	164	126	61	72	19	31	29	55	83	8	667	309	

* At Meerut in June, and at Deyrah in September, probably true forerunners of the epidemic of 1861.

JAIL POPULATION IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1860.

JAIL STATIONS.	Average Strength during the Year.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,896	...	2	33	30	2	..	8	3	3	...	...	1	82	...	42	...
Baraset ...	246	...	...	1	1	...	1		1	...	...	...	...	4	...	..	...
Jessore ...	445	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Kishnaghur ...	359	...	...	3	2	1	...	1	1	...	...	...	...	8	...	...	...
Moorshedabad ...	118	...	...	...	...	...	..	...	...	...	...	...	...	..	...	...	...
Howrah ...	76	...	...	1	1	2	...	2	...	...	...	...	...	6	...	1	...
Hooghly ...	672	...	39	8	18	...	...	...	7	7	81	13	53	226	...	87	...
Burdwan ...	583	...	...	2	2	...	...	2	2	1	...	1	...	10	...	3	...
Bancoorah ...	310	...	1	2	...	12	12	1	...	...	...	...	...	28	...	11	...
Purulea ...	286	...	...	...	...	...	24	2	...	...	...	...	...	26	...	12	...
Raneegunge ...	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Sooree ...	364	1	...	...	...	1	...	...	...	...	...	...	...	2	...	1	...
Malda ...	53	...	...	...	1	...	...	...	...	...	...	...	...	1	...	.	...
Dinagepore ...	458	6	...	...	...	11	24	3	...	...	..	1	1	46	...	17	...
Rampore Bauleah ...	539	...	9	...	...	...	...	...	...	...	...	...	...	9	...	4	...
Rungpore ...	300	...	...	2	...	...	...	...	1	...	...	...	...	3	...	2	...
Bograh ...	138	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Mymensing ...	459	...	...	23	37	6	...	...	...	1	...	...	...	67	...	18	...
Pubna ...	136	...	...	...	9	...	...	...	...	...	...	...	...	9	...	6	...
Furreedpore ...	384	...	...	2	9	2	...	...	2	1	1	...	...	17	...	2	...
Backergunge ...	404	...	...	11	3	...	...	...	...	...	...	...	5	19	...	12	...
Noacolly ...	298	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Chittagong ...	405	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Tipperah ...	394	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dacca ...	506	...	...	1	8	3	...	...	...	...	...	...	...	12	...	9	...
Sylhet ...	391	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Cherrapoonjee ...	51	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gowalparah ...	161	...	...	...	...	48	...	4	...	...	11	...	...	63	...	43	...
Gowhatty ...	136	...	...	1	...	1	...	...	...	12	12	3	...	29	...	20	...
Seebsaugor ...	100	1	...	2	2	...	...	...		...	2	...	...	7	...	3	...
Nowgong ...	46	...	...	...	...	...	...	...	...	...	5	...	...	5	...	3	...
Tezpore ...	200	.	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Debrooghur ...	92	...	...	..	...	2	...	...	...	1	18	...	...	21	...	10	...
Midnapore ...	629	...	1	32	15	...	140	7	...	...	...	4	...	199	...	93	...
Balasore ...	107	...	1	...	...	1	...	...	...	...	...	..	...	2	...	1	...
Cuttack ...	276	...	...	9	1	...	1	4	...	...	...	...	1	16	...	4	...
Pooree ...	59	...	1	2	...	...	4	1	..	...	...	...	...	8	...	2	...
Sumbulpore ...	154	...	1	...	...	...	...	8	3	...	...	...	...	12	...	9	...
Chyebassa ...	136	...	...	...	...	...	..	...	...	..	...	...	...	...	...	...	...
Ranchee ...	332	...	...	...	2	11	13	15	21	...	...	...	...	62	...	33	...
Hazareebaugh ...	473	...	...	1	1	49	7	...	...	...	...	1	...	59	...	30	...
Monghyr ...	401	...	...	1	23	7	5	...	...	...	...	...	...	36	...	19	...
Bhaugulpore ...	297	...	...	38	29	...	...	...	...	...	...	...	...	67	...	30	...
Purneah ...	322	1	...	3	38	2	...	1	...	...	...	...	...	45	...	20	...
Darjeeling ...	36	...	...	...	...	...	...	2	..	...	...	...	...	2	...	1	...
Total ...	14,335	10	55	178	232	161	231	61	41	26	131	23	61	1,210	8·44	549	38·30
Gya ...	459	...	...	5	2	...	1	2	57	...	...	...	...	67	...	37	...
Patna ...	456	...	...	..	...	2	1	12	21	1	1	...	...	38	...	14	...
Arrah ...	340	...	...	1	3	3	...	90	...	...	...	1	.	98	...	48	...
Chumparun ...	178	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferpore ...	395	...	...	...	4	6	9	1	...	32	6	...	...	58	...	20	...
Chuprah ...	373	...	...	...	16	3	1	10	17	12	...	...	...	59	...	26	...
Ghazeepore ...	760	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Benares ...	1,176	...	...	2	1	...	...	...	40	3	...	..	...	46	...	19	..
Mirzapore ...	270	...	...	7	4	...	..	...	...	...	...	...	...	11	...	7	...
Azimghur ...	234	...	...	...	1	3	1	1	...	...	...	...	...	6	...	1	...
Jounpore ...	88	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore ...	696	...	...	...	...	15	5	...	...	...	...	...	...	20	...	7	...
Baraitch ...	106	...	...	...	2	...	...	...	...	...	...	...	...	2	...	...	...
Fyzabad ...	259	1	...	...	4	...	...	...	1	...	...	...	1	7	...	3	...
Gonda ...	66	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Rae Bareilly ...	65	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sultanpore ...	83	...	...	...	3	...	...	...	...	...	...	...	...	3	...	. 2	...
Pertabghur ...	72	...	...	...	...	2	...	...	...	...	...	...	...	2	...	...	...
Hurdui ...	70	...	...	...	...	...	...	...	...	...	.	...	...	...	...	...	...
Durriabad ...	32	...	...	...	...	...	1	...	1	...	..	...	...	2	...	...	...
Luckhimpore ...	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow ...	663	...	...	...	9	...	...	1	...	...	...	...	...	10	...	4	...
Seetapore ...	119	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Oonao ...	57	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Etah ...	141	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Futtehghur ...	410	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Cawnpore ...	62	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	116	...	...	...	3	...	...	...	...	...	...	...	...	3	...	...	...
Humeerpore ...	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagode ...	94	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Allahabad ...	1,595	...	...	...	10	1	2	...	...	...	...	...	...	13	...	8	...
Total ...	9,652	1	...	15	65	36	21	117	137	48	7	1	1	449	4·65	197	20·41

CHOLERA OF THE JAIL POPULATION OF 1860 —*continued.*

JAIL STATIONS.	Average Strength during the Year.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Raepore ...	305	...	...	6	6	2	1	...	...	...	...	...	...	15	...	10	...
Bandhara ...	226	...	...	1	8	19	...	...	...	...	...	...	...	28	...	11	...
Chanda ...	160	...	...	...	...	28	...	2	...	...	...	...	...	30	...	15	...
Nagpore ...	557	...	...	*	*	...	*	*	...	...	...	...	...	(44)	...	(15)	...
Chindwarra ...	231	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore ...	1,108	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundla ...	44	...	...	...	...	...	27	1	...	...	...	...	...	28	...	9	...
Dumoh ...	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	358	...	...	...	...	...	...	11	...	...	...	...	...	11	...	6	...
Nursingpore ...	200	...	...	...	2	...	...	...	...	...	...	...	...	2	...	1	...
Lullutpore ...	253	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	278	...	...	...	2	6	...	...	...	...	...	...	...	8	...	3	...
Baitool ...	128	...	...	...	...	...	1	2	...	...	...	...	...	3	...	2	...
Sehore ...	85	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	234	...	...	...	...	2	...	...	...	...	...	...	...	2	...	1	...
Mundlaisir ...	131	...	...	18	...	...	...	...	1	...	...	...	...	19	...	8	...
Ajmere ...	189	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beaur ...	76	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	4,887	...	...	25	18	57	29	16	1	...	...	...	...	190	3·89	81	16·57
Muttra ...	147	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra ...	1,890	...	...	...	...	...	...	...	801	7	...	...	...	808	...	173	...
Secundra ...	190	...	...	...	...	...	...	...	8	...	...	...	...	8	...	2	...
Etawah ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	159	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	193	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	120	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	331	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Bareilly ...	690	...	...	2	3	...	...	...	...	...	...	...	...	5	...	1*	...
Budaon ...	295	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scharunpore ...	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bijnour ...	278	...	...	...	2	...	...	...	...	...	...	...	...	2	...	...	...
Deyrah ...	55	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Almorah ...	146	...	...	...	...	1	...	...	...	1	...	...	...	2	...	...	...
Mozuffernuggur ...	87	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	216	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Meerut ...	2,096	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi ...	249	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goorgaon ...	158	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
TOTAL ...	7,554	...	...	3	6	1	...	...	810	8	...	...	...	828	10·96	178	23·56
Rhotuk ...	213	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Hissar ...	263	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa ...	225	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Kurnaul ...	257	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thanesur ...	361	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa ...	561	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Simla ...	42	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Loodianah ...	256	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	365	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	306	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	373	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore Central ...	1,567	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ City ...	494	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	333	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...	150	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goordaspore ...	155	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	339	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojrat ...	238	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	295	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	158	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira ...	313	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	328	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferghur ...	243	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ..	270	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leia ...	99	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan ...	54	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismail-Khan ...	232	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	77	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hurreepore ...	50	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	700	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Peshawur ...	388	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
TOTAL ...	9,826	...	...	...	1	...	...	...	...	...	...	...	...	1	·01	...	...
BENGAL PRESIDENCY	46,254	11	55	221	322	255	281	194	989	82	138	24	62	2,678	5·79	1,005	21·73

* Returned as cholera biliosa.

EPIDEMIC OF 1859-62.

CHOLERA OF 1861.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1861.

See Map of 1861.

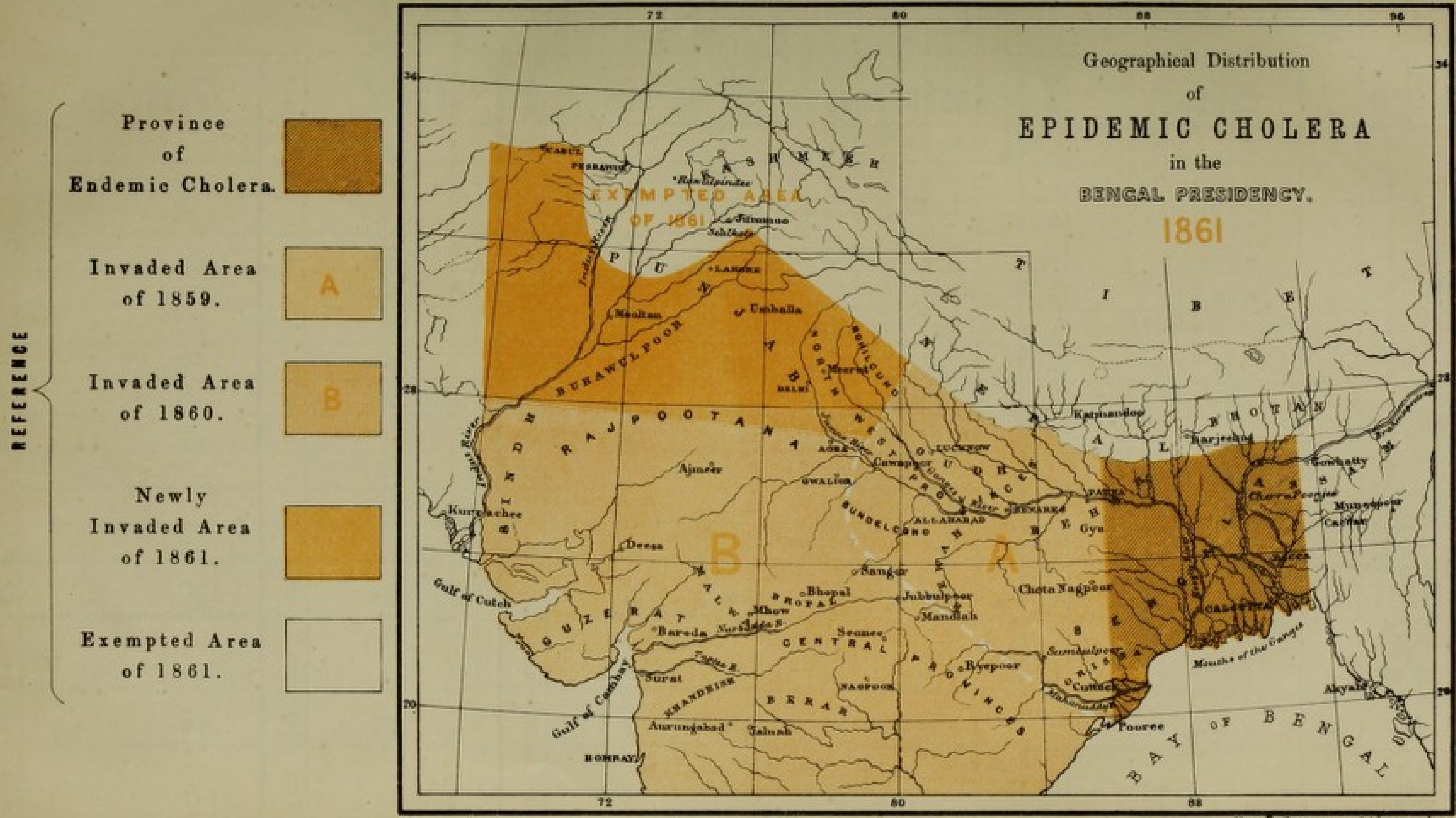
Cholera generally reproduced over the eastern division of the epidemic area, but having no longer the aspect of a moving cholera: universally reproduced in April and May over the portion of the western area invaded in 1860; and from this tract invading with the monsoon, from south-east to north-west, the area exempted in 1859 and 1860, the limit of the year being reached in the same week as in 1856: limited in its north-western extension to the same area of primary invasion as in 1856, the north of the Punjab still remaining an exempted tract.

The history of the cholera of 1861 is typically exhibited in the Table for the European Army. The appearance over the east is shown, with the general want of epidemic vigour. In the west, the reappearance of cholera at Morar, Agra, and Muttra marks the revitalisation of the cholera of 1860; and the cholera occupying the invaded tract of the year is typical for the geographical distribution of the epidemic. The exempted areas within the boundaries of the invaded tract were the same as in the invasion of 1856.

The Table for the Native Army indicates the presence of cholera over the eastern division, but with much diminished strength; the universality of the invading cholera in the northern epidemic highway between Agra and Ajmere, and its absence to the south and west; the invasion of Meerut and of the Punjab as high as Meean Meer, and the almost entire exemption of the northern districts of the Punjab lying beyond.

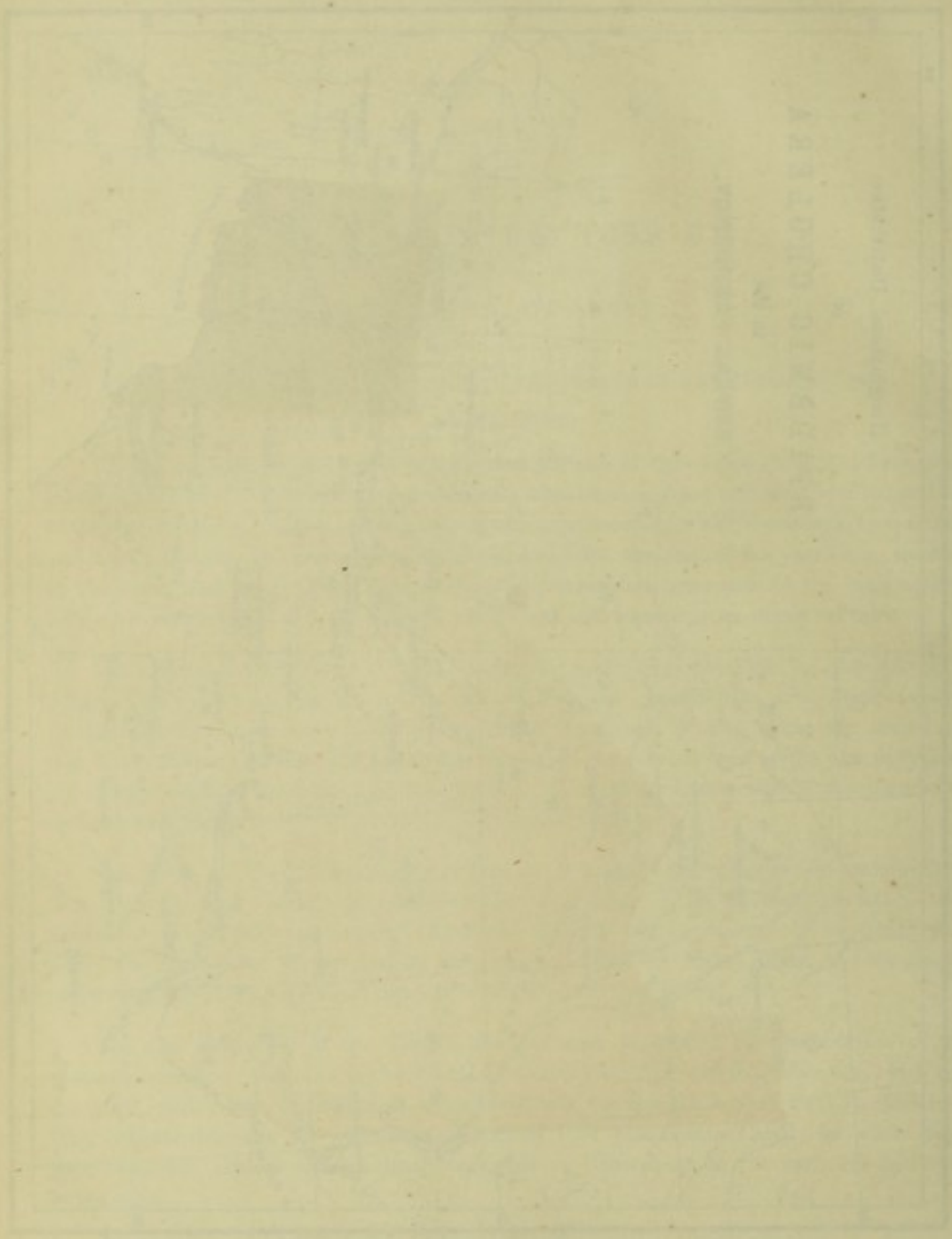
The cases occurring in the Punjab in April were apparently true forerunners of the monsoon invasion. The cases in the Frontier Force of November and December were, with one exception, which was reported from Abbottabad, from the outposts beyond Dera-Ismail-Khan. They indicate the route by which the cholera of 1861 passed into Cabul; for while these were occurring cholera was virulently epidemic in Bhawulpore to the east and in Cabul to the west.

The Table for the Jail Population shows a distribution precisely the same as is shown in the case of the European and Native Armies.


Geographical Distribution
of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1861
REFERENCE
Province of Endemic Cholera.
Invaded Area of 1859.
A
Invaded Area of 1860.
B
Newly Invaded Area of 1861.
Exempted Area of 1861.
EXEMPTED AREA OF 1861
PUNJAB
RAJPOOTANA
NORTH WEST PROVINCES
CENTRAL PROVINCES
BENGAL
BAY OF BENGAL
Gulf of Cutch
Gulf of Cambay
Kurrachee
Mooltan
Umballa
Meerut
Ajmeer
Deesa
Bhopal
Saugor
Jubbulpoor
Mandlah
Seonee
Ryepoor
Chota Nagpoor
Sumbulpoor
Cuttack
Pooree
Surat
Baroda
Mhow
Aurungabad
Jalnah
BOMBAY
Cawnpoor
Gya
Darjeeling
Khatmandoo
Gowhatty
Cherra Poonjee
Munneepoor
Cachar
Akyab
Mouths of the Ganges
72
80
88
96
34
28
20

Litho: at the Survr. Genl's Office Calcutta Septr. 1863

H. A. D. Lawrence Lithographer.



EUROPEAN ARMY IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1861.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions during the year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Presidency Hospital	...	1	1	5	7	4	...	...	...	...	1	...	...	19	...	9	...
Fort William ...	1,056	3	2	8	2	3	...	...	...	...	...	...	...	18	...	9	...
Dum-Dum ...	803	...	...	5	6	...	...	...	...	...	...	...	...	11	...	4	...
Barrackpore ...	1,141	1	1	3	1	3	3	1	...	...	...	...	...	13	...	6	...
Chinsurah Depôt ...	204	...	...	...	2	...	...	...	...	...	...	...	...	2	...	2	...
Raneegunge „ ...	140	...	...	...	4	...	...	...	...	...	2	...	...	6	...	3	...
Berhampore ...	275	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debroogurh ...	70	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	3,689	4	3	16	15	6	3	1	...	...	2	...	...	50	1·35	24	6·51
Darjeeling Depôt ...	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sikkim Field Force	562	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	846	1	...	...	...	...	...	2	...	...	...	...	...	3	...	...	...
Dinapore ...	783	...	...	...	2	...	...	...	...	...	...	...	1	3	...	2	...
Benares ...	737	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
„ Rajghat ...	160	...	...	...	...	...	...	...	2	1	...	...	...	3	...	3	...
Goruckpore ...	907	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gonda ...	921	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Fyzabad ...	1,114	...	...	...	...	...	3	...	...	2	...	...	...	5	...	1	...
Rae Bareilly ...	648	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow ...	2,215	...	...	...	1	...	...	2	6	...	...	...	...	9	...	3	...
Seetapore ...	682	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehgurh (10 months) ...	434	...	...	...	...	...	...		11	...	...	...	...	11	...	5	...
Cawnpore ...	1,230	...	...	1	...	8	9	10	19	...	...	1	...	48	...	35	...
Allahabad ...	1,277	...	...	...	...	4	2	20	4	...	2	...	...	32	...	21	...
„ General Hospital	113	...	...	...	1	1	...	5	8	...	...	1	...	16	...	10	...
Nagode ...	203	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Shahjehanpore (9 months) ...	525	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	1,188	...	...	...	...	...	...	...	1	3	...	...	...	4	...	5	...
Total ...	14,583	1	...	1	5	13	15	39	52	6	2	2	1	137	·94	86	5·90
Moradabad (9 months)	459	...	...	...	...	...	...	1	1	...	...	...	...	2	...	2	...
Nynee Tal ...	310	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Landour ...	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Roorkee ...	588	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
Meerut ...	2,535	...	...	...	1	1	...	88	27	...	1	...	...	118	...	87	...
Delhi ...	1,327	...	...	1	1	...	...	81	1	...	...	...	...	84	...	50	...
Total ...	5,049	...	...	1	2	1	...	170	30	...	1	...	...	205	4·06	140	27·73
Muttra ...	347	...	...	...	...	...	...	10	9	...	...	...	...	19	...	4	...
Agra ...	1,220	...	...	...	...	...	1	103	8	1	1	...	...	114	...	69	...
Morar ...	1,106	...	...	...	...	...	...	64	133	13	...	...	...	210	...	152	...
Gwalior Citadel ...	244	...	...	...	...	...	...	2	6	...	...	...	...	8	...	7	...
Jhansi ...	623	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lullutpore ...	176	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	240	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	860	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore ...	861	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Total ...	5,677	...	...	...	...	...	1	179	156	14	2	...	...	352	6·20	232	40·87

CHOLERA OF THE EUROPEAN ARMY OF 1861—*continued.*

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Umballa ...	1,820	...	...	...	...	...	...	10	57	4	...	...	...	71	...	53	...
Dugshaie (7 months)	1,055	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Subathoo (8 months)	1,019	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kussowlie ...	223	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jutogh ...	35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillour ...	125	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	1,015	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Ferozepore ...	889	...	...	...	...	...	...	...	...	2	...	2	...	4	...	1	...
Meean Meer ...	1,700	...	...	...	...	...	...	...	661	64	...	...	...	725	...	450	...
Lahore Citadel ...	149	...	...	...	...	...	...	...	39	7	...	...	...	46	...	29	...
Umritsur and Govindghur ...	481	...	...	...	...	...	...	...	...	50	...	...	...	50	...	41	...
Mooltan ...	734	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	106	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	1,494	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Kangra ...	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	1,846	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Attock ...	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowshera (11 months)	805	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Campbellpore (7 months) ...	339	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	1,955	...	...	...	...	...	1	...	...	1	...	...	...	2	...	...	...
Murree ...	229	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	15,900	...	1	...	...	...	2	10	757	128	...	2	...	900	5·66	574	36·10
BENGAL PRESIDENCY	44,879	6	5	23	29	24	21	399	995	148	8	4	1	1,663	3·71	1,065	23·73

NATIVE ARMY IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1861.

Strength of August 1861.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
	Regiments on the march ...	5	3	4	3	8	7	...	...	...	...	...	...	30	12
	Bengal Proper and Assam—														
1,059	Calcutta	...	2	4	...	4	1	...	...	1	1	1	...	14	5
963	Barrackpore	...	3	3	3	1	...	...	...	...	...	...	...	10	4
334	Berhampore	...	...	1	2	...	...	...	...	...	...	...	...	3	2
169	Julpigoree	2	...	...	...	4	1	1	...	...	...	...	...	8	6
240	Sylhet and Out-posts ...	...	..	...	...	...	...	...	...	1	..	...	5	6	4
254	Dacca	1	...	...	...	...	1	...	...	...	...	...	4	6	5
302	Cherrapoonjee	...	...	...	1	...	...	...	1	...	...	...	...	2	2
343	Gowhatty	1	...	...	...	23	...	...	...	...	...	...	...	24	7
148	Gowalparah	...	...	...	...	...	...	...	...	1	...	...	...	1	1
58	Tezpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
816	Upper Assam	...	3	...	...	...	...	3	1	1	2	1	...	11	5
	Behar, Benares, Oude, and Cawnpore—														
493	Darjeeling	...	...	...	6	5	...	2	...	...	...	...	...	13	6
204	Dorundah	...	...	...	...	1	3	...	...	...	...	...	...	4	None.
277	Dehree Ghât	...	...	...	...	...	2	...	...	...	...	...	...	2	2
532	Dinapore	...	...	...	1	1	...	1	...	...	...	...	...	3	1
135	Segowlie	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
686	Benares	...	...	1	...	3	1	6	1	...	...	...	...	12	9
547	Jounpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
618	Goruckpore	...	..	...	1	1	...	...	...	1	...	1	...	4	1
423	Fyzabad	...	...	...	...	...	...	1	...	...	1	...	...	2	None.
372	Gonda	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
633	Lucknow	...	...	1	...	...	...	...	...	1	4	...	...	6	1
1,018	Seetapore	...	...	...	...	...	1	...	...	...	...	...	...	1	None.
351	Futtehghur	...	...	...	...	...	...	...	1	...	...	...	...	1	None.
876	Cawnpore	...	...	...	1	8	9	...	2	...	...	...	...	20	8
303	Banda	...	...	...	...	...	...	...	4	2	...	...	...	6	1
378	Humeerpore	...	...	..	...	...	...	1	1	...	..	...	...	2	None.
501	Allahabad	...	...	...	...	...	...	...	...	...	...	..	...	None.	None.
	Central India, Agra, Meerut, and Rohilcund—														
958	Erinpoorah	...	...	...	...	...	...	...	...	...	...		...	None.	None.
696	Sirdarpore	...	...	...	...	...	...	..	1	...	..	...	...	1	None.
600	Kherwarrah	...	..	...	...	...	...	...	...	..	...	...	...	None.	None.
501	Augur	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
498	Goonah	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
701	Lullutpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
532	Jhansi	.	...	...	...	...	...	...	...	...	...	...	...	None.	None.
963	Nowgong	...	...	...	...	...	...	...	...	...	..	...	...	None.	None.
533	Jubbulpore	...	...	...	...	...	...	...	...	..	1	1	...	2	None.
895	Deolee	...	..	...	...	...	...	..	1	1	...	...	...	2	None.
755	Beaur	...	...	...	...	...	...	...	...	...	...		...	None.	None.
533	Ajmere	..	...	...	..	...	...	4	11	3	...	...	...	18	2
1,438	Morar	...	...	...	...	...	...	...	1	...	...	...	...	1	None.
619	Agra	...	...	...	...	...	4	10	7	...	...	...	...	21	3
1,028	Delhi	...	...	1	3	...	1	28	8	...	...	...	...	41	9
763	Meerut	...	...	...	...	...	..	4	2	...	...	...	...	6	2
750	Deyrah	...	...	2	1	..	...	...	18	6	1	...	...	28	7*
363	Roorkee	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
345	Moradabad	...	...	...	...	...	...	...	.	...	.	...	...	None.	None.
563	Almorah	...	...	...	.	...	...	...	...	...	...	...	...	None.	None.
824	Bareilly	...	...	...	...	...	...	...	...	...	...	.	..	None.	None.
600	Shahjehanpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
	Carried over ...	9	11	17	22	59	31	61	60	18	10	4	9	311	105

* Goorkhas.

CHOLERA OF THE NATIVE ARMY OF 1861 —*continued.*

Strength of August 1861.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
	Brought forward ...	9	11	17	22	59	31	61	60	18	10	4	9	311	105
	Punjab—														
823	Umballa	...	...	...	...	...	...	...	4	...	...	...	...	4	2
887	Jullundur	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
512	Ferozepore	...	...	...	...	...	...	...	...	48	6	...	...	54	30*
1,187	Mooltan	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
640	Dhurmsala	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
450	Goordaspore	...	...	...	...	...	...	...	...	1	...	...	...	1	1
431	Sealkote	...	...	...	1	...	...	...	...	...	...	...	...	1	None.
694	Meean Meer	...	...	...	...	...	...	...	38	2	1	...	...	41	16
260	Umritsur	...	...	...	...	...	...	...	...	16	...	...	...	16	10*
811	Rawulpindee	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
50	Murree	...	...	...	...	...	...	...	..	...	...	...	...	None.	None.
461	Attock	...	...	...	...	...	...	..	...	...	1	...	...	1	None.
1,993	Peshawur	...	...	...	1	...	...	2	...	...	...	...	..	3	1
8,747	Punjab Frontier Force ...	...	...	...	1	...	2	...	...	4	...	8	1	16	8
46,437	Army of the Presidency ...	9	11	17	25	59	33	63	102	89	18	12	10	448	173

* Goorkhas.

JAIL POPULATION IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1861.

JAIL STATIONS.	Average Strength during the Year.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Admitted per cent. of Strength.	Total Deaths of the Year.	Died per 1,000 of Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,759	...	...	5	7	6	1	4	1	2	3	...	1	30	...	11	...
Baraset ...	184	...	...	...	...	1	...	1	...	1	1	...	...	4	...	1	...
Jessore ...	540	...	...	2	...	2	...	...	...	...	...	...	...	4	...	2	...
Kishnaghur ...	349	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...
Moorshedabad ...	156	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Howrah ...	99	...	...	...	...	...	1	...	...	1	...	...	...	2	...	...	...
Hooghly ...	713	...	...	4	32	20	4	1	6	14	12	6	4	103	...	15	...
Burdwan ...	567	...	...	2	5	1	2	...	...	...	1	...	...	11	...	3	...
Bancoorah ...	306	...	...	...	...	1	3	...	...	...	1	...	...	5	...	2	...
Purulea ...	224	...	...	...	...	...	10	5	...	...	...	...	...	15	...	9	...
Raneegunge ...	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sooree ...	275	...	...	...	4	23	...	...	...	...	...	...	1	28	...	17	...
Deoghur ...	120	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nya Doomka ...	75	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rajmehal ...	196	...	...	1	6	...	1	...	...	...	...	...	...	8	...	3	...
Malda ...	39	...	...	...	...	2	...	...	...	...	...	...	1	3	...	...	...
Dinagepore ...	369	1	...	1	...	1	...	...	...	...	...	...	...	3	...	1	...
Rampore Bauleah ...	494	...	...	2	4	4	...	...	...	...	...	2	...	12	...	3	...
Rungpore ...	293	...	...	...	...	1	...	...	...	1	...	...	...	2	...	1	...
Bograh ...	171	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymensing ...	555	...	...	...	...	10	9	..	...	...	18	16	...	53	...	27	...
Pubna ...	215	...	...	...	..	...	...	4	1	...	...	...	...	5	...	3	...
Furreedpore ...	404	1	1	...	2	...	...	1	...	1	1	1	...	8	...	1	...
Backergunge ...	293	1	...	...	5	1	2	...	...	...	...	1	4	14	...	8	...
Noacolly ...	205	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittagong ...	386	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tipperah ...	375	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Dacca ...	543	3	...	...	4	...	5	2	...	...	1	...	...	15	...	6	...
Sylhet ...	356	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cherrapoonjee ...	40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	116	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Gowalparah ...	154	..	...	...	...	2	...	1	...	...	2	...	2	7	...	6	...
Gowhatty ...	153	...	...	...	...	...	...	...	...	...	1	..	...	1	...	...	...
Seebsaugor ...	83	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	45	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Tezpore ...	212	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debrooghur ...	124	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Luckhimpore ...	25	...	...	...	...	6	...	...	...	...	...	...	...	6	...	4	...
Midnapore ...	497	...	...	12	3	...	...	...	...	...	...	...	...	15	...	5	...
Balasore ...	108	...	...	...	...	...	...	2	1	...	...	...	...	3	...	...	...
Cuttack ...	238	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Pooree ...	21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sumbulpore ...	85	...	...	...	...	...	...	...	2	...	...	...	...	2	...	2	...
Chyebassa ...	158	1	...	1	...	...	2	10	2	...	...	...	...	16	...	8	...
Ranchee ...	227	...	...	...	...	...	5	8	2	...	...	...	...	15	...	12	...
Hazareebaugh ...	468	...	...	1	2	...	...	...	...	...	...	...	...	3	...	2	...
Monghyr ...	288	...	...	...	1	10	3	...	3	...	...	...	...	17	...	8	...
Bhaugulpore ...	362	...	...	...	33	1	...	...	...	...	...	...	...	34	...	14	...
Purneah ...	311	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Darjeeling ...	32	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Total ...	14,021	7	1	31	109	93	49	39	18	22	42	26	14	451	3·22	178	12·69
Gya ...	374	...	...	...	2	7	..	...	1	...	...	...	...	10	...	4	...
Patna ...	394	...	...	...	...	...	2	31	...	...	...	...	...	33	...	14	...
Deegah ...	213	...	...	...	27	...	11	11	...	...	2	...	...	51	...	13	...
Arrah ...	445	...	...	1	1	...	2	2	...	...	...	...	...	6	...	3	...
Chumparun ...	178	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferpore ...	381	...	...	...	1	31	6	1	...	...	...	2	...	41	...	10	...
Chuprah ...	326	...	...	...	...	1	...	13	...	...	...	...	...	14	...	7	...
Ghazeepore ...	688	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Benares ...	1,397	...	...	...	...	1	...	1	...	...	...	...	...	2	...	...	...
Mirzapore ...	275	...	...	1	...	...	2	18	...	...	...	...	...	21	...	11	...
Azimghur ...	263	...	...	1	...	1	...	...	...	...	...	...	...	2	...	...	...
Jounpore ...	99	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Carried over ...	5,033	...	...	3	31	41	23	77	1	...	2	2	...	180	...	62	...

CHOLERA OF THE JAIL POPULATION OF 1861 —*continued.*

JAIL STATIONS.	AVERAGE STRENGTH DURING THE YEAR.	NUMBER OF ADMISSIONS FROM CHOLERA IN EACH MONTH.												TOTAL ADMISSIONS OF THE YEAR.	ADMITTED PER CENT. OF STRENGTH.	TOTAL DEATHS OF THE YEAR.	DIED PER 1,000 OF STRENGTH.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Brought forward ...	5,033	...	...	3	31	41	23	77	1	...	2	2	...	180	...	62	...
Goruckpore ...	791	...	...	...	...	...	3	...	...	...	...	...	...	3	...	...	...
Gonda ...	65	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baraitch ...	86	...	...	...	...	...	...	...	10	...	...	...	...	10	...	3	...
Fyzabad ...	342	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sultanpore ...	202	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rae Bareilly ...	103	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pertabghur ...	144	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hurdui ...	71	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Luckhimpore ...	60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Durriabad ...	52	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oonao ...	77	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Alumbagh ...	614	...	...	...	...	...	...	...	...	25	...	...	...	25	...	14	...
Lucknow ...	769	...	...	...	...	...	...	...	...	...	...	8	...	8	...	6	...
Seetapore ...	239	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Etah ...	204	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Humeerpore ...	76	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	69	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	482	...	...	...	1	...	...	26	34	...	...	...	...	61	...	22	...
Cawnpore ...	203	...	...	...	...	...	3	...	...	...	...	...	...	3	...	...	...
Banda ...	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagode ...	81	...	...	...	...	...	3	...	...	...	...	...	...	3	...	2	...
Allahabad ...	1,730	...	...	...	...	56	3	6	1	...	...	...	...	66	...	26	...
TOTAL ...	11,602	...	...	3	32	97	35	109	46	25	2	10	...	359	3·10	135	11·64
Raepore ...	371	...	...	...	...	4	4	...	...	...	...	...	...	8	...	7	...
Bandhara ...	201	...	...	...	...	...	...	...	...	...	...	..	...	(1)	...	...	...
Chandah ...	97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagpore ...	572	...	...	...	...	...	..	...	...	...	...	...	...	(2)	...	...	...
Chindwarah ...	188	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kowtah ...	43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundla ...	85	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore ...	1,079	...	...	...	..	...	...	2	...	...	...	...	...	2	...	1	...
Dumoh ...	132	..	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Saugor ...	370	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	257	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lullutpore ...	117	...	...	...	...	...	...	...	...	...	...	...	...	(1)	...	1	...
Jhansi ...	159	...	...	...	...	...	..	...	...	...	...	..	...	(3)	...	...	...
Seonee ...	216	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baitool ...	440	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Sehore ...	73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	195	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundlaisir ...	171	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ajmere ...	203	...	...	...	...	...	...	11	...	...	...	...	...	11	...	3	...
Beaur ...	123	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	5,092	...	...	..	...	4	4	13	...	...	...	...	...	28	·55	12	2·36
Muttra ...	184	...	...	...	...	...	..	1	...	...	...	...	...	1	...	1	...
Agra ...	2,494	...	...	...	...	...	2	169	19	...	...	...	...	190	...	67	...
,, Secundra ...	194	...	...	...	...	...	...	2	1	...	...	...	...	3	...	...	...
Etawah ...	153	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	166	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Allyghur ...	336	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	258	...	...	...	...	..	2	1	1	...	...	...	...	4	..	3	...
Shahjehanpore ...	524	...	...	1	2	...	...	...	...	..	...	...	...	3	...	...	...
Bareilly ...	1,171	...	...	...	...	...	...	...	11	1	...	...	...	12	...	5	...
Budaon ...	198	...	...	...	...	...	...	...	...	...	...	...	...	...	. .	...	...
Scharunpore ...	181	...	...	...	...	...	...	1	...	..	...	...	...	1	...	...	...
Bijnour ...	350	...	...	...	...	...	...	...	4	1	...	...	...	5	...	3	...
Deyrah ...	66	...	...	...	...	...	...	...	13	1	1	...	...	15	...	6	...
Almorah ...	126	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Mozuffernuggur ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	266	...	...	...	...	...	...	..	1	...	...	...	...	1	...	1	...
Meerut ...	2,189	3	...	...	...	...	...	32	635	...	...	...	...	670	...	335	...
Delhi ...	423	...	...	...	...	1	...	30	...	...	...	...	...	31	...	18	...
Goorgaon ...	65	...	...	...	...	...	10	1	...	...	...	...	...	11	...	3	...
TOTAL ...	9,465	3	...	1	2	1	16	237	685	3	1	...	...	949	10·03	443	46·80

CHOLERA OF THE JAIL POPULATION OF 1861 —*concluded.*

JAIL STATIONS.	AVERAGE STRENGTH DURING THE YEAR.	NUMBER OF ADMISSIONS FROM CHOLERA IN EACH MONTH.												TOTAL ADMISSIONS OF THE YEAR.	ADMITTED PER CENT. OF STRENGTH.	TOTAL DEATHS OF THE YEAR.	DIED PER 1,000 OF STRENGTH.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Rhotuk ...	328	...	...	...	...	...	...	...	26	33	...	...	...	59	...	24	...
Hissar ...	413	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa ...	352	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnaul ...	64	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Thanesur ...	477	...	...	...	...	...	...	9	1	...	...	...	...	10	...	5	...
Umballa ...	704	...	...	...	...	...	...	...	...	27	...	...	...	27	...	18	...
Loodianah ...	114	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	618	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	365	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	687	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore ...	2,101	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Dhurmsala ...	165	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	613	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	323	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	368	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira ...	401	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	682	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ...	338	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan ...	55	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	289	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	108	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	65	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	754	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1	...
Peshawur ...	451	...	...	...	...	...	2	...	...	...	...	...	...	2	...	1	...
TOTAL ...	10,835	...	...	...	...	...	2	10	28	60	1	...	...	101	·93	49	4·52
BENGAL PRESIDENCY	51,015	10	1	35	143	195	106	408	777	110	46	36	14	1,888	3·70	817	*16·01

* The ratios in this Table and in others of the series from 1859 to 1863, differ slightly from those given in the Abstract for the same years as printed. The ratios of these Abstracts were drawn from Annual Returns, and in a few cases the aggregate of the Admissions and Deaths has since been found to differ from the details as given month by month. In the Table for 1861, the difference of ratio is due to a great disparity between the Monthly and Annual Returns of the Jail at Meerut.

EPIDEMIC OF 1859-62.

CHOLERA OF 1862.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1862.

See Map of 1862.

Cholera extinct or at a minimum over the eastern division of the epidemic area: generally manifested both in the spring and in the monsoon season over the portion of the western division covered in 1860 and 1861: invading the exempted tracts of 1861, with the exception of the Doab between the Jhelum and the Indus: appearing on the Frontier in April and persisting until the first week of November, when the epidemic of 1859-62 became extinct in Northern India.

The minimum of the east among the European Troops is marked by the occurrence of a single fatal case of cholera in the eastern division. In the western division, from Jhansi and Morar in the south-east, and Meerut and Shahjehanpore in the east, to the Peshawur Frontier, the universality of the cholera of 1862 is shown.

The Table for Native Troops also shows the almost entire extinction of fatal cholera over the eastern division, and the universality of cholera over every portion of the western division, from Jhansi, Morar, Agra, and Meerut, to the Frontier, where it appeared on 20th April, as is indicated by the Admissions and Deaths among the Frontier Force at Bunnoo in that month.

The Jail Table also shows the extreme debility of the cholera of 1862 in the east, and the general distribution throughout the western division, terminating with the outbreak of the jail at Peshawur in October.

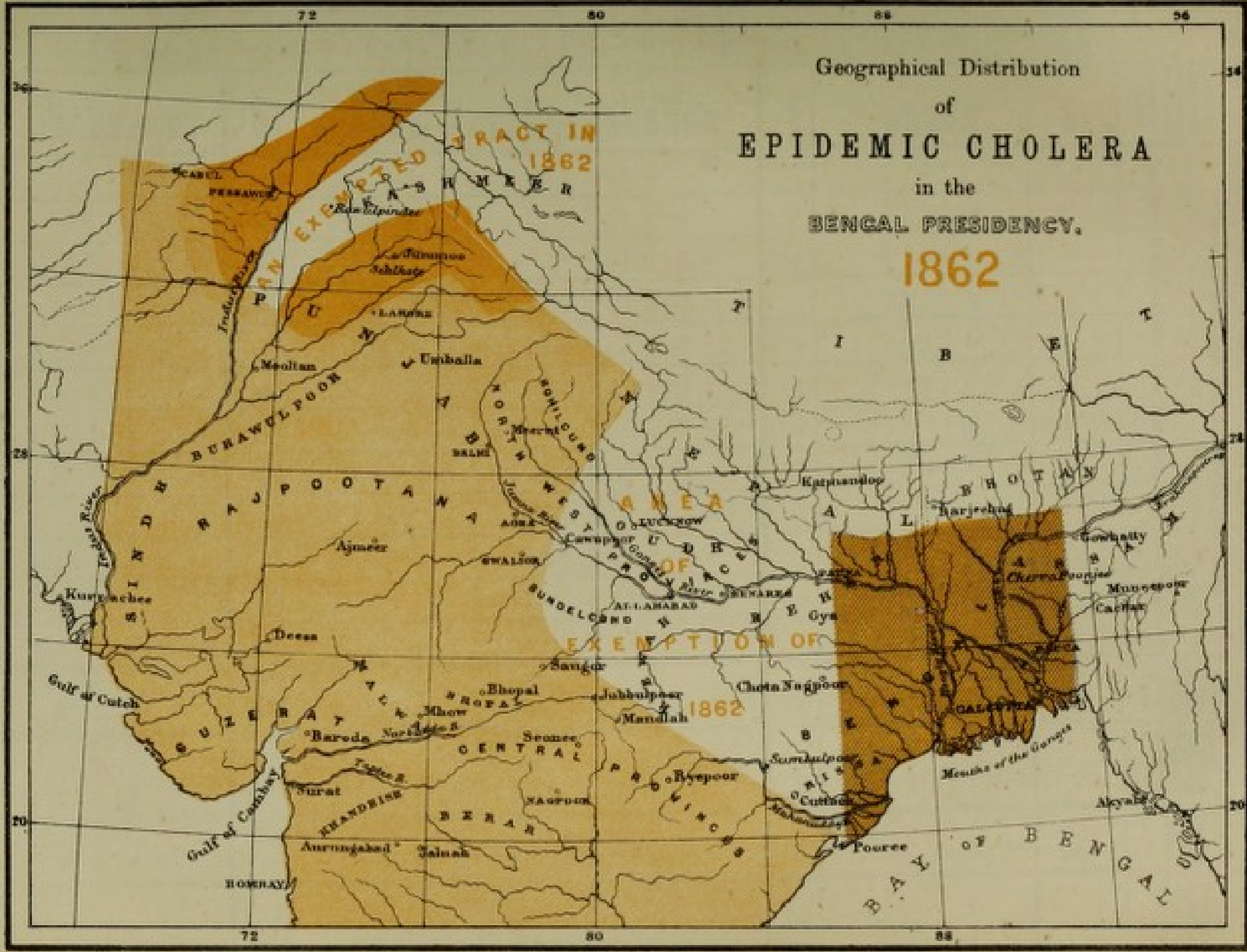
REFERENCE

Province of Endemic Cholera.

Epidemic Area of 1862. the invaded Area of 1860 & 1861.

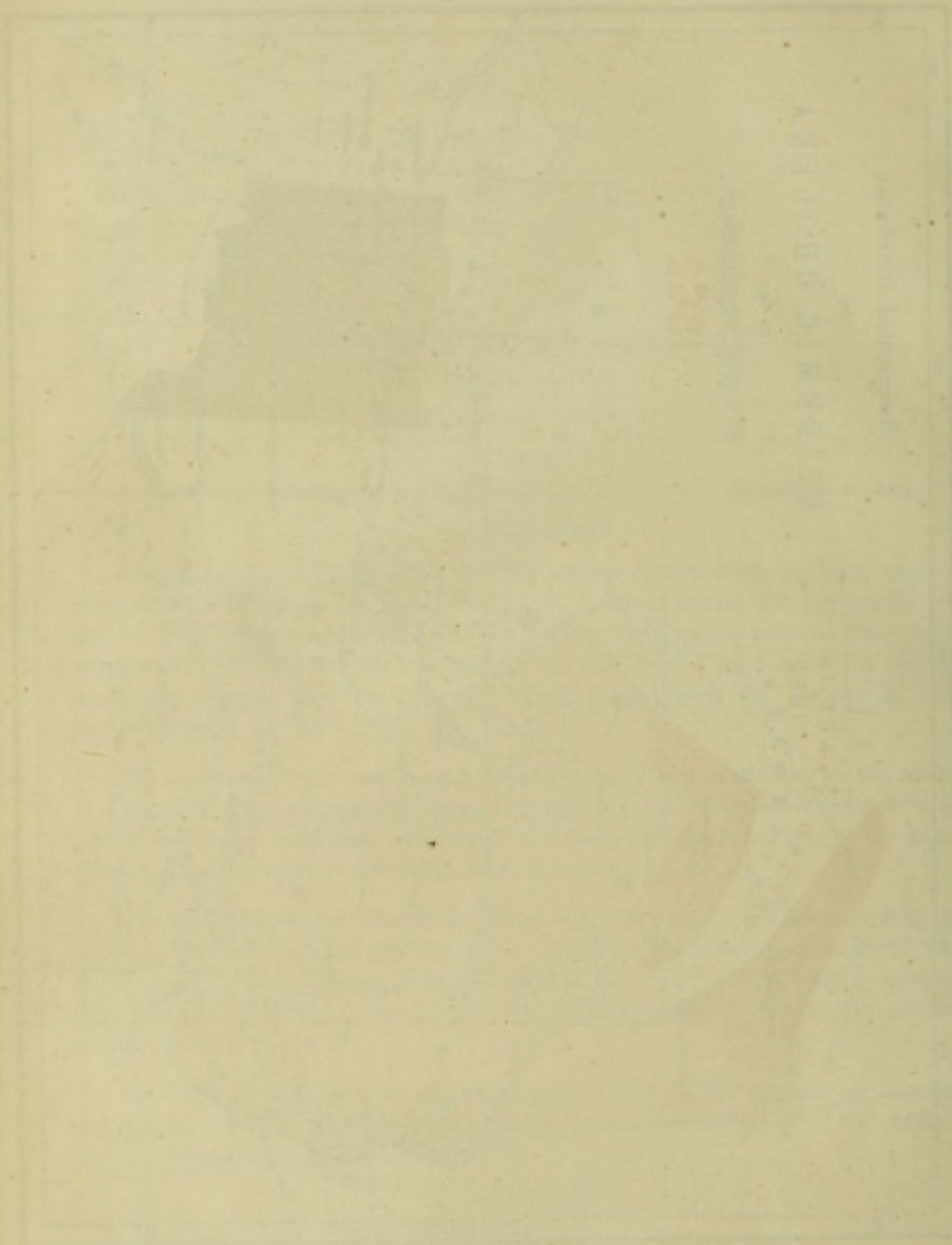
Invaded Area of 1862.

Exempted Areas of 1862.



Litho: at the Survr. Genl's Office Calcutta Sept 1861

H. A. D. Lawrence Lithographer



EUROPEAN ARMY IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1862.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Presidency Hospitals & Chinsurah Depôt	403	1	...	4	1	1	...	...	...	...	...	3	5	15	...	12	...
Fort William ...	880	...	1	...	7	2	...	5	...	...	...	1	...	16	...	13	...
Barrackpore ...	768	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Berhampore ...	296	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...
Raneegunge ...	462	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debroogurh ...	51	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Total ...	2,457	...	1	1	7	3	...	5	...	...	...	1	...	18	·73	15	6·11
Darjeeling Depôt (8 months) ...	105	...	...	...	...	...	...	...	...	...	...	...	...	...		...	...
Darjeeling ...	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	1,101	...	...	...	1	1	...	..	...	...	..	...	...	2	...	1	...
Dinapore ...	655	1	...	...	...	1	...	...	...	...	...	2	...	4	...	...	...
Benares ...	1,142	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Goruckpore ...	483	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gondah ...	787	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Fyzabad ...	1,254	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Rae Bareilly ...	587	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow ...	2,093	...	...	...	1	...	...	...	1	...	...	...	...	2	...	...	...
Seetapore ...	606	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Futtehghur ...	549	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	1,259	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad ...	1,107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, General Hospitals ...	95	...	...	1	...	..	...	...	..	...	...	...	1	2	...	1	...
Nagode ...	236	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	530	...	1	...	...	1	...	...	1	...	...	...	...	3	...	3*	...
Bareilly ...	1,096	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	13,823	1	1	2	2	3	1	...	2	...	...	2	1	15	·11	5	·36
Moradabad ...	428	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lohooghat (8 months) ...	77	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nynee Tal (8 months)	339	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Landour (7 months)	204	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Roorkee ...	611	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	2,038	...	...	...	1	...	1	24	26	...	...	...	...	52	...	32	...
Delhi ...	1,170	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	4,677	...	...	...	1	...	1	24	27	...	...	...	...	53	1·13	32	6·84
Muttra ...	502	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra ...	1,153	...	...	...	...	...	2	1	63	...	...	...	...	66	...	49	...
Gwalior Fortress (10 months) ...	237	...	..	...	1	...	...	2	23	...	...	...	...	26	...	20	...
Morar ...	1,048	...	...	...	...	...	...	19	21	22	4	...	...	66	...	39	...
Seepree (7 months)...	164	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
Jhansi ...	767	...	...	...	...	...	...	11	40	...	...	...	...	51	...	37	...
Nowgong ...	251	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	832	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore ...	847	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	5,695	...	..	...	1	...	2	33	148	22	4	...	...	210	3·69	146	25·64

* These three cases belong properly to the cholera of the province lying to the west.

CHOLERA OF THE EUROPEAN ARMY OF 1862—*continued.*

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Umballa ...	1,767	...	...	...	...	4	...	...	...	...	...	...	...	4	...	2	...
Camp Umballa ...	293	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dugshaie (9 months)	914	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Subathoo ...	810	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jutogh ...	59	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kussowlie (7 months)	422	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillour (8 months)	218	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	1,165	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meean Meer ...	1,362	...	...	...	...	1	...	...	87	38	2	...	...	128	...	68	...
Ferozepore ...	967	...	...	...	...	...	...	1	4	...	...	...	...	5	...	4	...
Lahore Citadel ...	154	...	...	...	...	...	...	...	5	4	...	...	1	10	...	5	...
Govindghur and Umritsur ...	532	...	...	...	2	...	...	...	11	17	...	...	...	30	...	15	...
Mooltan ...	1,117	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Dera-Ismail-Khan ...	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	1,438	...	...	...	...	...	...	...	5	9	...	...	...	14	...	10	...
Kangra (8 months)...	110	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala (7 months) ...	43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum (7 months)...	156	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	1,591	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Campbellpore (6 months) ...	350	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Attock ...	195	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowshera ...	722	...	...	...	...	...	...	...	2	...	...	...	...	2	...	2	...
Peshawur ...	1,970	...	...	...	...	...	...	73	14	13	63	5	...	168	...	97	...
Murree (7 months)...	296	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	15,930	..	...	...	2	6	...	74	129	81	65	5	1	363	2·28	203	12·74
BENGAL PRESIDENCY	42,980	2	2	7	14	13	4	136	306	103	69	11	7	674	1·57	413	9·61

NATIVE ARMY IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1862.

Strength of July 1862.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
	Bengal Proper and Assam—														
700	Alipore and Calcutta ...	1	1	3	5	...	4	...	...	...	...	4	3	21	10
1,352	Barrackpore	1	...	1	...	...	3	...	...	...	1	1	...	7	1
303	Berhampore	...	3	...	...	...	...	...	...	...	...	...	...	3	1
961	Julpigoree	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
564	Sylhet	...	2	2	...	...	...	...	...	...	...	...	...	4	None.
811	Cherrapoonjee	...	1	1	...	..	...	...	...	...	...	...	...	2	2
1,360	Gowhatty and Lower Assam...	...	-	...	...	4	...	...	4	2	1	1	2	14	5
683	Upper Assam	...	...	...	...	5	4	1	...	...	1	...	...	11	3
	Behar, Benares, Oude, and Cawnpore—														
492	Dorundah	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
418	Dinapore	...	...	...	...	1	1	...	...	2	2	3	...	9	2
377	Segowlie	..	...	1	...	...	...	...	...	...	...	...	...	1	None.
470	Benares	...	...	...	...	...	...	...	...	...	...	...	..	None.	None.
566	Jounpore	...	...	...	...	...	...	...	...	..	...	...	...	None.	None.
388	Goruckpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
640	Fyzabad	...	...	...	...	...	...	...	...	...	...		...	None.	None.
1,316	Lucknow	...	...	...	2	...	...	...	...	...	...	...	...	2	None.
1,050	Seetapore	...	1	1	...	...	1	1	...	...	...	...	...	4	None.
488	Allahabad	...	-	1	1	...	...	...	...	...	...	...	...	2	1
817	Cawnpore	...	1	1	1	...	...	...	...	...	...	...	...	3	None.
650	Nagode	...	...	...	1	...	...	...	...	...	...	...	...	1	None.
633	Banda	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
589	Humeerpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
	Rohilcund and Meerut—														
688	Shahjehanpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
742	Bareilly	...	...	...	...	...	...	...	...	...	...	...	..	None.	None.
336	Moradabad	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
346	Roorkee	...	...	...	...	...	...	...	...	...	..	...	...	None.	None.
1,103	Meerut	...	...	...	...	...	...	...	7	...	...	...	...	7	2
291	Allyghur	...	...	...	...	...	...	1	...	...	...	...	...	1	1
598	Delhi	...	...	...	...	1	1	1	...	...	...	...	...	3	1
752	Deyrah	...	...	...	...	3	...	...	...	...	...	...	...	3	3
709	Almorah	...	...	...	...	2	...	...	...	...	...	...	...	2	1
	Central India and Agra—														
477	Augur	...	1	1	...	...	...	...	...	...	...	...	...	2	None.
499	Goonah	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
707	Kherwarrah	...	...	...	...	...	...	...	1	...	...	...	...	1	1
624	Sirdarpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
904	Deolee	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
953	Erinpoorah	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
682	Agra	...	...	...	...	1	...	1	1	...	...	...	...	3	None.
1,629	Morar	...	...	...	...	...	2	1	4	...	...	...	...	7	5
795	Jhansi	...	...	...	...	...	...	...	2	...	...	...	...	2	1
486	Nowgong	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
633	Lullutpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
	Punjab—														
651	Simla Hills	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
484	Kurnaul	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
979	Umballa	...	...	1	1	6	...	...	...	...	...	...	...	8	8
210	Jullundur	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
660	Ferozepore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
1,001	Mooltan	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
646	Dhurmsala	...	...	...	...	3	...	...	...	...	...	...	...	3	1
400	Sealkote	...	...	...	..	...	...	...	3	...	...	...	...	3	None.
614	Meean Meer	...	...	...	...	...	...	1	5	5	...	...	...	11	6
449	Umritsur	...	...	...	...	...	...	...	...	4	...	...	...	4	2
1,056	Rawulpindee	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
2,908	Peshawur	...	...	...	...	1	...	13	..	1	21	2	...	38	22
749	Rawulpindee District ...	...	...	...	...	...	...	...	1	...	...	...	...	1	1
	Frontier Force—														
	Abbottabad	...	...	...	...	...	...	1	...	...	...	...	...	1	None.
	Murdan	...	...	...	...	...	...	...	2	...	...	...	...	2	None.
	Kohat	...	...	...	...	1	8	31	...	...	12	...	...	52	25
10,651	Bunnoo	..	...	...	17	27	1	...	...	...	...	...	...	45	18
	Dera-Ismael-Khan ...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
	Dera-Ghazee-Khan ...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
	Rajanpore	...	...	...	...	...	...	...	.	...	...	...	...	None.	None.
	Tak	...	...	...	...	...	..	...	1	2	...	...	...	3	3
	On Board Steamers on Ganges and Bhurmpooter ...	...	1	...	...	23*	...	...	...	...	...	1	1	26	19
	On the march	...	...	...	4	...	1	...	...	...	...	..	...	5	2
51,040	Army of the Presidency ...	2	11	13	32	78	26	52	31	16	38	12	6	317	147

* The 25th Native Infantry on the Ganges. Cholera broke out on the day on which the Steamer left Mirzapore.

JAIL POPULATION IN THE EPIDEMIC OF 1859-62.

CHOLERA OF 1862.

JAIL STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Average Strength.	Total Deaths of the Year.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,823	...	...	8	15	4	5	6	2	7	1	6	2	56	...	13	...
Baraset ...	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jessore ...	621	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kishnaghur ...	506	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moorshedabad ...	187	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
Howrah ...	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hooghly ...	688	2	3	28	36	2	...	13	19	3	11	7	2	126	...	19	...
Burdwan ...	567	...	...	...	13	...	1	...	...	...	...	...	...	14	...	5	...
Bancoorah ...	367	...	...	1	...	...	1	...	...	...	...	...	...	2	...	...	...
Purulea ...	200	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...
Raneegunge ...	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sooree ...	261	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deoghur ...	75	...	...	...	1	...	...	2	...	...	...	...	...	3	...	1	...
Rajmehal ...	182	...	1	2	7	...	1	...	...	2	...	1	...	14	...	9	...
Maldah ...	53	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Dinagepore ...	480	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rampore Bauleah ...	444	1	...	1	23	1	...	...	...	...	...	...	...	26	...	5	...
Rungpore ...	459	1	...	...	...	...	...	...	...	...	1	...	...	2	...	...	...
Bograh ...	191	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymensing ...	403	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Pubna ...	142	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Furreedpore ...	433	...	1	6	2	...	...	...	1	...	...	...	...	10	...	3	...
Backergunge ...	447	...	...	3	6	4	...	...	...	...	...	...	...	13	...	8	...
Noacolly ...	208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittagong ...	385	...	...	1	...	...	...	...	...	...	...	1	...	2	...	...	...
Tipperah ...	475	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dacca ...	441	...	...	3	1	...	1	...	...	...	5	...	...	10	...	2	...
Sylhet ...	435	...	...	...	8	38	...	...	...	...	...	...	...	46	...	27	...
Cherrapoonjee ...	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	166	...	...	2	4	3	...	...	...	...	...	...	...	9	...	6	...
Gowalparah ...	199	...	...	...	1	1	...	...	...	...	...	1	7	10	...	5	...
Gowhatty ...	159	...	...	...	...	...	...	...	4	...	...	...	...	4	...	4	...
Seebsaugor ...	101	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	64	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tezpore ...	181	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debrooghur ...	178	...	...	...	3	2	6	1	...	...	...	...	...	12	...	7	...
Midnapore ...	433	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Balasore ...	128	...	...	...	...	...	...	2	...	...	...	...	...	2	...	2	...
Cuttack ...	292	1	...	...	...	...	...	...	...	...	...	2	...	3	...	1	...
Pooree ...	19	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Sumbulpore ...	158	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Chyebassa ...	160	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	210	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	378	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Monghyr ...	269	...	...	1	25	...	...	...	...	1	...	...	...	27	...	14	...
Bhaugulpore ...	334	...	...	...	27	...	1	...	...	...	...	...	...	28	...	11	...
Purneah ...	454	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Darjeeling ...	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	14,695	6	5	56	174	57	16	25	27	13	18	18	12	427	2·91	147	10·00
Gyah ...	421	...	...	...	...	...	...	1	1	...	...	...	...	2	...	1	...
Patna ...	398	...	...	...	...	...	...	...	10	...	...	...	...	10	...	3	...
Deegah ...	149	...	...	...	...	...	...	...	...	...	3	...	...	3	...	...	...
Arrah ...	443	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chumparun ...	191	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferpore ...	401	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chuprah ...	324	...	...	1	...	1	1	1	2	...	1	...	...	7	...	...	...
Ghazeepore ...	650	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Benares ...	1,718	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Mirzapore ...	320	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Azimghur ...	425	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	...
Jounpore ...	280	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore ...	737	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gonda ...	55	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Carried over ...	6,512	...	...	1	...	2	2	2	14	...	4	...	1	26	...	6	...

CHOLERA OF THE JAIL POPULATION OF 1862—*continued.*

JAIL STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Average Strength.	Total Deaths of the Year.	Died per 1,000 of Average Strength
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Brought forward ...	6,512	...	...	1	...	2	2	2	14	...	4	...	1	26	...	6	...
Baraitch ...	118	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Fyzabad ...	766	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Sultanpore ...	498	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rae Bareilly ...	172	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pertabghur ...	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hurdui ...	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Luckhimpore ...	79	...	...	...	2	...	...	...	...	...	...	...	...	2	...	...	...
Durriabad ...	85	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Alumbagh ...	921	...	...	1	1	...	...	...	...	...	...	...	...	2	...	...	...
Oonao ...	95	...	...	2	...	...	...	...	...	...	...	...	...	2	...	...	...
Lucknow ...	882	...	1	...	6	1	...	...	...	...	...	...	...	8	...	...	...
Seetapore ...	428	...	...	...	...	...	...	...	2	...	1	...	...	3	...	2*	...
Etah ...	173	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Humeerpore ...	93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	520	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	245	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	163	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagode ...	85	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad ...	1,979	...	1	1	...	...	...	...	...	...	...	...	...	2	...	1	...
Total ...	14,149	...	2	6	9	3	3	3	16	...	5	...	1	48	·34	11	·78
Raepore ...	505	...	...	...	...	...	...	28	1	...	...	...	...	29	...	11	...
Bandhara ...	302	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chandah ...	126	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagpore ...	574	...	...	...	...	...	...	1	1	...	...	...	...	2	...	...	...
Chindwara ...	181	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kowtah ...	78	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundla ...	63	...	...	...	...	...	...	7	...	...	...	...	...	7	...	3	...
Jubbulpore ...	1,124	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dumoh ...	150	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	379	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	249	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lullutpore ...	129	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	134	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	278	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baitool ...	182	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sehore ...	38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	276	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundlaisir ...	165	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ajmere ...	235	...	...	...	...	...	5	7	11	...	...	...	...	23	...	11	...
Beaur ...	148	...	...	...	...	...	...	...	2	...	...	...	...	2	...	1	...
Total ...	5,316	...	...	...	...	...	5	43	15	...	...	...	...	63	1·19	26	4·89
Muttra ...	88	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra ...	2,209	...	...	...	...	...	...	...	23	...	...	...	...	23	...	12	...
„ Secundra ...	332	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Etawah ...	107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	210	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	246	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	192	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	363	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	1,768	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Budaon ...	201	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seharunpore ...	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bijnour ...	162	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Deyrah ...	53	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Almorah ...	111	...	...	...	...	...	4	6	...	...	...	...	...	10	...	5	...
Mozuffernuggur ...	93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	286	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	1,342	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi ...	424	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goorgaon ...	41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	8,361	...	...	...	...	...	4	7	23	...	...	...	...	34	·41	17	2·63

* Returned as cholera bilious.

CHOLERA OF THE JAIL POPULATION OF 1862—*concluded.*

JAIL STATIONS.	AVERAGE STRENGTH FOR THE YEAR.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS OF THE YEAR.	ADMITTED PER CENT. OF AVERAGE STRENGTH.	TOTAL DEATHS OF THE YEAR.	DIED PER 1,000 OF AVERAGE STRENGTH.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Rhotuk ...	261	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hissar ...	259	...	...	...	...	...	5	...	...	...	...	...	...	5	...	2	...
Sirsa ...	344	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Kurnaul ...	54	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Umballa ...	539	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Loodianah ...	204	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Jullundur ...	303	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	401	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	585	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore ...	2,109	...	...	...	...	...	...	1	81	12	...	...	...	94	...	41	...
Sealkote ...	277	...	...	...	...	...	...	...	33	...	...	...	...	33	...	10	...
Dhurmsala ...	173	...	...	...	1	3	...	...	...	...	...	...	...	4	...	2	...
Goordaspore ...	277	..	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Goojranwalla ...	430	...	...	...	...	...	...	...	49	2	...	...	...	51	...	13	...
Goojrat ...	317	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	268	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	311	...	...	...	...	...	...	...	...	3	...	...	...	3	...	...	...
Googaira ...	350	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	880	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ...	341	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan ...	34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	312	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	114	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Bannoo ...	67	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	764	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	371	...	...	...	...	...	...	23	...	...	23	...	...	46	...	23	...
TOTAL ...	10,345	...	...	...	1	3	7	25	163	17	24	...	...	240	2·32	93	8·99
BENGAL PRESIDENCY	52,866	6	7	62	184	63	35	103	244	30	47	18	13	812	1·54	294	5·56

EPIDEMIC OF 1863-66.

First Year, 1863.—Cholera epidemic from the east, invading and confined to the eastern division of the epidemic area: entering the Central Provinces and occupying the southern epidemic highway in June and July.

Second Year, 1864.—Cholera generally revitalised over the eastern area, but repressed from active manifestation by the peculiar meteorology of the year: absent from the Northern Provinces, which remained uninvaded in 1864: in the south, universal throughout the Central Provinces in every station on the southern epidemic highway.

Third Year, 1865.—Cholera still general over the eastern area: still universal and in force as a great epidemic in the Central Provinces, which were covered from sea to sea: invading the western area from the south-east, but confined as a powerful epidemic to the districts south of the Jumna, in which the mortality was very great. An offshoot from the body of cholera epidemic to the south of the Jumna, which was weak in itself and was checked in its progress towards the north-west, entered Meerut and Rohilcund in May, and remained in vitality until November.

Fourth Year, 1866.—Cholera dying out throughout the Central Provinces: nearly extinct over the eastern area in the districts unaffected by the new epidemic of the year: nowhere in epidemic strength in the western division of the epidemic area. The cholera history of 1866 embraces the details of two separate epidemics—of the dying epidemic of 1863-66, and of the new epidemic invading from the east, between July and November, chiefly indicated in these Tables by the Statistics of the Jail Population of the Behar Provinces.

EPIDEMIC OF 1863-66.

CHOLERA OF 1863.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1863.

See Map of 1863.

Cholera epidemic from the east, invading and confined to the eastern division of the epidemic area: entering the Central Provinces and occupying the southern epidemic highway in June and July.

The universality of the eastern invading cholera of 1863 is thoroughly illustrated in the Tables for all the types. As Jhansi was the last district lying to the west reached in the eastern invasion of 1855, and Jaloun in the invasion of 1859, so in 1863 Agra was the station lying furthest to the west touched by the invading cholera. This limit is illustrated in the Tables for all the three types; and even the day of the invasion was typical, for as in previous epidemics, the jail at Agra was first struck on the 20th May.

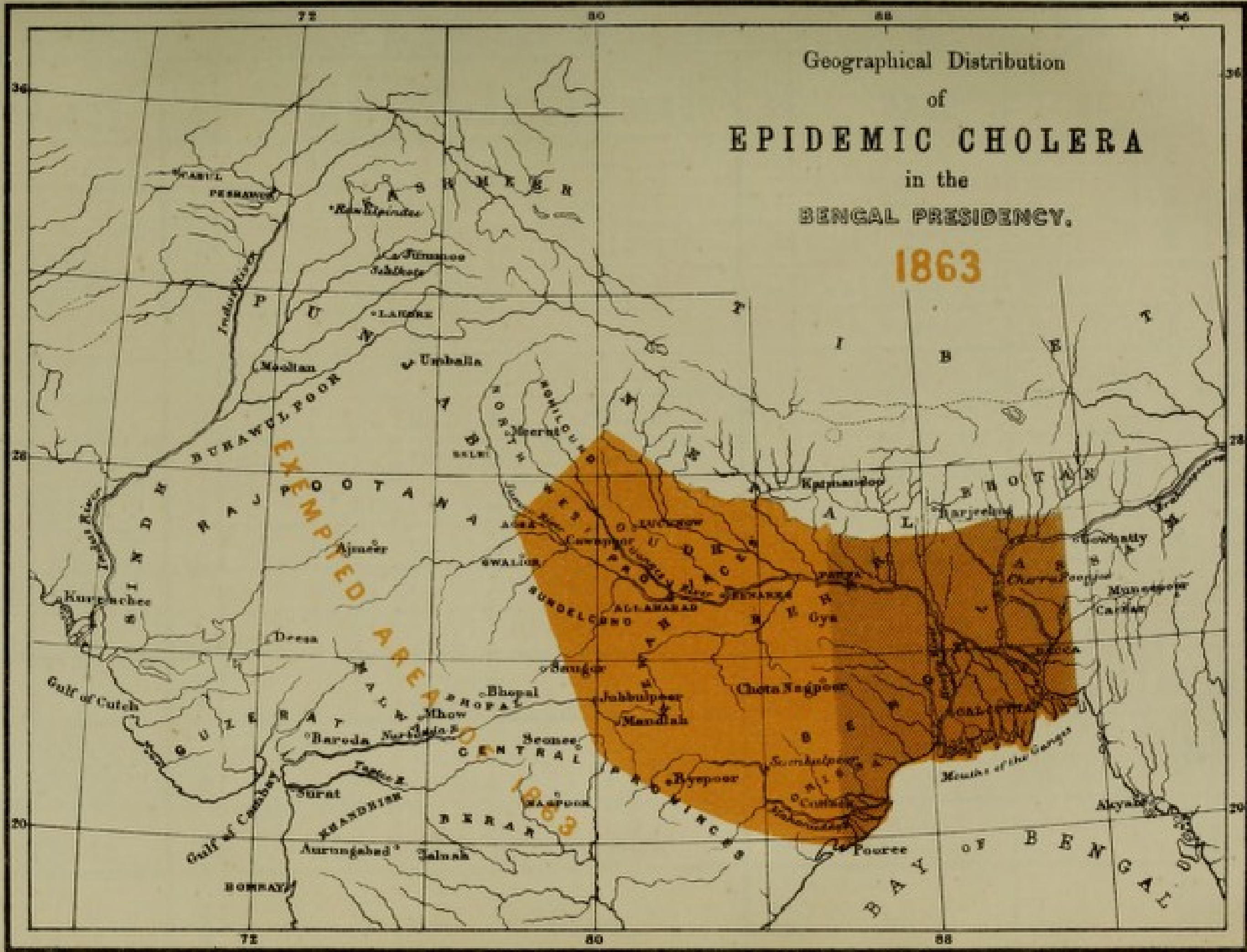
The three fatal cases at Kohat and Abbottabad in April, shown in the Table for the Native Army, were apparently derived from the remains of the great frontier cholera of 1862. Elsewhere, the cholera of 1860-62 is exhibited as dead throughout the western division. In the Jail Table, the invasion of the Central Provinces in June by the cholera invading from the east, and the general occupation of the southern epidemic highway, requires specially to be noticed, as showing the origin and date of invasion of the great cholera of the Central Provinces of 1864 and 1865.

REFERENCE

Province of Endemic Cholera

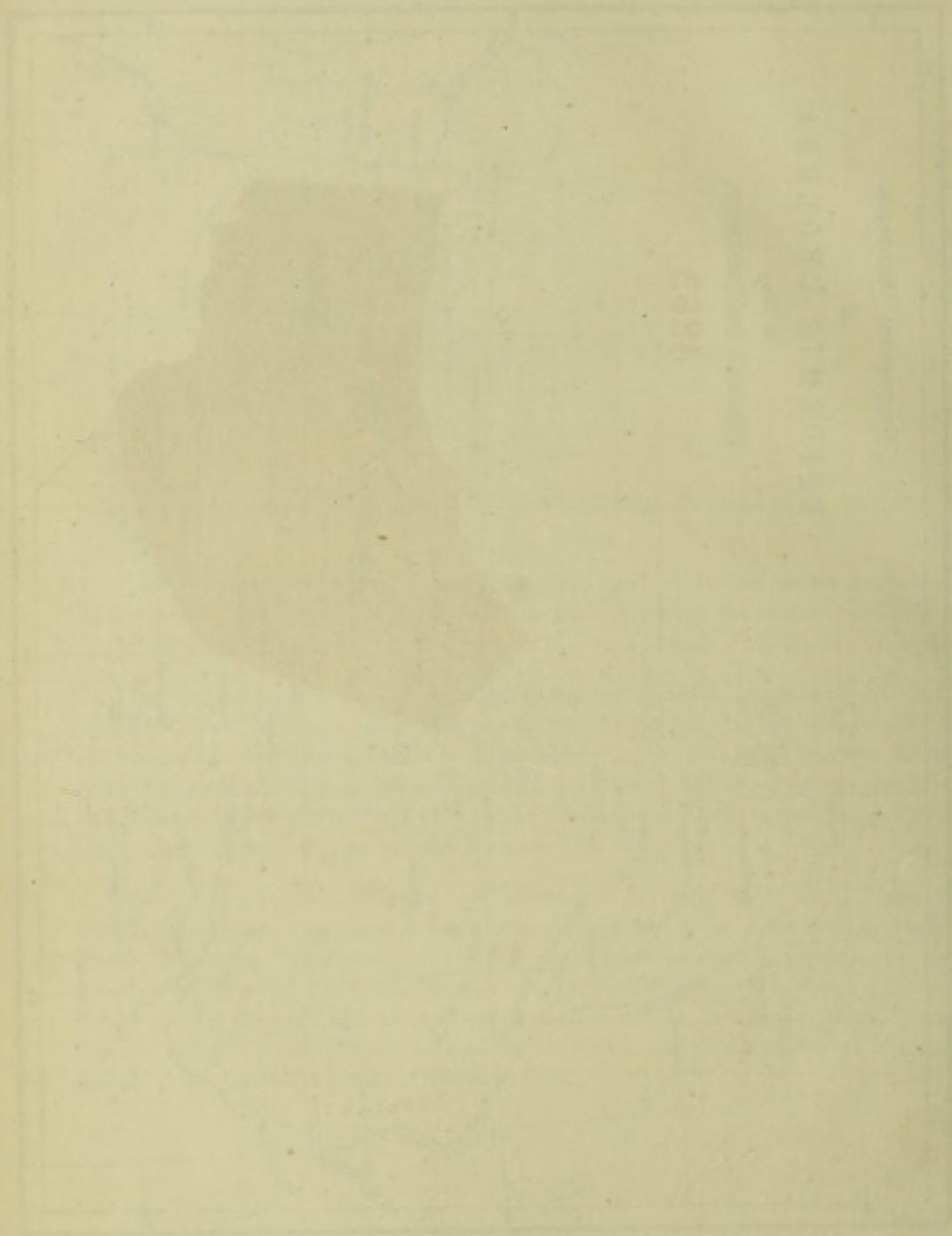
Invaded Area of 1863

Exempted Area of 1863



Lith: at the Survr. Genl's Office Calcutta Septr 1869.

H. A. D. Lawrence Lithographer



EUROPEAN ARMY IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1863.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions during the Year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Presidency Hospitals & Chinsurah Depôt	402	...	...	...	1	...	...	...	...	...	...	2	1	4	...	4	...
Troops and Invalids on the march ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fort William ...	745	...	...	...	...	...	...	1	...	1	2	1	...	5	...	4	...
Dum-Dum (9 months)	648	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Barrackpore ...	439	...	...	1	1	...	...	...	...	...	...	...	...	2	...	1	...
Berhampore ...	223	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Total ...	1,893	...	1	1	2	...	...	1	...	1	2	1	...	9	·48	6	3·17
Darjeeling Depôt (8 months) ...	155	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Darjeeling ...	246	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	730	...	...	...	...	...	...	2	1	...	...	...	...	3	...	3	...
Dinapore ...	925	...	...	1	1	...	1	1	...	...	...	...	...	4	...	3	...
Benares and Rajghat	1,210	1	...	1	12	...	...	26	2	2	...	...	...	44	...	35	...
Azimghur & Jounpore	336	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gondah ...	815	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fyzabad ...	1,073	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rae Bareilly (10 months) ...	402	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow ...	2,420	...	...	...	...	...	...	23	15	1	7	...	...	46	...	25	...
Seetapore ...	592	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehgurh ...	567	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	1,162	...	...	...	...	...	...	...	10	6	1	...	...	17	...	*24	...
Allahabad ...	1,054	...	...	...	1	3	...	26	24	...	...	...	...	54	...	44	...
„ General Hospital ...	...	3	...	...	...	...	...	1	3	...	...	...	...	7	...	2	...
Nagode ...	214	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	539	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	916	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	13,099	4	...	2	14	3	1	79	55	9	8	...	...	175	1·34	136	10·38
Nynee Tal (8 months)	283	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Landour (7 months)	216	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Roorkee ...	587	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	393	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	2,024	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi ...	1,066	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	4,423	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Muttra ...	581	...	...	...	...	...	...	...	2	...	...	...	...	2	...	...	...
Agra ...	1,115	...	...	...	...	...	...	21	11	...	...	...	...	32	...	21	...
Gwalior Citadel ...	241	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Morar ...	1,192	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seepree (8 months) ...	164	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	742	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	215	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	845	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore ...	820	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Total ...	5,860	...	...	...	...	...	1	21	13	...	...	...	...	35	·59	21	3·58

* Seven deaths from Choleraic Diarrhœa have been included in the mortality from Cholera.

CHOLERA OF THE EUROPEAN ARMY OF 1863 —*continued.*

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions during the year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Umballa ...	1,683	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
Dugshaie (10 months)	825	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Subathoo ...	860	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kussowlie (6 months)	242	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ Depôt ...	402	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillour ...	90	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur (11 months)	787	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore (11 months) ...	838	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meean Meer (10 months ...	1,363	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore Citadel ...	153	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur and Govindgurh ...	409	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	1,042	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera Ismail Khan ...	96	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote (10 months)	1,318	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kangra ...	93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsalla ...	30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	74	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawul Pindee (8 months ...	1,652	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1	...
Campbellpore (6 months) ...	347	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Road-making Detachment ...	200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Attock ...	148	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowshera (9 months)	659	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	1,720	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murree (7 months) ...	363	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cheerat (5 months) ...	409	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eusufzaie Field Force	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	15,660	...	...	...	...	...	...	...	1	...	1	...	...	2	·01	2	·13
Bengal Presidency	41,351	4	1	3	17	3	2	101	69	10	11	3	1	225	·55	169	4·09

NATIVE ARMY IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1863.

Strength of August 1863.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
	Bengal Proper and Assam—														
646	Fort William ...	1	1	1	5	3	8	...	...	2	...	...	...	21	8
600	Alipore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
1,262	Barrackpore	...	...	...	...	...	2	2	9	5	2	...	...	20	10
440	Dacca	...	...	...	...	...	...	...	...	...	...	...	...	None	None
485	Chittagong	...	...	...	...	...	1	...	...	...	...	...	...	1	1
782	Sylhet	...	...	...	...	...	...	...	...	...	...	...	...	None	None
647	Jowaie	...	...	...	...	...	...	...	...	...	...	1	...	1	1
661	Gowhatty	...	...	...	2	1	...	1	4	1	...	...	...	9	3
576	Cherrapoonjee	...	...	...	...	1	3	1	...	1	2	2	...	10	2
675	Upper Assam	...	...	...	...	...	...	...	...	...	...	...	...	None	None
1,085	Julpigoree	...	...	...	...	...	3	...	...	1	..	...	...	4	None
424	Bhaugulpore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
	Behar, Benares, Oude, and Cawnpore—														
578	Dorundah	...	...	...	...	...	...	...	...	...	...	...	...	None	None
670	Dinapore	...	...	1	2	1	2	1	1	...	1	...	...	9	1
380	Segowlie	...	...	...	...	...	...	...	...	...	...	...	...	None	None
563	Benares	...	...	...	1	1	1	1	3	...	1	...	...	8	5
533	Goruckpore	...	...	...	...	...	...	...	...	...	...	2	...	2	2
578	Fyzabad	...	...	...	...	...	...	...	...	...	...	...	...	None	None
1,717	Lucknow	...	...	...	...	...	...	4	3	1	...	1	...	9	2
483	Seetapore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
449	Futtehgurh	...	...	...	...	...	...	1	...	...	...	...	...	1	None
594	Cawnpore	...	...	...	1	...	1	...	1	...	...	...	...	3	1
347	Banda	...	...	...	...	...	...	...	...	...	...	...	...	None	None
455	Humeerpore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
602	Nagode	...	1	...	1	...	...	...	...	...	...	...	...	2	1
643	Allahabad	1	...	...	3	1	...	...	2	...	...	...	...	7	4
	Rohilcund and Meerut—														
365	Shahjehanpore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
1,146	Bareilly	...	...	...	...	...	...	...	...	...	...	...	...	None	None
376	Roorkee	...	...	...	...	...	..	...	...	...	...	...	...	None	None
587	Almorah	...	...	...	...	...	...	...	...	...	...	...	...	None	None
129	Deyrah	...	...	...	...	...	...	...	...	...	...	...	...	None	None
732	Moradabad ... } Allyghur ... }	...	...	...	...	...	...	...	...	...	...	...	...	None	None
482	Meerut	...	...	...	...	...	...	...	1	...	...	...	...	1	None
683	Delhi	...		...	...	...	...	...	...	...	...	...	...	None	None
	Central India and Agra—														
499	Augur	...	...	...	...	...	...	...	...	...	...	...	...	None	None
498	Goonah	...	...	...	...	...	...	...	...	...	...	...	...	None	None
707	Kherwarrah	...	...	...	1	...	...	...	...	...	...	...	...	1	None
611	Sirdarpore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
1,488	Deolee	...	...	...	...	...	...	...	...	...	...	..	...	None	None
953	Erinpoorah	...	...	...	...	...	...	...	...	...	...	...	...	None	None
704	Agra	...	...	...	...	2	...	...	...	...	...	...	...	2	1
1,154	Morar	1	...	...	...	...	...	...	...	...	...	...	...	1	1
1,054	Jhansi	...	...	...	...	...	...	..	...	...	...	...	...	None	None
488	Nowgong	...	...	...	...	...	...	...	...	...	...	...	...	None	None
685	Lullutpore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
	Carried over ...														

CHOLERA OF THE NATIVE ARMY OF 1863 —*continued.*

Strength of August 1863.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec		
	Brought forward ..														
	Punjab—														
666	Simla Hills	...	...	...	...	...	...	...	...	...	...	...	...	None	None
719	Umballa	...	...	...	...	...	...	...	...	...	...	...	...	None	None
948	Jullundur	...	...	...	...	...	...	...	...	...	...	...	...	None	None
708	Ferozepore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
475	Umritsur	...	...	...	1	...	...	...	...	...	...	...	...	1	None
673	Dhurmsalla	...	...	...	...	...	...	...	...	...	...	...	...	None	None
777	Meean Meer	...	...	...	...	...	...	...	...	...	...	...	...	None	None
918	Mooltan	...	...	...	...	...	...	...	...	...	...	...	...	None	None
1,087	Rawul Pindee	...	...	...	...	...	...	...	...	...	...	...	...	None	None
4,675	Peshawur	...	...	...	...	...	...	...	...	...	...	...	...	None	None
10,342	Kohat	...	...	...	3	...	...	...	1	...	...	...	...	4	2
	Bunnoo ...	1	1	...	...	...	...	...	...	...	...	...	...	2	None
	Murdan	...	...	...	...	...	...	...	...	...	...	...	...	None	None
	Abbottabad ...	...	...	...	1	...	...	...	...	...	...	...	...	1	1
	Dera Ismail Khan ...	...	...	...	...	...	...	...	...	...	...	...	...	None	None
	Dera Ghazee Khan ...	...	...	...	...	...	...	...	...	...	...	...	...	None	None
	Rajanpore	...	...	...	...	...	...	...	...	...	...	...	...	None	None
	Tak	...	...	...	...	...	...	...	...	...	...	...	...	None	None
	Troops on the march ...	..	...	2	...	...	...	...	...	...	...	...	14*	16	11
52,144	Army of the Presidency ...	4	3	4	21	10	21	11	25	11	6	6	14	136	57

* Goorkha Company of 9th N. I. on the march from Fyzabad to Lucknow.

JAIL POPULATION IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1863.

JAIL STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Average Strength.	Total Deaths of the Year.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,817	4	1	28	6	2	6	9	2	3	10	4	...	75	...	13	...
Baraset ...	155	...	...	...	..	...	...	...	1	..	...	...	...	1	...	1	...
Jessore ...	619	...	...	...	...	...	...	...	...	1	2	...	...	3	...	...	...
Kishnaghur ...	436	...	1	...	...	...	...	1	...	...	...	...	...	2	...	..	...
Moorshedabad ...	148	...	...	...	..	...	...	...	...	...	..	...	...	1	...	1	...
Howrah ...	117	...	...	3	...	...	...	...	...	...	...	2	...	5	...	...	...
Hooghly ...	571	...	18	7	10	...	9	..	...	...	3	39	...	86	...	28	...
Burdwan ...	437	1	...	1	1	..	...	...	...	1	...	...	...	4	...	...	...
Bancoorah ...	427	...	...	...	..	...	2	...	...	...	...	...	...	2	...	...	...
Purulea ...	142	...	...	1	1	...	...	...	...	...	...	...	...	2	...	1	...
Raneegunge ...	18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sooree ...	271	...	...	...	...	1	...	...	...	...	...	1	...	2	...	1	...
Deoghur ...	104	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Nya Doomka ...	82	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rajmehal ...	209	1	1	...	3	...	...	...	...	...	...	...	...	5	...	1	...
Malda ...	69	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Dinagepore ...	497	...	...	1	1	3	...	...	...	1	...	...	...	6	...	1	...
Rampore Bauleah ...	419	...	...	5	...	1	...	...	...	...	...	...	...	6	...	...	...
Rungpore ...	402	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Bograh ...	187	...	...	...	...	...	...	...	...	...	...	6	...	6	...	1	...
Mymensing ...	543	...	...	13	22	...	...	...	...	...	...	...	...	35	...	11	...
Pubna ...	123	...	...	...	...	2	.	...	...	...	...	...	...	2	...	...	...
Furreedpore ...	368	...	...	..	1	1	...	...	...	...	...	...	...	2	...	1	...
Backergunge ...	570	...	...	24	23	12	4	1	...	...	...	4	37	105	...	51	...
Noacolly ...	250	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittagong ...	348	...	...	...	..	11	...	...	...	...	...	...	...	11	...	4	...
Tipperah ...	446	..	...	...	2	..	...	...	...	...	...	...	...	2	...	1	...
Dacca ...	490	...	...	5	1	1	1	1	...	..	4	...	1	14	...	1	...
Sylhet ...	411	...	...	5	6	3	1	...	...	1	...	...	...	16	...	7	...
Cherrapoonjee ...	23	...	...	...	...	...	9	...	...	...	...	...	...	9	...	7	...
Cachar ...	190	...	...	1	6	2	...	...	...	...	..	..	...	9	...	5	...
Gowalparah ...	174	2	...	...	1	1	...	..	1	...	1	...	...	6	...	2	...
Gowhatty ...	148	...	...	...	...	...	...	1	15	..	...	...	...	16	...	12	...
Seebsaugor ...	125	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	90	...	...	...	...	...	4	5	...	...	...	...	...	9	...	5	...
Tezpore ...	178	...	...	...	1	...	...	...	...	...	...	...	..	1	...	1	...
Debrooghur ...	121	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Midnapore ...	524	...	...	1	...	..	1	...	...	...	...	...	...	2	...	...	...
Balasore ...	155	..	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Cuttack ...	348	...	1	1	...	..	2	..	...	...	...	...	...	4	...	3	...
Pooree ...	25	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Sumbulpore ...	215	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Chyebassa ...	186	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	256	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	392	...	...	...	...	...	...	5	11	18	...	...	...	34	...	15	...
Monghyr ...	380	...	...	36	5	...	4	27	...	...	...	...	...	72	...	39	...
Bhaugulpore ...	375	...	..	13	26	...	...	...	...	...	...	...	...	39	...	10	...
Purneah ...	478	...	...	211	...	...	3	1	...	...	...	...	...	215	...	81	...
Darjeeling ...	28	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Total ...	15,087	9	23	356	116	40	47	52	30	25	20	56	38	812	5·38	307	20·35
Gya ...	435	...	...	2	...	5	...	3	26	..	...	...	...	36	...	9	...
Patna ...	436	...	...	22	...	...	...	31	18	...	...	...	..	71	...	19	...
Deegah ...	92	...	...	1	...	2	...	...	...	...	...	..	..	3	...	1	...
Arrah ...	486	...	...	...	...	...	6	14	5	...	1	...	...	26	...	10	...
Chumparun ...	256	...	...	..	...	...	...	...	...		...	...	...	...	..	...	...
Mozufferpore ...	423	...	...	...	5	60	3	5	...	7	...	...	...	80	...	16	...
Chuprah ...	388	...	...	3	...	6	3	20	11	1	1	...	...	45	...	13	...
Ghazeepore ..	688	...	...	..	...	2	.	...	...	...	...	...	...	2	...	2	...
Benares ...	1,412	...	...	1	...	...	31	38	1	...	...	...	...	71	...	44	...
Mirzapore ...	355	...	...	1	...	...	4	4	2	...	...	...	...	11	...	4	...
Azimghur ...	415	...	...	...	1	...	...	1	...	...	..	...	...	2	...	2	...
Jounpore ...	286	...	...	...	...	...	...	...	...	...	10	...	...	10	...	5	...
Goruckpore ...	826	...	...	...	...	3	1	65	16	...	...	...	...	85	...	44	...
Gonda ...	78	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Baraitch ..	102	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Fyzabad ...	891	...	2	...	..	4	...	...	19	...	...	...	...	25	...	9	...
Sultanpore ...	506	1	...	1	2	...	...	...	...	...	...	...	...	4	...	1	...
Rae Bareilly ...	153	...	...	...	...	...	...	...	15	...	...	...	...	15	...	6	...
Pertabghur ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hurdui ..	139	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Luckhimpore ...	93	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Durriabad ...	57	...	...	...	...	...	...	1	3	...	...	...	...	4	...	1	...
Oonao ...	95	...	...	...	1	...	...	1	8	...	...	..	...	10	...	3	...
Carried over ...	8,733	1	2	32	9	82	50	183	124	8	12	...	...	503	...	190	...

CHOLERA OF THE JAIL POPULATION OF 1863—*continued.*

JAIL STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Average Strength.	Total Deaths of the Year.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Brought forward ...	8,733	1	2	32	9	82	50	183	124	8	12	...	...	503	...	190	...
Lucknow ...	1,981	...	...	...	...	...	...	219	1	3	34	45	3	305	...	153	...
Seetapore ...	695	...	...	2	...	...	...	...	...	...	...	3	...	5	...	2	...
Etah ...	205	...	...	...	...	...	...	*	...	...	...	...	...	...	...	...	...
Humeerpore ...	93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	141	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	464	...	...	...	...	...	...	...	1	5	...	...	...	6	...	3	...
Cawnpore ...	200	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	227	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagode ...	130	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad ...	2,233	...	1	...	2	...	...	4	...	1	...	...	1	9	...	5	...
Total ...	15,102	1	3	34	11	82	50	406	126	17	46	48	4	828	5·48	353	23·37
Raepore ...	393	...	...	...	...	...	...	21	...	...	...	...	...	21	...	11	...
Bandhara ...	400	...	...	...	...	...	9	20	...	...	...	...	...	29	...	9	...
Chanda ...	125	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagpore ...	446	...	...	...	...	...	...	1	...	4	14	1	...	20	...	8	...
Chindwara ...	113	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kowtah ...	64	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundla ...	81	...	...	...	...	...	15	1	...	...	...	...	...	16	...	7	...
Jubbulpore ...	1,200	...	...	...	...	...	...	29	...	...	...	...	...	29	...	8	...
Dumoh ...	201	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	340	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Nursingpore ...	223	...	...	...	...	...	...	2	1	1	8	...	...	12	...	2	...
Lullutpore ...	179	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	165	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	314	...	...	...	...	...	9	19	...	...	...	...	...	28	...	14	...
Baitool ...	177	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sehore ...	56	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	327	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundlaisir ...	189	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Ajmere ...	261	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beaur ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	5,375	1	...	...	...	...	33	93	1	6	22	1	...	157	2·92	59	10·98†
Muttra ...	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra ...	2,158	...	...	...	...	7	...	49	54	...	...	...	...	110	...	42	...
Secundra ...	251	...	...	...	...	...	...	...	4	...	...	...	...	4	...	3	...
Etawah ...	200	...	...	...	...	...	...	...	1	...	...	2	...	3	...	...	...
Mynpoorie ...	209	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	209	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Bolundshuhur ...	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	204	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	1,323	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Budaon ...	253	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scharunpore ...	163	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bijnour ...	182	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deyrah ...	68	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Almorah ...	131	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozuffernuggur ...	94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	337	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	1,383	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi ...	325	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goorgaon ...	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	7,838	...	...	...	...	7	...	49	59	1	...	2	...	118	1·51	46	5·87

* Twenty-eight cases of choleroid disease, without any death, occurred in July. This was probably the most westerly indication of the eastern invading epidemic of the year. For a parallel see the Table for 1855, when Cawnpore, the most westerly jail touched in the invasion of the year, had 72 cases of true choleraic disease with only three deaths.

† This Table includes the cholera of the Bandhara Jail, which was omitted in the abstract as originally printed for want of the Annual Return.

CHOLERA OF THE JAIL POPULATION OF 1863—*concluded.*

JAIL STATIONS.	AVERAGE STRENGTH FOR THE YEAR.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS OF THE YEAR.	ADMITTED PER CENT. OF AVERAGE STRENGTH.	TOTAL DEATHS OF THE YEAR.	DIED PER 1,000 OF AVERAGE STRENGTH.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Rhotuk ...	239	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hissar ...	223	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa ...	253	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnaul ...	38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa ...	852	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Loodianah ...	148	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	318	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	427	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	537	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore ...	2,027	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
,, Female Jail...	175	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	220	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goordaspore ...	230	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	325	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojrat ...	277	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	202	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	247	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira ...	274	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	715	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ...	248	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan...	48	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan...	262	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	111	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	67	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	682	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	355	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
TOTAL ...	9,632	...	...	...	...	...	...	...	...	...	1	...	...	1	·01	...	...
BENGAL PRESIDENCY	53,034	11	26	390	127	129	130	600	216	49	89	107	42	1,916	3·61	765	14·42

EPIDEMIC OF 1863-66.

CHOLERA OF 1864.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1864.

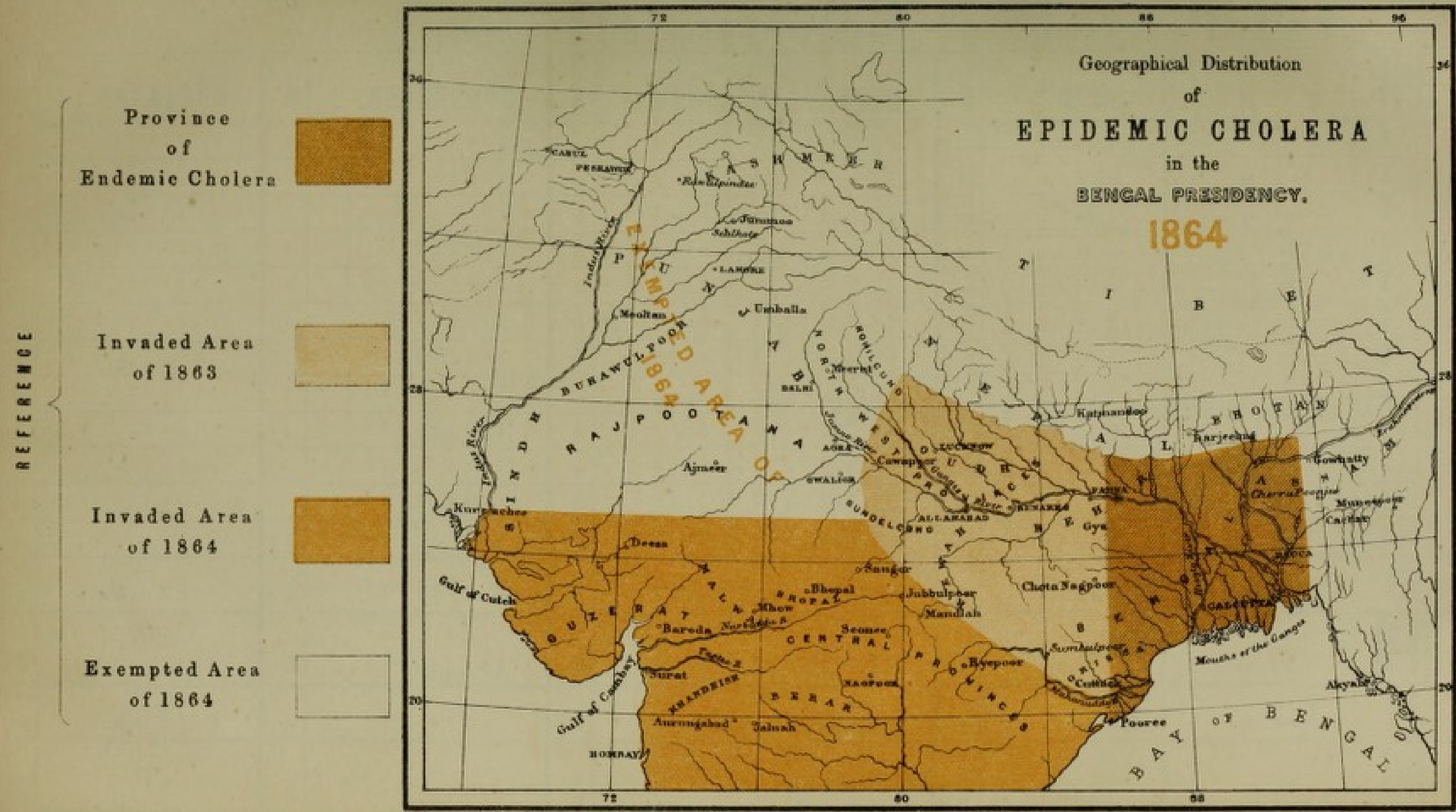
See Map of 1864.

Cholera generally revitalised over the eastern area, but repressed from active manifestation by the peculiar meteorology of the year: absent from the northern provinces of the western division, which remained uninvaded in 1864: in the south, universal throughout the Central Provinces in every station on the southern epidemic highway.

In the western division, each of the types gives but one fatal case returned under the head of cholera; this exemption denotes the absence of cholera west of the line of 80°.

The general presence of cholera over the eastern area is clearly shown in the case of all the three types. The fact of repression is shown in the Table for the European Troops by the occurrence of two severe outbreaks only in this division, and by the delay of these until September, when the epidemic season was nearly at a close.

The Table for the Jail Population shows the reappearance of the cholera of the Central Provinces in March, and the general occupation of the natural province in May. The Table for the Native Army also affords the evidence that in May this province was universally covered; this is shown by the attack of the portion of the Central India Force cantoned in the extreme south and west. Central India Proper is exhibited as enjoying complete immunity from cholera in 1864, in common with the provinces lying to the north.


REFERENCE
Province of Endemic Cholera
Invaded Area of 1863
Invaded Area of 1864
Exempted Area of 1864
Geographical Distribution of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1864
EXEMPTED AREA OF 1864
KASHMEER
PUNJAB
RAJPOOTANA
GUZERAT
CENTRAL PROVINCES
BERAR
BENGAL
BAY OF BENGAL
Gulf of Cutch
Gulf of Cambay
CALCUTTA
ALLAHABAD
LUCKNOW
Umballa
Ajmeer
Mooltan
Sungor
Jubbulpoor
Chota Nagpoor
Pooree
Bhopal
Mhow
Baroda
Surat
Aurungabad
Jalnah
BOMBAY
Deesa
Kurrachee
Akyab
Gowhatty
Cherra Poonjee
Cachar
Darjeeling
Khatmandoo
Meerut
Cawnpore
Gya
Seonee
Mundlah
Ryepoor
Cuttack
Mouths of the Ganges
72
80
88
96
36
28
20
Litho at the Surv. Genl's Office Calcutta Sept. 1865
H. A. D. Lawrence Lithographer

EUROPEAN ARMY IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1864.

STATIONS.	AVERAGE STRENGTH DURING THE PERIOD OF OCCUPATION.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS.	ADMITTED PER CENT. OF AVERAGE STRENGTH.	NUMBER OF DEATHS.	DIED PER 1,000 OF AVERAGE STRENGTH.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Hospital Ship *Bentinck* ...	74	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kidderpore Hospital	...	...	1	1	...	...	...	...	...	...	1	2	...	5	...	3	...
Chinsurah Depôt ...	...	...	...	...	1	...	...	...	...	...	...	3	...	4	...	3	...
Allahabad General Hospital ...	37	...	1	2	...	1	...	...	...	1	...	1	...	6	...	5	...
Invalids, Recruits, and Time-expired men on the march	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fort William ...	790	...	2	...	1	1	...	...	...	...	1	...	2	7	...	2	...
Dum-Dum ...	592	...	1	...	1	...	...	...	...	...	...	...	...	2	...	1	...
Barrackpore ...	455	...	...	1	2	...	...	...	...	...	...	...	...	3	...	2	...
Berhampore ...	202	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bhootan Field Force	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	2,002	...	3	1	4	1	...	...	...	...	1	...	2	12	·60	5	2·50
Sinchal, Darjeeling...	219	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Darjeeling Depôt ...	144	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	938	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Dinapore ...	968	...	...	...	1	...	...	5	1	...	1	...	...	8	..	5	...
Benares ...	1,081	...	...	...	...	1	1	4	1	...	...	..	...	7	...	6	...
Jounpore ...	149	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Azimghur ...	198	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Fyzabad ...	964	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Rae Bareilly ...	333	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Lucknow ...	2,470	...	...	...	...	...	...	...	...	54	1	...	...	55	...	39	...
Seetapore ...	653	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehgurh ...	551	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	1,131	...	...	...	...	...	1	...	4	1	...	...	...	6	...	6	...
Allahabad ...	950	...	...	2	...	...	...	...	...	11	...	...	...	13	...	12	...
Nagode ...	198	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	10,333	...	...	2	2	2	2	9	6	66	2	...	...	91	·88	70	6·77
Shahjehanpore ...	539	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	881	...	...	...	...	...	1	...	...	...	...	...	..	1	...	1	...
Nynee Tal ...	279	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Landour ...	188	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	337	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Roorkee ...	546	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	1,880	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi ...	964	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Muttra ...	503	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
TOTAL ...	5,950	...	...	...	...	...	1	...	...	...	...	...	...	1	·02	1	·16
Agra ...	1,036	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Morar ...	1,051	..	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
Gwalior Citadel ...	207	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seepree ...	148	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	686	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	213	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Saugor ...	817	...	...	...	...	..	...	1	...	...	1	...	...	2	...	2	...
Jubbulpore ...	757	..	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
TOTAL ...	4,854	...	...	...	...	...	1	1	...	1	1	...	...	4	·08	3	·62

CHOLERA OF THE EUROPEAN ARMY OF 1864—*continued.*

STATIONS.	AVERAGE STRENGTH DURING THE PERIOD OF OCCUPATION.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS.	ADMITTED PER CENT. OF AVERAGE STRENGTH.	NUMBER OF DEATHS.	DIED PER 1,000 OF AVERAGE STRENGTH.
		Jan.	Feb.	Mar	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Umballa ...	1,635	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dugshaie ...	799	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dugshaie Depôt ...	53	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kussowlie ...	236	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kussowlie Depôt ...	402	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Subathoo ...	882	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillour ...	105	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	893	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	890	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	934	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	1,319	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kangra ...	123	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	501	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fort Lahore ...	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meean Meer ...	910	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Rawulpindee ...	1,671	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Campbellpore ...	423	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Attock ...	145	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murree Convalescent Depôt ...	316	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Road-making Detachments, Murree Hills	605	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowshera ...	807	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	2,012	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nundcote Depôt ...	103	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Troops on the march (Punjab) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	15,886	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	·06
Troops on the march, Bengal and N. W. P.	...	...	...	9	15	...	...	...	...	...	...	...	...	24	...	12	...
BENGAL PRESIDENCY	40,385	...	5	15	22	5	4	10	6	68	5	6	2	148	·33	103	2·55

NATIVE ARMY IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1864.

Average Strength for the Year.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
...	Regiments marching ...	...	...	...	3	2	...	...	...	...	3	1	...	9	2
	Bengal Proper and Assam —														
388	Fort William	...	...	1	...	13	...	...	...	...	...	2	...	16	6
576	Alipore	...	...	...	4	2	...	...	...	...	1	...	1	8	3
1,341	Barrackpore	...	...	1	...	4	...	...	...	1	2	...	...	8	3
171	Berhampore	...	...	...	...	...	...	...	...	..	...	...	...	None.	None.
584	Dacca	...	...	...	9	6	9	4	1	1	2	7	1	40	21
333	Chittagong	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
412	Cherrapoonjee	...	...	...	...	...	1	...	...	...	...	...	...	1	None.
168	Cachar	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
455	Sylhet	...	...	10	1	...	...	1	...	...	...	1	...	13	10
188	Gowalparah	...	...	...	...	...	2	...	...	...	...	...	...	2	2
361	Gowhatty	...	...	...	2	1	...	...	...	...	...	...	2	5	2
139	Nowgong	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
210	Tezpore	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
647	Debrooghur	...	...	...	1	...	...	...	1	...	1	...	...	3	None.
883	Julpigoree	...	...	...	...	5	...	...	...	...	...	...	...	5	1
1,922	Bhootan Force (2 months) ...	...	..	...	...	...	...	...	...	...	...	5	2	7	3
	Behar, Benares, Oude, and Cawnpore—														
602	Dorundah	...	...	...	...	...	...	...	...	...	...	...	...	...	...
465	Bhaugulpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
587	Dinapore	...	...	...	...	...	...	1	4	...	...	...	...	5	1
355	Segowlie	...	...	...	...	...	...	...	...	...	...	...	...	...	...
551	Benares	...	...	...	1	1	1	...	...	...	...	...	...	3	2
630	Goruckpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
679	Fyzabad	...	...	...	...	...	2	...	...	...	...	...	...	2	2
1,588	Lucknow	...	...	...	...	2	...	...	...	1	...	...	...	3	1
478	Seetapore	...	...	...	...	1	...	...	...	...	...	...	...	1	...
796	Cawnpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
383	Banda	...	...	...	1	...	1	...	...	...	...	...	...	2	...
431	Humeerpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
570	Nagode	...	...	...	1	...	...	...	...	...	...	...	...	1	...
518	Allahabad	...	...	...	...	...	2	...	...	...	...	...	...	2	2
	Central India and Agra—														
497	Goonah	...	...	...	...	1	...	...	...	...	...	..	...	1*	1
497	Augur	...	...	...	...	1	3	...	...	...	...	...	...	4*	4
612	Sirdarpore	...	...	...	...	1	1	...	...	...	...	...	...	2	...
869	Erinpoorah	...	...	...	...	...	...	...	...	...	...	...	..	...	...
916	Kherwarrah	...	...	...	..	...	...	...	...	...	...	...	...	...	...
1,113	Deolee	...	...	...	...	...	...	...	...	...	...	...	...	...	...
709	Lullutpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1,109	Jhansi	...	...	...	...	...	...	...	...	...	...	...	...	...	...
469	Nowgong	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1,582	Morar	...	...	...	...	...	...	...	...	...	...	...	...	...	...
608	Agra	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rohilcund and Meerut—														
309	Shahjehanpore	...	...	...	1	...	...	...	...	...	...	...	...	1	...
866	Bareilly	...	...	...	...	2	...	...	...	...	...	...	...	2	...
895	Roorkee	...	...	...	2	...	...	...	...	...	...	...	...	2	...
524	Almorah	...	...	...	...	...	...	...	...	...	...	...	...	...	...
120	Deyrah	...	...	...	...	...	...	...	...	...	...	...	...	...	...
391	Moradabad	...	...	...	...	...	...	...	...	1	...	...	...	1	...
817	Meerut	...	...	...	...	...	...	...	...	...	...	...	...	...	...
411	Allyghur	...	...	...	...	...	...	...	...	...	...	...	...	...	...
547	Delhi	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10,504	Punjab	...	...	...	...	...	...	...	...	...	...	...	1	1†	1
9,348	Punjab Frontier Force ...	...	...	...	3‡	...	...	...	...	...	...	...	...	3	1
51,077	Army of the Presidency ...	None	None	12	29	42	22	6	6	4	9	16	7	153	68

* These cases occurred in outposts.
† A case at Umritsur; no explanation is given regarding this case.
‡ At Kohat.

JAIL POPULATION IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1864.

STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.				
Alipore ...	1,793	2	4	14	19	7	3	3	3	4	1	6	3	69	...	17	...
Baraset ...	139	...	...	1	...	...	...	...	...	...	...	...	...	1	...	..	...
Jessore ...	489	...	...	...	46	...	...	...	1	...	...	...	...	47	...	22	...
Kishnaghur ...	363	...	...	3	...	...	...	...	...	1	...	...	...	4	...	3	...
Moorshedabad ...	186	...	...	...	...	...	...	...	...	...	...	...	..	...	...	..	...
Howrah ...	127	...	...	...	1	...	...	...	...	...	...	2	...	3	...	1	...
Hooghly ...	451	...	17	2	3	...	...	1	4	...	1	...	...	28	...	7	...
Burdwan ...	411	...	...	4	4	...	...	...	...	...	...	'	...	8	...	4	...
Bancoorah ...	395	...	8	31	...	...	3	...	...	...	...	...	...	42	...	16	...
Purulea ...	183	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Raneegunge ...	26	...	2	1	...	...	...	...	...	...	...	...	...	3	...	1	...
Sooree ...	285	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rajmehal ...	169	...	...	...	2	33	...	...	...	...	...	...	...	35	...	14	...
Deogurh ...	89	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	..
Malda ...	72	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dinagepore ...	462	...	...	6	70	8	...	...	...	...	...	...	...	84	...	37	...
Rampore Bauleah ...	394	...	10	45	7	1	...	...	...	...	...	...	...	63	...	18	...
Rungpore ...	323	...	...	...	3	...	...	...	...	...	...	...	...	3	...	1	...
Bogra ...	171	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...
Mymensing ...	474	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Pubna ...	141	...	...	...	14	2	...	...	...	...	...	2	8	26	...	10	...
Furreedpore ...	410	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Backergunge ...	495	3	2	19	7	...	1	...	...	...	6	5	1	44	...	17	...
Noacolly ...	224	...	..	...	...	1	...	4	...	...	...	...	...	5	...	2	...
Chittagong ...	327	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Tipperah ...	398	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...
Dacca ...	463	1	1	2	2	...	...	...	...	...	...	...	...	6	...	1	...
Sylhet ...	359	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cherrapoonjee ...	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	211	...	...	...	...	...	1	1	...	...	...	8	...	10	...	7	...
Gowalparah ...	149	...	...	...	3	1	11	5	2	1	...	..	...	23	...	2	...
Gowhatty ...	153	...	...	...	...	3	...	...	...	...	...	...	...	3	...	2	...
Seebsaugor ...	123	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	92	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tezpore ...	198	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debrooghur ...	125	...	...	..	..	...	...	...	1	...	...	...	...	1	...	...	...
Midnapore ...	544	...	2	3	...	1	...	...	...	...	...	...	...	6	...	4	...
Balasore ...	210	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cuttack ...	353	...	...	1	...	...	...	4	...	...	...	...	...	5	...	3	...
Pooree ...	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sumbulpore ...	175	...	...	...	58	9	...	...	...	...	...	...	...	67	...	46	...
Chyebassa ...	215	...	...	1	1	2	...	...	...	...	...	...	...	4	...	...	...
Ranchee ...	290	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	439	...	...	...	...	...	..	...	..	...	...	...	...	...	...	...	...
Monghyr ...	362	...	...	...	1	...	...	...	...	..	...	...	...	1	...	...	...
Bhaugulpore ...	359	...	...	5	24	12	15	1	...	...	...	...	...	57	...	10	...
Purneah ...	522	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Darjeeling ...	51	...	...	...	...	...	2	...	...	...	...	...	...	2	...	2	...
TOTAL ...	14,441	6	47	140	265	81	36	19	11	6	8	24	12	655	4·54	250	17·31
Gyah ...	339	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Patna ...	467	...	...	2	24	1	...	...	1	...	...	...	...	28	...	8	...
Deegah ...	76	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arrah ...	499	...	...	1	...	...	5	...	...	...	...	...	...	6	...	3	...
Chumparun ...	203	...	...	...	1	...	4	...	...	...	...	...	...	5	...	3	...
Mozufferpore ...	433	...	...	1	13	1	...	...	...	...	...	...	...	15	...	1	...
Chuprah ...	440	...	...	1	1	1	1	1	1	2	1	...	...	9	...	1	...
Ghazeepore ...	662	...	4	...	...	...	...	...	...	...	...	...	...	4	..	3	...
Benares ...	1,306	...	...	2	1	...	...	2	44	...	...	...	...	49	...	26	...
Mirzapore ...	351	...	2	...	...	...	...	...	...	...	...	1	1	4	...	1	...
Azimghur ...	358	...	...	...	...	...	4	...	...	...	...	...	...	4	...	1	...
Jounpore ...	269	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Goruckpore ...	727	...	...	...	2	3	20	11	6	...	...	...	...	42	...	19	...
Gondah ...	92	...	...	...	...	..	..	...	...	...	...	...	...	...	...	...	...
Baraitch ...	107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fyzabad ...	988	...	...	...	56	...	...	...	...	...	...	...	...	56	..	19	...
Sultanpore ...	528	...	...	...	...	49	5	...	...	...	...	...	...	54	...	18	...
Rae Bareilly ...	135	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pertabghur ...	162	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Hurdui ...	148	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Luckhimpore ...	115	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Lucknow ...	2,550	..	...	3	...	...	...	...	...	...	...	...	...	3	...	...	...
Seetapore ...	779	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Etah ...	206	...	...	...	1	...	...	..	...	...	...	...	...	1	...	...	...
Humeerpore ...	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	128	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehgurh ...	404	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	279	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	258	...	...	...	...	...	8	...	...	...	...	...	...	8	...	3	...
Nagode ...	116	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad ...	2,192	...	...	...	1	...	101	...	1	...	...	...	...	103	...	28	...
TOTAL ...	15,450	...	6	10	101	56	148	15	53	2	1	1	1	394	2·55	136	8·80

CHOLERA OF THE JAIL POPULATION OF 1864 —*continued.*

STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Raepore ...	343	...	...	...	...	...	43	...	...	...	...	...	...	43	...	23	...
Belaspore ...	81	...	...	...	...	5	...	...	...	...	...	...	...	5	...	3	...
Bandhara ...	417	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chanda ...	170	...	...	1	12	1	..	...	...	...	...	...	...	14	...	5	...
Nagpore ...	559	...	...	24	3	...	...	1	...	...	...	...	...	28	...	9	...
Chindwara ...	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kowtah ...	68	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Sironcha ...	30	...	...	...	...	...	..	...	...	...	..	...	...	...	...	...	...
Mundla ...	59	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Jubbulpore (Civil) ...	471	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore (Thuggee)	565	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dumoh ...	207	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	348	...	...	...	...	...	...	17	23	3	3	...	...	46	...	16	...
Nursingpore ...	192	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lullutpore ...	259	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	298	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	268	...	...	...	...	4	6	...	...	...	...	...	...	10	...	6	...
Baitool ...	163	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sehore ...	95	...	...	...	...	5	1	...	...	...	...	...	...	6	...	...	...
Hoshungabad ...	272	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundlaisir ...	148	...	...	...	...	3	...	...	...	...	...	...	...	3	...	1	...
Ajmere ...	229	...	..	...	...	...	...	...	...	...	...	...	...	...	..	..	...
Beaur ...	103	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	5,448	...	...	25	15	18	50	18	23	3	3	...	...	155	2·85	63	11·56
Muttra ...	243	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra ...	1,963	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ Secundra ...	257	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Etawah ...	183	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	340	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	165	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	141	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Shahjehanpore ...	258	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	1,449	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Budaon ...	212	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seharunpore ...	204	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bijnour ...	230	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deyrah ...	67	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Almorah ...	130	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozuffernuggur ...	97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	357	...	...	...	...	...	...	...	1	...	...	...	..	1	...	...	...
Meerut ...	1,415	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	7,641	...	...	...	...	...	...	...	1	...	...	...	...	1	·01	...	...
Delhi ...	299	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Rohtuk ...	218	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hissar ...	219	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa ...	211	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnaul ...	48	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa ...	866	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Loodianah ...	745	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	332	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	441	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Umritsur ...	554	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore ...	1,644	...	...	..	...	..	...	...	...	...	...	...	...	...	...	...	...
Lahore Female Jail ...	168	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	191	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...	137	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Goordaspore ...	295	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Goojranwalla ...	330	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojrat ...	264	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	239	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	220	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira ...	315	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	653	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ...	268	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan ...	42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	255	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	113	...	..	...	...	...	..	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	91	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	763	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	308	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	9,630	...	...	...	1	...	...	...	...	...	...	...	...	1	·01	1	·10
BENGAL PRESIDENCY	52,598	6	53	175	382	155	234	52	88	11	12	25	12	1,206	2·29	450	8·56

EPIDEMIC OF 1863-66.

CHOLERA OF 1865.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1865.

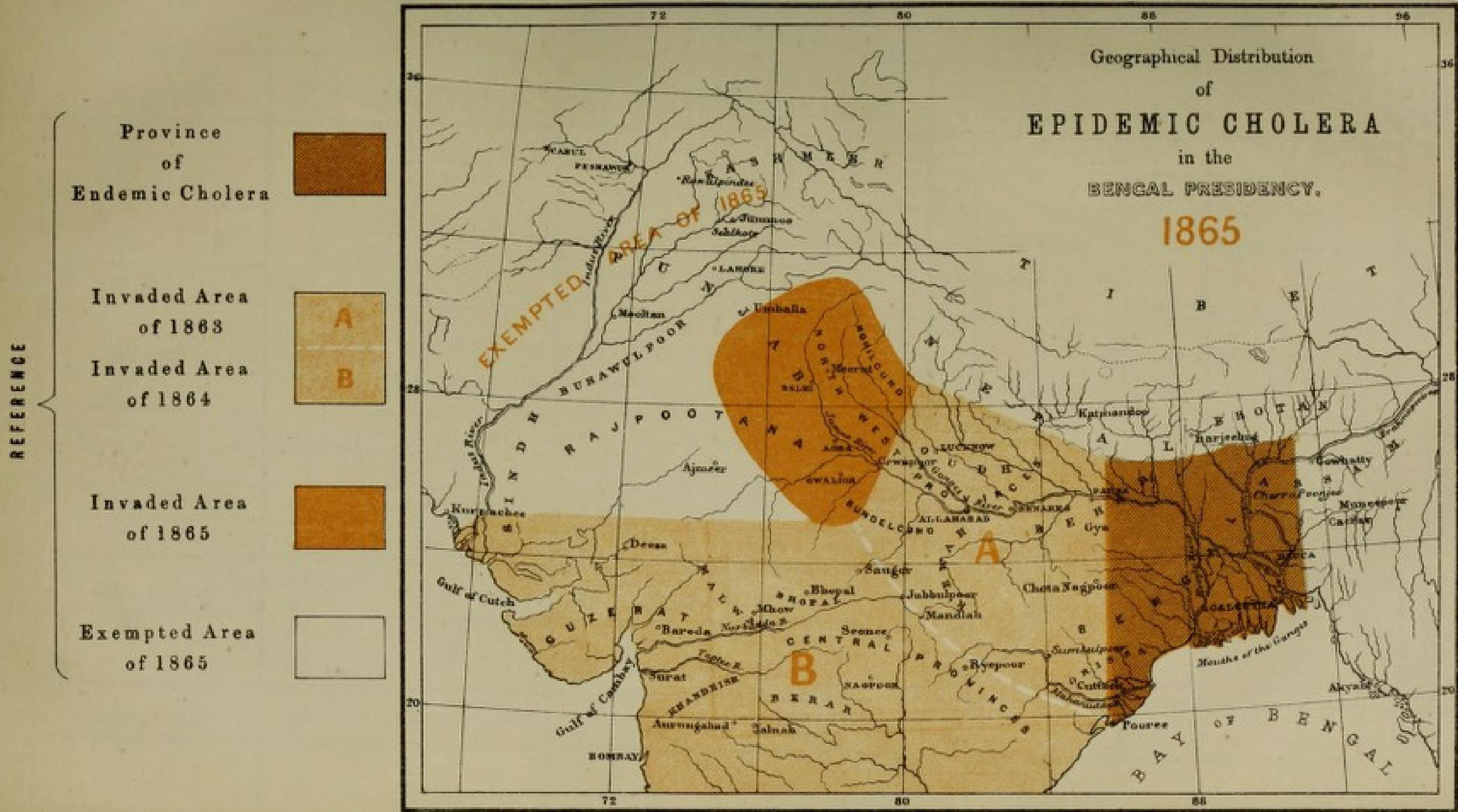
See Map of 1865.

Cholera still general over the eastern area: still universal, and in force as a great epidemic in the Central Provinces, which were covered from sea to sea: in the north, invading the western area from the south-east, but confined as a powerful epidemic to the districts south of the Jumna, in which the mortality was very great; an off-shoot from this body, which was weak in itself and was checked in its progress towards the north-west, entered Meerut and Rohilcund in May, and remained in vitality until November.

The Table for the European Army shows that few stations in the east escaped cholera in 1865. The distribution shown in the western division is typical; the cholera of Jubbulpore and Saugor is the representative of the great southern cholera of the year, and to this the cholera of Jhansi and Morar was directly added on. The invading cholera of the last weeks of May and the first week of June is also typically represented.

The great prevalence of cholera in the local corps of the west of Central India, indicating the northern limit of the cholera of the south, is seen in the Table for the Native Troops; and in this Table there is exhibited also the fact of the northward extension to Jhansi and Morar. A single admission at Deyrah in May is an indication of the invasion of Meerut and Rohilcund from the south.

The Jail Table of the year exhibits perfectly the geography of the cholera of the south and west in 1865. It shows the universal prevalence in the Central Provinces between March and August, the advance northward as far as to Etawah, and the out-runner of May thrown forward as far as Hissar. The cases noted at Sealkote and Montgomery are not authenticated as cases of cholera.


Geographical Distribution
of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1865
REFERENCE
Province of Endemic Cholera
Invaded Area of 1863
Invaded Area of 1864
Invaded Area of 1865
Exempted Area of 1865
A
B
EXEMPTED AREA OF 1865
TIBET
BAY OF BENGAL
Gulf of Cutch
Gulf of Cambay
Mouths of the Ganges
Indus River
SINDH
RAJPOOTANA
BUHAWULPOOR
NORTH WEST PROVINCES
ROHILCUND
OUDH
BUNDELCUND
CENTRAL PROVINCES
BERAR
KHANDEISH
GUZERAT
BHOPAL
NEPAL
BHOTAN
ASSAM
BENGAL
ORISSA
CABUL
PESHAWUR
Rawulpindee
Jummoo
Sealkote
LAHORE
Mooltan
Umballa
DELHI
Meerut
AGRA
GWALIOR
Ajmeer
Kurrachee
Deesa
Baroda
Surat
BOMBAY
Aurungabad
Jalnah
NAGPOOR
Seonee
Mhow
Bhopal
Saugor
Jubbulpoor
Mundlah
LUCKNOW
Cawnpoor
ALLAHABAD
BENARES
PATNA
Gya
Chota Nagpoor
Sumbulpoor
Ryepoor
Cuttack
Pooree
CALCUTTA
DACCA
Katmandoo
Darjeeling
Cherra Poonjee
Gowhatty
Munneepoor
Cachar
Akyab
72
80
88
96
36
28
20

Litho at the Surv^r Genl's Office Calcutta Sept^r 1869.

H. A. D. Lawrence, Lithographer

EUROPEAN ARMY IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1865.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of Average Strength.	Number of Deaths	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Kidderpore Hospital	...	1	1	...	...	...	...	...	...	...	...	..	...	2	...	1	...
Chinsurah Depôt ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad General Hospital ...	...	...	...	...	...	1	...	...	1	...	...	...	...	2	...	...	...
Invalids, Recruits, and Time-expired men on the march...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	...
Bhootan Field Force	145	...	...	1	...	3	...	1	...	...	...	...	...	5	...	3	...
Fort William ...	789	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Dum-Dum ...	717	...	...	...	1	10	...	...	...	...	1	...	1	13	..	10	...
Barrackpore ...	357	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Berhampore ...	147	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
TOTAL ...	2,028	...	...	...	1	12	...	...	...	...	1	...	1	15	·74	13	6·41
Darjeeling ...	915	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Darjeeling Depôt ...	39	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Parisnath Depôt ...	28	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Hazareebaugh ...	851	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dinapore ...	1,062	...	...	...	...	...	...	...	...	...	...	1	2	3	...	1	...
Benares ...	998	4	...	...	7	...	...	...	..	...	...	...	..	11	...	9	...
Azimghur ...	204	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Fyzabad ...	953	...	...	...	13	...	...	...	...	...	...	...	..	13	...	11	...
Rae Bareilly ...	386	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow ...	1,884	...	...	...	1	2	...	...	14	6	...	...	...	23	...	20	...
Seetapore ...	583	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	203	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	880	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Allahabad ...	1,013	...	...	...	6	...	...	...	5	3	...	...	...	14	...	10	...
Nagode ...	176	...	...	...	...	...	3	...		...	...	...	...	3	...	3	...
TOTAL ...	9,917	4	...	...	27	2	3	...	19	10	...	1	2	68	·68	55	5·55
Shahjehanpore ...	484	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	853	...	...	...	...	...	...	...	...	3	...	..	...	3	...	2	...
Nynee Tal ...	307	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Landour ...	208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	254	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Roorkee ...	554	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	1,783	...	...	...	...	1	...	...	...	...	1	1	...	3	...	2	...
Delhi ...	434	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Muttra ...	394	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	5,122	...	...	...	...	1	...	...	...	3	1	1	...	6	·12	4	·78
Agra ...	876	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Morar ...	1,115	...	...	...	...	...	...	1	10	1	...	...	...	12	.	8	...
Gwalior Citadel ...	213	...	...	...	...	...	...	...	2	...	...	...	...	2	...	2	...
Seepree ...	152	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	667	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Nowgong ...	208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	820	...	...	...	...	...	...	6	25	...	...	...	...	31	...	18	...
Jubbulpore ...	688	...	...	...	...	...	...	...	7	...	...	...	...	7	...	6	...
TOTAL ...	4,689	...	...	...	...	...	...	8	44	1	...	...	...	53	1·13	34	7·25

CHOLERA OF THE EUROPEAN ARMY OF 1865 —*continued.*

STATIONS.	AVERAGE STRENGTH DURING THE PERIOD OF OCCUPATION.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH												TOTAL ADMISSIONS.	ADMITTED PER CENT. OF AVERAGE STRENGTH.	NUMBER OF DEATHS.	DIED PER 1,000 OF AVERAGE STRENGTH.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Umballa ...	1,477	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Dugshaie ...	889	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	..
Kussowlie Depôt ...	606	...	...	...	...	...	1	1	...	...	...	...	...	2	...	2	...
Subathoo ...	601	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	..
Phillour ...	78	...	...	...	...	1	..	...	...	...	...	...	...	1	...	...	...
Jullundur ...	776	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	788	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	867	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	99	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	1,185	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsala ...	83	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kangra ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	147	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fort Lahore ...	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mecan Meer ...	1,038	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	1,450	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Campbellpore ...	408	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Attock ...	156	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murree Depôt ...	376	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Road-making Detachments, Murree Hills	643	...	...	..	...	...	..	...	...	..	...	...	...	...	...	...	...
Nowshera ...	611	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	1,740	...	...	...	..	...	...	...	..	...	...	...	...	...	...	..	...
Nundcote Depôt ...	130	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Troops on the march (Punjab) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...
TOTAL ...	13,880	...	...	...	...	2	1	1	...	...	...	...	...	4	·03	2	·14
Troops on the march, Bengal ...	...	...	...	3	...	...	...	...	...	...	...	...	...	3	...	2	...
Troops on the march, N. W. Provinces...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	...
BENGAL PRESIDENCY	37,210	5	1	4	28	21	4	10	64	14	2	2	5	160	·43	116	3·12

NATIVE ARMY IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1865.

Average Strength of the Year.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept	Oct.	Nov.	Dec.		
...	Regiments marching ...	...	13	...	2	9	...	...	...	...	1	7	...	32	15
	Bengal Proper and Assam—														
1,287	Calcutta	1	8	2	6	6	1	2	5	2	1	...	4	38	17
778	Barrackpore	1	1	...	4	2	4	...	...	...	...	...	...	12	8
466	Dacca	...	...	5	1	6	...	3	...	3	5	1	...	24	8
448	Cherrapoonjee	...	...	...	...	1	1	...	...	...	...	...	...	2	...
551	Sylhet	...	...	...	1	...	...	...	...	...	1	1	3	6	5
88	Nowgong	...	...	...	...	...	2	...	...	...	...	...	...	2	2
569	Debrooghur	...	...	...	...	2	3	...	...	...	...	...	...	5	2
5,084	Bhootan Force	...	...	...	56	67	36	5	1	4	...	20	2	191	113
	Behar, Benares, Oude, and Cawnpore—														
358	Bhaugulpore	...	...	...	...	...	1	...	2	...	4	3	...	10	5
551	Dorundah	...	...	...	...	...	...	...	...	...	...	...	...	...	...
626	Dinapore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
338	Segowlie	...	...	...	...	...	...	...	...	...	...	...	...	...	...
595	Benares	...	...	...	...	2	...	...	...	1	1	...	...	4	2
620	Goruckpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
705	Fyzabad	...	...	...	...	...	...	...	2	5	...	...	...	7	6
1,569	Lucknow	...	...	...	...	...	2	1	...	...	...	...	...	3	2
367	Seetapore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
372	Banda	...	...	...	...	...	1	...	...	...	...	...	...	1	...
573	Cawnpore	...	...	...	...	...	10	...	...	...	...	...	...	10	4
574	Allahabad	...	...	...	...	...	...	...	...	...	...	...	...	...	...
501	Nagode	...	...	...	...	1	1	...	...	...	1	...	...	3	2
	Central India and Agra—														
4,273	Sirdarpore	...	...	...	...	8	1	...	...	...	...	...	...	9	6
	Erinpoorah	...	...	...	...	...	...	1	1	...	...	...	...	2	1
	Kherwarrah	...	...	...	...	2	2	29	2	7	...	...	...	42	23
	Augur	...	...	...	1	2	...	1	...	...	...	...	...	4	4*
	Goonah	...	...	...	...	†	...	...	...	...	...	...	...	...	...
	Deolee	...	...	...	...	...	...	...	...	...	...	...	...	...	...
428	Lullutpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
437	Nowgong	...	...	...	...	...	...	...	...	...	...	...	...	...	...
921	Jhansi	...	...	...	...	...	1	7	4	...	...	...	...	12‡	6
1,165	Morar	...	...	...	...	...	...	1	8	...	...	...	...	9	7
647	Agra	...	...	...	...	...	...	...	...	1	...	...	...	1	...
	Meerut and Rohilcund—														
276	Shahjehanpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
824	Bareilly	...	...	...	...	...	...	...	...	...	...	...	...	...	...
563	Almorah	...	...	...	...	...	...	...	...	...	...	...	...	...	...
100	Deyrah	...	...	...	...	1	...	...	...	...	...	...	...	1§	...
516	Roorkee	...	...	...	...	...	...	...	...	...	...	...	...	...	...
388	Moradabad	...	...	...	...	...	...	...	...	...	...	...	...	...	...
859	Meerut	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	Allyghur	...	...	...	...	...	...	...	...	...	...	...	...	...	...
589	Delhi	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10,543	Punjab—	...	...	1	...	...	...	...	...	...	...	...	...	1	None.
9,964	Punjab Frontier Force ...	...	...	...	3	1	1	...	...	1	...	...	...	6	2
51,064	Army of the Presidency ...	2	22	8	74	110	67	50	25	24	14	32	9	437	240

* All-in outposts.
† Two cases in May among Camp followers.
‡ While returning from furlough, attacked near Jhansi; cholera was epidemic at the time all around Jhansi.
§ A case of genuine cholera, indicating the invasion of Meerut and Rohilcund at this time.

JAIL POPULATION IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1865.

STATIONS.	Average Strength of the Year.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,811	2	6	...	2	1	...	...	...	3	36	13	3	66	...	25	...
Baraset ...	102	...	...	...	...	...	...	...	1	...	4	...	...	5	...	3	...
Jessore ...	534	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kishnaghur ...	333	...	1	...	1	...	...	...	...	...	...	...	...	2	...	1	...
Moorshedabad ...	204	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Howrah ...	152	...	...	...	2	...	1	...	...	...	...	1	...	4	...	1	...
Hooghly ...	578	2	...	...	6	1	...	1	2	1	2	...	...	15	...	6	...
Burdwan ...	487	...	...	1	1	...	2	...	1	...	...	...	...	5	...	...	...
Bancoorah ...	480	...	...	12	18	...	...	...	...	...	...	...	...	30	...	8	...
Purulea ...	174	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Raneegunge ...	28	...	...	2	...	...	...	...	...	...	...	...	...	2	...	...	...
Sooree ...	245	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rajmehal ...	136	...	...	...	...	...	12	...	...	...	...	...	...	12	...	4	...
Deogurh ...	79	...	...	...	...	...	...	...	...	...	2	...	...	2	...	1	...
Malda ...	55	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Dinagepore ...	443	...	...	...	1	...	...	...	...	1	...	...	...	2	...	2	...
Rampore Bauleah ...	425	...	...	...	2	...	...	...	...	...	...	...	...	2	...	...	...
Rungpore ...	355	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bograh ...	124	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymensing ...	418	...	...	...	...	1	...	...	...	...	3	...	...	4	...	2	...
Pubna ...	136	...	...	...	1	14	...	...	...	...	...	...	...	15	...	3	...
Fureedpore ...	436	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Backergunge ...	407	...	...	4	...	5	...	...	...	...	...	4	...	13	...	1	...
Noacolly ...	173	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittagong ...	304	...	...	...	...	...	2	...	...	...	...	...	...	2	...	2	...
Tipperah ...	374	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dacca ...	474	...	...	2	...	...	...	...	...	...	...	...	...	2	...	...	...
Sylhet ...	403	...	...	...	...	...	...	...	...	...	...	3	...	3	...	3	...
Cachar ...	226	...	...	2	...	2	4	...	..	...	21	6	...	35	...	24	...
Gowalparah ...	140	...	...	1	...	..	2	...	...	...	...	.	...	3	...	...	...
Gowhatty ...	154	...	...	...	20	...	...	..	...	...	..	...	...	20	...	11	...
Seebsaugor ...	81	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tezpore ...	214	...	...	...	3	9	...	2	1	...	...	...	...	15	...	9	...
Debrooghur ...	122	...	...	1	...	...	..	..	...	...	...	1	...	2	...	...	...
Midnapore ...	616	...	...	...	...	...	...	1	1	...	...	...	..	2	...	...	...
Balasore ...	227	1	...	...	...	...	...	...	..	...	..	...	...	1	...	...	...
Cuttack ...	398	...	...	..	...	.	...	...	...	...	...	...	...	...	...	...	...
Pooree ...	77	...	...	...	...	...	3	2	...	...	...	...	...	5	...	3	...
Sumbulpore ...	148	...	..	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Chyebassa ...	142	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	279	...	...	...	2	1	...	1	9	1	...	1	...	15	...	9	...
Hazareebaugh ...	626	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Monghyr ...	378	...	...	...	...	...	...	...	...	4	1	8	...	13	...	6	...
Bhaugulpore ...	341	...	...	...	3	...	...	2	1	...	...	...	...	6	...	1	...
Purneah ...	420	...	...	...	44	...	...	...	...	...	...	...	...	44	...	23	...
Darjeeling ...	72	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	14,598	5	7	25	106	34	27	9	16	10	69	37	3	348	2·38	148	10·15
Gyah ...	475	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patna ...	433	...	...	1	32	...	..	...	...	...	...	...	...	33	...	14	...
Deegah ...	419	...	...	...	22	...	...	...	...	5	1	8	...	36	...	15	...
Arrah ...	433	..	...	...	1	...	...	...	1	...	...	...	...	2	...	...	...
Chumparun ...	235	...	...	...	...	...	...	...	...	..	...	...	..	...	...	...	...
Mozufferpore ...	477	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...
Chuprah ...	484	...	...	...	...	...	...	34	8	6	25	...	...	73	...	24	...
Ghazeepore ...	705	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Benares ...	1,193	...	...	...	...	...	...	...	...	2	...	...	...	2	...	1	...
Mirzapore ...	431	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Azimghur ...	474	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Carried over ...	5,759	...	1	1	55	...	...	34	9	13	26	9	...	148	...	56	...

CHOLERA OF THE JAIL POPULATION OF 1865 —*continued.*

STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Brought forward ...	5,759	...	1	1	55	...	...	34	9	13	26	9	...	148	...	56	...
Jounpore ...	258	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore ...	664	...	...	...	..	...	...	2	...	...	...	...	...	2	...	2	...
Gondah ...	365	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baraitch ...	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fyzabad ...	867	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Sultanpore ...	450	...	...	...	-	1	...	...	...	...	...	...	...	1	...	1	...
Rae Bareilly ...	130	...	...	...	...	...	...	...	3	...	...	...	...	3	...	1	..
Pertabghur ...	146	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hurdui ...	123	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Luckhimpore ...	112	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Lucknow ...	2,619	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Seetapore ...	875	...	...	...	...	...	...	...	1	30	...	...	...	31	...	11	...
Etah ...	201	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Humeerpore ...	129	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	105	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehgurh ...	432	...	...	-	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	265	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	289	..	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Nagode ...	72	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Allahabad ...	2,346	...	...	...	...	...	...	...	8	..	...	...	...	8	...	2	...
TOTAL ...	16,343	...	1	1	55	2	1	37	21	43	26	9	...	196	1·20	75	4·59
Raepore ...	385	...	...	...	5	42	3	16	5	...	1	...	...	72	...	40	...
Belaspore ...	75	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...
Bandhara ...	294	...	...	...	...	...	5	43	1	...	...	...	...	49	...	26	...
Chanda ...	212	...	...	2	1	...	...	...	...	1	...	..	...	4	...	3	...
Nagpore ...	790	...	...	7	13	1	2	68	11	...	...	...	...	102	...	54	...
Chindwara ...	149	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kowtah ...	40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sironcha ...	48	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundla ...	60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore (Civil) ...	407	...	...	...	...	...	2	1	...	...	...	...	...	3	...	2	...
Jubbulpore(Thuggee)	518	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dumoh ...	125	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	278	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	185	...	...	...	...	5	1	...	...	...	...	...	...	6	...	3	...
Lullutpore ...	158	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Jhansi ...	264	...	...	-	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	191	...	...	...	...	...	7	1	...	...	...	...	...	8	...	5	...
Baitool ...	162	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sehore ...	108	...	...	...	...	1	1	...	...	...	...	...	...	2	...	...	...
Hoshungabad ...	239	...	...	...	13	...	...	...	...	...	...	...	...	13	...	8	...
Nimar ...	124	...	...	...	4	2	...	...	...	...	...	...	...	6	...	1	...
Ajmere ...	318	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Beaur ...	91	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	5,221	...	...	9	36	51	22	129	17	2	1	...	...	267	5·11	143	27·39
Muttra ...	281	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra ...	1,830	...	...	...	1	...	...	12	18	...	...	...	..	31	...	20	...
„ Secundra ...	103	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Etawah ...	192	...	...	...	...	...	...	...	9	...	...	...	...	9	...	1	...
Mynpoorie ...	304	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	282	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	157	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	286	...	-	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	1,697	...	...	...	...	...	..	...	...	...	1	...	...	1	...	1	...
Budaon ...	202	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Scharunpore ...	239	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bijnour ...	251	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deyrah ...	58	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Almorah ...	126	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozuffernuggur ...	113	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	330	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	1,242	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	7,693	...	...	...	1	...	...	13	27	...	1	...	...	42	·55	22	2·86

CHOLERA OF THE JAIL POPULATION OF 1865—*concluded.*

STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of Average Strength.	Number of Deaths	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Delhi ...	278	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rohtuk ...	209	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Hissar ...	174	...	...	...	...	1	...	...	..	...	...	...	...	1	...	1	...
Sirsa ...	257	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Kurnaul ...	69	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa ...	446	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ Gang at Jhugger	183	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Loodianah ...	168	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	292	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	435	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	535	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore ...	1,964	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore Female Jail	186	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	308	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Dhurmsala ...	154	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goordaspore ...	278	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	352	...	...	...	...	...		...	...	...	...	...	...	...	...	...	...
Goojerat ...	259	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	254	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	259	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Googaira and Montgomery ...	307	...	...	...	...	...	2	...	...	...	...	...	...	2	...	...	...
Mooltan ...	925	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ...	378	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan...	116	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	282	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	114	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	108	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Rawulpindee ...	852	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Peshawur ...	358	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	10,482	...	...	...	...	1	2	1	...	1	...	...	...	5	·05	2	·19
Bengal Presidency	54,337	5	8	35	198	88	52	139	81	56	97	46	3	858	1·58	390	7·19

EPIDEMIC OF 1866-68.

First Year, 1866.—Cholera invading from the east in July: confined as a great epidemic to the Behar Provinces and Chota Nagpore, but indicating by distinct forerunners its presence in the districts lying to the west: invading the western area from the south-east in the end of October and in November, when the fact of epidemic advance both into Rajpootana and into Meerut and Rohilcund was made manifest.

Second Year, 1867.—The Central Provinces the exempted area of the year: cholera universal in Upper India from the Behar Provinces to the North-Western Frontier.

Cholera became universal in the eastern division subsequent to revitalisation within the area covered in 1866 and to the invasion of that portion of the province which remained unoccupied after the completion of the epidemic movement of 1866. The invasion of Cawnpore and Banda was typically displayed in May, but the strength of the eastern invasion was determined towards the north, causing the great epidemic of Goruckpore, Northern Oude, and Shahjehanpore, while the Doab and the districts south of the Jumna were comparatively exempted.

Throughout the western division, after the middle of April, the invading cholera of 1866 was revitalised, and covered Northern India universally, from the line limiting the exempted area in the south to the frontier.

The cholera of 1863-66 was dead in the Central Provinces, and no portion of the epidemic of 1866-67 was determined towards the south or south-west.

Third Year, 1868.—Cholera manifested over many portions of the area invaded in 1867, but generally diminished in volume or extinguished, in relation to the fact that the distribution of the cholera of 1867 was not limited by the boundaries of Northern India, and that the body of the epidemic was diffusely spread beyond the boundaries of Hindostan: much repressed also over Upper India by the meteorological conditions of the year, especially throughout the western division of the epidemic area: the tract south of the Jumna exempted in 1867, still in 1868, an area of absolute exemption; and the Cawnpore district and the districts adjoining, which formed an area of comparative exemption in 1867, still an exempted area, perhaps altogether free from cholera, geographically added on to that lying south of the Jumna.

The Cholera of a new epidemic (1868-69) *invaded, from within the endemic area, Chota Nagpore and the Central Provinces between March and May, and before the end of the year became universal on the Southern Highway and throughout the Province of the South-West Monsoon.*

EPIDEMICS OF 1863-66 AND 1866-68.

CHOLERA OF 1866.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1866.

See Map of 1866.

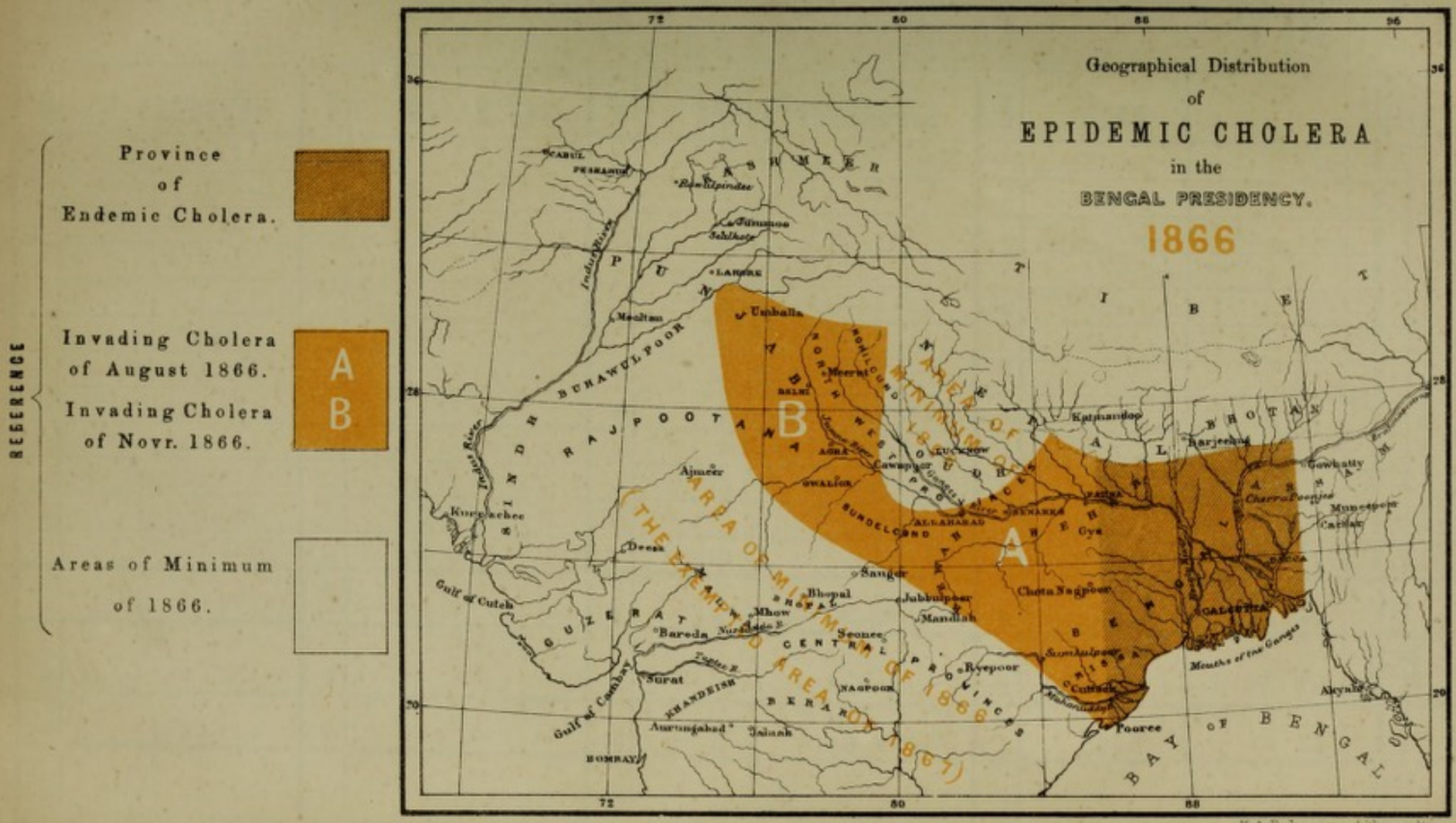
Epidemic of 1863-66.—Cholera dying out throughout the Central Provinces: nearly extinct over the eastern area in the districts unaffected by the new epidemic of the year: nowhere in epidemic strength in the western division of the epidemic area.

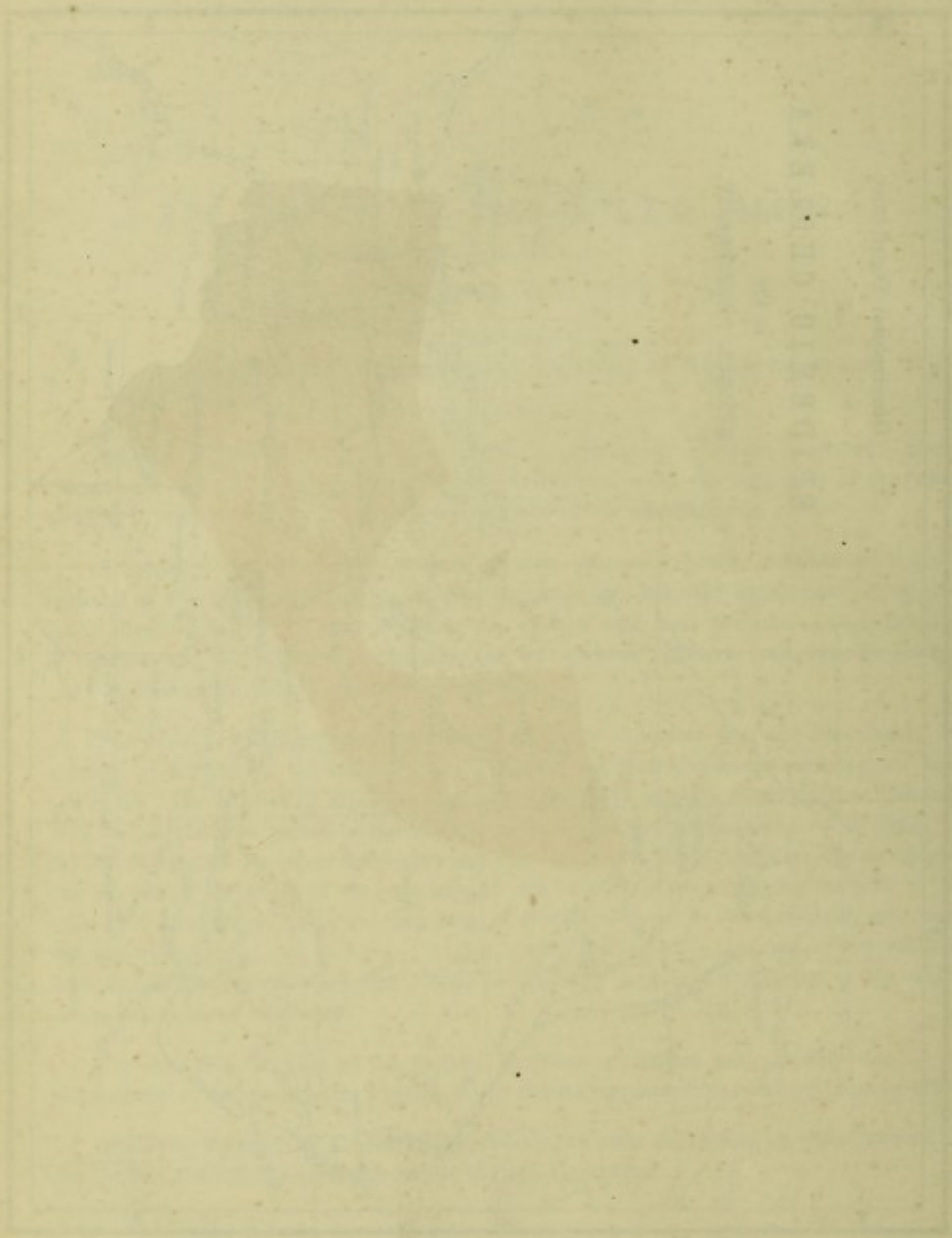
Epidemic of 1866-68.—Cholera invading from the east in July; confined as a great epidemic to the Behar Provinces and Chota Nagpore, but indicated by distinct forerunners in the districts lying to the west: invading the western area from the south-east in the end of October and in November, when the fact of epidemic advance both into Rajpootana and into Meerut and Rohilcund was made manifest.

The Table for the European Army shows the death of cholera over the west before the invasion of November; the invasion is indicated by fourteen admissions occurring at Agra and Delhi. The invasion of Hazareebaugh and the Gangetic stations, occurring simultaneously with the universal occupation of the Behar Provinces, is very well illustrated. The Table for the Jail Population absolutely defines the base from which the Gangetic cholera was an offshoot, and the western limitation of the main body of the cholera constituting the material of the epidemic. In the Jail Table, the exemption of Northern India is also exhibited with great clearness; the single case at Agra in August, which occurred while the aura of the epidemic was affecting the Gangetic provinces, is to be regarded as a true forerunner of the cholera of the first week of November.

The cholera of the jails of the Central Provinces of August was probably due to the revitalisation of the great cholera of 1865, for no cholera reappeared over this province in 1867.

The Table for the Native Army gives precisely the same indications as those afforded by the Tables for the European Army and for the Jail Population.


Geographical Distribution
of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1866
REFERENCE
Province of Endemic Cholera.
Invading Cholera of August 1866.
A
Invading Cholera of Novr. 1866.
B
Areas of Minimum of 1866.
AREA OF MINIMUM CASES
(THE EXEMPTED AREAS OF MINIMA OF 1866)
BAY OF BENGAL
CALCUTTA
BOMBAY
Gulf of Cutch
Gulf of Cambay
Mouths of the Ganges



EUROPEAN ARMY IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1866.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Kidderpore Hospital	...	2	...	1	...	...	...	...	...	...	...	...	...	3	...	3	...
Chinsurah Depôt	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...
Allahabad Garrison Hospital	...	...	...	...	...	...	...	...	6	..	...	...	...	6	...	3	...
Invalids and Time-expired men on the march	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Fort William	... 861	...	...	1	...	...	...	...	1	2	...	..	...	4	...	2	...
Dum-Dum	... 680	...	1	...	...	2	...	...	...	...	...	...	...	3	...	2	...
Barrackpore	... 404	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...
Berhampore	... 121	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
TOTAL	... 2,075	...	1	1	...	2	...	...	1	2	...	...	...	7	·34	4	1·93
Sinchal, Darjeeling	... 491	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Darjeeling Depôt	... 99	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Parisnath Depôt	... 27	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Hazareebaugh	... 806	...	...	...	...	...	...	5	12	2	...	...	...	19	...	13	...
Dinapore	... 892	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Benares	... 645	...	...	...	...	...	...	3	6	...	1	...	...	10	...	6	...
Azimghur	... 146	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Fyzabad	... 921	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Rae Bareilly	... 401	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Lucknow	... 2,241	...	...	...	1	...	...	...	1	...	...	...	...	2	...	...	...
Seetapore	... 566	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Futtehgurh	... 235	...	...	...	...	...	...	...	1	...	...	...	..	1	...	1	...
Cawnpore	... 813	...	...	...	...	...	...	...	...	...	...	...	...	..	...	..	...
Allahabad	... 1,020	...	...	...	...	...	...	3	4	1	...	...	...	8	...	4	...
Nagode	... 202	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL	... 9,318	...	...	1	2	...	...	11	26	3	1	...	...	44	·47	25	2·89
Shahjehanpore	... 509	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly	... 845	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nynee Tal	... 308	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Landour	... 187	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad	... 284	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Roorkee	... 457	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
Meerut	... 1,667	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delhi	... 380	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...
Muttra	... 415	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL	... 4,904	...	...	...	...	...	...	..	...	...	...	...	1	1	·08	...	...
Agra	... 1,002	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...
Morar	... 1,029	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gwalior Citadel	... 223	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seepree	... 148	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi	... 556	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong	... 192	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor	... 563	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore	... 651	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL	... 4,314	...	...	...	...	...	...	...	...	...	...	1	...	1	·02	·1	·23

CHOLERA OF THE EUROPEAN ARMY OF 1866 —*continued.*

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Umballa ...	1,416	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dugshaie ...	865	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Kussowlie Depôt ...	360	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Subathoo ...	602	...	...	...	...	...	...	.	...	...	...	...	...	...	...	..	...
Phillour ...	56	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ..	731	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...
Ferozepore ...	712	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	827	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Dera-Ismael-Khan ...	106	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	1,096	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...
Dhurmsalla ...	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kangra ...	75	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Govindghur ...	147	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fort Lahore ...	116	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meean Meer ...	1,048	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	994	...	...	...	...	...	...	.	...	...	..	...	...	...	...	...	...
Campbellpore ...	441	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Attock ...	157	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murree Depôt ...	312	...	...	...	...	...	...	. .	...	...	...	. .	...	...	...	...	...
Road-making Detachment, Murree Hills	639	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowshera ...	588	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	1,921	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Nundcote Depôt ...	108	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Troops on the march (Punjab) ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	13,185	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Troops on the march, Bengal and N. W. Provinces ...	...	1	...	4	...	...	...	...	...	...	...	...	...	5	..	4	...
Troops in Camp at Agra in November	...	...	...	...	...	...	...	...	...		...	12	...	12	...	7	...
Bengal Presidency	35,013	3	1	7	2	2	...	11	33	5	1	14	1	80	·23	48	1·37

NATIVE ARMY IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1866.

Average Strength for the Year.	Stations.	Number of Admissions from Cholera in each Month.												Total Admissions of the Year.	Total Deaths of the Year.
		Jan.	Feb.	Mar.	April	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		
...	12th Native Infantry on G. T. Road near Raneegunge ...	..	...	18	...	...	...	..	...	...	...	...	...	18	12
	Bengal Proper and Assam—														
	Calcutta	5	5	18	15	14	8	7	3	1	...	...	1	77	43
	Barrackpore	...	2	...	...	2	1	...	...	..	...	...	...	5	3
	Berhampore	...	..	...	...	...	...	...	...	...	...	...	...	...	...
	Dacca	...	1	1		...	...	...	...	...	...	...	2	4	1
	Shillong	...		...	...	2	1	1	1	...	...	...	...	5	1
	Cachar	...	...	...	...	..	...	..	...	...	...	...	...	...	...
9,812	Gowhatty	...	...	...	...	1	...	...	1	...	...	...	...	2	1
	Debrooghur	...	1	...	...	...	8	2	1	1	...	...	...	13	6
	Tezpore	...	...	...	...	1	...	...	...	...	...	...	...	1	...
	Julpigoree	...	..	...	...	...	...	...	...	...	...	...	...	...	...
	Dalimkote	...	...	...	...	...	...	...	...	...	...	...	..	...	...
	Buxa Doear	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Dewangiri	...	...	...	...	...	...	...	..	...	...	...	..	...	...
	Behar, Benares, Oude, and Cawnpore—														
	Bhaugulpore	...	...	...	...	...	...	...	2	...	...	1	...	3	2
	Dorundah	...	...	...	...	...	...	1	...	...	...	...	...	1	...
	Dinapore	...	...	...	...	...	...	...	1	1	...	...	...	2	1
	Segowlie	...	...	...	...	...	...	...	...	...	...	1	...	1	...
	Benares	...	...	...	3	4	...	...	1	...	...	...	...	8	5
	Goruckpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7,084	Fyzabad	...	...	..	...	..	...	...	...	...	...	...	...	...	...
	Lucknow	...	...	...	...	...	1	...	...	-	...	...	...	1	1
	Seetapore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Futtehghur	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cawnpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Banda	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Allahabad	...	...	-	...	...	...	...	...	...	...	...	...	...	...
	Nagode	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Central India and Agra—														
3,980	Central India Force ...	...	...	...	...	...	1	...	...	...	...	*1	...	2	1
	Deolee	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Erinpoorah	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Lullutpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4,479	Nowgong	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jhansi	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jubbulpore	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Morar	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Agra	...	...	...	...	...	...	...	...	...	...	3	...	3	...
	Troops in camp and marching in Agra and Meerut Districts	...	...	...	...	...	...	...	...	...	...	28	1	29	19
4,273	Meerut and Rohilcund ...	...	...	...	...	...	...	...	...	...	...	...	1	1	None.
11,125	Punjab	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
9,725	Punjab Frontier Force ...	...	...	...	...	...	...	...	...	...	...	...	...	None.	None.
51,228	Army of the Presidency ...	5	9	37	18	24	20	11	10	3	...	34	5	176	96

* This case occurred at Deolee; it is the most westerly indication to us of the cholera of Agra and Rajpootana of November.

JAIL POPULATION IN THE EPIDEMIC OF 1863-66.

CHOLERA OF 1866.

STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	1,904	1	6	9	3	5	41	8	2	4	5	2	...	86	...	24	...
Baraset ...	178	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Jessore ...	539	...	1	...	...	...	...	...	...	1	...	...	...	2	...	...	...
Kishnaghur ...	344	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moorshedabad ...	255	...	...	1	...	1	...	...	...	...	1		...	3	...	2	...
Howrah ...	191	1	...	...	...	...	1	9	1	1	...	...	...	13	..	7	...
Hooghly ...	642	...	...	10	...	2	...	4	...	6	...	...	19	41	...	17	...
Burdwan ...	573	...	...		...	10	4	...	...	...	...	...	...	14	...	6	...
Bancoorah ...	622	...	...	1	2	...	...	...	1	3	...	...	...	7	...	3	...
Purulea ...	326	...	...	...	...	...	...	...	8	3	...	...	..	11	...	7	...
Raneegunge ...	57	...	...	3	...	...	...	..	6	...	...	...	...	9	..	8	...
Sooree ...	373	...	...	...	...	...	...	...		...	...	1	...	1	...	1	...
Rajmehal ...	129	...	1	1	...	...	...	...	12	...	..	...	...	14	...	6	...
Deoghur ...	103	...	1	...	1	3	1	...	...	1	..	...	...	7	...	3	...
Malda ...	61	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...
Dinagepore ...	392	...	...	2	1	...	...	...	...	...	...	...	...	3	...	1	...
Rampore Bauleah ...	445	...	...	2	1	...	...	...	...	...	...	1	...	4	...	1	...
Rungpore ...	369	...	...	19	...	...	...	...	..	1	1	...	...	21	...	3	...
Bograh ...	126	...	...	...	...	...	...	...	..	...	...	...	..	..	..	..	...
Mymensing ...	404	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Pubna ...	143	...	...	3	16	2	...	...	...	...	...	3	...	24	...	7	...
Furreedpore ...	404	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Backergunge ..	380	...	...	...	2	3	2	...	...	...	...	...	1	8	..	5	...
Noacolly ...	215	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	..
Chittagong ...	243	1	...		...	...	...	...	...	...	...	...	...	1	..	1	...
Tipperah ...	353	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Dacca ...	449	...	...	3		3	...	...	...	...	...	...	...	6	...	5	..
Sylhet ...	394	...	...	...	10	...	...	...	...	..	...	...	...	10	...	4	...
Shillong ...	38	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Cachar ...	216	...	5	1	2	1	...	...	...	..	...	..	...	9	...	6	...
Gowalparah ...	136	...	6	2	...	...	...	...	...	...	...	...	1	9	...	3	..
Gowhatty ...	225	...	...	...	3	1	...	1	...	...	...	...	...	5	...	2	...
Seebsaugor ...	101	...	...	...	1	...	...	...	...	..	...	...	...	1	...	1	...
Nowgong ..	66	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Tezpore ...	170	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Debrooghur ...	96	...	...	...	...	...	4	1	...	...	...	...	...	5	...	2	...
Midnapore ...	814	...	21	6	...		13	2	...	...	...	...	...	42	...	23	...
Balasore ...	564	...	...	22	23	1	33	3	5	2	...	...	...	89	...	37	...
Cuttack ...	856	...	...	8	6	3	66	36	42	31	4	3	17	216	...	113	...
Pooree ...	394	...	...	14	...	3	3	1	1	2	2	...	...	26	...	12	...
Sumbulpore ...	131	...	..	...	...	...	...	...	...	...	...	...	...	...	...	..	..
Chyebassa ...	228	..	...	25	1	43	15	25	20	2	5	...	...	136	...	84	...
Ranchee ...	235	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Hazareebaugh ...	689	...	...	...	...	1	...	130	22	1	...	...	...	154	...	76	...
Monghyr ...	468	...	1	1	...	1	...	...	11	...	...	...	...	14	...	6	...
Bhaugulpore ...	341	...	...	3	9	1	...	1	32	...	...	...	...	46	...	16	...
Purneah ...	343	2	...	...	...	...	...	...	...	..	...	...	...	2	...	1	...
Darjeeling ...	72	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	16,794	6	42	136	82	85	183	221	164	58	18	11	38	1,044	6·22	495	29·48
Gyah ...	649	...	...	..	...	...	...	16	3	2	...	1	...	22	...	12	...
Patna ...	571	...	...	13	4	...	...	..	22	8	...	..	...	47	...	18	...
Deegah ...	605	...	...	2	...	4	...	13	59	...	...	...	...	78	...	28	...
Arrah ...	492	...	...	...	...	..	1	20	36	...	7	15	..	88	...	32	...
Chumparun ...	286	...	...	...	...	1	...	...	17	2	...	...	...	20	...	14	...
Mozufferpore ...	457	...	...	1	1	...		72	...	...	...	...	...	74	...	17	...
Chuprah ...	499	...	...	...	1	2	27	47	2	...	3	..	...	82	...	19	...
Ghazeepore ...	630	...	...	...	..	...	...	...	...	...	...	...	...	...		...	...
Benares ...	1,170	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mirzapore ...	357	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Azimghur ...	338	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jounpore ...	287	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore ...	708	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Gonda ...	951	...	...	1	...	...	...	...	...	...	...	...	...	1	...	..	...
Baraitch ...	158	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Fyzabad ...	762	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sultanpore ...	227	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rae Bareilly ...	102	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Pertabghur ...	135	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Hurdui ...	134	...	...		...		1	...	...	...	...	...	..	1	..	...	...
Luckhimpore ...	93	...	...	1	...	...	...	...	..	...	...	...	...	1	...	...	...
Lucknow ...	2,619	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Seetapore ...	786	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Etah ...	205	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Humeerpore ...	202	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Oraie ...	88	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Futtehgurh ...	415	...	...	...	...	...	...	..	1	...	...	...	...	1	...	1*	...
Cawnpore ...	322	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	352	...	...	...	...	...	..	...	...	...	...	...	...	...	...	..	...
Nagode ...	84	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad ...	2,403	...	...	...	...	...	...		...	...	...	...	...	...	...	...	...
TOTAL ...	17,088	...	...	18	6	7	30	177	140	12	10	16	...	416	2·43	141	8·25

* The Medical Officer in charge remarks that this case did not come under his personal observation.

CHOLERA OF THE JAIL POPULATION OF 1866 —*continued.*

STATIONS.	AVERAGE STRENGTH FOR THE YEAR.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS.	ADMITTED PER CENT. OF AVERAGE STRENGTH.	NUMBER OF DEATHS.	DIED PER 1,000 OF AVERAGE STRENGTH.
		Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.				
Raepore ...	440	...	...	...	...	...	...	57	18	...	...	...	...	75	...	44	...
Belaspore (8 months)	40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bandhara ...	179	...	...	...	...	...	...	4	...	...	...	...	...	4	...	2	...
Chanda ...	173	...	...	...	...	...	...	...	3	2	...	...	...	5	...	2	...
Nagpore ...	885	...	...	...	...	...	...	...	7	...	...	...	...	7	...	2	...
Chindwara ...	86	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wurdah ...	54	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...
Sironcha ...	56	...	...	...	...	...	...	...	2	3	...	...	...	5	...	4	...
Mundla ...	72	...	...	...	...	...	...	...	1	..	...	...	...	1	...	1	...
Jubbulpore (Civil) ...	480	...	...	...	...	...	...	...	2	...	...	...	...	2	...	2	...
Jubbulpore (Thuggee)	587	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dumoh ...	107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	238	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	150	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lullutpore ...	115	..	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Jhansi ...	207	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	188	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baitool ...	94	...	...	...	...		...	...	...	...	...	...	...	...	...	...	...
Sehore ...	82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nimar ...	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ajmere ...	299	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beaur ...	84	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	4,956	...	...	1	...	...	...	61	33	5	...	...	...	100	2·02	57	11·50
Muttra ...	148	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra ...	1,787	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
„ Secundra ...	59	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra District (10 months).	338	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Etawah ...	346	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	379	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	341	...	...	...	...	...	...	...	.	...	...	...	...	...	...	...	...
Bolundshuhur ...	175	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	273	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	1,515	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Budaon ...	291	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seharunpore ...	249	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bijnour ...	143	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deyrah ...	50	...	.	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Almorah ...	116	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozuffernuggur ...	117	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Moradabad ...	241	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	1,275	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	7,787	...	.	...	...	...	...	...	1	...	..	...	...	1	·01	1	·13
Delhi ...	299	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rohtuk ...	220	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hissar ...	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa ...	254	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnaul ...	105	...	...	...	...	...	...	..	..	...	...	...	...	...	...	...	...
Umballa ...	496	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ Gang at Jhugger	202	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..
Loodianah ...	188	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	305	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	375	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	675	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore ...	1,883	...	...	.	...	...	..	...	...	...	...	...	...	...	...	...	...
Lahore Female Jail	193	...		...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	279	...	...	...	..	...	...	...	...	...		...	...	...	...	...	...
Dhurmsala ...	119	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goordaspore ...	270	...	.	..	...	...	...	...	...	...	...	...	...	...	...	...	..
Goojranwalla ...	349	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojrat ...	238	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	256	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	241	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Montgomery ...	313	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	773	...	...	...	...	...	...	...	...	...	...	...	...	. .	...	...	...
Jhung ...	383	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	274	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	286	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	122	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	92	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Peshawur ...	898	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	417	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	10,697	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
BENGAL PRESIDENCY	57,322	6	42	155	88	92	213	459	338	75	28	27	38	1,561	2·72	694	12·10

EPIDEMIC OF 1866-68.

CHOLERA OF 1867.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1867.

See Map of 1867.

The Central Provinces the exempted area of the year: cholera universal in Upper India from the Behar Provinces to the North-Western Frontier.

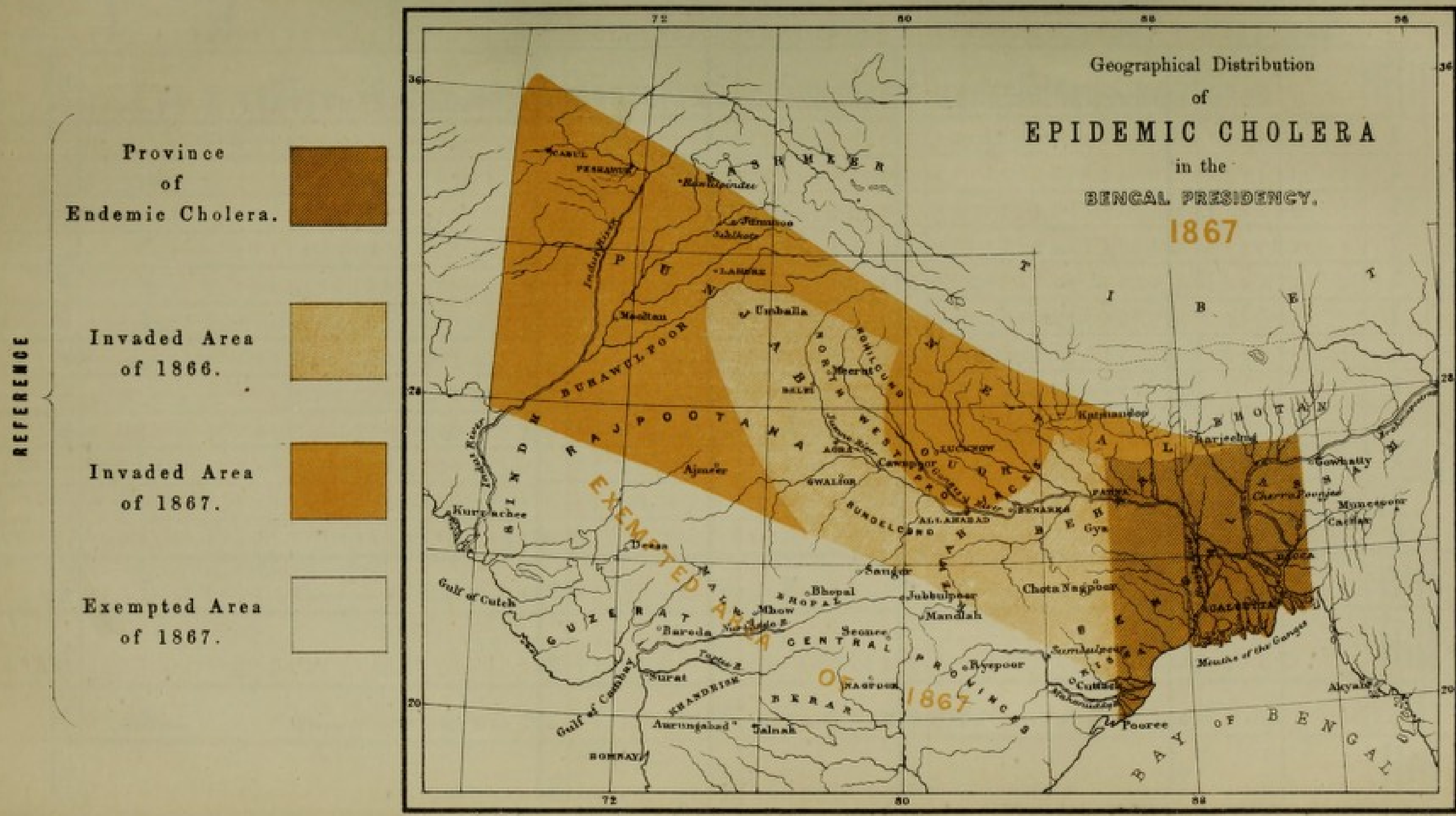
Cholera became universal in the eastern division subsequent to revitalisation within the area covered in 1866 and to the invasion of that portion of the province which remained unoccupied after the completion of the epidemic movement of 1866. The invasion of Cawnpore and Banda was typically displayed in May, but the strength of the eastern invasion was determined towards the north, causing the great epidemic of Goruckpore, Northern Oude, and Shahjehanpore, while the Doab and the districts south of the Jumna were comparatively exempted.

Throughout the western division, after the middle of April, the invading cholera of 1866 was revitalised, and covered Northern India universally, from the line limiting the exempted area in the south to the frontier.

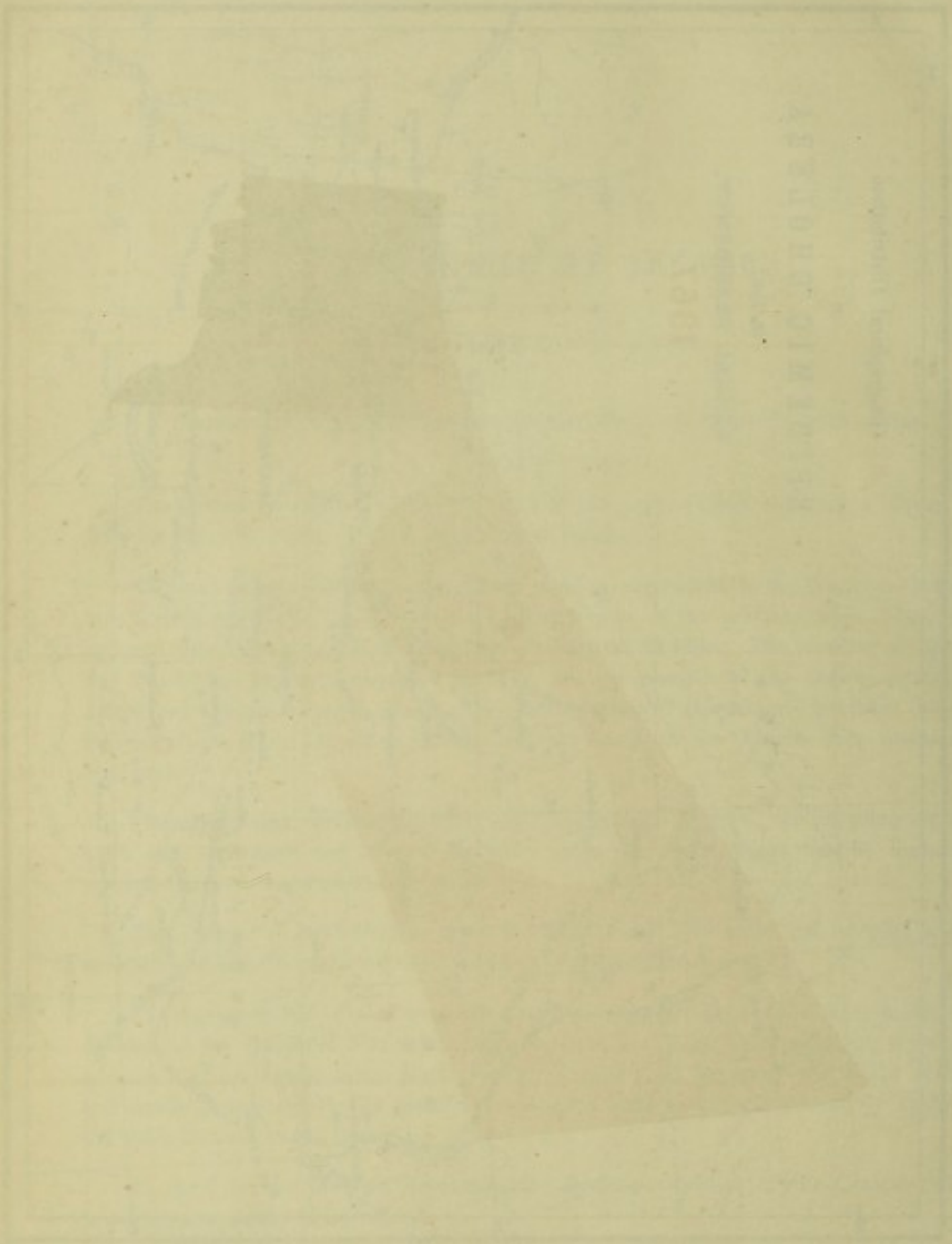
The cholera of 1863-66 was dead in the Central Provinces, and no portion of the epidemic of 1866-67 was determined towards the south or south-west.

The universality of cholera over the eastern division, and the revitalisation in the western division of the cholera of November 1866 in April and May 1867 with the simultaneous advance from the Jumna to the North-Western Frontier, and the persistence of the revitalised and invading cholera up to the close of the monsoon in September, is beautifully exhibited in the Table for each of the types.

In the Table for the Jail Population the absolute exemption of the Central Provinces is a feature especially to be noticed.


Geographical Distribution
of
EPIDEMIC CHOLERA
in the
BENGAL PRESIDENCY.
1867
REFERENCE
Province of Endemic Cholera.
Invaded Area of 1866.
Invaded Area of 1867.
Exempted Area of 1867.
EXEMPTED AREA OF 1867
KASHMEER
PUNJAB
RAJPOOTANA
NORTH WEST PROVINCES
OUDE
NEPAL
BEHAR
BENGAL
BHOTAN
ASSAM
TIBET
SINDH
GUZERAT
CENTRAL PROVINCES
ORISSA
BERAR
BAY OF BENGAL
Gulf of Cutch
Gulf of Cambay
CABUL
PESHAWUR
LAHORE
Mooltan
Umballa
Meerut
DELHI
AGRA
Cawnpoor
LUCKNOW
GWALIOR
ALLAHABAD
BENARES
PATNA
Gya
Chota Nagpoor
Ajmeer
Kurrachee
Deesa
Bhopal
Mhow
Baroda
Surat
Aurungabad
Jalnah
BOMBAY
Jubbulpoor
Mandlah
Saugor
Seonee
NAGPOOR
Ryepoor
Cuttack
Pooree
CALCUTTA
DACCA
Darjeeling
Gowhatty
Munneepoor
Cachar
Akyab
Mouths of the Ganges
BUHAWULPOOR
ROHILCUND
BUNDELCUND
KHANDEISH
72
80
88
96
36
28
20

Lithe at the Surv: Genl's Office Calcutta Septr 1868.   W. A. D. Lawrence Lithogr.



EUROPEAN ARMY IN THE EPIDEMIC OF 1866-68.

CHOLERA OF 1867.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of the Average Strength.	Number of Deaths.	Died per 1,000 of the Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Chinsurah Depôt ...	...	2	...	...	..	...	...	...	...	1	...	...	1	4	...	2	...
Recruits, Invalids, and Time-expired men on march ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Fort William ...	739	...	...	...	...	1	...	...	1	...	...	1	..	3	...	2	...
Dum-Dum ...	472	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...
Barrackpore ...	357	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...
Berhampore ...	126	...	...	...	...	...	...	..	..	...	...	...	...	...	...	...	...
TOTAL ...	1,600	...	...	...	...	1	...	...	1	...	..	3	...	5	·31	4	2·50
Sinchal, Darjeeling...	518	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Darjeeling Depôt ...	145	...	...	...	...	...	..	...	..	...	...	...	...	...	...	...	...
Parisnath Depôt ...	22	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Hazareebaugh ...	876	...	...	...	...	...	...	...	..	...	...	1	...	1	..	1	...
Dinapore ...	907	...	...	...	...	1	..	...	...	...	...	...	..	1	...	1	...
Benares ...	595	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Fyzabad ...	887	...	...	...	2	1	...	..	...	...	...	...	...	3	...	2	...
Rae Bareilly ...	393	...	...	...	...	...	...	...	...	...	..	.	...	...	...	...	...
Lucknow ...	2,535	...	...	...	...	...	...	1	7	3	...	...	...	11	...	6	...
Seetapore ...	574	...	...	...	...	...	..	...	4	4	...	...	...	8	...	6	...
Futtehghur ...	286	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Cawnpore ...	691	...	..	...	...	1	...	2	...	...	...	...	...	3	...	2	...
Allahabad ...	958	...	...	..	...	...	...	2	26	..	..	...	...	28	...	18	...
Nagode ...	203	...	...	...	...	...	...	..	...	...	..	...	...	...	...	...	...
TOTAL ...	9,580	...	...	...	2	3	..	5	37	7	...	1	...	55	·58	36	3·76
Shahjehanpore ...	472	...	..	...	...	...	...	...	23	1	...	...	...	24	...	19	...
Bareilly ..	805	...	...	...	...	1	...	1	1	...	...	...	...	3	...	2	...
Nynee Tal Depôt ...	343	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Landour Depôt ...	205	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Roorkee ...	360	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Moradabad ...	299	...	...	...	...	...	...	4	3	...	...	...	...	7	...	5	...
Meerut ..	1,579	...	...	...	...	...	...	.	16	106	1	...	...	123	...	112	...
Delhi ...	351	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Muttra ...	412	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
TOTAL ...	4,747	..		...	1	2	...	5	43	107	1		..	159	3·35	140	29·49
Agra ...	967	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Morar ...	868	...	...	...	...	...	1	4	8	2	...	...	...	15	...	10	...
Gwalior Citadel ...	219	...	...	...	..	...		1	5	2	...	...	...	8	...	4	...
Seepree ...	149	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi	608	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	193	...	...	...	...	...	...	.	...	...	...	...	...	...	...	...	...
Saugor	657	..	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Jubbulpore ...	634	..	...	...	...	...	.	...	...	...	...	...	...	...	...	...	...
TOTAL ...	4,246	...	..	...	...	...	1	5	13	4	...	...	...	23	·54	14	3·30
Umballa ...	1,329	...	...	...	4	22	1	...	...	2	...	...	...	29	...	22	...
Dugshaie ...	805	...	...	...	...	...	...	.		...	..	...	...	...	...	...	...
Kussowlie Depôt ...	327	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Subathoo ..	751	...	...	...	1	...	8	3	26	2	...	...	...	40	...	19	...
Phillour ...	68	...	...	...	...	...	...	...	...	.	...	..	...	...	...	...	...
Jullundur ...	788	...	...	...	...	...	...	...	...	12	...	...	...	12	...	9	...
Ferozepore ...	773	...	...	...	...	...	3	12	1	...	...	...	...	16	...	8	...
Mooltan ...	763	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismail-Khan ...	101	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	1,262	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Dhurmsalla ...	107	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Kangra ...	73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Govindghur ...	138	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Fort Lahore ...	140	...	...	...	...	...	...	2	1	1	...	...	..	4	...	2	...
Meean Meer ...	1,030	...	...	...	...	6	8	62	10	...	...	...	.	86	...	52	...
Rawulpindee ...	1,352	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cambellpore ...	406	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Attock ..	160	...	...	...	...	...	...	...	...	.	...	...	...	...	...	...	...
Road-making Detachments, Murree Hills	644	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murree Depôt and Family Camp ...	346	..	...	...	...	...	...	5	2	...	...	...	...	7	...	3	...
Nowshera ...	730	...	...	...	...	...	5	...	...	...	...	...	...	5	...	2	...
Peshawur }	1,754 {	...	...	...	...	163	106	4	...	...	...	...	...	273	...	162	...
Cheerat }	{	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Troops on the march, Punjab ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	13,570	...	...	...	5	191	131	91	40	18	...	...	...	476	3·51	283	20·86
Troops on the march, Bengal and N. W. Provinces ...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
BENGAL PRESIDENCY	34,603	2	...	...	8	197	132	106	134	137	1	4	1	722	2·09	479	13·84

NATIVE ARMY IN THE EPIDEMIC OF 1866-68.

CHOLERA OF 1867.

STATIONS.	Average Strength for the period of observation.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Deaths of the Year.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.			
Fort William ...	612	...	1	...	...	..	...	...	...	...	...	3	1	5	2	
Alipore ...	1,078	1	...	3	3	1	2	6	...	1	5	2	1	25	9	
Dum-Dum (9 months) ...	645	...	...	9	1	1	...	1	...	...	...	2	10	24	15	
Barrackpore ...	953	...	...	...	...	..	...	1	...	...	...	...	...	1	...	
Berhampore ...	128	...	...	...		...	...	...	...	.	...	...	...	...	...	
Dacca ...	320	...	...	...		...	...	...	..	...	...	...	1	1	1	
Cachar ...	242	...	..	...	5	...	...	...	...	...	..	...	...	5	2	
Cherrapoonjee and Shillong	834	...	...	...	2	...	...	...	...	...	...	...	...	2	1	4·56
Gowhatty ...	348		...	...	...	...	...	...	...	...	...	...	...	...	...	
Nowgong ...	87	..	...	...	...	..	...	...	1	...	...	...	...	1	1	
Tezpore ...	424	...	...	...	1	5	...	...	1	.	...	...	1	8	3	
Debrooghur ...	912	...	...	1	...	..	1	1	...	1	2	1	1	8	3	
Buxa Dooar ...	698	...	...	...	..	...	...	..	...	1	...	..	...	1	...	
Julpigoree ...	522	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Bhaugulpore ...	460	..	...	...	...	...	...		...	...	...	...	...	...	...	
Dinapore ...	639	...	...	..	...	...	...	2	4	1	2	...	...	9	6	
Segowlie ...	293	...	...	...	..	...	...	..	...	...	...	..	...	...	...	
Benares ...	541	...	...	2	..	1	...	...	...	..	.	...	..	3	2	
Goruckpore ...	623	...	..	...	...	...	...	...	...	...	...	...	...	...	...	
Fyzabad ...	681	...	...	.	...	...	...	...	...	...	...	...	...	...	...	
Lucknow ...	1,590	...	..	...	..	...	2	3	...	...	...	...	...	5	4	2·73
Seetapore ...	353	...	...	...	...		...	...	2	1	...	...	...	3	3	
Futtehghur ...	184	...	...	...	...	...	...	.	...	...	...	...	...	...	...	
Cawnpore ...	796	...	...	...	...	...	1	...	...	...	...	...	...	1	1	
Banda ...	300	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Allahabad ...	627	...	...	..	...	...	...	...	7	...	...	...	...	7	4	
Nagode ...	703	...	...	...	..	...	...	...	...	...	...	...	...	...	...	
Shahjehanpore ...	207	...	...	...	2	...	...	...	3	..	...	...	...	5	3	
Bareilly ...	883	...	..	...	...	..	...	...	...	...	...	...	...	...	...	
Roorkee ...	809	...	..	...	2	...	...	.	...	...	...	...	...	2	1	
Almorah ...	442	...	...	...	...	...	...	1	...	...		...	...	1	1	
Deyrah ...	63	...	...	...	...	..	..	...	...	...	...	...	...	...	...	
Moradabad ...	382	...	...	..	4	1	...	...	..	...	...	...	...	5	5	2·53
Meerut ...	888	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Allyghur ...	450	...	...	..	1	...	...	...	...	...	...	...	..	1	1	
Delhi ...	618	...	...	...	...	..	1	...	...	...	...	...	...	1	1	
Agra ...	703	...	.	...	...	1	...	...	...	.	...	...	...	1	...	
Morar ...	1,697	...	...	...	1	1	1	...	...	.	...	...	...	3	2	
Jhansi ...	679	...	...	...	...	...	...	...	...	...	...	...	...	..	...	
Nowgong ...	423	...	...	...	...	...	...	...	...	1	...	...	...	1	...	
Jubbulpore (11 months) ...	704	...	...	...	...	...	...	..	...	..	...	...	...	...	...	
Deolee ...	262	...	...	...	...	...	...	6	...	...	...	...	...	6	3	·91
Erinpoorah (9 months) ...	105	...	..	...	...	...	...	...	...	...	...	...	...	...	...	
Saugor ...	993	...	..	...	...	...	...	...	...	...	...	...	...	...	...	
Umballa ...	937	...	...	...	...	...	6	...	..	...	...	...	...	6	3	
Simla (7 months) ...	154	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Loodianah ...	128	...	...	..	1	1	...	..	...	..	...	...	...	2	1	
Jullundur ...	486	...	...	..	2	...	..	...	1	...	...	...	...	3	1	
Ferozepore ...	583	...	...	...	..	...	5	...	...	...	...	...	...	5	1	
Mooltan ...	1,040	...	...	..	...	...	...	3	...	...	...	...	...	3	2	
Sealkote (9 months) ...	389	...	...	...	..	...	...	...	..	...	...	...	...	...	...	
Dhurmsalla (9 months) ...	643	...	...	...	...	3	...	...	...	...	...	...	...	3	3	3·81
Bukloh ...	388	...	...	.	...	...	...		...	...	...	...	...	...	...	
Umritsur ...	144	...	...	...	...	..	...	...	...	1	..	...	...	1	1	
Mecan Meer ...	1,324	...	...	...	1	...	...	11	1	...	...	...	...	13	5	
Rawulpindee ...	1,503	...	...	...	...	...	2	1	...	...	...	...	...	3	2	
Attock ...	148	...	...	...	...	...	2	1	...	...	...	..	..	3	2	
Peshawur ...	4,395	...	...	...	..	25	32	4	...	2	...	...	...	63	27	
Troops on the march, Punjab ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Troops on the march, Bengal and N. W. Provinces ...	...	...	3	...	...	...	..	...	...	...	...	...	1	4	2	...
Bengal Presidency ...	39,114	1	4	15	26	40	55	41	20	9	9	8	16	244	124	3·17
Central India Force ...	4,212	...	...	...	...	...	...	20	...	...	...	...	...	20	3	·71
Punjab Frontier Force	9,135	...	..	...	...	...	2	24	39	15	6	...	...	86	39	4·26

JAIL POPULATION IN THE EPIDEMIC OF 1866-68.

CHOLERA OF 1867.

STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	2,356	...	2	36	8	5	2	15	...	2	1	2	4	77	...	20	...
Baraset ...	166	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Jessore ...	598	...	...	1	3	...	...	...	...	5	...	3	...	12	...	2	...
Kishnaghur ...	382	...	...	...	1	...	...	...	1	...	...	...	...	2	...	...	...
Moorshedabad ...	209	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Howrah ...	130	...	...	...	...	...	...	...	...	1	...	1	...	2	...	1	...
Hooghly ...	593	...	..	...	9	...	...	...	...	...	...	1	...	10	...	5	...
Serampore ...	40	2	...	...	...	...	...	...	1	...	...	...	...	3	...	...	...
Burdwan ...	392	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bancoorah ...	525	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Purulea ...	226	1	...	...	2	1	...	...	...	...	...	...	...	4	...	1	...
Raneegunge ...	30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sooree ...	371	...	...	...	1	...	...	..	1	...	...	...	...	2	...	1	..
Rajmehal and Pakour	105	...	...	...	1	1	...	...	...	...	...	...	...	2	...	2	...
Deoghur ...	80	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...
Malda ...	58	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dinagepore ...	403	...	...	1	...	...	...	...	1	...	...	...	1	3	...	1	...
Rajshahye ...	568	...	...	2	...	2	...	...	...	...	...	...	...	4	...	2	...
Rungpore ...	364	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Bograh ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mymensing ...	401	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pubna ...	110	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Serajgunge ...	36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Furreedpore ...	407	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Backergunge ...	434	...	...	7	3	...	1	...	...	...	...	...	1	12	...	5	...
Noacolly ...	191	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittagong ...	229	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tipperah ...	342	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Dacca ...	459	...	...	..	...	...	...	..	...	...	...	...	...	...	...	...	...
Sylhet ...	362	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shillong ...	44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	212	...	...	...	22	3	...	...	...	...	...	...	...	25	...	16	...
Gowalparah ...	134	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...
Gowhatty ...	201	...	...	...	...	2	1	...	...	1	2	...	...	6	...	1	...
Seebsaugor ...	127	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	91	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tezpore ...	185	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debrooghur ...	85	...	...	...	...	...	...	..	...	1	...	...	...	1	...	...	...
Midnapore ...	539	...	...	1	...	...	...	1	...	...	...	...	...	2	...	1	...
Balasore ...	196	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...
Cuttack ...	613	2	...	...	1	...	...	...	...	1	...	...	...	4	...	1	...
Pooree ...	159	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sumbulpore ...	118	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chyebassa ...	159	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	199	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh, Central ...	642	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh District ...	197	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Monghyr ...	394	...	...	...	2	1	...	24	...	...	...	...	...	27	...	8	...
Bhaugulpore ...	317	...	...	...	3	...	...	1	10	...	...	...	...	14	...	5	...
Purneah ...	332	...	...	...	3	62	...	...	...	...	...	...	...	65	...	43	...
Darjeeling ...	60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	15,692	5	2	49	60	77	4	42	13	12	3	8	6	281	1·79	119	7·85
Gya ...	374	...	...	...	1	...	1	...	...	..	...	..	...	2	...	...	...
Patna ...	533	...	...	...	13	1	...	...	...	1	7	21	...	43	...	25	...
Deegah ...	694	...	...	...	...	...	...	...	3	36	...	...	...	39	...	26	...
Arrah ...	387	...	...	2	3	...	...	5	3	...	...	...	...	13	...	3	...
Chumparun ...	193	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...
Mozufferpore ...	297	...	...	2	1	...	...	...	...	9	...	...	...	12	...	6	...
Chuprah ...	334	...	...	...	1	1	...	2	1	...	1	...	...	6	...	1	...
Ghazeepore ...	447	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Benares ...	1,240	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mirzapore ...	228	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Azimghur ...	285	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jounpore ...	222	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore ...	395	...	...	...	...	...	...	...	2	3	...	...	...	5	...	3	...
Bustee (8 months) ...	168	...	...	...	...	...	...	...	..	2	...	..	...	2	...	2	...
Gonda ...	836	...	...	1	...	...	...	...	...	...	...	1	...	2	...	...	...
Baraitch ...	214	...	...	...	...	...	2	2	...	...	...	..	..	4	...	1	...
Fyzabad ...	948	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sultanpore ...	328	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Rae Bareilly ...	141	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pertabghur ...	143	...	...	...	...	1	1	...	...	...	..	...	...	2	...	...	...
Carried over ...	...	...	...	5	19	3	4	9	9	51	8	22	...	130	...	67	...

CHOLERA OF THE JAIL POPULATION OF 1867 —*continued.*

STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Year.												Total Admissions of the Year.	Admitted per cent. of the Average Strength.	Number of Deaths.	Died per 1,000 of the Average Strength
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Brought forward ...	...	...	...	5	19	3	4	9	9	51	8	22	...	130	...	67	...
Hurdui ...	193	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Luckimpore ...	142	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow, Central ...	1,765	...	...	4	4	2	...	...	...	...	1	...	...	11	...	1	...
Lucknow District (11 months) ...	717	...	...	1	1	...	...	1	...	...	...	...	...	3	...	...	...
Seetapore ...	915	...	...	...	...	...	...	...	51	2	...	...	...	53	...	13	...
Nawabgunge ...	83	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Oonao ...	215	...	..	...	...	...	...	...	...	1	..	...	..	1	...	1	...
Etah ...	238	...	...	...	...	...	...	...	...	2	...	...	...	2	...	1	...
Humeerpore ...	138	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	88	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur, Central	354	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Futtehghur District	336	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	283	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Futtehpore ...	330	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	323	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagode ...	77	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad, Central	1,985	...	...	24	3	...	...	...	...	...	...	...	...	27	...	14	...
Allahabad District (10 months) ...	560	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	16,940	...	...	34	27	5	4	10	60	56	9	22	...	227	1·34	97	5·73
Raepore ...	417	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Belaspore ...	66	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bandhara ...	130	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chanda ...	132	...	...	...	...	...	...	...	..	...	..	...	...	...	...	...	...
Nagpore ...	930	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chindwara ...	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wurdah ...	64	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sironcha ...	54	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundla ...	36	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jubbulpore ...	660	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Dumoh ...	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	204	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	117	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lullutpore ...	113	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	206	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	137	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baitool ...	73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sehore ...	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	308	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...
Nimar ...	74	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ajmere ...	311	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Beaur ...	97	...	...	...	...	...	...	...	2	1	...	...	...	3	...	1	...
Total ...	4,421	...	...	...	...	...	...	...	2	1	...	...	...	3	·07	1	·23
Muttra ...	153	...	...	...	7	...	...	...	...	...	...	...	...	7	...	2	...
Agra, Central ...	1,826	...	..	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Agra District ...	340	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Etawah ...	378	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	267	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	328	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...
Bolundshuhur ...	118	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	277	...	...	...	...	1	...	3	18	...	...	...	...	22	...	6	...
Bareilly ...	1,342	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Budaon ...	289	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scharunpore ...	177	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bijnore ...	112	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...
Deyrah ...	41	...	...	...	4	8	...	...	...	...	...	...	...	12	...	2	...
Almorah ...	139	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
Mozuffernuggur ...	95	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	244	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	1,277	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	7,403	...	...	...	11	9	...	3	20	2	...	...	...	45	·61	13	1·76

CHOLERA OF THE JAIL POPULATION OF 1867 —*concluded.*

STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Average Strength.	Number of Deaths.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Delhi ...	287	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rohtuk ...	217	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hissar ...	210	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa ...	243	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnaul ...	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa ...	487	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ Gang at Jhugger ...	201	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	...
Loodianah ...	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	326	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	363	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	571	...	...	...	...	...	3	3	5	...	...	...	...	11	...	4	...
Lahore, Central ...	1,917	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore Female Jail	166	...	...	...	...	...	...	11	...	1	...	...	...	12	...	9	...
Sealkote ...	265	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsalla ...	112	...	...	...	...	6	6	...	2	...	...	...	...	14	...	7	...
Goordaspore ...	246	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	356	...	...	...	...	...	...	1	2	4	...	...	...	7	...	4	...
Goojrat ...	234	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	267	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	252	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Montgomery ...	323	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	660	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung ...	390	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan ...	361	...	...	...	...	...	...	2	...	...	...	...	...	2	...	2	...
Dera-Ismael-Khan ...	298	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat ...	111	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	86	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	869	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sohan (Temporary Jail) ...	112	...	...	...	...	13	1	...	2	...	...	...	...	16	...	9	...
Peshawur ...	406	...	...	...	...	2	11	...	...	...	...	...	...	13	...	5	...
Total ...	10,506	...	...	...	...	22	21	17	11	5	...	...	...	76	·71	41	3·90
Bengal Presidency	54,962	5	2	83	98	113	29	72	106	76	12	30	6	632	1·15	271	4·93

EPIDEMIC OF 1866-68.

CHOLERA OF 1868.

GENERAL INDICATIONS OF DISTRIBUTION AFFORDED BY THE TABLES OF 1868.

See Map at the beginning of the Report.

Cholera manifested over many portions of the area invaded in 1867, but generally diminished in volume or extinguished, in relation to the fact that the distribution of the cholera of 1867 was not limited by the boundaries of Northern India, and that the body of the epidemic was diffusely spread beyond the boundaries of Hindostan: much repressed also over Upper India by the meteorological conditions of the year, especially throughout the western division of the epidemic area: the tract south of the Jumna exempted in 1867, still, in 1868, an area of absolute exemption; and the Cawnpore district and the districts adjoining, which formed an area of comparative exemption in 1867, still an exempted area, perhaps altogether free from cholera, geographically added on to that lying south of the Jumna: *the cholera of a new epidemic (1868-69) invading, from within the endemic area, Chota Nagpore and the Central Provinces between March and May, and before the end of the year becoming universal on the Southern Highway and throughout the province of the South-West Monsoon.*

The Table for the Jail Population shows the almost total exemption of Upper India from cholera in 1868. No fatal case occurred among the prisoners west of Allahabad; the jails of Oude, Rohilcund, Agra, and the Punjab, show no fatal case of cholera. The occupation of the Central Provinces is very clearly indicated in this Table.

The cholera of Jubbulpore and Saugor of the European Army also marks the invasion of the exempted area of 1867. No fatal case is shown in the Table for European Troops in Upper India west of Lucknow; but the wide range of the admissions of August must not be overlooked, since in all probability it points to the invasion of a cholera which with a different meteorology would have shown itself in much greater strength. The two cases at Lucknow and Morar in December are to be noted as occurring at an unusual season; and as indicative of epidemic movement, they have a significance of an importance beyond what the mere fact of their occurrence might suggest.

EUROPEAN ARMY IN THE EPIDEMIC OF 1866-68.

CHOLERA OF 1868.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of the Average Strength.	Number of Deaths.	Died per 1,000 of the Average Strength.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Chinsurah Depôt ...	...	...	1	..	6	5	7	...	...	...	1	...	1	*21	...	*17	...
Invalids, Recruits, and Volunteers on march	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...
Fort William ...	858	...	...	2	1	...	...	...	...	...	...	1	1	5	...	5	...
Dum-Dum ...	555	...	...	...		...	...	...	...	...	...	...	...	...	...	...	...
Barrackpore ...	441	...	...	...	...	...	2	...	...	...	...	...	...	2	...	1	...
Berhampore (9 months) ...	261	...	...	1	...	2	...	5	...	...	...	...	...	8	...	5	...
TOTAL ...	2,059	...	...	3	1	2	2	5	...	...	...	1	1	15	·73	11	5·34
Darjeeling (11 months)	446	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...
Darjeeling Depôt (9 months) ...	105	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh ...	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dinapore ...	854	...	...	...	...	...	1	...	...	1	...	...	...	2	...	1	...
Benares ...	663	...	...	..	...	...	...	...	1	1	...	...	...	2	...	1	...
Fyzabad ...	829	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow ...	2,215	...	...	...	1	...	...	...	6	1	...	...	1	9	...	7	...
Seetapore (9 months)	553	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur ...	232	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	722	...	...	...	...	...	...	...	3	...	...	...	...	3	...	...	...
Allahabad ...	910	...	...	...	...	...	...	...	1	1	...	...	...	2	...	2	...
TOTAL ...	7,438	...	...	...	1	...	1	...	11	4	...	...	1	18	·24	11	1·48
Shahjehanpore (9 months) ...	437	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	894	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nynee Tal Depôt (8 months) ...	337	...	..	...	...	...	...	...	...	...	...	...	...	...	...	..	...
Landour Depôt (7 months) ...	206	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Roorkee ...	320	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sappers, Chuckrata Road (9 months) ...	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad (10 months) ...	313	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut ...	1,616	...	...	...	1	...	...	...	1	...	...	...	...	2	...	...	...
Delhi ...	301	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Muttra ...	425	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	4,582	...	...	...	1	...	...	...	1	...	...	...	...	2	·05	...	...
Agra ...	908	...	...	...	...	...	...	...	2	1	...	...	...	3	...	...	...
Morar ...	784	...	...	...	...	...	...	...	1	...	...	...	1	2	...	...	...
Gwalior Citadel ...	220	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
Seepree (10 months)	146	.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	557	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	185	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	763	...	...	...	...	...	...	...	1	...	2	...	...	3	...	2	...
Jubbulpore ...	633	...	...	...	...	3	10	3	...	...	...	...	...	16	...	12	...
TOTAL ...	4,170	...	...	...	...	3	10	3	4	1	2	...	1	24	·58	14	3·36

* In connection with prevalence of cholera in Lower Bengal, the repeated outbreaks of the Chinsurah Depôt should not be lost sight of.

CHOLERA OF THE EUROPEAN ARMY OF 1868—*continued.*

STATIONS.	AVERAGE STRENGTH DURING THE PERIOD OF OCCUPATION.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS OF THE YEAR.	ADMITTED PER CENT. OF THE AVERAGE STRENGTH.	NUMBER OF DEATHS.	DIED PER 1,000 OF THE AVERAGE STRENGTH.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Umballa ...	972	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dugshaie (10 months)	727	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kussowlie Depôt (8 months) ...	380	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Subathoo (9 months)	670	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillour (11 months)	70	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur (9 months)	750	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	817	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	774	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	99	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	974	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsalla Depôt (7 months) ...	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kangra ...	74	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur and Govindghur ...	130	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fort Lahore ...	84	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meean Meer ...	988	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee (11 months) ...	1,170	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Campbellpore (10 months ...	364	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Attock ...	162	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Huzara Field Force	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murree Depôt (7 months) ...	284	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Family Camp near Murree (5 months)	78	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Road making Detachment Murree Hills (3 months) ...	647	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ Dalhousie Hills (6 months) ...	186	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowshera ...	553	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	1,676	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Troops marching in the Punjab ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	12,576	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Troops on the march, Bengal and N. W. Provinces ...	...	...	...	3	1	...	...	...	...	...	...	2	...	6	...	3	...
BENGAL PRESIDENCY	31,560	...	1	6	10	10	20	8	16	5	3	4	4	87	·27	57	1·81

NATIVE ARMY IN THE EPIDEMIC OF 1866-68.

CHOLERA OF 1868.

STATIONS.	Average Strength during the period of occupation.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admission rate per cent. of Strength for each Province.	Total Deaths of the Year.	Died per 1,000 of Average Strength in each Province.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Fort William ...	620	...	...	...	...	1	...	...	...	1	...	...	...	2		2	
Alipore ...	672	...	...	1	9	2	...	1	1	...	...	...	1	15		6	
Dum-Dum ...	619	1	1	1	2	...	...	1	...	1	...	...	...	7		3	
Barrackpore ...	1,044	...	...	1	...	...	1	...	...	...	2	...	1	5		4	
Berhampore ...	126	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Dacca ...	355	3	1	1	...	...	...	...	...	...	...	...	1	6		3	
Cachar ...	338	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Shillong and Cherrapoonjee ...	890	...	...	...	...	...	8	4	1	...	...	...	...	13	·65	...	2·51
Gowhatty ...	350	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Tezpore (11 months)	423	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Nowgong ...	87	...	...	...	...	1	1	...	...	...	...	...	...	2		1	
Debrooghur ...	887	...	...	...	...	...	1	...	1	...	...	...	...	2		1	
Buxa Dooar ...	637	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Julpigoree ...	556	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Bhaugulpore (11 months) ...	407	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Hazareebaugh (11 months) ...	110	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Dinapore ...	660	...	...	...	...	...	...	1	...	...	...	...	...	1		1	
Segowlie ...	306	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Benares ...	563	...	...	...	...	1	...	...	...	...	...	...	...	1		1	
Goruckpore ...	665	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Fyzabad ...	726	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Lucknow ...	1,917	...	...	...	...	...	...	1	1	...	...	...	...	2	·14	2	1·27
Seetapore (9 months)	394	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Futtehghur ...	189	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Cawnpore ...	644	...	...	...	...	...	...	...	1	...	...	...	...	1		1	
Banda ...	364	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Allahabad ...	785	...	...	...	1	...	...	1	...	1	...	2	1	6		5	
Nagode (10 months)	743	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Shahjehanpore ...	252	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Bareilly ...	961	...	...	...	...	...	...	...	...	...	1	...	...	1		1	
Roorkee ...	452	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Road-making Detachment, Chuckrata Road (9 months) ...	405	...	...	...	...	...	...	...	...	...	...	...	...	...	·08	...	·20
Almorah ...	618	...	...	...	...	...	...	...	...	1	...	...	...	1		...	
Deyrah ...	120	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Moradabad ...	428	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Meerut ...	998	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Alleghur (8 months)	518	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Delhi ...	694	...	...	...	2	...	...	...	...	...	...	...	...	2		...	
Agra (11 months) ...	710	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Morar ...	1,742	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Jhansi ...	752	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Nowgong ...	430	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Jubbulpore ...	741	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Augur (11 months)...	265	...	...	...	...	...	...	...	...	...	...	...	...	...	·03	...	·16
Mehidpore (11 months) ...	391	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Deolee ...	211	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Saugor ...	823	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Malligaum ...	...	...	...	...	...	...	...	...	2	...	...	...	...	2		1	
Umballa (10 months)	837	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Simla (8 months) ...	141	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Loodianah ...	107	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Jullundur ...	540	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Ferozepore ...	508	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Mooltan ...	1,137	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Dhurmsalla (8 months)	670	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Bukloh (8 months)...	515	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Umritsur ...	152	...	...	...	...	...	...	...	...	...	...	...	...	...	·01	...	...
Meean Meer ...	803	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Rawulpindee (11 months) ...	1,222	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Attock ...	173	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Peshawur ...	4,062	...	...	...	...	...	1	...	...	...	...	...	...	1		...	
Hazara Field Force	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Troops on the march, Punjab ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		...	
Troops on the march, Bengal and N. W. Provinces ...	...	*20	...	...	...	...	...	...	...	...	...	...	†3	23	...	13	...
BENGAL PRESIDENCY	40,770	24	2	4	14	5	12	9	7	4	3	2	7	93	·23	45	1·10

* 7th Native Infantry on board boats on the Bhurmpooter.
† The 26th Native Infantry on the march eastwards from Mehidpore and Augur.

CHOLERA OF THE NATIVE ARMY OF 1868 —*continued.*

STATIONS.	AVERAGE STRENGTH DURING THE PERIOD OF OCCUPATION.	NUMBER OF ADMISSIONS INTO HOSPITAL IN EACH MONTH.												TOTAL ADMISSIONS OF THE YEAR.	ADMISSION RATE PER CENT. OF STRENGTH FOR EACH PROVINCE.	TOTAL DEATHS OF THE YEAR.	DIED PER 1,000 OF AVERAGE STRENGTH IN EACH PROVINCE.
		Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Augur ...	239	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goonah ...	307	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sehore ...	870	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirdarpore ...	356	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kherwarrah ...	616	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erinpoorah ...	848	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deolee ...	745	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jeypore ...	66	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CENTRAL INDIA FORCE	4,047	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murdan ...	897	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Abbottabad (9 months)	1,484	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...
Kohat ...	2,424	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bunnoo ...	1,028	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan ...	1,385	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismael-Khan ...	1,721	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rajanpore ...	410	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bhawulpore ...	260	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur (7 months)	574	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Huzara Field Force (5 months) ...	1,761	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PUNJAB FRONTIER FORCE ...	10,308	...	..	...	...	...	...	...	1	...	...	...	...	1	...	...	...

JAIL POPULATION IN THE EPIDEMIC OF 1866-68.

CHOLERA OF 1868.

JAIL STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Average Strength.	Total Deaths of the Year.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	Apl.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Alipore ...	2,451	1	5	11	1	5	5	1	...	1	1	4	2	37	...	12	...
Baraset ...	130	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jessore ...	766	...	1	1	...	...	1	...	...	1	2	4	...	10	...	1	...
Kishnaghur ...	368	...	...	...	1	...	...	...	...	...	...	3	...	4	...	...	...
Moorshedabad ...	158	...	...	1	1	...	...	...	...	...	...	...	...	2	...	2	...
Howrah ...	141	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Hooghly ...	549	...	...	...	...	...	...	...	...	...	4	...	2	6	...	2	...
Serampore ...	27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Burdwan ...	324	...	...	...	9	...	...	...	...	...	...	...	...	9	...	...	...
Bancoorah ...	496	...	...	...	...	5	...	...	...	...	...	...	...	5	...	2	...
Purulea ...	141	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Raneegunge ...	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sooree ...	302	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rajmehal and Pakour	111	...	...	...	2	5	...	...	...	...	...	...	...	7	...	4	...
Deoghur and Sub-divisions ...	89	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Maldah ...	88	...	2	...	1	1	1	...	...	...	...	...	7	12	...	3	...
Dinagepore ...	402	...	...	...	3	...	...	5	4	...	...	...	...	12	...	1	...
Rajshahye ...	532	...	...	3	37	17	...	...	...	...	...	1	1	59	...	37	...
Rungpore ...	399	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bograh ...	191	...	...	...	...	...	...	...	...	...	...	14	...	14	...	8	...
Mymensing ...	395	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Pubna ...	149	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Furreedpore ...	409	...	1	...	...	...	...	...	1	...	...	...	...	2	...	1	...
Backergunge ...	522	...	...	10	...	9	1	...	...	...	...	9	4	33	...	19	...
Noacolly ...	247	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittagong ...	231	...	...	...	...	...	...	...	...	...	...	1	11	12	...	4	...
Tipperah ...	323	...	...	...	1	5	...	...	...	...	...	...	...	6	...	1	...
Dacca ...	427	...	...	2	1	...	...	1	1	...	...	...	1	6	...	5	...
Sylhet ...	366	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shillong ...	44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cachar ...	181	...	...	...	...	...	...	...	...	...	1	4	...	5	...	2	...
Gowalparah ...	137	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Gowhatty ...	183	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seebsaugor ...	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nowgong ...	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tezpore ...	170	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...
Debrooghur ...	83	...	...	...	...	...	...	2	...	...	1	...	...	3	...	1	...
Midnapore ...	496	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Balasore ...	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cuttack ...	388	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	...
Pooree ...	85	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sumbulpore ...	73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chyebassa ...	121	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ranchee ...	231	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
Hazareebaugh, Central ...	652	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hazareebaugh, District ...	217	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Monghyr ...	354	...	...	1	...	1	1	...	...	...	...	...	...	3	...	...	...
Bhaugulpore ...	302	...	...	...	...	...	...	...	...	...	...	2	1	3	...	1	...
Purneah ...	309	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Darjeeling ...	53	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL ...	15,160	2	10	29	57	51	9	10	7	2	9	42	30	258	1·70	110	7·26
Gyah ...	361	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patna ...	399	...	...	...	1	4	1	1	4	...	2	1	1	15	...	6	...
Deegah ...	620	...	...	...	1	3	5	5	1	...	...	...	1	16	...	4	...
Arrah ...	351	...	1	...	...	3	1	...	...	...	...	...	...	5	...	...	...
Chumparun ...	246	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...
Mozufferpore ...	293	...	...	...	...	...	...	...	...	3	...	...	...	3	...	1	...
Chuprah ...	265	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Ghazeepore ...	461	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Benares, Central ...	961	...	...	...	...	1	...	...	...	...	...	1	...	2	...	1	...
Benares, District ...	439	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mirzapore ...	249	...	...	...	1	...	...	1	...	1	...	...	...	3	...	1	...
Azimghur ...	327	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jounpore ...	165	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goruckpore ...	556	...	...	...	...	...	...	5	1	...	...	...	...	6	...	5	...
Bustee ...	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gonda ...	568	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baraitch ...	199	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fyzabad ...	1,028	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sultanpore ...	466	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rae Bareilly ...	184	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pertabghur ...	196	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Husdui ...	271	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Carried over ...	...	...	1	...	4	11	7	12	7	4	2	2	2	52	...	19	...

CHOLERA OF THE JAIL POPULATION OF 1868—*continued.*

JAIL STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Average Strength	Total Deaths of the Year.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Brought forward ...	...	...	1	...	4	11	7	12	7	4	2	2	2	52	...	19	...
Luckimpore and Kheree ...	183	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow, Central ...	1,698	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lucknow, District ...	839	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seetapore ...	883	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nawabgunge ...	82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oonao ...	159	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Etah ...	186	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...
Humeerpore ...	165	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oraie ...	128	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur, Central	499	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehghur, District	290	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cawnpore ...	370	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Futtehpore ...	338	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Banda ...	381	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagode ...	77	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allahabad, Central ...	1,848	...	...	2	...	...	...	..	...	...	...	...	...	2	...	2	...
Allahabad, District...	558	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	17,400	...	1	2	4	11	7	12	7	4	2	2	2	54	·31	21	1·21
Raepore ...	391	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Belaspore ...	69	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bandhara ...	122	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chanda ...	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nagpore ...	913	...	...	...	...	...	...	1	...	1	...	...	...	2	...	2	...
Chindwara ...	72	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wurdah ...	57	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sironcha ...	20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mundla ...	49	...	...	...	...	...	2	...	...	...	...	...	...	2	...	1	...
Jubbulpore ...	694	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dumoh ...	91	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saugor ...	208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nursingpore ...	140	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...
Lullutpore ...	166	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhansi ...	234	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seonee ...	110	...	...	...	...	...	2	.	...	...	...	...	...	2	...	2	...
Baitool ...	50	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sehore ...	107	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hoshungabad ...	290	.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nimar	61	..	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...
Ajmere ...	377	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...
Beaur	87	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	4,440	...	...	...	...	...	4	2	...	1	...	...	...	7	·16	6	1·35
Muttra ...	198	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Agra, Central ...	1,802	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Agra, District ...	348	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Etawah ...	228	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mynpoorie ...	325	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Allyghur ...	359	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bolundshuhur ...	131	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahjehanpore ...	257	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bareilly ...	1,175	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Budaon ...	285	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Seharunpore ...	161	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bijnour ...	158	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Deyrah ...	43	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Almorah ...	135	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Mozuffernuggur ...	119	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moradabad ...	253	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut, Central ...	1,103	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meerut, District ...	151	...	...	...	...	. .	...	...	1	...	...	...	...	1	...	...	...
Total ...	7,231	1	...	...	...	...	...	...	1	...	...	...	...	2	·03	...	...

CHOLERA OF THE JAIL POPULATION OF 1868 —*concluded.*

JAIL STATIONS.	Average Strength for the Year.	Number of Admissions into Hospital in each Month.												Total Admissions of the Year.	Admitted per cent. of Average Strength.	Total Deaths of the Year.	Died per 1,000 of Average Strength.
		Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.				
Delhi	253	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rohtuk ...	185	...	...	...	...	...	...	...	...	...	...	...	...		...	...	...
Hissar	179	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sirsa	268	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnaul ...	98	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa ...	603	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umballa Gang at Jhugger ...	219	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Loodianah ...	166	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jullundur ...	331	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ferozepore ...	338	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Umritsur ...	535	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore, Central ...	1,849	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lahore Female Jail	150	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sealkote ...	301	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dhurmsalla ...	114	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goordaspore ...	225	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojranwalla ...	382	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goojrat ...	250	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahpore ...	329	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhelum ...	264	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Montgomery ...	346	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mooltan ...	691	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jhung	419	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ghazee-Khan...	367	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dera-Ismail-Khan ...	332	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kohat	126	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bannoo ...	100	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rawulpindee ...	1,213	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peshawur ...	423	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	11,056	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bengal Presidency	55,287	3	11	31	61	62	20	24	15	7	11	44	32	321	·58	137	2·46