

## THE LANCET.

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## HISTORY

OF THE

RISE, PROGRESS, RAVAGES, &amp;c.

OF THE

## BLUE CHOLERA OF INDIA.

WE avail ourselves of the first favourable opportunity to devote a more than customary number of our pages, to the connected and detailed consideration of the several important features in the history of the disease which has recently so deeply engaged the attention of the public and of the medical profession.

There is no subject connected with the temporal interests and concerns of mankind in which, in the abstract, they are more fearfully engaged, than in the study of those diseases which occasionally ravage extensive districts, attacking with indiscriminate fury all persons susceptible of their influence, or exposed to the causes which ensure their propagation. War, however destructive in its sphere,—famine, however pinching and disastrous, presses heavily but on the denizens of comparatively small surfaces of the earth. To the one, human conventions may put a period,—human industry, and the natural and speedy revolution of the seasons, afford a certain remedy to the other. But pestilence, though the offspring of one locality, soon extends its desolation to many. Sowing its seeds not infrequently in every soil over which it travels, it deposits the source of successive generations of calamity for the reiterated persecution of man. No rank escapes its attack,—but the peaceful and the charitable, the minister of religion, and the assuager of the sick, seem marked as its special victims; under its influence whole families are exterminated—civilised nations changed to savage hordes, and, in short, when it exceeds a certain point, all grades and bonds of social organisation disappear. Such have been the effects of various pestilences

which historians have recorded, and such may be again their consequences, unless happily we learn from the melancholy lessons of the past, those maxims which may lead to our future conservation.

Lulled into a forgetfulness of such frightful evils by the immunity from their existence, enjoyed in every shape for a period of nearly double the lifetime of our oldest men, the people of Great Britain had ceased to pass even a transitory thought upon such visitations, when early in the year 1818, vague rumours reached England of the outbreak of a new and terrible disorder in our Indian possessions. Report, as usual, added not a little to the horrors reported to characterise its nature. Many, it was said, were, by its sudden seizure, stricken with death, as if by lightning, while in the most prolonged cases, life was extinct in a few hours; a respite so fraught with torture, that it was rather deprecated than desired.

More sober, but, unhappily, still distressing statements, soon were obtained, and the name of *cholera* (a name most injudiciously, as we shall subsequently find, applied to the disease at the outset of the primitive epidemic) having been mentioned as the designation of the malady, the alarm at first excited was readily appeased, by one of these erroneous directions of the public reason, of so frequent occurrence under similar circumstances. Misled thus by the identity of a name of hurried and almost popular imposition, the cholera of India was confusedly deemed identical with the disease of that title familiar to the English practitioner; and, arguing from the rare mortality, and the evidently non-contagious nature of the latter, the public erroneously flattered themselves with the notion, that the Indian pestilence had received exaggerated attributes, and that it would doubtless remain within the cradle of its birth, and never manifest the power of extending its virulence to other climates.

The average symptoms at first rumoured of this disease, certainly afforded some confirmation to such an opinion. *Profuse vomiting* and *purging*—excessive coldness of the skin—prostration of strength—*muscular cramps* and *spasms*. Such were the leading phenomena described; the first and last group of symptoms, with especial emphasis; and this outline was filled up by

the insertion of the various details, crowded, as a matter of clinical routine, into the description of almost every disease; for example, sunken and injected eyes, livid eyelids, and the expression of anguish and anxiety in the patient's features. So far, it was true, the maladies strictly coincided; but no long time elapsed when peculiar and most characteristic features pressed themselves into notice. The presence of bile in the vomited and dejected matter in the old European cholera having ever been especially remarkable, it was now found that, on the contrary, in the Indian disease, that fluid was invariably absent, and that the rejected matters were composed of a peculiar whitish substance resembling coagulated albumen. It was even found that vomiting and purging were phenomena of very minor importance, and by no means peculiar to the Indian cholera, as they were in multitudes of cases *altogether absent*. The strictly essential symptoms were recognised to appertain to unexampled derangement of the nervous and respiratory systems; the pulse failed, animal heat was no longer generated, voluntary strength was exhausted, the venous circulation laboured, and its channels became clogged with black, thickened, and stagnant blood. Death ensued in periods varying from a few minutes to some hours, and it was only when natural strength of constitution or other inexplicable causes interfered, that vomiting, purging, and spasm, supervened, as the secondary and insignificant sequelæ of the real disorder.

#### ORIGIN OF THE EPIDEMIC.

Such is a glimpse of the leading tokens of the epidemic, which, starting up in the August of 1817, has now made in *one* direction an uninterrupted tour from the Gangetic Delta to the river Wear. Of the time when *this* visitation commenced there exists no controversy, neither is the fact of its expansion a matter of the least difference of opinion. Whatever dispute has arisen, refers either to times before 1817, or to the mode in which the diffusion has been subsequently effected. Postponing the discussion of these points to more appropriate periods of this article, we now proceed to point out the circumstances which attended the reputed origin of the existing

disease, and the routes by which it travelled over Hindostan, and thence to the multitudinous regions it has since overspread. Having done this, and so brought it, as it were, within the immediate range of our own grasp and vision, we shall be the better prepared to investigate its symptoms, its physiology, and whatever other circumstances are interwoven with its history, in a precise and intelligible manner, unincumbered by the clouds with which far-distant objects are so frequently invested.

In a previous number of this Journal we took occasion, in our analysis of Dr. Kennedy's excellent work on the pestilence *now* prevailing, to describe the anomalous character of the seasons, for some time preceding its first irruption at Jessore. Aided by his statements, we showed how all the orders and regularity of the climate were reversed, and how, from circumstances which we need not now repeat, the tanks and ponds of the Gangetic Delta and the swampy surfaces of the Sunderbunds were converted into apparent spiracles of poison. Never perhaps was there, in the history of the world, a more close and abundant concatenation of the causes, which transmute the decay of vegetable life into the pestilence of the living animal; and never perhaps was a malady thus produced which swept the world with more destructive virulence than that which we are about to consider.

In the month of August, 1817, the present disease is said to have commenced in Jessore, the capital of the Sunderbunds, and distant from Calcutta about sixty English miles. Jessore is a crowded, filthy place, surrounded by impenetrable and marshy jungles, and consequently exposed to all the horrors of a malarious and ill-ventilated atmosphere. On the 28th of August it was reported to the Government that a malignant disorder had broken out, attacking all classes of natives promiscuously, and destroying from twenty to thirty inhabitants every day. So destructive was it in mortality, so unexampled in character, that, to use the language of the report, "The inhabitants, astonished and terrified at the unaccountable and very destructive inroads of the pestilence, fled in crowds to the country as the only means of escaping impending death. So unforeseen and appal-

ling was the attack, that the functionaries, in extreme consternation, closed the civil courts of the district, and business of every description was abandoned for a time." In the course of a few weeks 10,000 of the inhabitants perished in this single district.\*

PROGRESS INTO THE ADJACENT PROVINCES OF HINDOSTAN.

For some weeks previous to this period the health of the poor of Calcutta was by no means in a satisfactory state, and in the beginning of September the pestilence commenced its havoc amongst them. It is, however, a matter of doubt whether it extended itself from Jessore, or spontaneously originated in Calcutta. The similarity of the local circumstances, however, renders it a matter of no consequence, either abstractedly, or as it relates to the elucidation of the progress of the malady.

Before the end of September, spreading like radii from a common centre, the disease occurred throughout and beyond the province of Bengal; from Purneah, Dinapore, and Silhet east, to the confines of Balasore and Cuttack; and from the mouths of the Ganges to its confluence with the Jumna. It is needless for us to particularize the towns, the villages, and the districts, ravaged in its progress between these points; their bare enumeration would almost form an itinerary gazetteer of the province.

The territories adjacent to Bengal now began to suffer, but with this difference in the progress of the malady, that while in Bengal it had almost simultaneously burst forth in different localities, or else traversed from place to place with such rapid strides, that the links in the chain of dissemination eluded strict observation, in the other provinces, on the contrary, its effects were at first limited to "particular lines and divisions of the country." † This was especially remarkable in the irruptions of the cholera along the banks of the Ganges in a north-westerly direction, while to the east it penetrated no further than Muzufferpore, leaving immense and populous tracts un-

touched. Pursuing then the course of the Ganges, and its tributary streams, it reached the interior of the country, and on the 6th of November a most remarkable irruption took place in the grand army then stationed in Bundelcund, encamped under the command of the Marquis of Hastings, on the banks of the Sinde, a tributary of the Jumna; the mortality was here appalling, five thousand men perishing between the 15th and 20th of November, and the deaths on the whole amounting to nine thousand persons. The invasion was so sudden and violent that the horsemen were stricken from their steeds, and in vain attempted to remount, and the roads were covered with the dying and the dead. ‡ After the 8th of December no new case occurred in the camp, but the pestilence still pursuing the track of the roads and rivers, every considerable town and village in Bundelcund was attacked, and it spread in succession to the provinces of Behar, Malwah, and Candeish, and eventually to almost the entire of the Deccan. In the month of March ten thousand Indians were cut off in the town of Banda and its environs, and Hutta, Saugur, Ougein, and Kotah, were proportionately afflicted. Kotah is built upon a solid rock along the east side of the Chumbul, yet here one hundred persons perished daily for such a length of time, that, struck with dismay, the surviving inhabitants abandoned the city.

The town of Saugur seemed to have been the point of divergence for two offsets of the epidemic, one of which, already alluded to, pursuing a south-westerly route, arrived at Kotah; the other, proceeding due south, attacked a force stationed on the Nerbuddah, and extended itself in one direction through the states of Nagpore and Poonah to the Presidency of Bombay. Before, however, we proceed to notice its journey to these cities, it is necessary to revert to the consideration of its progress northwards from Allahabad, where it broke out in March 1818, and where, in a few months, it swept off ten thousand persons. The pestilence still persevered in its ascent along the Ganges, and it was announced to exist in Cawnpore on the 8th of April. Meerhut, Agra,

\* Vide p. 21 of History of the Contagious Cholera, by James Kennedy.—London: Cochrane and Co. November 1831.

† Kennedy, Op. Cit. p. 25.

‡ History of the Administration of the Marquis of Hastings.—Asiatic Journal, vol. 16. p. 534.

and Delhi, were soon attacked, and it is especially remarkable that between the two last cities numerous villages escaped, which were situated in low marshy grounds, and consequently exposed to the effluvia of animal and vegetable matter in a state of putrefaction. From Delhi the disease spread in a south-westerly direction to the principality of Jeypore, the capital of which it reached in the latter end of August. On the 14th of September it appeared in the camp of Major Agnew, at Tityrya, a place twenty-five miles distant from Jeypore. The malady seems to have advanced but little further in this direction.

In April and May 1818, the middle provinces of Hindostan were attacked, places which had escaped the first irruption of the epidemic.\* Lucknow and Fyzabad, the chief cities of the celebrated territory of Oude, were ravaged with peculiar severity; and in Goruckpore thirty thousand persons became its victims. It was remarked with surprise that during this horrible devastation not one of the individuals confined in the prisons of that city contracted the disease.

In the northern progress of the cholera the important fact was first established that elevation of territory possesses little influence on its severity,—the high mountains which separate Hindostan from the Nepaul being invaded, as well as the high table lands of Nepaul, Patun, and Rhatgoun, which have an elevation of at least four thousand feet above the sea.† Catmandou also was affected, a town situated on the lower ridge of the Himalaya mountains at a height exceeding that of Briancon, one of the most elevated cities in France, and differing little in altitude from the Pyrenean villages situated on the furthest verge of the districts inhabited by mankind.

Such is a brief but accurate sketch of the progress of this virulent pestilence in the Presidency of Bengal, during the early months of its existence. Before proceeding to trace its extension to the territories of Bombay and Madras, it is necessary to observe the melancholy truth that in whatever part of India it broke forth, there

it seems to have deposited the seeds of new irruptions of the distemper, of which not less than two hundred instances have occurred up to 1831, in the chief cities already named; while in many cases the second attack exceeded in mortality the first visitation. The very latest advices received from Bengal communicate the intelligence that the twelfth irruption of cholera has taken place this summer in Calcutta.

It is unnecessary for us to track minutely the steps of the pestilence through the southern districts of the Indian peninsula; it is quite sufficient to say that duly-authenticated reports show it to have descended to the south in three nearly parallel lines. One, following the eastern coast washed by the Gulf of Bengal, proceeded slowly through every successive town and port on the Coromandel coast, till it arrived at Cape Comorin. The second or inland division took nearly the centre of the peninsula, passing through Seringapatam, &c. &c. The third proceeded to the coast of Malabar and the Portuguese colony of Goa. In short, by the expiration of a few months the whole peninsula was affected, and the mortality had amounted to an enormous number. When we bear in mind this fact, and also that up to the present time each of the districts attacked has again and again become the theatre of the pestilence, the probability of the calculation is shown which estimated the mortality in India at the awful total of twenty millions of individuals.

During this career of destruction, the folly of the doctrine which attributes the exclusive habitation of cholera to the low jungle and morass, was again fully proved by the propagation of the disease in some remarkably elevated places, especially on the table land of Mysore, at Darwar, Belgaum and Bangalore. The town of Mysore is very nearly as high as Pontarlier,\* the most elevated town in France, and more so than any of the inhabited high lands of England, Scotland, or Wales. The Gaut mountains were also crossed, which, according to the measurement of Lambton, are equal in altitude to the Carpathians or Pyrennees.

We have now followed this disease in its marchings and countermarchings in every

\* Rapport au Conseil Supérieur de Santé, sur le Cholera Morbus Pestilentiel, &c. Par Alex. Moreau de Jonnes. Paris, July, 1831.

† Moreau de Jonnes, p. 173.

\* Moreau de Jonnes, p. 218.

direction of the compass, from Jessore and its vicinity, till it had reached the utmost bounds of the Peninsula. In doing so, we have designedly avoided the recital of the various coincidences which took place between the outbreak of the malady in sound places, and the arrival of troops, or pilgrims or refugees, in the same district, from infected quarters. We pass by these facts, partly from the minor importance which should generally be attached to circumstances indicative of the transmission of a disease in the place of its undisputed origin, and partly because the points which are really conclusive shall find a place when we arrive at the consideration of the controversy regarding the mode in which the subsequent extension has been occasioned. We now proceed to show the second scene of this frightful drama, and that which first effectually awakened the attention of distant countries—namely, the migration of the cholera over the gulfs and arms of the ocean which wash the littoral boundaries of the Indian peninsula. Of these the most remarkable are, first, its passage into Ceylon; secondly, into the Birman empire and thence to the Indian Archipelago; thirdly, from the coast of Malabar to the shores of the Persian gulf.

APPARENT EXPORTATION OF THE CHOLERA TO CEYLON, MALACCA, &c.

The cholera prevailed at Madras in October 1818, and from the Coromandel coast it possibly may have been transported by sea to Ceylon, in the capital of which island, Candy, it broke out with dreadful severity in December of the same year. It commenced on the coast, and spread itself gradually over the interior, and was stated to have been imported from Palamcotah, a town on the opposite side of the strait, which was infected at the time.\* The town of Candy is situated at a great elevation above the sea.

About this time, namely, at the end of November 1819, the disease began to rage in the island of Mauritius, a short time after the arrival of the *Topaze* frigate, several of the crew of which vessel died of cholera on the passage from Calcutta, and the officers of which vessel refused to submit to quarantine rules. The island of Bourbon,

close to Mauritius, immediately established a strict system of sanatory regulations, and for a length of time it continued uninfected. On the 7th of January, however, a ship, named the *Pic-Var*, held a contraband communication with the shore, and on the 14th the cholera broke out at St. Dennis. Immediate measures were now resorted to, on the hypothesis that the disease spread by contagion. Part of the population was withdrawn, a lazaretto was established, and a double cordon was drawn around the infected spot. The disease spread no further in this island.

From the Delta of the Ganges the disease extended itself, in a few months after its first irruption, along the eastern coast of the gulf of Bengal, and from Arracan, which it entered in 1819, it proceeded gradually to the peninsula of Malacca. In 1820 the kingdom of Siam was attacked, and 40,000 inhabitants perished in its capital, Bankok. In 1823, coincident with the Burmese war, and the march of our troops from sick districts in British India, the Birman empire became affected. Coincident again with the general or particular periods of the arrival of individual vessels or trading flotillas, we find the malady in Achem, the capital of Sumatra; at Banca, Java, and Borneo, in the Philippine islands; at Amboyna in the Moluccas, and at length in Macao and Canton on the west coast of China. In the Philippine islands the malady was marked by one of those terrific outbursts of barbarian despair which have more than once signalized the progress of this pestilence. The Chinese and Europeans were accused of magic by the superstitious crowd, and numbers of them were massacred on the shore within sight of an English vessel.\* Amongst the victims of assassination was the celebrated Godfrey, whose collection of reptiles and insects lent especial countenance to their insane accusations. Into the interior of these vast regions it penetrated, we are informed, by the itinerary lines, running from the harbours where it first found footing. The rivers especially led the malady to their sources, as in the case of the Irrouaddy,† which it followed for 230 leagues into the Birman empire. By the Menan, again, it penetrated Siam and by the Cam-

\* Dr. Bisset Hawkins's History of the Spasmodic Cholera, p. 172.

\* Gov. Gazette, Feb. 1, 1831.

† Moreau de Jonnes, p. 254.

bogia, a pathway was opened into the kingdom of Laos, while the extensive system of inland navigation in China permitted its rapid propagation through the population of that immense empire. In a space of two years and a half it thus travelled from Macao to Peking. No certain data have ever been obtained concerning its ulterior progress in this extraordinary country. All that is known satisfactorily is, that it continued to ravage China in various places, from 1820 to the present time; that in 1825 Kiachta, the great emporium of the Russo-Chinese commerce, was reduced to a state of inactivity by the desolation occasioned in the interior; and that in 1827, according to the statement of the Russian Director of Customs, the great wall of China was traversed, and the inhabitants of Cocu-Coton, a town in the great desert of Cobi, were attacked.

Returning to the peninsula of Hindostan, other offsets of the disease require to be noticed; one, for example, which, proceeding to the north, reached Lahore in 1827, and extended through the various intermediate districts to the north till it reached Caboul in the desert, beyond which no concatenation in its progress has been detected; though from the chains of caravans which pass in that direction through the country of the Kirghis-Kaïssacks to Orenburg, it will presently be seen, that the occurrence of cholera in that city in the year 1830, has been attributed with some appearance of plausibility to this kind of communication.

We have already alluded to the progress of the cholera eastward to Bahar, and from Bahar northward to Benares, Lucknow, Cawnpore, and Delhi. It then directed its course southward to Agra, Hussingabad, and Nagpore. From Nagpore it again struck off in a south-east direction to Aurungabad, and then to Panwell and Poonah. Finally, in the second week of September 1818, it broke out in Bombay.

#### APPARENT EXPORTATION TO BOMBAY AND THE PERSIAN GULF.

The circumstances attending the irruption at Bombay deserve attention, as they form one of the earliest examples of the supposed exportation of the epidemic from one shore to another. On the 6th of August, 1818, the cholera visited Panwell, a considerable village situated in the main line of intercourse between Poonah and Bombay. Panwell is distant from Bombay eighteen miles, and is

separated from that city by an arm of the sea. Between these places the maritime communication is constant. During the 9th or the 10th of August, according to Dr. Taylor's report to the Bombay Medical Board, the first case of cholera occurred in Bombay—coincident with the arrival of a traveller from Panwell. Mr. Jukes again reports, that it spread north and south along the sea-coast from the same place, and that its appearance near Tannah in the island of Salsette immediately followed the arrival of a detachment of troops which escorted a state prisoner from Panwell to that garrison. During the progress of the malady in Salsette, it was carefully traced in its slow progress from village to village, and in the majority of cases its outbreak was contemporaneous with the ascertained arrival of persons from infected places.\* Lastly, some of the villages with which little or no intercourse was maintained escaped the pestilence for several months. Such was the commencement of an irruption which (to use the words of Moreau de Jonnes, re-echoed by Sir Gilbert Blane) renewed every year in this part of Asia, has served as a centre and point of departure for the itinerary lines, by which the cholera has advanced to the Persian Gulf, to the Mediterranean, the Caspian and the Baltic; and we may now, unfortunately, add, to the German ocean and the river Wear.

The populous city of Bombay, situated on the western coast of the Indian peninsula, was once one of the great depôts of eastern commerce, but after the peace of 1815, the ever-increasing prosperity of Calcutta threatened its entire eclipse, and forced it to seek new openings for its exports.† Events soon favoured this desire. The Imaum of Muscat, having, when reduced to a desperate position, received succours from the British forces, became the ally, if not the vassal of Great Britain, and threw open to that power the navigation and commerce of the Persian gulf. Ferocious and puissant bands of pirates, which had long possessed themselves of all the communications with the southern provinces of Persia and Mesopotamia, were attacked and dispersed, their towns sacked and burnt, and their war praams destroyed. A military settlement was then established

\* Preface to the Bombay Medical Report.

† Moreau de Jonnes, p. 256.

in the isle of Kischmé, which commands the straits of Ormus. Naval surveys were made of the coasts, and at length British courage and perseverance were rewarded with a facility and safety of navigation equal to that of the Irish Channel, and the Persian Gulf soon bore a thousand British vessels on its bosom.

In Muscat, a seaport at the extremity of the Arabian peninsula, and the most frequented harbour for the traffic of Bombay, the cholera broke out in the month of July 1821, and according to the statement of the Imaum, it soon exterminated 10,000 persons. Almost at the same time the islands of Ormus and Kischmé, at the mouth of the Persian gulf, and by which the trading vessels have to pass, were invaded by the disease. By August it had penetrated into the Gulf, and along the Arabian shore. Its desolation was excessive, especially at the island of Barheim, where the pearl fishery has located a dense population. Bassorah, the key to Mesopotamia and Bendar Abassi, that which opens the high way to the interior of Persia, were now attacked.

The port of Bendar Abassi (which also has received the appellations of Gomron, Cosroom, and Buschire) was invaded in the middle of July 1821, the cholera having been prevalent in Bombay since the preceding March. In a short time one-sixth of the inhabitants of Bendar Abassi sunk beneath its rage. Human misery perhaps never showed itself in more terrific colours than on this fatal occasion. The bazaars were closed, the houses abandoned, the unburied dead lay heaped in the streets, and the surviving population sought safety in flight. Shiraz, which is one hundred leagues distant, but in perpetual intercourse with Bendar Abassi, became infected in September, and the Harem of the Prince Royal of Persia was almost the first arena for its fury. In this city, one-eighth of the inhabitants were cut off, and the British consul, Rich, a man famed for his zealous and able cultivation of science, was amongst the earliest victims. A singular sanitary measure is recorded\* to have been practised here in an attempt to turn aside the current of the calamity. Salvos of artillery and peals of musketry roared from the rising to the

setting sun, loud shouts were raised by united thousands, and gongs and trumpets increased the horrid commotion; but the unrelenting progress of the pestilence soon showed the inefficacy of this clamour, and the crash of ordnance and martial music gave place to the shrieks and melancholy wailings of the dying and the bereaved. Progressing northward the cholera next reached Yerd, between Shiraz and Ispahan, and six months after its first appearance in Bendar Abassi, towards the end of August, it entered Ispahan. Its prevalence was here however but very moderate, and the route of the malady seemed to have been impeded by the decreasing temperature of a Persian winter. But here, as in Bombay and the Gangetic Delta, the succeeding spring witnessed its unwelcome resurrection, and now the lines of towns on the routes of the northward caravans from Ispahan were consecutively affected. Having reached Tauris, it thence extended to Armenia, and at length reached Erzeroum, just as the victorious Abbas Mirza had shut up the Turkish army in that city. But the conqueror soon in turn was attacked by a more potent enemy. The cholera swept his ranks from front to rear, and his terror-stricken soldiers threw down their arms in dismay, and fled before this invisible destroyer.

From this period to the year 1823, cholera in slow succession visited the towns and villages of the north of Persia. It followed the course of the river Khour up to its confluence with the Araxes, and thus extended itself to the shores of the Caspian Sea, which were now attacked in various districts. Early in September, 1823, it entered Astrakan, a large and populous town on the northern shore of the Caspian. The Russian fleet was first infected, and of 216 persons, 144 died. Instant alarm being taken, the strictest measures were adopted to prevent the extension of the disease further north, but whether owing to these measures or not we will not here venture to express a decided opinion; the fact is, however, certain, that the disease made no further progress in this direction.

But before we proceed to notice any of the places it has since affected, it is necessary to trace briefly its general steps in another quarter. When advancing

\* Frazer's Narrative of a Journey into Khorasan, 1825.

from south to north it approached within forty leagues of Teheran, the residence of the Shah of Persia, in apprehension of the communication of the cholera by the approaching caravan, the arrival of which had in other towns coincided with the irruption of the disease, a royal order prohibited its approach. The reader will mark the instructive fact that as the caravan turned aside and made a wide bend to avoid the capital, so the pestilence, for that time, also passed by Teheran, and followed the wake of the merchants in their ulterior journey.

The narrative of the progress of cholera into Syria and Mesopotamia is still more marked with calamity. Bassorah, a town fifteen leagues from the sea, but communicating with it by the Euphrates and a navigable canal, was first infected, and in eleven days 18,000 persons, one third of the population, were swept away. The disease thence travelled to Bagdad, along the course of the Tigris, and burst out with such overwhelming fury that one-third of the population there also perished. From Bagdad two branches of the disease stretched forth; one to the west again penetrated into Persia, another to the east ascended the Euphrates to Annah, at the entrance of the desert which separates Mesopotamia and Syria. The malady here once more seemed to slumber, and its existence was not again recognised till the spring of 1822, when it suddenly re-appeared between the Tigris and Euphrates, and advanced anew to Syria in a different direction. In July, Moussol, a town sixty miles north of Bagdad, was visited, and the epidemic then turned to the west, through the towns of Merdin, Diarbekir, Orfa, Biri, and Antab, where it passed the boundaries of the Syrian provinces. In November, Aleppo was infected, and for three days, 300 victims daily fell beneath its poison. Here also autumnal colds seemed to arrest its progress, but the following spring again witnessed its recurrence. In June, Latachia and Antioch were infected, and by reaching the former port the cholera at length confronted Europe, having travelled 1500 leagues from its origin in Bengal. Following the coast to Tortosi, Tripoli and Suedia consecutively suffered, and the degree of violence of the irruption may be gathered from the following fact related by the British consul, Mr. Barker:—

Twenty peasants of Suedia, robust, vigorous, and in the flower of life, were labouring at the harvest work, when, on the 9th of July, at noon, one was suddenly attacked and the others in a short time showed symptoms of the disorder. In three hours the entire band was exhausted; before sunset many had ceased to live, and by the morrow there was no survivor.

An inland parallel line was meanwhile running through the pachalicks of Syria, from north to south, over Mount Lebanon to Damascus; and thus, during the year 1823, in a space of seven months, it had ravaged from Caramania to Judea. The town of Tiberias was attacked in the winter of 1824. The disease thus closely adjacent to Egypt on one side, it threatened the isle of Cyprus on the other. By Caramania it might have reached Asia Minor, and gaining the port of Smyrna infected the Grecian Archipelago. These districts, however, then escaped, an immunity which, as far as Egypt was concerned, was attributed to the vigorous precautionary measures adopted by the Pacha, at the suggestion of the French Council of Health. It is not, however, clear that this interference was the sole cause of the prevention of the disease, for the island of Cyprus has still continued free from the infection, although we have no authority for stating that any direct measures were there adopted. Up to the present year, numerous statements have, from time to time, been received of the occurrence of the disease in Arabia. Egypt, however, retained its immunity till August 1831, when it suffered the horrors of the pestilence, under circumstances to which we shall have occasion again to revert.

#### COMMENCEMENT OF THE DISEASE IN RUSSIA.

Persia, it will be remembered, continued to suffer during 1829 and 1830, and towards the close of that year authentic accounts of the progress of cholera to the north-west were received in St. Petersburg. In the beginning of July, the disease occurred in the Russo-Asiatic provinces of Schirvan and Bakou, whence it spread by land through the defiles of the Caucasus to Teflis, the capital of Georgia, and, apparently, by sea from the port of Bakou to Astrakan, a brig having just arrived from



Bakou, of the crew of which eight had died from cholera on the passage.

Before we proceed to sketch the routes which the malady pursued from this fatal epoch, it is necessary to advert to some circumstances connected with its appearance in the Russian province of Orenburg, in the years of 1829 and 1830.

The first well-ascertained case of cholera, according to the official reports,\* occurred on the 26th August, 1829, at Orenburg, the capital of the province of that name, situated on the Tartar frontiers, 400 miles north of the Caspian, and lying north-east from Tabreez and Reschd (vide map), where it had prevailed extensively some years before. In another week, 8th September, a second case occurred; on the 9th two more, on the 10th two; after which the cholera became general, until one-tenth of the population were affected. From Orenburg it speedily extended about 200 miles northward, about the same distance north-west, 60 west. On the 23d February, 1830, the disease was every-where extinct. The origin of the Orenburg epidemic is involved in the utmost obscurity. M. Moreau de Jonnes and the Orenburg physicians endeavoured to trace it to importation by the caravans which arrive from Central Asia every midsummer. In Professor Lichtenstadt's reports, however, satisfactory evidence is adduced of the failure of this attempt. It is nevertheless true, that though the caravans continued healthy on the route across the great steppes of the Kirghis-Kaissacks, and though 35 days elapsed between the arrival of the caravan and the outbreak of the epidemic, yet that the disease was prevalent in the Persian districts, whence the convoy proceeded. It is indeed with much more probability contended, that the Kirghis-Kaissacks, whose country immediately touches Orenburg to the east, were the conveyors of the malady, as it was ascertained to have prevailed amongst them, and as their traffic with the Russians is extensive along the border of their country. We are induced to allude particularly to the Orenburg disease, because its origin being uncertain and its extension limited, we shall presently find that it forms an important

topic in the controversy regarding the mode of propagation in this disease.

We now arrive at the occurrence of the epidemic in Astrakan, the principal facts concerning which we shall extract from Dr. Solomov's interesting narrative, ably analysed in the *Edinburgh Medical and Surgical Journal* for July, 1831:—

“ Cholera first appeared on the frontiers of the Astrakan government on the 3d of July, on board a ship of war, which had arrived from Baku (350 miles down the Caspian), and lay sixty miles from Astrakan. Till the 20th of the month the disease was confined within the Sedlitovski Lazaretto, whither the vessel with the sick had been brought. But on that day four people were taken ill in the city, near the river Kutum; and from this point the disease imperceptibly spread over the whole town, carrying off a great number of people. After the 27th it attacked the suburbs, then the nearest villages, and then gradually extended over the whole government. \* \* \* In reaching Astrakan from Baku it passed over all the intermediate districts of the Russian territories. \* \* \* The first places attacked after Astrakan were several Tartar villages in the immediate vicinity, at a distance of from two to four miles, the inhabitants of which were in constant communication with the town, and to which also many families fled out of it as the disease spread. On the 27th of July it also appeared in the village of Tscherepacha, eight miles from Astrakan, on the return of some inhabitants, who had been to the town in search of work, and one of whom was the first person taken ill. After the 29th it proceeded through the Cossack stations and the town of Enotaevsk, on the highway to Moscow, up the stream of the Volga, its extension in this direction evidently accompanying the fugitives from the places successively attacked. In the town of Enotaevsk it spread with the arrival of a sick boor. On the 29th of July a barge arrived at Tchernojar, one hundred and fifty miles up the Volga, with several rowers on board, who were ill of cholera. On the 8th of August the disease began to prevail among the inhabitants, and then passed across the river among the neighbouring Kirghis, as well as upwards to the villages of Solodnikovsko and Vaisovka, in one of which the first person attacked was a military prisoner, who had been exposed to the disease. On the 25th of July the epidemic also began in Krasnojarsk, situated on the northern mouth of the Volga, twenty miles from Astrakan; and it first seized a private of invalids and a girl of thirteen years of age, who had both recently come from that ca-

\* Dr. Sokolov. Die Asiatische Cholera in Russland. D. S. Lichtenstadt au Berlin, 1831.

pital. On the 3d of August it appeared in the estate of M. Nekrasov, ten miles from Krasnojarsk, and among the Algarin hills in the vicinity of the town; from which it finally extended down to the Cossack cordon on the Caspian, between which and Krasnojarsk there is constant communication. While the disease prevailed in Astrakhan some fishermen were there from Makovsky and Schitinsky, two places on the shore of the Caspian, where the Volga opens into it. These men, terrified at the progress of the epidemic, hastened home, to place themselves, as they imagined, in security. But they had already imbibed the poison; some fell sick on the way, others after arriving at their homes; and the disease soon spread throughout the community to which they belonged.

“On the 2d of August the salt depôt of Basinsk in the Caucasian kingdom, ten miles off the highway, was subjected to the general pestilence. On the 1st of the month an Armenian, convalescent from cholera, arrived at the house of a private of the depôt guard, who was taken ill and died next day; and other cases occurred afterward. At the salt depôt likewise of Kigatska, twenty miles from Krasnojarsk, a private soldier was taken ill whom I had sent thither from Astrakhan, with medicines and instructions for the inhabitants, in case the disease should appear among them; and various individuals were attacked subsequently.”

“Many gardens and farms in the neighbourhood of Astrakhan remained exempt from the epidemic, having broken off all intercourse with the diseased districts. In many villages too, where similar measures of security were taken, the issue was equally fortunate, although the cholera raged all around them, for example, in the lordships of Smirnov, Beketov, and Prince Dolgoruki, in Sarepta, eight miles from Zaritzin, and some other places. On the other hand, the Kalmucks, who, as soon as the disease appeared among them, left their sick comrades behind them and repaired to pasturage-grounds fourteen miles off and more, did not in this way get rid of their fatal visitor: fresh cases occurred among the families who were first attacked.”

In the city of Astrakhan, the mortality amounted to 4,043, and 21,263 perished in the provinces. The cholera now commenced a north-west course with unprecedented velocity, along the Volga to Enotaevsk, Tschernojur and Tsaritzin, which last place it reached on the 4th August. At Saratov it appeared on the 6th August, and in three weeks cut off 2367 persons. We extract the following itinerary of its route from the analysis already quoted.

“In its course north from Tsaritzin to Saratov, it also struck off at right angles to the Volga, and attacking the country of the Don Cossacks had, at the 17th September, affected 1792, and killed 1334 of these, or two-thirds; then continuing its branch-course westwards, it passed through the government of Woronesch, then reached Kharcov 350 miles from the Volga, and subsequently the government of Kiev, 150 miles farther west. But the main stream of the epidemic continuing to follow upwards the channel of the Volga from Saratov, turned north-eastward with the river, and arrived at Samara, in the government of Simbirsk, and 200 miles north-east from Saratov, on the 27th of August. Here, in seven days, 47 people died of the disease. At the same time, it passed about 140 miles in a northerly direction from Saratov, across the country to Penza, capital of the government of that name, where it arrived on the 17th of August, and in fourteen days attacked 1200 of the population, of whom 800 died. Penza is situated near the source of a tributary of the Volga running *northwards*, consequently in an opposite direction to the main stream of the river, and falling into it at Nischnei-Novgorod, where the main stream has a winding course from west to east, so as to make a great bend before taking its southerly direction. At Nischnei-Novgorod, the cholera commenced about the end of August; down to the 20th of September, 800 persons had been seized; and, on the 19th of October, it had affected 1863, of whom 968 died, or fully a half. Being now in the heart of the European dominions of Russia, it seems no longer to have observed its uniformity of direction. On the 9th of September it broke out at Kasan, capital of the government of the same name, 200 miles *down* the Volga, and east from Nischnei Novgorod; and here, up to the 17th of October, 1957 had been attacked, and 1174 carried off. At the same time it spread in a north-west direction from Nischnei-Novgorod to Kostroma, 150 miles *up* the river; and in various parts of the government of Kostroma had, down to the 25th of October, affected 430 persons, of whom 125 died. From this place it spread north, north-west, and west, into the governments of Vologda, Novgorod, and Tver; where, however, at the date of the publication of the reports on the 14th of November, it had either ceased, or never prevailed but to a limited extent. In a third direction from Nischnei-Novgorod, namely, a little to the south of west, it proceeded along a tributary of the Volga, and then striking off from it arrived at Moscow, about 260 miles from Nischnei-Novgorod, towards the middle of September. Between this period and the 10th of Novem-

ber, 5451 persons had been attacked in Moscow, and 2876, or three-fifths, died.

From Moscow the cholera proceeded north to Yaroslaff, and, turning to the west, it gained Rybinsk, a town still nearer the capital, in October 1830. On the 19th and 20th March, 1831, several fatal cases occurred at Usbeskni, a city in the government of Twer, 60 leagues north of Moscow, on the road to St. Petersburg.

At length the malady broke out at St. Petersburg, on the 26th June, in the quarter of the town where the barks from Twer, Novgorod, &c., exchanged their cargoes, and the disease then rapidly spread over the city. It is, however, by no means clearly ascertained how it reached St. Petersburg. It is not improbable that it came from another quarter, to the consideration of which we next proceed.

#### ARRIVAL OF THE CHOLERA IN POLAND, PRUSSIA, AND AUSTRIA.

Soon after the commencement of the brilliant efforts of the unhappy Poles to regain their independence, a detachment of the Cossacks were ordered to march on Poland from the provinces of Koursk and the Ukraine, at that time infected with cholera. Wherever these troops went, as they marched through the vast districts of Podolia and Volhynia, the towns and villages were infected in their order of succession from the east to Warsaw.† Following the line of military communication, the malady entered Poland at the south-east angle of the kingdom, and first showed itself in the fortress of Zamosc on the 26th March, and towards the end of the same month, after involving a number of villages, Lublin was attacked. Almost at the same period Bryescysa was infected. On the 1st of April, Siedlec received numbers of soldiers labouring under the disease. On the 15th, MM. Legallois and Brierre de Boismont recognised it in the Convent of Mienia, which had just been fitted up as a temporary hospital; on the 16th it appeared in Praga, in the lazareto, and on the 19th and 20th, Warsaw was infected. It now radiated in every direction, and on the 3th July, Konin was attacked. It next entered

the Duchy of Posen and Silesia; in short, by the end of July the malady had become disseminated all over the fated land, and had commenced ravaging the frontiers of the adjoining countries. The multiplied movements of the armies between the Niemen and Vistula, contributed much to spread the disease. While in one direction Augustowo, on the frontiers of eastern Prussia, was attacked, the disease pursuing the course of the Vistula towards its source, ascended to Cracow, and, on the other hand, took its course towards Dantzick, which city became infected on the 26th May.

Almost at the same time the disease broke out in Polaugen. On the 25th, pursuing the descent of the Dwina, it occurred in Riga. Miltau and Liebau soon shared the same fate. The town of Thorn on the Vistula remained free from cholera for many months in the centre of the ravages of the disease.

On the 31st of August, 1831, the malady was announced in Berlin, the high road from Posen having been infected, step by step. From Berlin it quickly reached the Elbe, and in its usual manner attacked many of the towns on its banks, and on the 7th of October Hamburg was affected.

To conclude our narrative of the progress of the disease, we must briefly revert to some circumstances connected with its first entry into Europe, in order to mark the manner which the Austrian empire, and Turkey in Europe, were invaded.

*Descending the Don, from the junction of one of its tributaries with the Volga, high up that river, in the year 1830 the cholera reached Sebastopol, the great maritime arsenal on the Black Sea: Odessa and Akerman were soon affected, and Bessarabia and Moldavia were also visited. In these two provinces, especially the latter, the mortality was appalling, Jassi, the capital of Moldavia, being almost depopulated by its ravages. The banks of the Danube now felt the horrors of the pest, which almost at the same time advanced on Vienna from Galicia and through the defiles of the Carpathian mountains. In Lemberg and Brodi it broke out in May, and other cities and towns became affected the following month. It was not until September that it arrived in Vienna.*

\* Drs. Barry and Russell's Report.

† Relation Historique et Medicale du Cholera de Pologne. Par A. Brierre de Boismont, Paris November, 1831.

## GEOGRAPHICAL SUMMARY.

We have now cautiously and closely pursued this pestilence from its root, through its branches and minute ramifications. Though we may be deemed to have dwelt on this itinerary with superfluous minuteness, we might show that, of all the extraordinary features in this most singular affection, its geographical history is perhaps the most peculiar. We are thus enabled to understand how, originating in the Delta and the Ganges, 23° N. lat., it partook of the character peculiar to all infectious epidemics, which have ever emanated from tropical climates, and from the alluvial districts bounding the mouths of mighty rivers. We have seen, as we followed it from clime to clime, how contemptuously it braved the opposing power of every atmospheric condition; how the burning heat of a Bengal or Molucca sun influenced its violence not more than the cold of a Moscow winter. We have found that extreme moisture, and excessive dryness, were alike unconnected with its maintenance, and still less essential to its existence, for we watched it desolating the dry and calcareous plains of Persia and the parched sands of Arabia, with the same fury that it manifested in the isles of the Indian ocean and the swampy Deltas of the Ganges, Euphrates, the Volga, and the Dnieper. Again, the preceding itinerary has more than once pointed out the remarkable fact of elevation of region affording no immunity against its rage; great chains of mountains, the Gaults, the Caucasus, Mount Ararat, and the Himalayas, having been traversed with the same violence that the malady swept the low jungle and the morass. Again, the route has shown the independence of the pestilence on any geological formation or terrestrial peculiarity, as it has traversed with equal ease the sandy plains of the Yemen, the basaltic declivities of the Mauritius and Bourbon, the steppes of Tartary, and the banks of the Euphrates, the Tigris, and Burrampooter. Neither have varieties in the human race, nor differences in human rank, had the least influence on its extension or diminution. We have seen it striking down its victims in every grade,—the nabob, the Brahmin,\* and the Paria; the planter and his slaves, the general and his soldiers, the

magistrate and the beggar, alike falling beneath its wrath. We have marked it ravaging camps and fleets, routing entire armies, changing the fate of battles, and wresting the palm of hard-earned victories from the conquering Persians and the gallant Poles. We have seen the iron precepts of Eastern superstition scoffed at by its powers, and the idol of Juggernaut, which was wont to drive over the prostrate bodies of multitudes of devoted pilgrims, left to moulder in its temple for the want of a sufficient number of devotees to move its colossal car.

We have traced the pestilence through 700 irruptions, and shown it ravaging nearly 2000 towns. We have seen it cutting off in Hindostan one-sixth of the whole population, in the cities of Arabia a third, in Persia a sixth, in Mesopotamia a fourth, in Armenia a fifth, in Syria a tenth, and in Russia, Poland, and Germany, a number not yet estimated with sufficient accuracy. Lastly, in the geographical route we have described we have been able to contemplate the enormous area of the disease, from the Mauritius 20° S. lat., to Archangel, 68 N.; and again from the Yellow Sea to the meridian of Greenwich.

IDENTITY OF THE CHOLERA IN INDIA  
AND RUSSIA.

Up to the moment of the irruption at Dantzick much doubt was entertained in this country and in other European nations respecting the identity of the Russian epidemic with the Indian disease. To settle this important point medical commissions were dispatched by several governments: M. Londe and a selection of men well known to medical science were sent from Paris, and, soon after, a commission followed from London, composed of Dr. Russell, who had previously witnessed the cholera of the east, and Dr. D. Barry. The result of the inquiries of each of these commissions we have now before us, and candour and justice oblige us to declare that of all the various official documents we have examined it has seldom been our lot to meet with any more distinguished for discrimination, and an impartial adherence to facts, or exhibiting less trace of controversial spirit, than those which the British commission have supplied.\* On the other hand, it is equally just to de-

\* Moreau de Jonnes, p. 329.

\* Second edition of Papers published by the Privy Council of Great Britain. London.

clare, that any-thing more meagre and unsatisfactory, more suppressive or distorting of facts, more partial and partisan-like, than M. Londe's communications,\* has never fallen under our notice in the investigation of a disputed inquiry.

The reports of Drs. Russell and Barry fully establish the important fact of the identity of the diseases of Russia and Jessoro, and they supply us with so perfect, and withal so concise, a description of the disease they witnessed at St. Petersburg, that we should conceive it unjust to our readers to alter the language of the Commissioners; we have already, indeed, made public some extracts, but it is absolutely necessary to the completion of our narrative that we should again give them a place in our pages.

"The cholera morbus of the North of Europe, to which the Russian peasants have given the name of 'chornaia colezn,' or *black illness*, like most other diseases, is accompanied by a set of symptoms which may be termed preliminary; by another set which strongly mark the disease in its first, cold, or collapse stage; and by a third set, which characterise the second stage, that of reaction, heat, and fever.

"*Preliminary Symptoms.*—We have but few opportunities of witnessing the presence of all these symptoms, some of which precede the complete seizure by so short an interval, that the utmost diligence is scarcely sufficient to bring the patient and the physician together, after their occurrence, before the disease is fully formed. Diarrhœa, at first feculent, with slight cramps in the legs, nausea, pain, or heat about the pit of the stomach, malaise, give the longest warning. Indeed, purging, or ordinary diarrhœa, has been frequently known to continue for one, two, or more days, unaccompanied by any other remarkable symptom, until the patient is suddenly struck blue, and nearly lifeless. Often the symptoms just mentioned are arrested by timely judicious treatment, and the disease completely averted. When violent vertigo, sick stomach, nervous agitation, intermittent, slow, or small pulse, cramps, beginning at the tips of the fingers and toes, and rapidly approaching the trunk, give the first warning, then there is scarcely an interval. Vomiting or purging, or both these evacuations, of a liquid like rice-water or whey, or barley-water, come on; the features become sharp and contracted, the eye sinks, the look

is expressive of terror, wildness, and, as it were, a consciousness on the part of the sufferer that the hand of death is upon him. The lips, the face, the neck, the hands, the feet, and soon the thighs, arms, and whole surface, assume a leaden, blue, purple, black, or deep-brown tint, according to the complexion of the individual, varying in shade with the intensity of the attack. The fingers and toes are reduced at least a third in thickness; the skin and soft parts covering them are wrinkled, shrivelled, and folded; the nails put on a bluish pearl-white; the larger superficial veins are marked by flat lines of a deeper black; the pulse is either small as a thread, and scarcely vibrating, or else totally extinct. The skin is deadly cold, and often damp; the tongue *always moist*, often white and loaded, but flabby and chilled, like a bit of dead flesh. The voice is nearly gone; the respiration quick, irregular, and imperfectly performed. Inspiration appears to be effected by an immense effort of the chest, whilst the *alæ nasi* (in the most hopeless cases, and towards their close), instead of expanding, collapse, and stop the ingress of the air. Expiration is quick and convulsive. The patient asks only for water, speaks in a plaintive whisper (the '*vox cholericæ*'), and only by a word at a time, from not being able to retain air enough in his lungs for a sentence. He tosses incessantly from side to side, and complains of intolerable weight and anguish around his heart. He struggles for breath, and often lays his hand on his stomach and chest to point out the seat of his agony. The integuments of the belly are sometimes raised into high irregular folds, whilst the belly itself is violently drawn in, the diaphragm upwards and inwards towards the chest; sometimes there are tetanic spasms of the legs, thighs, and loins; but we have not seen general tetanus, nor even trismus. There is occasionally a low, suffering whine. The secretion of urine is always totally suspended, nor have we observed tears shed under these circumstances; vomiting and purging, which are far from being the most important or dangerous symptoms, and which, in a very great number of cases of the present epidemic, have not been profuse, generally cease, or are arrested by medicine easily in the attack. Frictions remove the blue colour for a time from the part rubbed; but in other parts, particularly the face, the livor becomes every moment more intense and more general. The lips and cheeks sometimes puff out and flap, in expiration, with a white froth between them, as in apoplexy. If blood be obtained in this state, it is black, flows by drops, is thick, and feels to the finger colder than natural. Towards the close of this scene, the respiration be-

\* Read before the Institute, and reported in the *Gazette des Hopitaux*, November, 1831.

comes very slow, there is a quivering among the tendons of the wrist, the mind remains entire. The patient is first unable to swallow, then becomes insensible; there never is, however, any rattle in the throat, and he dies quietly, after a long convulsive sob or two.

“The above is a faint description of the very worst kind of case, dying, in the cold stage, in from six to twenty-four hours after the setting in of the bad symptoms.

“From the aggravated state which we have just described, but very few indeed recover, particularly if that state has been present even for *four hours* before treatment has commenced. A thread of pulse, however small, is almost always felt at the wrist, where recovery from the blue or cold stage is to be expected. Singular enough to say, hiccough coming on in the intermediate moments, between the threatening of death and the beginning of reaction, is a favourable sign, and generally announces the return of circulation.

“In less severe cases the pulse is not wholly extinguished, though much reduced in volume; the respiration is less embarrassed; the oppression and anguish at the chest are not so overwhelming, although vomiting and purging and the cramps may have been more intense. The coldness and change of colour of the surface, the peculiar alteration of the voice, a greater or less degree of coldness of the tongue, the character of the liquids evacuated, have been invariably well marked in all the degrees of violence of attack which we have hitherto witnessed in this epidemic. In no case or stage of this disease have we observed shivering; nor have we heard, after inquiry, of more than one case in which this febrile symptom took place.

“*Fever or Hot Stage.*—After the blue cold period has lasted from twelve to twenty-four, seldom to forty-eight hours or upwards, the pulse and external heat begin gradually to return, headach is complained of, with noise in the ears, the tongue becomes more loaded, redder at the tip and edges, and also drier. High-coloured urine is passed with pain in small quantities, the pupil is often dilated, soreness is felt on pressure over the liver, stomach, and belly, bleeding by the lancet or leeches is required. Ice to the head gives great relief. In short, the patient is now labouring under a continued fever not to be distinguished from ordinary fever. A profuse critical perspiration may come on from the second or third day, and leave the sufferer convalescent; but, much more frequently, the quickness of pulse and heat of skin continue, the tongue becomes brown and parched, the eyes are suffused and drowsy, there is a dull flush, with stupor

and heaviness about the countenance, much resembling typhus; dark sordes collect about the lips and teeth; sometimes the patient is pale, squalid, and low, with the pulse and heat below natural; but with the typhous stupor, delirium supervenes, and death takes place from the fourth to the eighth day, or even later, in the very individual, too, whom the most assiduous attention had barely saved in the first or cold stage. To give a notion of the importance and danger of cholera fever, a most intelligent physician, Dr. Reimer, of the Merchant Hospital, informs us, that of twenty cases treated under his own eye, who fell victims to the disease, seven died in the cold stage, and thirteen in the consecutive fever.

“The singular malady is only cognizable *with certainty* during its blue or cold period. After reaction has been established, it cannot be distinguished from an ordinary continued fever, except by the shortness and fatality of its course.”

The authors of the preceding report have also noticed some immaterial points of difference between the Russian and Indian diseases; for example, the supervention of febrile symptoms in the second stage. In every other respect, however, the *symptoms* of the diseases perfectly agree. We shall presently find that the identity of the pathological phenomena is not less complete.

#### PATHOLOGY OF CHOLERA.

On this head we have collected the observations of the several Indian reports, of the French commissioners in Warsaw, the English in Petersburg, MM. Foy, Brierre de Boismont, and Legallois, and the majority of the Anglo-Indian writers, whose works we have recently reviewed. We extract the following description from Moreau de Jonnes, p. 13:—

“The autopsy of the bodies has given these results. The entire intestinal canal was *pale*, soft, distended with air, and containing an enormous quantity of whitish turbid matter. The stomach contracted, its substance hard, and frequently thickened—its contents varying in appearance. On its mucous membrane, as well as on that of the intestines, ulcerated patches are occasionally found. The liver shows marks of congestion or inflammation, and is of a darker colour than usual. The other organs essential to the performances of the vital functions showed no marks of derangement. The most striking peculiarity is, on the entire, the existence in the alimentary canal of an argillaceous substance apparently deposited by the turbid fluid already

mentioned. This substance is so abundant, that when voided by involuntary dejections, it remains on the clothes in the form of a thick earthy sediment, after the more fluid part has evaporated or drained off. This singular product, respecting which we have in vain sought for more definite knowledge, is not less characteristic of this disease than the black vomit is of yellow fever."

Mr. Scott, of Madras, affords us an account of the appearances he observed, very similar to the preceding. He more particularly mentions general venous congestion, and the occurrence in the intestines of large quantities of the conjee-looking fluid, or of turbid serous matter. The duodenum, and occasionally the jejunum, were loaded with an adherent greenish or white mucus.

Again, M. Londe, the president of the French commission at Warsaw, says,

"The vessels of the *brain* are gorged with black and viscous blood. The same appearance pervades the whole *venous system*, and sometimes the great *arterial* canals.

"The *peritoneum* is not of the usual shining colour. The alimentary canal communicates a strange feeling of pastiness. Its internal surface is covered, in numerous places, with an opaque *whitish* viscous adherent substance; the cavity of the intestines is frequently filled with a turbid liquid, containing grumous flakes.

"The *bladder* is much contracted, empty, and drawn up between the pubis and the testicles, retracted to the external abdominal ring."

M. Chamberet, a member of a medical commission sent from Paris to Warsaw, points out inflammation of the gastro-intestinal mucous membrane in the prolonged cases, corresponding, we presume, to the second or febrile stage of Drs. Barry and Russell. The mucous membrane is, according to M. Chamberet, also covered with a pultaceous liquid of a white-grey colour. The gall-bladder is described as distended with the bile, and the ducts pervious. The abdominal venous system gorged with thick black blood; the urinary bladder contracted, the meninges of the brain generally injected, and the vessels of that viscus in a state of extreme congestion.

Turnbul Christie, a writer of high authority, also describes the occurrence of the whitish substance in the intestines, and even in the *bronchi* and the *bladder*; he also notices venous congestion and the black-

ness and thickness of the blood. Annesley's observations establish the same fact, and this author has also occasionally seen a vermilion injection of the intestinal mucous membrane. Labrousse, a French naval surgeon, who witnessed the epidemic of the Mauritius, speaks of gangrenous spots on the internal mucous membrane in the most intense cases. We have no doubt, however, that he mistook for gangrene the black patches which occur beneath the sound mucous membrane in almost every case where death has been preceded by violent vomiting, as is seen in the effects of the irritant poisons.

In Russia, the necroscopic evidence has, generally speaking, been but superficially attended to. In forty-four dissections, Marcus observed nineteen examples of softening of the spinal chord, a very remarkable fact, partially corroborated by Dr. Joennichen in Moscow, who observed it in six out of fifty cases. It is right, however, to observe, that both these statements must be received with caution, inasmuch as the numbers vary, as recorded in two separate analyses of M. Double's report to the Parisian Institute. M. Foy, indeed, in twenty inspections made in Warsaw, declares that the spinal chord was invariably normal; if any difference existed it was *rather in its preternatural hardness*; and he attributes the softening above described to the want of proper facilities, good instruments, &c. for the gentle section of the spinal column. M. Foy, in his autopses, also found the creamy matter so frequently mentioned, and the *aorta and its branches*, as well as the venous system, congested with thick black blood. The bladder was in all his cases strongly contracted.

By far the most connected as well as the most scientific record that we have met with respecting the pathology of this disease, is given by M. Brierre de Boismont in the work already quoted. He shows that in the intensely rapid cases, or, as he expressively terms them, the "*cholera foudroyant*," organic alterations are either absent or totally inappreciable. He emphatically alludes to this singular white exudation which he detected in the bladder and in the nasal fossæ and *bronchial tubes*, as well as in the intestines. Respecting venous congestion and the state of the bladder,

he agrees with the other reporters. He has not noticed spinal softening, he found inflammation of the gastric mucous membrane very frequently in the protracted cases; and, lastly, he offers the following important remarks on the state of the blood:—

“The blood in patients affected with cholera undergoes remarkable changes, it becomes black, thickened, viscous, and frequently forms a compact mass, separating with great difficulty into serum and coagulum. When the disease has lasted any length of time no serosity is found in the blood; this ingredient diminishing with the progress of the malady. \* \* \* \* The density and viscous oiliness of the blood are not, however, invariably present, for we have sometimes found it sufficiently fluid, but always of a peculiar brown colour. The blood, bile, urine, and vomited matters, were subjected to chemical analyses in Warsaw without any remarkable result.”

It is a source of much regret that no *satisfactory* analysis has yet been made either of the blood in cholera or of the argillaceous matter lining the intestines. The inquiry was attempted by M. Foy at Warsaw, but with no success. In the east it has been tried by Mr. Orton with similar inutility. Both these experimentalists, however, seem to think that the white matter contains the proximate principles of blood except its fibrin. Mr. Herman, of Moscow, indeed, states that the fluids voided by stool and vomiting contained, besides water, some acetic acid, osmazome, salivary matter, butyric acid, mucus and *albumen*, but no free muriatic acid. The blood also affords less *albumen* than in the healthy state.

#### SYMPTOMS AND EFFECTS OF THE CHOLERA.

We have now placed before our readers, with all the minuteness that our limits allow, a narrative of the symptoms and pathological effects of this disease. We are consequently now fully prepared to analyse the former, and examine which are the essential, which the accidental, features of the malady in the living subject, and which are the essential, which the accidental, changes it effects in our organisation, at least as far as tangible and visible evidence is considered.

To accomplish the first object properly, it is necessary to follow closely the laws of strict logical investigation, such as Boerhave once practised in his study of the nature of fever.

When anxious to ascertain what were its essential characters, and what were only of a fortuitous nature, he collected some thousand narratives of cases, and successively striking out from each case every symptom which he found deficient in any other, he eventually reduced the essential, unailing, ever-present external manifestations of the malady, to rigors or shivering, followed by increased heat and excited circulation.

Now, let us apply this system of exclusion to the semeiology of the cholera of Jessore, and what are the results? Is vomiting perpetually present? Thousands have perished of the disease without ever nausea having supervened. The same remark applies to purging; the same, and still more emphatically, to muscular cramps and spasms. What, then, are the essential, inseparable symptoms, those which never are absent from a case, however slight, and which attend upon the severest? The answer may be expressed in nearly as few words as the Boerhavian definition of fever. The essential manifestations of *the cholera* (if we must preserve that absurd denomination) are, *Collapsed countenance, blue lips and nails, shrunken fingers, the total failure of the usual secretions, deficient animal heat, suspension of the pulse, and remora or stagnation in the venous circulation.\**

Let us not, we repeat, be misled and drawn captive by a name. Call the *present* malady what you will; be it cholera with M. Double, Trisplanchnia with M. Marners, Chorneia Colezn with the Russian, or Mort de Chien with the Hindoo; the essential nature of the malady is not altered by the appellation it has accidentally received from the astounded sponsors who celebrated its baptism when it surprised them in Hindostan. But we must postpone the full discussion of the topic to a future page. Let us now examine the explanation which the laws of life, as far as they have been ascertained, afford to the essential and the accidental *symptoms*, and the pathological effects induced by *the cause* of the disease.

#### PHYSIOLOGY.

It would be a worse than idle waste of time and space, did we place before our

\* Treatise on the Cholera Asphyxia, &c. by Geo. Hamilton Bell. Edinburgh, 1831.



readers even an epitome of the absurdities advanced on this subject. Having shown that spasm was an accidental, not an essential symptom, we are relieved from the necessity of combating the views of those who make spasm the pick-lock to all the mysteries of the affection. Again, having demonstrated, by ample authority, the total absence of abdominal inflammation in the dissections of rapid cases, we need not dwell on the ravings of the Broussain ontology, which locates even *the cholera* in the regions of gastro-enterite. We may also pass over, with little more than a smile, the solemn nonsense of M. Double, who declares it to be "a profound lesion of innervation, accompanied by a state of general catarrh." We therefore proceed at once to analyse the arguments of Mr. George Hamilton Bell, an author who has, we conceive, most satisfactorily traced the mode in which the essential and accidental symptoms, and the pathological effects, of this malady are occasioned. Mr. Bell commences his argument by deprecating, in energetic terms, the absurdity of applying to the malady of which we treat the name of one which only resembles the former in two unimportant symptoms. He then shows distinctly the inadequacy of the hypothesis of inflammation of *pure nervous debility*, or of *depraved secretion*, in the explanation of the affection. Neither, he demonstrates, does the respiratory system afford a clearer elucidation.

Proceeding further, he shows that cholera cannot be referred to a topical and exclusive affection of any of the great organs—the respiratory, sensorial, or circulatory. He also briefly asserts, that the *cause* of cholera is not a morbid state of the circulating blood, how deeply soever that alteration may be occasioned, as a consequence of the true morbid impression:—

"In cholera, in the very outset of the disease, all secretions, properly so called, are found to have failed; the alimentary ejecta are not gastric juice, pancreatic fluid, bile, mucus, or excrementitious matter. The kidneys cease to secrete urine; saliva no longer flows into the mouth, nor are the eyes moistened with tears; carbonic acid gas is not thrown off in its usual quantities from the lungs, and animal heat is not evolved in the body. Here then is a disease, which consists of a suspension of a

great class of involuntary functions; and it appears to be a fair conclusion, that its immediate cause is to be sought for in the nervous system,

"At this stage of our inquiry the question occurs,—How can a disease be considered a nervous failure, in which we find the sensorium, the respiratory, and the voluntary powers, unaffected? The answer to this difficulty may be comprehended in the following propositions, which embody the conclusions on this subject at which the author has arrived.

"1. The great ganglionic or sympathetic system of nerves, is possessed of a power wholly unconnected with cerebral influence, which it may retain after the brain and spinal marrow are removed, and which may exist while these retain the full exercise of their functions.

"2. To this system belong the circulation and distribution of blood; and it consequently has a most important share in regulating secretion, and in carrying on the involuntary functions. And,

"3. To the suspension of this power of the system, is to be ascribed the disease which has obtained the name of Cholera Asphyxia."

"The symptoms of cholera asphyxia, throughout its course, must be referred to the condition of the circulation. At whatever period of the disease the state of this important function is examined, it is found to be morbidly affected. Even before patients themselves are aware that they have been attacked, the arteries are beating feebly, and the venous circulation is perceptibly obstructed; and at however early a period in the course of the disease venesection is performed, the current of the blood is found to be retarded, and the colour of the fluid is unnaturally dark. If, in such circumstances, we should find every function of the system suspended, we might conclude that the disease arose from a morbid change in the blood itself. But the continuance of the sensorial and respiratory powers, after the failure of the circulation in the trunk and extremities, and the suspension of all the organic functions, is a direct proof that the disease is not to be ascribed to 'death of the blood.'

"Every character of cholera authorises us in concluding, that it arises from failure of a portion of the *nervous system*. When, in consequence of a blow on the head, a man loses all sensorial and voluntary power, while the respiration and circulation remain little affected, no one doubts that it is a systematic portion of his frame which has been suspended, and that the loss of perception and of motion has arisen from the source of nervous energy to which these belonged, having lost its controlling

power. In cholera the animal heat sinks, secretion fails, and the circulation ceases. Whatever may be the ultimate means by which these important properties of the system are produced, whether chemical, mechanical, or vital, every one will admit that the combinations which effect them must depend on the nervous system. It has been demonstrated, that in this disease the sensorial voluntary and respiratory involuntary nerves retain their functions. A man on the point of death from cholera, breathes, and can give expression to his thoughts. We must, therefore, in endeavouring to ascertain the source of the disease, look to the sympathetic system of nerves, which we find perfect in those tribes of animals which have no brain, and which is proved by experiments to retain its independence in the higher classes of organised animals, to whom the brain has been superadded. If we refer to the symptoms of cholera, we shall find that the functions over which I have endeavoured to prove this system to have control, are those which the disease suspends; and it is particularly worthy of notice, that wherever the branches of the sympathetic system are largely distributed, there the symptoms of the disease are most prominent."

Into the train of reasoning by which he supports these inferences, we cannot accompany him, and we pass it over with the remark that it reflects the highest credit on Mr. Bell's physiological attainments.

We now proceed to follow him in his explanation of the discharges which frequently become a principal feature in cholera, and which he prefaces by some able general remarks on the subject of secretion. This term he, with great propriety, refuses to apply to the discharges in the cholera. Secretion is, with Mr. Bell, an *arterial* action alone. Exhalation or transudation he conceives may proceed from the *venous* terminations. They constitute two separate and totally different actions, and are even characteristic of totally different diseases. Secretion, in fine, he restricts to that change in the blood which is productive of a substance wholly different from the primary fluid. To the disengagement of any of the *component parts* of the blood in an unchanged state, the terms exhalation or exudation are applied.

"The above observations on secretion generally appeared necessary to render the following explanation of the cholera discharges intelligible.

"The fluids evacuated by the stomach and bowels, during cholera asphyxia, are found to be portions of the component parts of the blood. In health we never see such fluids discharged from the abdominal viscera;—they are not gastric or duodenal juice,—they are not bile,—they are not excrementitious matter,—nor are they the mucous secretion of the canal. The cholera discharge consists of the serum and fibrin of the blood. But then evacuations go on, and the bowels are filled, after the heart has ceased to act, when the arteries are empty, and when the capillary vessels are no longer supplied with blood by the usual course. The great veins, however, the liver, and the right side of the heart, are gorged with blood; the abdominal veins having no valves, regurgitation takes place, the capillaries are filled by a retrograde course of the blood, and are thus enabled to discharge the more attenuated parts of it. And although I believe that, in these circumstances, there is a deficiency of the nervous energy necessary towards *secretion*, still, as the medullary nerves retain their functions, the action by which this fluid is excreted, will retain the character of life, and will differ from the purely mechanical and chemical changes which take place after death."

The profuse cold perspiration always witnessed in the intense form of the disease, he attributes to venous exhalation, and illustrates the absence of arterial power in the skin by the impossibility of inducing inflammation of this tissue so long as the disease continues.

According to the preceding views, it is obvious, that all the essential symptoms receive ample explanation, and that the only constant pathological phenomena are rendered equally intelligible. The next point then to be considered is, what is the *ultimate* cause which induces this affection of the sympathetic system and its consequent influence on the circulation?

#### REMOTE CAUSES.

The leading opinions on this subject may be classified under the following heads; first, that which attributes the first morbid effect to the injurious influence of some of the conditions of the atmosphere, such as heat, cold, moisture, &c.; secondly, the deleterious effects of prejudicial food; thirdly, to the operation of a cause, independent of the laws of matter, such as electricity or an unknown morbid agent; fourthly, to the influence of poison, which has been stated to be of three kinds; *a.* animate or animal-

cular; *b.* terrestrial or compound; *c.* of a strictly animal nature, and of human origin.

In alluding to the remote cause we must again press upon our readers that we write not of cholera, of trisplanchnia, or of any other name, but we limit our inquiries to the search for the agent or agents which have given origin and currency to the *disease*, whatever it be denominated, which has travelled from India to Europe since the year 1817. In investigating the question, it is not our intention to render it still more complex by inquiring minutely whether a similar or identical malady ever before prevailed in Hindostan; or whether it was actually in the centre of the Sunderbunds that this calamity originated. Many have asserted that such a malady did previously exist. Mr. Scott has endeavoured to show that it is described in the medical writings ascribed to the Hindoo Dhanwantari, a mythological personage, corresponding to the Esculapians of the Greeks. A disease, marked by similar symptoms and extensive mortality, is described by Bontius, a very early writer; and in various periods, from 1700 to 1814, accounts have appeared of endemic visitations in Arcot, Trincomalee, the Mauritius, and other places. Even the epidemic of 1817 is, by some, asserted to have originated high up on the banks of the Burrampooter. We repeat, however, that we do not attach much consequence to the inquiry, even though (we may state by anticipation) it has been clumsily brought to bear on a controversy that will presently engage our attention. Little consequence should, we think, be attached to it, since it is quite clear that the cause or causes which may have generated the malady in the Sunderbunds, whether they were aerial, terrestrial, electric, or otherwise, *might* have existed in the same place at any previous period; or it is equally clear that a similar concatenation of climatic vicissitudes might have predisposed the human constitution to be more violently affected by the common causes which at other times would have given rise but to ordinary forms of disease.

We have before us the facts, at least, that if cholera, identical with the present disease, did previously exist in Hindostan, it did not spread as in the present instance. The same fact occurs in the history of every malady which has traversed the world.

*Plague* raged in Egypt and Syria for many years before it spread, and it rages now without extending itself any further. *Typhus fever* occurs in the solitary hamlet of our inland counties, or it desolates a village or town, confining for the time its virulence to its original residence; but ever and anon these diseases, without changing their identity, shift from place to place, and extend themselves at will. It matters therefore nothing, we repeat again, to any argument on the contagiousness or non-contagiousness of the malady, to prove, as perhaps *may* be done, that cholera had previously raged *endemically* in India or elsewhere. We must, however, at the same time remark, that if the identity of the older endemics, with the spreading pestilence of 1817, rested on no better authority than that of the descriptions by Dhanwantari, Bontius, Dellon, Curtis, &c., the point could never be sustained. Infinitely more strength of inference resides in the bare probability that the occurrence of similar causes did, under similar circumstances, originate an identity of effects. One great principle requires attention before we examine into the remote cause of this disease. Its operation must be viewed in the abstract—it is one and the same in India and Archangel, on the ice of Moscow or beneath the tropic sunbeams of the Indian Ocean. It is of no consequence, therefore, what place or places, or person or persons, afford us the theme for investigation. The disease is individual and identical in every place and patient. Its cause is one and identical throughout.

Let us look then to the conditions of the atmosphere we breathe, and ask—Was the influence of moisture, its hygrometric attribute, the remote cause of cholera? “Yes,” exclaims the partisan who viewed the malady in the Mesopotamian meadow—in the swamps and mire of the alluvial deltas of the east. But if we turn to our itinerary, we find that it swept the surface of the Arabian deserts, where showers never fall, and where a spring of water is the object of a journey of a hundred leagues.

Was tropical heat the remote cause of the evil? The history of the Russian cholera at once proves the negative of the question. Again—Did famine, or peculiar food, or a vitiated harvest, afford the noxious agent?

The continuance of the malady in the farmer's hut and the prince's mansion, and its recurrence after the successive gathering in of plenteous and wholesome crops, afford us an instant reply.

Baffled in these theories, the mind of man, ever prodigal in speculation, launched out new hypotheses in the utmost profusion. Mr. Orton spoke of negative, others of positive, electricity. A third saw a comet in the east. A fourth marked the rise of a volcano. A fifth, Dr. Adam Neale, whose talented enthusiasm in natural history we should admire more fully were it tempered by some admixture of inductive thought, heard of a swarm of green flies in Astrakan, and straightway he jumped at his conclusion of the generation by animate contagion. A sixth attributed the malady to astronomical changes. But we must pursue these speculations no farther; we might, we say it seriously, with as much rationality attribute the remote causation of the cholera to the fairies of the Scottish highland, or the "Evil Eye" of the Levant, as to these equally improbable phantoms of speculative fancy.

We have already shown that the circumstances of local elevation, or level, have exerted no influence whatever on this disease.

We now arrive at the only item in the list of possible remote causes which admits of any lengthened contemplation, viz. the operation of a poison on the system. Now when we view the essential symptoms of the cholera, as described by Drs. Barry and Russell, when we examine its physiology as elucidated by Mr. Bell, when we scrutinise the pathological phenomena which a crowd of authors have reported, and, finally, when we call to mind the effects of numerous poisonous agents, we see sufficient ground at least to admit the possibility of the remote cause being the operation of a poison, and this possibility amounts almost to certainty, when we remember, that all the other causes have been shown to be inapplicable.

What then is the nature of this poison? Is it of vegetable birth, and does it, like the exhalations from the Walcheren fens, acquire its birth from vegetable decay? Or is it of inorganic and terrestrial origin, containing, like choke damp, or sulphuretted hydrogen, elements which have never lived, and which chemical analysis can divide and

exhibit in their individual forms? Or, lastly, is it a poison of human generation, which, like the exhalations from typhus, prove poisonous to those exposed under particular circumstances to their influence? To some of these divisions it must evidently belong. That the essential phenomena of cholera are occasioned solely by a vegetable exhalation, might seem exceedingly probable, if we limited our observations of the disease to the Sunderbunds or similar places; but, when we come to consider the circumstances attending its appearance on chalky or sandy plains, where, for hundreds of miles, no blade of verdure ever springs, we must either at once reject the hypothesis, or suppose the pestilence to arise from some vegetable poison conveyed by subterranean or aerial current from some distant reservoir. Now facts, the bare enumeration of which would fill the remnant of our pages, show that currents of air are not the agent in question, the disease having gradually extended itself in opposite directions at the same time, and having marched directly against monsoons; when, too, it followed their direction it should have kept pace with their celerity, and visited, with them, every spot over which they blew. But the slowness of its progress, and its capriciousness in the selection of infected places, at once establish the impossibility of the disease having spread by means of aerial currents, setting off like the Samiel of Syria, and the African Simoom, from some given spot, travelling with the rapidity of thought, and striking down all who meet their progress, and visiting every rood of land, and every human being, over which the carrier wind wings its way.

Did the "fons et origo mali," then, travel in a subterranean path, exhaling wherever it found vent? We might admit the hypothesis did we not witness the irruption of the disease in successive stages through a chain of islands, hundreds, nay thousands of miles distant from each other, and that also in the teeth of a monsoon—did we not see how it traversed immense oceans—did we not know that it commenced its ravages in Moscow while the ground and rivers were locked up with ice—did we not, finally, observe the occurrence of the pestilence in every possible variety of soil and geological formation, on the highest mountains, and

under every possible concatenation of those atmospheric circumstances which must effectually arrest any local terrestrial exhalation.

Precisely the same remarks apply to the idea that an inorganic vapour is the cause. What then are we left to adopt in explanation of the remote origin of these symptoms? We can only suppose the existence of a poison which progresses independently of the wind, of the soil, of all conditions of the air, and of the barrier of the sea; in short, *one that makes mankind the chief agent for its dissemination.*

Such is the only conclusion which strict induction, and the argument by amotion of causes, permit any thinking mind to adopt. Let us now see how far it is reconcilable with the history of other epidemic disease—with the history of this particular affection; and, again, let us see how far the characters of the progress of cholera differ from or correspond with those of other diseases confessedly communicable from man to man, and those which as evidently depend for their extension on other causes. In the first place, as far as regards the characters distinguishing the origin and progress of acknowledged transmissible diseases, it is evident that there is nothing in the symptoms, nothing in the pathology, nothing in the history of cholera, which, in the abstract, renders it more difficult for us to believe in its transmissibility than in that of typhus fever, scarlatina, measles, or any of the well-known infectious diseases. An individual in sound health approaches, but does not touch one labouring under measles, and he soon becomes infected; the same occurs in typhus fever, the same in scarlatina, the same in pertussis. We see not, neither do we feel, the infecting agent in any of these cases, but we are constrained to admit its existence by precisely the same method of reasoning that carries conviction to the mind in metaphysical inquiries; by circumstantial evidence equal to that which is acknowledged by legal tribunals, and by testimony, superior in demonstrable accuracy, and, consequently, in conclusions, to that on which we ground a willing faith in many a mysterious tenet.

Having thus shown that there is no greater difficulty in supposing the transmissibility of cholera than of typhus, &c.,

we will now proceed to furnish additional proofs of the communication. *How the communication takes place* is an object for subsequent inquiry.

PROOFS OF COMMUNICATION OF  
CHOLERA BY MAN.

We shall classify our proofs of communication under the following heads of:—

1. The coincidence between the irruption of the disease in previously-uninfected places, with the arrival of ships, of caravans of fugitives or pilgrims, of individuals, and with the progress of armies.
2. Examples of the coincidence between the occurrence of cholera in individuals, and their contact with others actually labouring under the disease.
3. Examples of immunity afforded by seclusion in the midst of an unhealthy district.

In the geographical notice we gave of the progress of the cholera, several facts were alluded to which illustrate, with singular clearness, the constancy with which the disease followed the track of ships, armies, pilgrims, caravans, and individuals, from one country to another. We proceed to detail at greater length some well-authenticated cases under each of the preceding heads:—

A. *Irruptions of Cholera coincident with the movements of Armies.*

*Fact 1.*—When cholera appeared in the 34th regiment, on the route from Bellary to Bangalore, all the villages through which the 34th passed suffered the disease immediately afterwards, and a native soldier travelling from Bangalore to Nundedroog, at neither of which stations cholera had appeared, on passing through the camp of the 34th while the disease prevailed, was attacked and died.—*Madras Report.*

*Fact 2.*—The disease prevailed in Nagpore during the month of May; and upon hearing of the march of Captain Doveton with a detachment, some part of which was afflicted with cholera morbus, it was generally apprehended that the disease might be brought thither by it. The detachment arrived towards the end of June; the cholera appeared there on the 3d of July.

The Russell brigade arrived there on the 4th, and marched on the 6th, without a symptom of the disease, which broke out

with great mortality among them a few days after; and Messrs. Palmer arrived here on the 4th and marched on the 6th without sickness. Before they arrived at Aurungabad many of their party were taken ill, and the disease was introduced into Aurungabad shortly after their arrival.—*Rep. of As. Surg. J. Kellie, Janluah, July 7, 1818.*

*Fact 3.*—In the month of November the English army encamped at Terayt in the best health, and received a detachment which, at the passage of the Junna, had been attacked with cholera. The malady appeared in the camp immediately after the junction of the detachment.

*Fact 4.*—In 1819 a company which had lost some men on its march, arrived at Trichinopoly, then quite healthy. The malady immediately burst out among them, reached the troops in this garrison, and spread to the environs.

*Fact 5.*—The 15th native regiment of infantry, while affected with cholera, were marched on Gooty; the villages through which it passed were immediately after desolated by this scourge, from which the inhabitants had ever before been exempt.

The next fact is so important and conclusive that although it has once before been noticed in our columns, we cannot avoid reprinting it here.

“*Fact 6.*—A detachment of Europeans from Madras, under the command of Major Wahab, arrived here with the cholera amongst them. The disease first attacked the setroops at the Kistnah, after exposure to a heavy storm of wind and rain, and it continued with them from thence to this place, although all the villages in their route were entirely free from the disorder. During the march, sixty individuals perished, of whom eight were Europeans. On its arrival here, the detachment encamped about two hundred yards in front of our artillery lines. In this new situation, three Europeans and a number of natives died. At this time no case of cholera had occurred in the encampment. The Europeans, however, of Major Wahab’s detachment mingled with our party of artillery; and, in the course of four or five days, the disease began among the latter. Several were severely affected, but they all recovered through the prompt medical assistance afforded. The next seized was the wife of a conductor in the artillery lines. She was attended, for a couple of hours, by her friend Mrs. Gray. Mrs. Gray was seized soon afterwards, and died the ensuing morning. The son of the latter, a boy about six years of age, was infected the day after his mother died, and recovered. My sub-assistant, Mr. Hoskins, who was

constantly with the sick, contracted the disease and died in twenty-four hours. Another acting sub-assistant, Mr. Sleven, who attended particularly to Mrs. Houghton, a patient that had suffered severely, was attacked; and Mr. M’Dougall, an assistant-surgeon, who was much among the sick, was also seized. From the artillery lines the disease travelled to the bazaars, and many of the natives were carried off. The men of his Majesty’s 30th regiment who are in barracks about half a mile to the right of the line completely escaped, not a man having been affected or any of the followers.

“I beg to add that Mr. Jones, surgeon of the 6th light cavalry, has just arrived from the Kistnah, by the same route as Major Wahab’s detachment pursued. Mr. Jones states that he found the cholera prevailing in every village, having commenced soon after the passage of Major Wahab’s detachment. The inhabitants said they had got it from that detachment.”

The last fact of this kind which we shall adduce, we extract from M. Brierre de Boismont’s *Relation Historique du Cholera Morbus de Pologne*, an excellent work just published, and the author of which formed one of the central council of health in Warsaw, and had, of course, access to all the official documents.

*Fact 7.*—After the battle of the 31st of March, the 1st division of infantry, under Gen. Rybinski, and composed of the 1st, 2nd, 5th, 6th regiments of the line, 5th *chasseurs a pied*, 3rd, 4th, 5th of *Hulans*, encamped on a morass, and sojourned eight days on the station. On the 10th of April a part of the division was engaged before Siedlec with the corps of Count Pahlen, which was infected with the cholera \* \* \*. On the 12th the army quitted Lalowicz to march on Kaluzzyn. The 13th, while passing Kuflew, a report was received from a medical officer, announcing the sudden death of six soldiers after a few hours illness. These men formed part of the 1st brigade, which had captured two standards, and taken several prisoners. Near Minsk the cases became more numerous, and on the 15th, when M. Legallois and I repaired to the camp, fifty deaths had taken place. The majority of the patients had articles of clothing taken from the enemy. The second brigade which had not been engaged at Siedlec, had no cholera for a length of time. \* \* \* \* \*

At a later period the Rybinski division in a state of perfect health, encamped in the environs of Kuflew, on the ground where the Russians had just been defeated; several bodies still lay exposed, others but half

buried. The cholera broke out anew among the Poles, but was of a mild character.

\* \* \* \* \*

Again towards the end of May the division had a serious engagement with the Russians at Tycocin, and for the third time the cholera broke out amongst the Poles.

\* \* \* \*

Lastly, the tailors of the Polish army, in number about two hundred, having taken some assistants from the Russian prisoners, the malady almost immediately broke out amongst the former. The Russian prisoners were dispersed over several villages and towns, and, wherever they went, the appearance of the cholera coincided with their arrival.

The preceding facts require no comment, farther than to remind our readers, that *multiplied* coincidences are tantamount to actual demonstration.

B. *Irruptions of cholera coincident with maritime communications.*

*Fact 1.*—While the cholera prevailed in the Mauritius, the isle of Bourbon, forty leagues distant, seemed the most favourably situated for receiving the disease. The governor Milius, to prevent the misfortune, adopted the severest measures, but, after two months of success, his vigilance was baffled by the clandestine disembarkation of negroes from a smuggling vessel named the Pic-Var, a little below the town of St. Denis. The malady almost immediately broke out, but the most urgent measures were taken to prevent its spreading. The disease was restricted to the spot where it first appeared, and the colony has since continued uninfected.

*Fact 2.*—In the month of August 1820, the admiral's ship Leander, on board of which the cholera had shown itself in the road of Pondicherry, having repaired to Trincomalee in Ceylon, disembarked several persons, who perished of the disease after having spread it in the town.—*Madras Official Gazette.*

*Fact 3.*—Immediately before the irruption of cholera in Astrakan, a brig arrived in the port having lost eight men from cholera on the voyage.

*Fact 4.*—At Sebastopol and Odessa, on the Black Sea, the French consuls describe the cholera to have broken out quickly after the arrival of some Russian men-of-war from infected ports.

*Fact 5.*—By Dr. Taylor's report to the Bombay Medical Board, it is rendered evident that the cholera broke out at Bombay a day or two after the arrival of a man from Panwell, where the malady raged violently.

We shall have occasion again to refer to this singular case.

For numerous additional facts we must request our readers to revert to the itinerary, and examine Dr. Sokolov's narrative of the cholera on the Volga, and to the description of the Persian gulf. It will be there found noted as a most remarkable fact that of all the fishing villages on the Arabian and Persian shores of the Gulf, not one was attacked, while Bender Abassi, Bahreim, and Kischmé, the great *ship* harbours and entrepots of commerce, were infected immediately after the arrival of vessels from Bombay. In the preceding enumeration of facts we have designedly omitted any notice of the alleged introduction of the disease into the Mauritius by the *Topaze* frigate. This occurrence we omit, not from any doubt as to the actual importation of the disease by that vessel, for on that we are quite decided; but from the great space which would necessarily be occupied by the briefest analysis of the controversy regarding this particular case.

C. *Coincidence of the irruption of cholera with the arrival of pilgrims at healthy places from infected districts.*

At certain periods the ceremonies of the religion of the Bramins collect immense multitudes in Hindostan, of pilgrims attracted from all quarters to sacred places and celebrated pagodas. We shall immediately see that on some remarkable festivals the cholera broke out amongst the assembled thousands, that the pilgrims fled in horror to their homes, and that wherever they arrived, cholera quickly made its appearance.

*Fact 1.*—Dr. Coates, in a letter to the Bombay Medical Board, relates that the disease occurred among the multitude assembled in 1818, at the festival of Jatra, in Punderpore; that in a few days three thousand persons fell its victims, that, struck with horror, the pilgrims fled to their homes, and that wherever they went, there the cholera also quickly broke out.

*Fact 2.*—In 1820, the King of Siam, alarmed by the irruption of cholera in his capital, convoked his subjects on the seashore, in order, by a religious ceremony, to pronounce an anathema on the disease; the effect was fearful; seven thousand persons perished on the spot, and with the arrival of the fugitives the cholera also appeared in all the districts they visited.

We pass over a multitude of similar facts, to mention one, not yet published in this country, which seems to us conclusive of the propositions, that the remote cause of cholera is a poison, and that this poison is conveyed and communicated by man to man. For these important facts we are indebted to M. Felix D'Arcet, the correspondent of the Pacha of Egypt in Paris, to whom they were officially communicated in a dispatch forwarded to Marseilles from M. Mimaut, the French consul-general in Egypt, and to official documents published by order of the privy council of Great Britain.

A furious irruption of cholera commenced its ravages at Mecca, in the latter days of the Chawal and the first of the Zilcade, corresponding to the second week in May 1831. The pilgrims had just arrived from Persia, the Indies, the Yemen, and other countries, suffering under the epidemic at their departure. Crowded together under every circumstance which could favour the propagation of the malady,—exposed to a broiling temperature, wallowing in the putrifying heaps of blood and entrails of victims sacrificed on the feast of the Coram Bairam, it will scarcely excite surprise that within four days 20,000 individuals perished.

It will be remembered, that Egypt escaped the cholera when it reached Damascus in 1823, when the ever-vigilant Pacha took the most strenuous measures to prevent its introduction on that side of his dominions. On the last melancholy occasion, the news of the occurrence of the pestilence reached him too late, so that a column of fugitive pilgrims had already passed Suez, and a second had proceeded beyond Coffeir, the only points of communication with the Egyptian dominions. Instant orders were dispatched by swift express to enforce a quarantine at these places; but the early travellers had already passed, and by the 13th July 4000 arrived in Cairo.

Mark, now, the coincidence; and, further, remember that no case of this disease had ever before taken place in Egypt.

The cholera broke out first at Suez and Coffeir in a few days after the arrival of the fugitives; Cairo next suffered. A hurried cordon of Bedouin Arabs was thrown across the road between Cairo and Alexandria.

On the 21st August, in the second line of the soldiers, several were attacked, and two or three cases were reported in Alexandria. On the 22d ten or twelve were ill. At three p. m. on the 23d, forty were affected, and then the ravages of the malady proceeded with terrific fury. On the 26th August 800 soldiers were in the hospital without medical aid, from the deaths or desertions of the physicians and apothecaries. The Committee of Health now abandoned its nugatory functions, numbers fled the city, and those who remained shut themselves up in their houses. Of the Europeans who did this, *not one who preserved rigid exclusion* became a victim of the disorder.

The singular conclusiveness of the preceding chain of circumstances might almost relieve us from the necessity of adducing further evidence in support of a position already proved by one of the strictest examples of the power of the argument by exclusion of causes, that the history of any inquiry presents; but anxious as we are to afford all the reasons we can find room for in support of the doctrine we have selected, we proceed to offer still further facts of another kind.

D. *Coincidence* of attacks of cholera in individuals who had communicated with others, *a.* either labouring under the disease, *b.* or healthy, but having had intercourse with infected things or persons.

*Fact 1, a.*—“ A physician (Dr. Calow) who had attended cholera patients, being at the time in bad health, and labouring under diarrhœa, died of cholera; on the day following, his landlord (Mr. Steibelt) died; a day afterwards, two children of the landlord died, and the servant-maid was taken ill of cholera, and recovered. The landlord's wife had been removed to quarantine. There have been no more cases of cholera in this street or its neighbourhood.”

The next fact is given by M. Brierre de Boismont in the work already quoted:—

“ *Fact 2, a.*—During my stay in the quarantine of Stzralkowo on the frontiers of Prussia, M. Faveski, the preceptor of one of the Grand Duke Constantine's children, informed me that the population of the Caucasus escaped the disease for some time by

† Private letter from Dr. Becker of Vienna.



flying to the mountains, but that these also were eventually attacked. While he was in that part of Prussia, he witnessed the following occurrence. A coachman, after a long journey, feeling himself indisposed, entered an adjoining post-house, went to bed, and died with every symptom of cholera. The persons who attended him, became successively ill, and the clergyman who witnessed his last moments, was himself attacked; the disease thence spread, and gained the soldiers in the garrison."

The next fact we select from a communication made by Dr. Russell to the British Government:—

*Fact 3, a.—Pensa.*—" " In a village of the government of Pensa, where this medical officer was sent in consequence of the breaking out of the cholera, to trace its origin and to afford medical aid, he learned the following circumstances, which are attested by all the village authorities, and of which we are promised an authenticated copy, signed by himself:—The son of a villager, who was coachman to a nobleman, at fifty versts distance, died of cholera; the father went to the place to collect the effects of the son, and brought home with him his clothes, which he put on and wore a day or two after his arrival at his native village. He was shortly thereafter seized with cholera, and died of it: three women, who had watched him in sickness, and washed his body after death, were also seized and died of the disease: the doctor arrived in time to see the fourth case, and, finding that it spread on that side of the village, he had the common street barricaded on the side where the disease had not reached, and interdicted all communication to the two sides of the village, even for the purpose of going to church. In that side in which the disease first broke out, upwards of 100 cases of cholera occurred,—of whom 45 died, but the disease did not appear on the other side of the barricade.' "

The next body of evidence is of a less direct, but still more important kind. It is founded on the *coincidence* of the occurrence of cholera in individuals, and their intercourse with others not actually labouring under the disease, but who had been either in direct contact with the sick, or had recently arrived from infected places. We say that this is the most important, because if the *multiplied examples* of such *coincidence*, which we shall exhibit, be taken (as, according to all rules of reasoning, it must) as tantamount to direct evidence of the fact, most of the anomalies apparent in the dis-

ease become immediately reconciled. Before we state these facts, we deem it right to remind our readers, that in all acknowledged infectious diseases, such as typhus fever, plague, measles, remarkably so in puerperal fever, and even in erysipelas (see *Medico-Chirurg. Review*), this mode of indirect communication is quite established.

The first fact of this kind we select from Drs. Barry's and Russell's communication regarding the Petersburg disease:—

*Fact 1, b. " City Prison.*—From the moment that the disease was proclaimed, the strictest precautions were adopted; no person was admitted without medical examination; rooms were set apart for a cholera hospital; and persons of both sexes appointed to attend the cholera cases, should any occur. Dr. Bish, who resides within the walls of the jail, and who, it must be observed, was an anticontagionist, as acknowledged by himself, showed us a plan of the prison, illustrating an introduction of the disease amongst the prisoners, led us round the whole building (July 30), and communicated to us the following information from his journal, which had been most accurately kept:—' A woman had been sent out some weeks before to be treated for a syphilitic complaint in a public hospital. Her husband was also in confinement at the time, in a different part of the building, but remained. The woman was returned to jail, on the 23d June O. S., with a diarrhœa upon her. She saw and embraced her husband for a moment, as she passed on to be placed in the room of observation. In a few hours she was seized with true cholera, and died that night. This was the very first case. The next persons attacked in the prison were three women in the same room with the former, one of whom had rubbed the deceased. These three died all within three days after the first. The next prisoner attacked was the husband of No. 1; he lived in a separate part of the jail. After this man, others in his room, all numbered on the plan, and registered in Dr. Bish's journal. In short, of twenty-seven attacked (fifteen dead), there is but one to whom communication cannot be traced. He was confined for a capital offence, and had less liberty than the others. There were about four hundred prisoners and attendants: the former are all well kept, and treated with great indulgence. *None of the noble class, who are lodged in a separate part of the building, were attacked.*' "

The second fact is taken from Dr. Taylor's report on the progress of cholera in Bombay:—

" Aware of the desire manifested by

your Board to ascertain, if possible, the manner in which the disease had originated in Bombay, I directed some inquiries on the subject. In reply, I was informed that, four or five days before, an inhabitant of Gunesa Wara, immediately on returning from a visit to Poonah, (the disease at this time raging at Panwell,) had been attacked with cholera and died; that on the day following, his wife, and the wife of a man who lived next door, had also been seized with the same complaint, of which both eventually died; and that almost immediately afterwards two other neighbours, an old woman and her granddaughter, had fallen victims.

“In the lane where these cases had occurred, the disease continued to spread during the five or six days following my first visit, after which it nearly subsided, and appeared only occasionally in one or two individuals. Seven other cases were observed on the 16th, in different parts of the native town; but the next fatal case which came to my knowledge happened on the 17th. The man had been taken ill during the night, and in the morning one of my assistants had been sent for. It was too late to perform any medical service: the patient died in five minutes after the assistant's arrival. This occurred in a pretty populous place above the jail. Soon after the preceding misfortune, a considerable number of people residing in the neighbourhood were attacked, and two or three of them, who did not resort to the use of medicine, were carried off.”

Under this head of indirect communication are included the host of cases in which the arrival of vessels and boats from infected places, free from disease, coincides with the irruption of the malady, as in the examples of the commencement of the disease in Persia, in Arabia, and Astrakan, in the history of the navigation of the Volga, given at length in a preceding page; in the outbreak of the disease on board the boats in the very district of St. Petersburg, where they arrive from Twer; in its occurrence in Berlin among the skippers on the boats lying on the river Spree, as there testified by the lamented Dr. Becker of that city; and the subsequent descent of the malady along the Elbe to Hamburg, and its final irruption in Sunderland, coincident with the arrival and in direct contact with ships from that country.

“The first cases of cholera in Berlin occurred among the skippers on the boats lying on the river Spree, which flows through the town, and in houses in the immediate neigh-

bourhood of the river. The disease has prevailed to a considerable extent in all those streets which lie along the navigated branch of the river, and whose inhabitants at the same time live in frequent intercourse with the skippers and fishermen. On the fourth and fifth days cases appeared in other parts of the city, and, in many instances, they were those of individuals who were known to have had intercourse with cholera patients, or at least with the boats lying on the river, and with the streets first infected.”

Another series of facts, and we have done with this side of the argument. They show the great security afforded by preserving a system of non-intercourse with infected places.

*Fact 1.*—When the cholera was ascending the Volga, the Moravian inhabitants of Sarepta shut the gates and harbours of the city and escaped.

*Fact 2.*—“M. de Lesseps, the Consul of France at Aleppo, when the cholera approached that city in 1822, retired, in company with all who wished to be of his party, to a garden at some distance from the city. His asylum was inclosed with walls, and was surrounded by a large fosse; there were only two doors, one for entrance, the other for going out. As long as the malady lasted, he admitted nothing from out of doors without submitting it to the precautions observed in lazarettos. His colony comprised two hundred persons, and consisted not only of Franks more or less acclimatised, but also of several natives. Not a single individual contracted the disease; while, at the very same time, within the city, four thousand beings perished in the space of eighteen days.”

*Fact 3.*—“The cordons around Zarcozelo and Peterhoff were removed last week. We immediately visited these places, and saw, for the first time, Sir William Crichton and James Leighton. Both these gentlemen separately and positively asserted, repeated the assertion, and permitted us to note it, that no case had occurred within the sacred precincts of either cordon since their establishment, though the circle of demarcation was completely surrounded with the disease, and though the enclosure around Zarcozelo contained from 8000 to 10,000 souls.”

—*Drs. Barry and Russell's Reports.*

*Fact 4.*—“Ever since the epidemic, the thoroughfare to Moscow has been through these little villages, which are separated by about half a verst, and contain about 200 souls. Yet, though at the village of Yshora, two versts further on, there have been several cases and deaths, and though there were so many at Colpina, there has not been a single case amongst the colonists up to this date (Aug. 3). \* \* \* The authorities say that no precautions of any kind were taken;

but it is remarked by Dr. Bowman, that travellers to and from Moscow never halt at the colony; Yshora on one side, and Colpina on the other, being so much better resting places."

*Fact 5.*—"The large establishment composing the Academy of Military Cadets, at Moscow, was preserved by a similar plan from the scourge which was so active on all sides of it."

*Fact 6.*—"There were 150 pupils on the officers' side (cadets at Cronstadt), which is kept perfectly distinct from the school, for petty officers and sailors. The gates were shut on the 19th of June, and as strict a quarantine as possible maintained to the 6th of August (O.S.) No case amongst the pupils, who are from nine to twenty years of age."

*Fact 7.*—"The town of Thorn on the Vistula adopted the same precautions, and remained free from the disorder for several months; vigilance was then allayed, and the malady immediately appeared.\*

We could occupy one hundred pages with similar facts, but more than enough has been already said to maintain our positions. Let us now in a few words cast a general glance on the amount of the preceding evidence. To sum up then in a few brief sentences the ideas and statements we have adduced regarding the remote cause of the present epidemic, we have seen, in the first place, that, by an analysis of equal accuracy with the most demonstrative chemical investigation, we excluded heat and cold, vitiation, or deficiency of food, moisture or dryness, lowness or altitude of site, the operation of electricity, of "sol-lunar" influence, and of animalculæ, from the production of the vital changes constituting the proximate cause of this disease. Having thus limited the causes to the operation of an absolute poison on the system (a view confirmed by the mode of action, semeiology and pathology of the majority of the known and tangible animal poisons), we showed that the poison (how generated we did not inquire) could alone be brought to bear on successive numbers of men by being wafted by currents of air, by travelling in subterranean passages, or by making various moving things its carriers from one place or person to another. Of these causes we showed, that the first was inadequate to the general extension of

the disease, it having travelled in the "wind's eye," like the phantom vessel of Table Bay. Neither did we find the second cause more unobjectionable, since the poison of cholera struck down its thousand victims, where a Russian frost had hermetically sealed every crevice in the surface of the earth. Had we stopped here, the argument in favour of the operation of the third cause, or the conveyance and generation of the malady by human beings, would have been quite as conclusive as the evidence which jurisprudence, which natural philosophy, which natural theology, or even chemistry, readily admits. But we went still further, and supplied facts, official and incontrovertible, in support of a doctrine, which, as a logical proposition, would have stood firm without their assistance. We recorded a crowd of examples where the irruption of the malady coincided with the arrival of ships, of individuals, of armies, and of pilgrims, from infected places; and we turned to the geographical itinerary of the disease, where we found the malady selecting for its route, all the roads and rivers, and levels of communication through which mankind hold intercourse with each other; for example, ascending the Volga to where it meets a tributary of the Don, then crossing and descending this river to its mouth, and meanwhile leaving in tact the numerous denizens of the mesopotamian districts.

We conceive, then, that we are fully entitled to conclude with Drs. Russell and Barry,

1. That the poison of cholera may be conveyed and communicated by man to man.
2. That, like the poison of typhus, it is regenerated in great quantities by those who suffer its influence.
3. That in crowded situations, and under favourable circumstances of temperature, or the poison accumulated by the combined exhalations of several individuals, may be carried by currents of air to a moderate distance, and produce the specific effects on all persons exposed to, and susceptible of, its impression.

In all these laws, we repeat once ore cholera, typhus fever, &c. are identical with each other.

\* Mr. Chad's dispatch to the British Government.

## ARGUMENTS AGAINST CONTAGION.

But as there never yet has been a legal proposition, however clear, which did not give rise to forensic mystification, so in medicine we have no example of the reception of any doctrine, however self-evident, without the excitement of more or less controversial disputation. Many a tract, and pamphlet, and large octavo, has been written, to show that small-pox was not contagious, and that syphilis was epidemic, and hydrophobia a mere tetanus caused by a punctured wound. It is not therefore surprising, that numerous writers and orators should at this time exist who flatly deny the conclusions we have just adopted. For the gratification of our readers, and in the hope of assisting in the extermination of the remnant of error still most unhappily entertained on this subject, we shall briefly state the grounds of this denial, and point out the fallacies by which the sceptics are misled.

One of the first, and certainly not the least specious, arguments against the transmission of cholera by material objects was, that other diseases prevailed over extensive districts independently of any such agency. Of these diseases, *influenza* has usually been particularised, and, to our utter astonishment, at a recent medical meeting, a gentleman of no mean celebrity added to the list the intermittent of the Pontine fens! and the Pellagra of Lombardy! We shall not waste our time by noticing, at any length, the absurdity of even comparing the latter endemic and strictly local maladies with that of which we treat at present. But, to turn to the *influenza*, surely those who adduced it as a parallel case with the cholera, are ignorant of every fact in its history. It is nearly sufficient for us to state, that at one and the same time the epidemic catarrh rages all over an entire zone; that it arrives with a particular wind, or accompanies a sudden decline of temperature. Such was the case with the epidemic of 1743, described by Sauvages; with that of 1762, treated of by Razoux; with all those described by Riviere, Sennert, Sydenham, Huxham, and others, all which authors are unanimous in attributing the malady to remarkable vicissitudes of temperature. Our sagacious friend "Alpha"

tells us that Professor Gregory told him, that the influenza travelled in the "wind's eye" from China to Europe; but he forgot to add that the journey was over *in a few months*,—that the inhabitants of *all Europe* were affected,—that the "wind's-eye" stage was accomplished during *the cold of a Siberian winter*,—that north-east winds prevailed during its European progress, and that it never, even on a solitary occasion, infested the inhabitants of the banks of a river, or the sides of a high road, leaving untouched the swarming populations of inland or secluded districts. Thus far, we believe, any analogy between these diseases is sufficiently disproved.

The same speaker already alluded to, declared that cholera was not a communicable disease, because, forsooth, it was not marked by a "*cutaneous eruption*." A gentleman present reminded the speaker of "typhus fever." Are there not "*petechiæ*" in typhus? quoth the opponent of the transmissible doctrine. Verily, we did not know before that passive hemorrhage constituted a *cutaneous eruption*. Enough of this.

A third set of casuists, again, triumphantly exclaim:—Oh! the cholera must have *arisen* (say in the Sunderbunds) independently of infection; ergo, it must have progressed exclusive of the operation of that agent. "It may, then, first be remarked (says a writer in the Bengal Reports, quoted by Alpha, LANCET, page 22), that the *rise* and *progress* of the disorder were attended by such circumstances as showed it to be entirely independent of contagion for its propagation." What a jumble of totally different things! What *know* we of the rise of cholera? The veriest anti-contagionists cry out, most loudly, that its origin is lost in the ancient history of Hindostan. But, in order to lend "Alpha" the utmost latitude the argument will allow him, let us suppose (as we think there is much reason for believing) that *this cholera* did *originate* in 1817, from the exhalations of the tanks and morasses of Jessore, what has that to do with the *propagation* of the disease? How did small-pox find its existence; what parent does typhus acknowledge? It is evident that *these* diseases originated independently of transmission, yet who will deny their contagious nature?

The well-proved inefficacy of inland cordons, when drawn over an extended territory, has again afforded the "close" reasoners, which Alpha so well represents, an excellent opportunity for cutting off another head of the contagious hydra. "The cholera has evaded a cordon, therefore cholera does not spread by contagion,—a cordon surely would have kept it out." Yet this conclusive reasoner, this man of facts, this verifier of dates, and corrector of erroneous topography, has the innocence to tell us, in a subsequent page, "that the cordon of Barcelona acquired the designation of the '*Piacetta*,' from the trivial price set on connivance at the passage of the sanitary lines. Had a travelling pest-house thus bribed the cordon and disseminated the plague, Alpha would deny the operation of contagion, because a cordon had been drawn across the district! Never, perhaps, was there a power more fully provided with well-disciplined men, and urged by deeper political as well as sanitary motives, than Prussia, when she drew a hedge of soldiery around the border lines between Poland and the Duchy of Posen,—sentinels were placed at intervals of 200 paces, and the officers patrolled from night to morn; yet M. Briere de Boismont informs us, that while he lay in the lazaretto of Strzalkwo, his sleep was perpetually interrupted by the fire of musketry on smugglers crossing the lines, and not a man of them was shot at with effect. Yet the failure of this very cordon in keeping out cholera from Berlin, is argued on as a proof of the non-contagious nature of that disease!

Thus far we fully agree with our benevolent friend, in deprecating warmly the folly and the ruinous extravagance of keeping up military lines on *extensive* frontiers. Such a cordon has never been, never can be successful; every passion the most powerful in the human breast, irksomeness of restraint, avarice, physical desire, the love of kindred, and the thousand other feelings, tempt to the accomplishment of clandestine intercourse; and such emotions are sure to conquer more formidable obstacles than the chances of a musket-bullet, aimed at random in the darkness of night. *Such were the real views of the King of Prussia and the Emperor of Austria in removing their sanitary lines.* They learned by experience, what common

sense might have previously taught them, that inland cordons can only be effectual when drawn across a gorge or a defile, where no passage exists to the right or left, but through a body of men under the constant scrutiny of vigilant and unbending commanders.

Again, it is contended that if cholera existed in India before 1817, as Bontius and still earlier writers seem to denote, it should, if contagious, have passed into Europe before. But let us reflect how it could have reached the western hemisphere. Before 1815 the commerce of the Persian gulf was shut against the western coast of the Indian peninsula: home-bound ships were subjected to a rigorous quarantine at the Cape, if illness prevailed when they departed. For many years previous to 1817, no epidemic of any note prevailed to the north of the Peninsula, and even if there had, we have seen that the recent cholera (whether epidemic or contagious) for years endeavoured in vain to fight its way across the enormous sand plains to the north of Lahore and Caboul. But if we go back to a far more olden time, we have histories of epidemics not dissimilar to the cholera, by many even supposed to be identical with it (the sweating sickness, for example), which it is not unlikely have derived their origin from the same source as the present disease, and which have traversed over equally extensive districts.

The curious eccentricities observed to exist in the occasional visitations of places by the cholera, is also turned against the doctrine of material communication. But it is perfectly clear that no aerial epidemic could be thus capricious, and it is equally obvious that local exhalation could not commit such freaks in any extensive district of geological identity of soil. On the other hand, it is this fitful movement that most of all characterises the commerce and intercourse of mankind. Mr. Bell lays great stress on the fact that in 1818 cholera spread more rapidly over five degrees of latitude from Madras north to south, at the season when the coast navigation is completely interrupted, than it did when the navigation was free; but that author forgets to add that no cholera prevailed in Madras until October, and that the inland communication was more than sufficient to have accounted

for the arrival of the disease at Cape Comorin, as far at least as time was concerned. When we associate this explanation with the indisputable fact that the rapidity of the march of cholera from place to place, is exactly augmented in the ratio of the increase in celerity of intercommunication of places, Mr. Bell's objection will, we believe, retain little weight.

We have next to notice, perhaps, the most ridiculous and withal the most gravely-advanced objection made to the views we have taken on this disease. We shall endeavour, notwithstanding, to describe and treat of it in a serious vein. We allude to the assertion particularly made by our correspondent, that cases of actual *bona fide Asiatic cholera* constantly occur in England, and do not spread.

"If the same assemblage of symptoms be admitted as constituting the same disease, it may at any time be established, to the entire satisfaction of an unprejudiced tribunal, that cases of cholera not unfrequently proving fatal, and corresponding in every particular to the average of cases as they have appeared in the above countries, have been frequently remarked as occurring in other countries, including England; and yet no cordon or quarantine regulations have been adopted on the presumption of the disease spreading by contagion."

'Tis passing strange, to see a man of such ability as Alpha evidently possesses, argue with a serious pen on such a perfectly untenable position. What rational investigator of disease ever dreamt, before Alpha, that the same assemblage of symptoms constituted identity in kind of malady? The question is simply, What is a disease composed of? Is it of its symptoms? No, for these are but the signs of the thing not seen. Diseases to be the same must consist of at least three identical parts, viz. identity of proximate causes, identity of external manifestations during life, and identity of pathological evidences after death. If one of these links be absent, the disease is not the same. Now how aptly is this truth enforced by the case, which he adduces of Anglo-Asiatic cholera, with a flourish of trumpets to the tune, that "if distinction can be made out, I must ever follow the philosophy of the man who doubted his own existence!" Let us see then what were the first symptoms.

"Thursday, August 11th, 1831. Martin M'Neal, aged 42, of the 7th fusileers, stationed at Hull, was attacked at a little before four A. M. with severe purging and vomiting: when seen by his surgeon at four o'clock, was labouring under spasms of the abdominal muscles and of the calves of the legs."

Is this the commencement of *the cholera*? We refer to the pages on the symptoms for the reply. Well, let us proceed.

"Half past six, seen again by the surgeon, who was informed that he had vomited the tea which he had taken; no appearance of bile in what he had thrown up; watery stools, with a small quantity of feculent matter; thirst; the spasms in abdomen and legs continued; countenance not expressive of anxiety; *skin temperate; pulse 68 and soft; the forehead covered with moisture.*"

Very like Indian cholera this, particularly the symptoms placed in italics! But *now* the peculiar symptoms begin to be developed, that is between four or five hours after the onset of the attack. *Now* we have a very satisfactory case of cholera indeed.

"At nine o'clock, only a very feeble action of the heart could be ascertained as going on, even with the aid of the stethoscope; the body cold, and covered with a clammy sweat; the features greatly sunk; the face discoloured; the lips blue; the tongue moist, and very cold; the hands and feet blue, cold, and shrivelled, as if they had been soaked in water, like washerwomen's hands; no pulsation to be detected throughout the whole extent of the upper or lower extremities; the voice changed, and power of utterance diminished."

Well, if our anonymous friend does not paint a little (the thing is occasionally done for the best purposes), this looks like something, only that these should have been the initiative, not the consecutive symptoms. But the man dies in sixteen hours, and his body is examined. What is found?

"On a post-mortem examination, polypi were found in the ventricles of the heart, and the cavæ were filled with dark blood. Some red patches were noticed on the mucous membrane; but the communication forwarded to me does not specify on what precise part of the stomach or intestinal canal; and my friend does not appear to attach much importance to them, from their common occurrence in a variety of other diseases."

And now it comes out that the man had been gorging himself with fruit, and got

intoxicated at a fair two days before his attack; he was also at the fair on the day of the attack, but went to bed sober. We have then no hesitation in saying, that the symptoms in the preceding case were totally different from those of Asiatic cholera, that the pathology was totally different; and that from the debauch in fruit and drink, of which the man was guilty so recently before death, it seems to us that Alpha might as well argue on a case of poisoning by arsenic. But suppose we admit the disease to have been identical with Asiatic cholera, what does the anti-contagionist gain by the fact of its spreading no further? Why precisely what he should know takes place daily, in the small-pox, plague, typhus, measles, &c. The occurrence of an epidemic disease among the schoolboys at Clapham has also, and in a similar tone, been cited on the anti-contagionist side of the question. It were waste of time to argue on this occurrence, so deplorably imperfect are the published statements. So far as they go, there is not one essential symptom of the Asiatic cholera described, and in the only dissection the pathological evidence was different.

This brings us to another subject. If cholera be an infectious malady, why does it not attack every individual who meets its destructive emanations? Why, says M. Chamberet, have we known three infants suckled by infected mothers and escape? Why, re-echoes a newspaper correspondent in a letter from Egypt, has Mr. ——— expired in the arms of his family, and not one of them imbibed the poison? We will not concede the anti-contagion inference until we are informed why Dr. William Hunter inoculated twenty dogs with rabid saliva, and only two became infected; and why vaccine matter, which succeeds in one case, fails in another? The cause is in each case equally palpable. The individual is not susceptible of the power of the poison. Yet, presently, by the influence of some unknown agents, this non-susceptibility wears off, and the vaccination succeeds.

As long, therefore, as small-pox is admitted to be a contagious malady, the immunity of *any number* of persons exposed to contact with those labouring under cho-

lera, cannot disprove the existence of the contagious poison. The reader who has leisure for the perusal of further facts on this matter will find them in abundance in "Haygarth's Enquiry how to prevent the Small-pox;" in which work masses of facts abound, which change but the name, and they are as applicable to the cholera as to the variolous disease.

But cholera cannot be propagated by inoculation. Can typhus fever, can measles?

There still remain a few points of objection to be considered: the first is the alleged infrequency of the medical attendant being attacked. Let us first inquire, Is this the fact? The melancholy experience of St. Petersburg, Berlin, and Vienna, and the fate of Becker and Rehman, &c., point out its total falsity. Let us hear Dr. Barry's report:—

"The number of medical men and hospital attendants attacked with cholera during the present epidemic, in proportion to the whole employed, and to the other classes of society, has been beyond all comparison greater here than in India, under similar circumstances; 25 medical men have been already seized, and nine have died out of 234. Four others have died at Cronstadt, out of a very small number residing in that fortress at the time the disease broke out there. Six attendants have been taken ill at a small temporary hospital behind the Aboucot since we wrote last. It is certain, however, that in some cholera hospitals favourably situated as to site and ventilation, very few attendants have suffered.—*Third Report from Drs. Barry and Russell.*"

Still more remarkable statements are adduced by Dr. Taylor and others, but we deem it unnecessary to quote them in detail. Only one other hypothesis can apparently account for this occasionally great mortality among medical men, viz. that they are exposed to the same *local* causes with their patients (vide Alpha's Letters). Now we have already clearly demonstrated the futility of the hypothesis of the aerial or terrestrial generation of this malady. So whatever force the objection may possess in the birth-place of any epidemic, it falls to the ground when we consider that malady at some distant point from its original centre, and where we can prove that no terrestrial malaria or aerial miasm can possibly have existence. Even though the general immunity were confirmed, the force

of the habitual exposure of medical men to insalubrious effluvia, and the consequent insusceptibility they must gradually acquire, should be taken into consideration. Moreover, of all men, physicians and medical attendants are accustomed to view disease with the greatest equanimity; and who is there who will doubt the efficacy of this counter-influence? Once for all, then, we have to repeat that even though the general immunity were fully proved, it would not disprove the contagious nature of cholera, it would only show that the individuals exposed were not susceptible of its effects. Let us, for example, view the malady in some other place than in an hospital. The medical attendants and the bystanders escape. Have they not been exposed to the same causes, whatever be their kind, as the patients they visited? Moreover, one of the main champions of anti-contagionism boldly declares that there is no latent period in the operation of the poison; in other and simpler words, that seizure is instantly consecutive on exposure. But suppose we cast all these facts overboard, and once more contemplate the phenomena of typhus fever, why, according to Mr Searle and the other declaimers\* at the Egyptian Hall, every medical attendant who treated a case of fever should perish.

A numerous tribe of anti-contagionists find fault with the gradual increase, general prevalence, and gentle decline of cholera in the populous districts which have suffered its visitation; they think the malady should extend rapidly, and never stop until the entire population has been swept off. We need dwell no further on this topic than to remind our readers of the great law acknowledged in all contagious epidemics, of regular increase, maturity, and decline, in their ravages, a fact evidently dependent on the susceptibility of the persons exposed, and the eventual exhaustion of such susceptible persons as encounter the poison. What this susceptibility is, essentially, we know not; but its existence is proved by the history of inoculation, of vaccination, of syphi-

litic infection, &c., and some of the laws by which it is influenced are also recognised in the predisposing agencies of fear, of famine, of excesses, and other debilitating causes, and of various meteorological phenomena, and external circumstances of ventilation, population, &c., which it is unnecessary more fully to particularise.

But baffled in this point, the very opposite case is selected, and Dr. Granville scornfully holds up the *Petersburgh Gazette*, showing (according to Dr. G.) that on the first day of the epidemic but one case was reported, and that in a few days more there were 420 sick. By reference to Drs. Russell and Barry's reports already quoted, the accuracy of this statement may be fairly suspected. But even if it were strictly true, how many of the 420 may have been in contact with the animate or inanimate carriers of the contagion before the irruption! The case here evidently rests on the existence or non-existence of a latent period. Who is there, who, after the perusal of the preceding pages, will assume the negative of this proposition?

We have now nearly reached the end of the discussion, and have only to notice the objections founded on, 1. The asserted occurrence of individual cases during an irruption of cholera, and in which no intercommunication could be traced. 2. The contemporary occurrence of epizootic diseases. 3. The alleged fact that those who have witnessed the malady deny its contagiousness; and the impeached veracity of some of the facts adduced by those who believe the disease to be the effect of a poison generated in the human system.

Under the first head are generally included the numerous cases constantly occurring in every epidemic, viz. small-pox,\* plague,† in which no communication can be traced between the sick and infected places. In any other inquiry, say the investigation of cases of suspicious possession of property, in the absence of evidence, the Scottish verdict of "Non proven" would be recorded, and the question of guilt or innocence left to future elucidation; no one would ever dream of declaring, for example, that the pauper possessor of a chaplet of

\* "Mr. WHITLAW declared, that the disorder all over the world arose from eating bad rice and rice, which a destructive worm infected, and which carried off 20,000 people in New York!!!"—*Meeting at the Egyptian Hall.—Times, Tuesday, November 18.*

\* See Haygarth, Op. Cit. † Mead, Russell, &c.



diamonds, could not possibly have stolen it because he was not witnessed in the actual commission of the theft. It is more than probable too, that little attention would be paid to the protestations of the suspected, that "he had never been near a jeweller's shop in his existence." Yet such precisely is the evidence in which this objection to the contagiousness of cholera is founded.

But we are ready to supply our antagonists with a better argument. A solitary case is on record, of a prisoner immured in a separate cell, prohibited from external intercourse except for his supplies of food, having contracted the malady during the Petersburg epidemic, and while the disease prevailed among the prisoners. How could he have contracted the disease? either by malarious emanation from the *stone floor* of his apartment, or from a poisonous miasm conveyed through the grating of his cell, or from the provisions with which he was supplied. Now when we reflect that in the jail fever of England (confessedly a contagious malady) precisely the same occurrence has been constantly witnessed, we must at once receive the fact, not as evidence against contagion, but as a proof of the most decisive kind, that the accumulated miasms rising from cholera patients within the same building, may be wafted on partial currents of air, and infect the susceptible, though apparently secluded inmates.

That the coincidence of *epizootic* diseases with epidemic, should have been especially laid hold of by the anti-contagonists, is by no means surprising, for their history, when superficially examined, certainly *seems* inconsistent with the opposite opinion. From the earliest times it has been a matter of common observation, that plagues and murrains among the lower animals, not infrequently either preceded or accompanied the visitations to which mankind were subjected. Thus, at the siege of Troy, we are told by Homer—

————— μετὰ δ' ἰὸν ἔηκε·  
 Δεινὴ δὲ κλαγγὴ γέενετ' ἀργύρεοιο βιοῖο.  
 Οὐρῆας μὲν πρῶτον ἐπῳχέτο, καὶ κύνας  
 ἀργούσ·  
 Αὐτὰρ ἔπειτ' αὐτοῖσι βέλος ἔχευε κῆς  
 ἐφίεις,  
 Βάλλ'· —————

In India we are informed, that poultry and dogs frequently perished during the prevalence of cholera, and with similar symptoms. At Marienburgh, in Prussia, this year, the fish in the large ponds in that government are all said to have perished during the prevalence of the epidemic, and forty tons of them were buried from the single pond of Dinperburgh. In Warsaw, some examples of a disease resembling cholera were also noticed among the lower animals. In the Irish and Scottish dysenteries the same circumstance has more than once been remarked. In Gibraltar, during the yellow-fever, parrots, monkeys, cats, and canaries, sickened and died in considerable numbers.

Now, arranging these curious facts, we find that the only authentic cases we have of the *epizootic* preceding the epidemic, are recorded in connexion with irruptions of dysentery. The disease described by Homer is supposed by all the old medical writers to have been dysenteric, and when we consider the frequent connexion established between this malady and various vitiations of air, soil, food, &c. it will not appear strange that the lower animals should have shown a greater sensitiveness to their effects than was manifested by armies in a high state of mental and bodily excitement. In cholera, the *epizootic* affection, in the *few* examples in which it has been noticed, occurred *contemporaneously* with the human epidemic. The rarity of the cases might alone entitle us to look upon them as accidental coincidences. We know, moreover, that poultry are liable, under numerous circumstances, to be swept off with extraordinary virulence by diseases, the obscurity of the symptoms and pathology of which scarcely permits any argument to be founded on their observation. Again, we see no reason why infection or contagion may not be propagated from man to animals and *vice versa*. The important and beautiful experiments of Dr. Souderland, of Barmen,\* show distinctly that the infection of small-pox will, in the gaseous form and *without inoculation*, induce the *vaccinè* disease in the cow, and that again the malady thus induced in the animal becomes infectious *without inoculation* to man. From this beautiful discovery,

\* Journal der Pratischen Heilkunde. Janv. 1831.

the author deduces some aphoristic conclusion of the highest importance, and he observes, "that an instructive lesson may hence be drawn, how the poison of diseases in the gaseous form may be communicated to the lower animals, and according to the difference in their constitution engender diversified products, which may be then used as protective means against the maladies from which they originated. Such, for example, may be subsequently proved of scarlet-fever, measles, yellow-fever, and plague." Taking these facts into consideration, and remembering the transmissibility of murrain and glanders from the lower animals to man, what is the difficulty in supposing, that if the malady in Mr. Searle's duck were "a most decided case of Asiatic cholera," the disease was engendered by the infectious poison of that distemper? In the typhoid murrain that ravaged the pastures of Europe during the last century, and which was witnessed by Camper, in Holland, in 1774; by Sauvages and Chaumel, in France, in 1745; by Count Moscati, in Lombardy, in 1795; it was found, that seclusion of the healthy canals preserved them, except where the keepers incautiously communicated from one flock to another.

As to the fishponds of Marienburgh, it is sufficient to observe that a similar mortality has several times occurred at the same season; and that into the lake where the loss was greatest, the inhabitants of the adjoining town had emptied an offensive drain as a sanatory measure. As well; therefore, might the poisoning of the Dutch eels by the Thames water be regarded as a precursor of cholera, or as an evidence of its non-infectious nature.

But, waiving all that has been already written, we are told,\* that "all those who have *seen* the malady, who have witnessed its ravages, and contended with its progress," have decided on its non-contagious nature. The simplest, though perhaps not the most courteous, reply to this unwarrantable assertion, is, that it is totally untrue. Of the three Indian reports, two advocate the contagious mode of propagation, and in the third, Mr. Jamieson, instead of executing his office of analyser of the reports submit-

ted to his Board, consumes the volume in speculations of his own against that doctrine; and, nevertheless, he eventually concludes that bodies of men can communicate the disease. In short, to use the language of the Foreign Quarterly Reviewer,—"The Calcutta Report cannot be looked upon as furnishing the opinions of the majority of medical men in that part of India, inasmuch as we find no authorities or opinions contained in it but those of Mr. Jamieson himself; and these are evidently so perfectly at variance with one another, and with the ascertained laws by which those diseases, which are familiarly recognised as infectious, are grounded, that we cannot, even although we receive some of the facts he adduces, consider him as an authority on this subject. In all his remarks he seems to suppose that contact is requisite to the propagation of contagious diseases, and that because some persons in contact with the sick so frequently escape, the cholera is not contagious." Again, Dr. Meunier, of Bagdad, firmly upholds the views we support. Dr. Walker, who was sent to Moscow by the British Government, and Dr. Russell, an anti-contagionist in India, agree with Dr. Barry in the same views; Dr. Reiman, the late lamented director of health police in the capital of Russia, expresses his conviction of the infectious\* nature of the malady, and of its mode of propagation being identical with that of typhus fever. Dr. Albers, the medical envoy of the Prussian Government to Moscow, participates in this sentiment. Dr. Becker, the assiduous investigator, and, it pains us to say, the latest victim of the cholera in Vienna, adduces facts, almost innumerable, to demonstrate the contagion doctrine. Lastly, of the French envoys to Warsaw, we may mention M. Brierre de Boismont, the eloquent and ingenious author we have already so frequently quoted.

Against the preceding phalanx, what do we find arrayed? In India a host of officers who unhesitatingly give opinions without mentioning a single *fact* in their support. One (Mr. Orton) denied contagion, but advocated sol-lunar influence, a doctrine

\* *Times* newspaper, Nov. 14, report of meeting at the Egyptian Hall.

\* We beg to be understood as using the terms *contagion* and *infection* as synonymous throughout this article.

which, with the candour ever the attribute of a philosophic mind, this author has recently surrendered to the overwhelming force of the evidence for contagion. Dr. James Johnson opposes contagion, but swallows terrestrial emanations. In Warsaw the blundering M. Foy inoculates himself with choleric blood, and pronounces the disease non-contagious, because he escapes. MM. Londe and Chamberet adopt the same opinion, because a few nurselings have not imbibed death from their mothers. We appeal to the common sense of our professional brethren, to such of them at least as have approached this subject with unbiassed minds, only anxious to disentangle truth from the fallacies so frequently thrown around it by ingenious men, if we should pursue this department of the subject any further. One word more, however, remains to be said before we quit the controversy, and proceed to a more remunerative topic. Alpha and his section, Dr. Granville and his constituents, &c. &c., endeavour to asperse the character of those men who differ from them in opinion. One accuses Moreau de Jonnes of being a military man. The second exclaims—"Credat Judæus," at the facts of which the learned and regretted Röhman pledged his name in verification. Dr. Granville and Alpha should know the danger of this line of argument. A failure in the attempt to impeach the credibility of a witness, only strengthens the cause against the accused. We regretted much that our ingenious correspondent should have spoken so lightly of a man, of whose extensive learning, singular industry, and brilliant talents, our profession might be justly proud, and who has done more for the elucidation of the history of some epidemic diseases, than any medical writer who has ever made them the subjects of a systematic treatise.

Having then, we trust, satisfied our readers of the rationality of the grounds on which we base our opinions, and having, we trust, contributed more or less to the rectification of the absurd errors disseminated by some thoughtless and incompetent writers in the public press, we now proceed to the consideration of the treatment and prophylaxis of this disease.

## TREATMENT.

If in the preceding pages it has been our task to signalize controversies almost interminable on matters of date and place, and on propositions susceptible of being argued with much of the precision of logical disputation, it cannot appear strange that the action of remedies on the mysterious sources of life and of disease should become the theme of equally vehement contention. Did we, again, like many of the older physicians, argue of the identity or dissimilarity of disease, by the reputed effects of the remedies with which it was treated, there cannot in nosology be two diseases more different than cholera would be to itself. In fact, to use the words of De Boismont, "The whole of Europe is little more than a vast advertisement, in which are announced, in colossal letters, the admirable recipes for the preservation against and the cure of this disorder. Here a cincture is advised, there an elixir is lauded, and every-where we meet abundant proof, that if this be the age of intelligence, knavery is not less on the increase." But even amongst men of the utmost science and purest intentions, equal diversity of sentiment prevails. One advocates venesection, while another as energetically cries it down. A second deems the warm-bath indispensable, but an opponent soon starts up, and pronounces it a deadly practice. Sedatives and stimulants, emetics, cathartics, and specifics, each have their strenuous supporters. It is worthy of remembrance too that these discussions are the fiercest amongst the actual witnesses of the disease. If they have thus differed upon curative measures, why should we expect from them unanimity of opinion on the mode of progress of the disorder?

It is not, however, improbable, that much of this diversity of opinion and proposal, and much even of the apparent discordance in the therapeutic facts narrated of this epidemic, might be altogether reconciled by a strict examination of the circumstances which are almost necessarily overlooked in the hurry of a widely-desolating pestilence. Opposite effects are then recorded of a remedy, overlooking the variety in the stage of the disease in which it was administered. Again, difference of age, of sex, of trade, of constitution, idiosyncrasy, and other causes, are equally liable to be neglected. Difference of opinion concerning one and the same thing should not therefore be a source of surprise. Mistaken diagnosis and diversity in degree of the disease also contribute to multiply these conflicting statements.

In the synopsis then of the several modes of treatment which we propose to offer, it will contribute to its utility if we set out with clear ideas of the leading principles

of general therapeutics. These may be obviously divided into four or five principal classes, viz. 1. the "rational" according to which indications of cure are collected from the known physiology of a disorder; 2, the "external," by which symptoms only are regarded; 3, the "pathological," which reasons on the organic effects appreciable by our senses; 4, the "empirical," which attempting no process of ratiocination, collects curative facts, real and apparent, and applies them to the treatment of disease. To this list we may add, 5, the "Homoïopathic," a term which we shall presently define.

We shall begin then with the "rational," of which Mr. H. Bell affords us the most appropriate example, and according to whose views, "the following may be considered the indications of cure:—1. To relieve the oppressed circulation; 2. To stimulate the system; 3. To restore the heat of the body; 4. To guard against local congestion; 5. To keep down reaction; and, 6. To produce a healthy condition of the alimentary secretions."

The first of these indications he proposes to achieve by venesection, of the *modus medendi* of which operation he thus speaks:—

"The effect of blood-letting in cholera is obviously in a great degree mechanical. The power of circulation has been injured; it is no longer capable of duly distributing the mass of blood in the system; and the cessation of the usual secretions, the deficient pulmonary function, and the effect of the discharges, have rendered the blood wholly unfit for vital purposes. By bleeding in such circumstances we relieve the gorged vessels, and thus enable the weakened energies of the circulating power, to act on the disburdened organs of circulation, and to restore the current of the blood. The lungs recover their function, pure blood is thrown into the left heart, the arteries are again filled with fluid fit to support life: this, it may be supposed, reacts on the sympathetic system, and by-and-by its energies are completely restored. In this way only can the effect of blood-letting in cholera be explained. No other method will account for the almost instantaneous recovery which so often follows venesection in such a condition of the system as has been described—a recovery more immediate than that which follows the removal of mechanical pressure from the brain. And it is confidently asserted, that in no case in which it has been possible to persevere in blood-letting, until the blood flows freely from the veins, and its colour is recovered, and the oppressed chest is relieved, will the patient die from that attack of the disease." \* \* \*

"In commencing the treatment of cholera, then, no time is to be lost in endea-

vouring to bleed the patient. He should be laid in a warm bed; and the great object being to get blood to flow, it is important that the operation should be performed with as little fatigue to him as possible. He should be kept in the recumbent position; and, as answering the two next indications will be the means of forwarding this important object, immediate recourse should be had to stimulants—applying artificial heat, using friction, &c. \* \* \* \* The blood ought to be allowed to flow, until the natural current in the veins has been restored, and there is evidence, in the improved colour of the blood, that the lungs have recovered their function. If opening one vein be not sufficient, let others be tried; and, until the disease yields, the practitioner must persevere in his endeavours to accomplish this great object."

His second indication, which is pursued at the same time with the first, is accomplished, he conceives, by frictions, external heat, sinapisms, &c., and internally by the administration of *small doses* of opium, ether, camphor, ammonia, peppermint, drogue amere, spirits, and calomel. He objects strongly to *large* doses of opium, He recommends the administration of the solid remedies in the *dry* state, in order that they may be more certainly retained. He permits cold drinks acidulated with tartaric acid. External heat is, he conceives, best applied by shampooing, friction with hot flannel, perhaps with hot spirits of turpentine, care being taken to prevent the cooling by its evaporation; bags of hot sand, or salt, he also advises; but he remarks, that frequently there is such a morbid sensibility of the skin to external heat, that this practice cannot be persevered in. The application of epispastics he repudiates for the satisfactory reason, that in cholera no vesication can be produced. In the early stages of the disease, he does not rely much on any *topical* application, such as nitric acid, hot water, &c.; but he conceives such agency may be subsequently valuable where a *local* affection may have supervened. With respect to the use of the hot-bath, he dwells much on the sensibility of the skin already mentioned, but declines its use solely from the time it takes to prepare, the fatigue to the patient, and the exposure on leaving the bath; he, however, praises the *vapour*, or hot air-bath, which he considers free from these objections.

"In all this nothing has been said of astringents, antispasmodics, &c. All who restrict their attention in the treatment of cholera to the discharges and spasms, are in danger of losing sight of the true nature of the disease. They are prescribing for *symptoms*, which, it will generally be found, at once

disappear, when the power of circulation is recovered. In fact, the removal of blood, to the necessary extent, has invariably, so far as the author's experience goes, put an immediate stop not only to spasms and oppression, but to vomiting and purging, and has relieved the prostration of strength. And in no situation has the physician more reason to be proud of his art, than when, in the course of a few minutes, a patient, from the agonies of cholera, and from the jaws of death, is placed in safety, and not only restored to a sensation of health, but to one of positive bliss. The effect of blood-letting would indeed sometimes appear almost miraculous. A patient will be brought in on a cot, unable to move a limb, and, but that he can speak and breathe, having the character (both to touch and sight) of a corpse, yet will he, by free venesection alone, be rendered, in the course of half an hour, able to walk home with his friends."

In the after treatment, which will correspond to Drs. Barry and Russell's "fever stage," the first indication is "to relieve local congestion;" on this it is of course unnecessary for us to dwell. In order to produce a healthy condition of the bowels, Mr. Bell administers ten grains, or a scruple of calomel, followed by some cathartic pill or powder; he cautions the practitioner, however, against the danger of prematurely irritating the intestinal canal.

According to these principles venesection was practised in India by a vast number of the medical officers. Of eighty-eight cases thus treated, with some immaterial modifications, Dr. Burrel reports that only two died. At Bassorah and Bagdad it was also adopted by Drs. Meunier and Morando, and with reported good effect. According to Sir W. Crichton, the Russian physicians found that bleeding practised *in time*, was always attended with great success. Previous to the battle of Ostrolenka, M. de Boismont informs us that venesection was generally performed with great advantage in Warsaw.

Although Dr. Kennedy also employs venesection, he does so under particular restrictions, and apparently with different views to the preceding practitioners.

Under this head should perhaps be included the methods of those who believing cholera to be a disease of general excitement, use various antiphlogistics, such as bleeding, calomel, and opium, Dover's powder, tartar emetic, &c.

Another group of "rationalists" also endeavour to effect every-thing by measures directed for the restoration of the cutaneous circulation. Of these we may mention the hay or linseed cataplasm, in which the Polish peasantry enveloped their patients—the hot air-bath, water-bath, &c.,

the epithem, sprinkled with tartar emetic, recommended by Dr. Ranque of Orleans, moxas, the application of hot hammers, boiling water, the actual cautery, &c.

The next class is that of—

The "*External*" indications. According to Dr. Kennedy there are symptoms of *apparent* and symptoms of *real* debility. The first which essentially occur in the outset of the disease, he meets by copious venesection and the application of *humid* heat or baths, on which he places great reliance. He meets the spasms by opium and calomel. In the stage of *real* debility he employs *dry* heat and other stimulants, to which we shall subsequently allude.

The numbers of practitioners who have followed *symptoms* alone in their treatment of cholera, have been very great indeed, and accordingly we find, that, to combat the spasmodic symptoms, opium, musk, camphor, and ether, have been prescribed in India, in Russia, Poland, &c.; and in the last country the cherry laurel water by M. Foy, and prussic acid by Dr. Mahir, were added to the list. M. Brierre de Boismont has with the same end proposed to sprinkle two grains of the acetate of morphia on a blistered surface. Again, on the same principle, copious draughts of brandy and water, doses of ammonia, musk, capsicum, bark, &c., have been prescribed to remedy the seeming debility. To this catalogue may also be added the essential oils of mint, cloves, &c., and the cajepout or kayapoa, to which we shall again revert. By this sect of practitioners the symptom of cutaneous cold has principally been treated by *dry* heat and various kinds of epispastic remedies.

The "*pathological*," or we might say the Broussain school, has also found numerous assertors in the treatment of cholera; and accordingly we find a tribe of authors in India and elsewhere, detecting, microscope in hand, ulcerations of the glands of Peyer and Brunner, red patches in the mucous membrane, and other evidences of inflammatory action, appertaining to which head they are even disposed to include the general venous congestion and peculiar white excretions so fully described in our pathological summary. Guided by these views, venesection, leeching, blistering, and the various antiphlogistic etcetera, have been assiduously employed. The success of this medication has been loudly proclaimed by many, and as vehemently denied by others.

But it is the "*empiric*" sect which would principally occupy our time, could we devote it to so profitless a subject. We do not, however, by this expression, mean to deny the value of empiric contributions to the armoury of medicine, for we must all admit that our administration of mercury in

syphilis, iodine in scrofula, quinine in ague, &c., as dictated by empiric experience alone. We should therefore look at least with a patient eye to some of the numerous remedies of this kind prescribed for the treatment of the present disease.

Calomel of course occupies a prominent place on the list, and there is scarcely an Indian practitioner who is not eloquent in its praises; and there is almost no method of treatment rational, empirical, or otherwise, into which it has not entered. On this point the *naive* observations of M. Double, the French reporter, may be read with interest, and are perhaps not destitute of truth. "Scarcely," he writes, "in all the numerous cases which we have had occasion to scrutinize, can we recal one to our recollection in which calomel has not been used, and yet has the issue been less unfortunate? It is true that the eastern practitioners are of the English school; and it is well known that in that country all doubtful and difficult cases, cases in which the danger is as urgent as in those of simple and manifest indications of cure, calomel, sometimes in one dose, sometimes in another, ever finds an ample place, as an antispasmodic, sedative, purgative, or specific."

Annesley gave calomel in scruple doses, several times daily, in the intention of ridding the intestinal mucous membrane of the creamy matter with which it is usually invested. According to this distinguished author, calomel is the only purgative which acts on this peculiar matter, and he continues its administration until no more of the white excretion occurs in the evacuations. From three to five scruples of calomel are necessary for this purpose. The same method has been nearly followed by Dr. Corbyn, and the Marquis of Hastings enforced the practice in the order of the day issued to the English army. Dr. Jamieson uses calomel to "combat the spasm of the intestines."

In Batavia, according to accounts received by M. Reveillé-Pariset, venesection and calomel having proved highly destructive, constant success is obtained by the use of a mixture of two parts of the *essence* of peppermint and one of laudanum.

In Warsaw, Mr. Searle is stated, by M. Brierre de Boismont, to have practised *acupuncturation of the heart* without any appreciable result. In an analogous affection which occurs in a catastatic or endemic form in Japan, the native physicians make several punctures with a gold or silver needle midway between the navel and the pit of the stomach. Three rows of these punctures are usually made, three in each row, the operation being throughout accompanied by various solemnities. It is

almost unnecessary to add, that, if we are to trust the statements of the Japanese, this medication is sure to succeed.

"The *drogue amere*" mentioned by Mr. Bell was principally employed by a Portuguese missionary, the friar Paolino de San Baitholomo, who practised medicine with the greatest celebrity at Goa. Its composition may prove of some interest:—Colophony resin 24 ounces, 12 incense, 4 myrrh, 3 Colombo root, 4 of mastic, and 4 of aloes; the ingredients are reduced to powder, and macerated in arrack for a month. Of the tincture thus prepared, one or two spoonfuls are a dose. The efficacy of this remedy has been equally vaunted with the Japanese acupuncturation. The medicine, we should not omit to add, having become scarce at Goa, the missionaries substituted for it cocoa brandy distilled over *horse-dung*, a medicine dignified by the appellation Tangara.

Dr. Hood, in a memoir read in 1825 before the Royal Society, recommends, in the onset of the disorder, a drink composed of 2 ounces of spirit and 10 drops of sulphuric acid in half a pint of cold water; Mr. Annesley advises tartaric acid, which he found to effect the solution of the pasty matter lining the alimentary canal. Mr. Hope, of Chatham, has recently, in one of the public papers, perhaps on similar grounds, prescribed small doses of diluted nitrous acid.

The physicians of the Isle of France discarded opium, and substituted Glauber salts (sulphate of soda), which they used till the dejections became of a yellow colour.

An exceedingly simple remedy was used, and, it is said, with unprecedented success, on board the vessels belonging to the United States. A common bottle cork was burnt, and the powdered coal given in a little water or milk. "The third dose, at most, was sufficient to allay the urgent symptoms;" and we are assured that it has more than once saved patients almost in the agony of death.

In Persia, during the irruptions of 1821 and 1822, a very different kind of treatment was followed. The people, according to Frazer, believed the disease to be of a hot nature, and that the remedies should consequently be of a cooling kind. With this view, the patients were sprinkled with *cold water*, and they were given *acid verjuice* to drink. Of two domestics, belonging to the English embassy, who were affected with the disease, one was treated thus, and of course recovered; the other followed the European method, and—of course, died.

In Warsaw, when, after the battle of Ostrolenka, the various moral calamities engendered by that murderous conflict contri-

buted to increase the severity of the epidemic, and when nothing but distraction prevailed among the medical attendants, Dr. Leo recommended the use of the *sub-niirate of bismuth*, a practice which at first seemed attended with extraordinary success. It was administered in doses of three grains every hour, with a little sugar. The method at first excited great attention, and was by royal order followed in the military hospitals at St. Petersburg; but the apparent success it occasioned is rationally attributed to a mitigation of the external causes which aggravated for a time the character of the disease.

To the preceding list we may add phosphorus, ox-gall, castor oil, oil of turpentine, and magnesia; all of which have had their seasons of celebrity and subsequent neglect. We shall notice but two more articles of this class, viz., common culinary salt, which Mr. Searle states that he has used with success in the Warsaw disorder. A large table-spoonful of salt was given in a wine-glass of warm water, and repeated at short intervals, till an emetic effect was produced. Smaller doses were subsequently given, till the bowels were naturally recovered. Of eight patients thus treated by Mr. Searle, six recovered; but of these three were also bled. MM. Isenbeck and Brailow also followed this practice in St. Petersburg, and attributed to it great success, though they always bled the subjects of the experiment. We find the same method officially recommended in the "Post Inrikes Gazette," Stockholm, 26th September, 1831. *Cajeput oil* is the last of the empiric remedies we shall notice. It is stated in evidence given to the Board of Health, that this remedy was administered by an Indian servant to some of the natives with beneficial effects; but, on the other hand, M. Lamarre Linnet, late pharmacien at the Isle of France, where he spent twelve years, has recently made a communication to the Académie de Médecine, in which he states, that he has known it to be most extensively used without the least success; and that it is highly objectionable for other reasons. It is a curious fact, that from the fashionable source that lately revived in England the recollection of this almost obsolete remedy, such was the *empressement* manifested for its possession, that the market was exhausted; and, as we have been credibly informed, its *manufacture* commenced in London on a large scale!

The next class of therapeutic principles which have been applied to the treatment of cholera is

The "*homoiopathic*," or that singular doctrine propounded by Hahneman, and enthusiastically followed by crowds of disciples in the German schools, and, according to

which diseases are to be treated by the use of such remedies as are capable of producing similar symptoms themselves. With this view *arsenic* has been tried in Germany, and of course with pretended success. Again, when Joennichen mangled some spinal chords, and fancied them in a state of ramollissement, the homoiopathists gave their patients *nux vomica*, in order to act on that organ. It is unnecessary to pursue this subject any further.

In offering a few very brief observations in review of the preceding methods of treatment, we are most anxious not to exceed the tone of diffidence in which this topic should be treated by those who have not witnessed the epidemic. The geographical history, the mode of propagation, the physiology, and indications of cure, may be discussed well by those who never approached within a thousand leagues of the malady, but with its treatment the case is far different. There are still, however, some general facts connected with the preceding synopsis on which it is quite legitimate to reason without a personal and practical knowledge of the disease. It is, for example, manifest, that the great majority of authors have fallen into one of the following faults; either they have, in contemplating the abstract unity of the malady, overlooked the influence of individual constitution, or idiosyncrasy, in modifying the proximate cause of the symptoms, or they have applied what was appropriate to one stage, to the entire circle in the malady. Again, we find remedies extolled as specifics which have either been used in concert with others, the operation of which is not reckoned on, or which have been employed in too limited a number of cases to permit of accurate deductions, or which have been administered to cases either too trivial to encourage confidence by their cure, or too hopeless to cast a stigma on the remedies if in vain employed. Thus it is that we find opium and prussic acid, and ether and cherry laurel water, remedies useful in the allaying of spasm, extolled as specifics by those who have administered them in proper time and place, but deprecated as useless or pernicious by those who chanced to employ them in an inappropriate season. Again, as to venesection, it is evident, that after a certain period of the disease, a period which the nicest professional sagacity is required to determine, this evacuation can only add to the general weakness, or at best can effect no improvement; and hence it perhaps comes to pass, that the character of this agent has been the theme of such warm contention. On the whole, it appears certain, that the treatment of a solitary case varies in its several stages, and that the treatment of a number of cases differs again

according to the variety of constitutions ; and, lastly, that the treatment of local divisions of the epidemic must be sensibly, if not materially modified, by the circumstances of climate, race, moral elevation or depression, season, &c.

It is obvious from all these circumstances that no physician, however experienced, can do much more than generalise on the subject, for to devise a method suitable to every variety of case, would require almost as many volumes as there are symptoms in the disorder. The reporter of the French Academy has well expressed himself on this subject. "As a general rule, the absolutely perfect application of therapeutic principles is an impossible thing. The individualities, which vain efforts of abstraction seek to remove, yet ever continue present in all their particular complexions and specific idiosyncracies, changing general previsions and commanding all important exceptions. These individualities which frequently and regularly modify morbid conditions, require also the modification of therapeutic measures. The great epidemic, which we now study, is a living proof of our position ; for while it doubtless presents general capital indications which, may be sympathetically expressed, it also offers on the variations of symptoms, organic susceptibilities, and individual constitutions, other considerations of equal importance."

We shall not, therefore, waste our pages by describing any one plan of treatment to which we would award our special favour. Fully confident in the zeal, the discrimination, and the conscientiousness of our professional brethren, it is enough to have referred them to those works on the subject, which, on mature reflection, we think best calculated to guide to correct practical measures. To the public generally also we would venture to appeal, most earnestly beseeching them, in the event of the spread of the malady in Great Britain, not to waste the precious moments in the early period of the attack in *trying* the effects of the utterly inadequate measures recommended in a recent official notification. On two things, at least, the medical world have agreed ; 1st, that the sole chance of success in the *treatment* of cholera depends on its being taken at its earliest onset ; and, secondly, that this auspicious period is frequently but of the most transitory duration. Let not then our fellow-countrymen, we repeat, consume these invaluable moments in watching the effects of "a mustard poultice," or of from \* "five to twenty drops" of cajeput oil, or of warm "broth with spice," or of any such

inert domestic quackery ; but let them instantly resort to the assistance of some one of those enlightened medical practitioners, with whom, happily for the inhabitants, these islands are so abundantly supplied.

#### SANITARY MEASURES.

Under this important head it is our intention to take a cursory glance at the great principles which should guide the various branches of society in their contemplation of an approaching pestilence. On a moment's consideration, it will be manifest, that almost every rank has its co-ordinate and peculiar duties. The great principles, to be remembered by all in the present instance, are that the disease is communicable from man to man ; that, under particular circumstances, it can impart an infectious power to currents of air ; that its diffusion by inanimate things is not proved, though this may be inferred ; and that the progress of the disease, in individual cases, is marked by the utmost velocity.

Acting on these principles, the primary duty devolves upon the executive government. To them the attempt to avert the malady from a frontier—inland, or maritime, of course belongs. To the machinery put in force for this purpose, on the coasts of Great Britain, it is not necessary to allude more minutely, than to say that it consists of the appointment of certain inlets, through which only vessels from suspected places can enter—of stations where ships in quarantine are detained under surveillance—of lazarettos for the purification of merchandise, apparel, etc., with the necessary officers for the execution of the contingent duties.

But as it is perfectly evident that quarantine may be infringed, or that a contagious disorder may be introduced by contraband traffickers, it behoves the executive to attend to the measures which may become necessary in the event of the epidemic occurring at a maritime station.

Reasoning, then, on the laws and history of the contagion of cholera developed in the preceding pages, it becomes obvious that the most perfect chance of preventing the extension of the disease in such a district, would be the separation of it from all intercourse with healthy places ; and this can only be done by a coast blockade, and an inland cordon thrown round the town or village. The practicability of effecting these measures then comes to be considered ; and here we have the accumulated experience of Asia and Europe, and we may add Africa, to show that no inland cordon was ever effectual in *permanently* arresting the progress of any contagious disorder, unless in a few rare examples, such as the Isle of Bourbon,

\* Mode of treatment recommended by the Board of Health.



where natural localities threw the whole included district under the actual eye of a vigilant commander. In every other case intercourse has been as easily carried on as if no cordon existed.

Moreover, in the formation of such cordons, the habits and customs of a population *must* be respected; else, as the history of the present malady has shown, anarchy and crime spring up on every side, and coercion only generates the fiercest, the blindest, resistance, where cheerful compliance might have been obtained by milder measures. Thus, in Hungary, an insane populace murdered the very physicians who risked their own lives for the relief of the sick. In St. Petersburg the same sanguinary drama was repeated; and we do not hesitate to state our candid opinion, founded on some knowledge of the feelings of the people, that no cordon could be established twenty-four hours in Great Britain, without exciting a civil contest in the district. Let us not be supposed to defend or encourage such resistance. We state but the conviction we entertain; and the consideration naturally follows, whether it be not preferable to seek for other means of extinguishing a pestilence, than by adding to its miseries, the bloodshed of intestine war.

Here, then, the functions of an executive naturally terminate, excepting in the duty imposed on it of facilitating in every way the collecting and publication of scientific contributions to the knowledge of the disease; the discrimination of wholesome and deliberate suggestions on its nature, history, etc; the provision of medical assistance, and the multiplication of facilities for treating the sick, by the means possessed by Government alone. Another important, but much-neglected duty, consists in the investigation of the amount of food in the country, and the prevention of the chance of scarcity, by timely modifications of the laws relating to the importation of grain.

The executive having thus discharged its part of the common duty, what remains for the other grades in the social family to perform?

1. All those external circumstances known to favour the generation, dissemination, and reception, of contagious diseases, are to be duly examined into, and where defective, measures are to be taken for their rectification.

2. Measures are to be taken for the effectual organization of a system of medical attendance and police, to be called into operation, both preparatory to, and coincident with, the irruption of the epidemic.

On each of these general laws, on their objects, and the various measures they

demand, we proceed to offer a few simple and explanatory observations.

With respect to the law first laid down, it is essential to remark, that whatever be the hypothesis embraced to account for the mode of spreading of any disease—for example, typhus fever, plague, yellow-fever, cholera, &c.—it is totally independent of all controversy that the history of these maladies furnishes abundant proof that a crowded population, poverty, filth, foul air, unwholesome food, especially bad water, depressing passions, habits of intemperance, defective clothing, and general bodily debility, powerfully predispose to the reception of these diseases, increase their mortality when received, and tend to promote their extension by other means, to persons sheltered by rank and circumstance from their primary influence.

An example of the operation of some of the preceding causes, is well afforded by M. Brierre de Boismont's narrative of the Warsaw epidemic. "At first it seized those poor and hapless individuals who fed on indigestible aliments, who adopted no precaution against atmospheric changes, who dwelt surrounded by filth, in narrow, damp, and unwholesome places. The most numerous victims were amongst the Jews, whose uncleanness has in Poland become proverbial. There can be no doubt," he continues, "but that had the filth been daily removed, the houses, barricades, and sinks, effectually cleansed, the number of deaths would have been materially diminished." That the association of too numerous individuals breathing a common air not only predisposes to epidemics, but even actually generates them, is shown indisputably by the occurrence of typhus, as described by Pringle and Rouppe on board crowded and imperfectly-ventilated ships; and in cholera, a disease shown to be so intimately connected with imperfect arterialization of the blood, it is not racking probability to presume, that the excess of carbonic acid generated in the common air, breathed by numbers of individuals, may contribute peculiarly to the reception of the poison. Again, as to the influence of poverty, Dr. Bisset Hawkins, in his "Elements of Medical Statistics," has proved beyond a doubt how deeply this cause is concerned in the extension of epidemics.

It is an evident fact, that if you remove the pre-disposition to any disease, the poison which produces it is exhaled in vain on the non-susceptible person. Now of all the pre-disposing causes we have pointed out, there is but one, viz. fear, beyond human amelioration. All the others may be removed by judicious sanitary measures; the poor may be better fed and clothed,

cleanliness may be enforced, the sick and weakly afforded medical assistance, the state of the public drainage, of food, of water, of nuisances, brought into a perfect condition. All that is required is, system, and pecuniary means. The former may at once be organized by parochial associations, comprising the magistracy, clergy, medical men, parochial officers, and such individuals of activity, rank, and benevolence, as are willing to come forward.

The first duty of these associations should be, to procure perfect information on the state of all the circumstances already alluded to; for this purpose, street or district sub-committees, or health-inspectors should be allotted to a certain space, and all the reports called in on a given day. Attention will then doubtless be directed to many, perhaps all, of the preceding defects which we have pointed out. Examples will occur in which heaps of human beings nestling in filth, and in a state of extreme poverty, are detected wallowing in their hovels. Adulterations of bread and beer will be pointed out; offensive sinks and drains will be mentioned; and statements will perhaps be made of habitations rendered noisome by stenches proceeding from undiscovered sources. Lists of sickly and unemployed persons will be handed in; general defects in day and night clothing and prevailing filthiness will be remarked.

To meet all these evils, there are obvious measures which we need not dwell on, further than to recommend that pauper lodging houses should be thinned of their inhabitants by parochial laws, &c.; that the adulterations of food, and the sale of unwholesome articles of diet, such as stale or spoiled fruit, vegetables, etc., should receive particular attention. The white-washing of houses with *caustic*, or quick lime; the digging up of earthen floors, and mixing them with lime; the assiduous search after the *causes* of offensive smells, should not be forgotten; premiums should be given for the encouragement of cleanliness. If blankets or clothing be issued, an inspection of the articles should (in order to prevent their transmutation into gin) take place by a visitor at uncertain periods; or they might be supplied on a receipt, which would convert the transaction into a loan, the violation of which might be punished by the magistrates in an exemplary manner.

In order to carry the second principle into effect, the medical members of the general board should form a separate committee. They should deliberate on and recommend such prophylactic or preservative measures as experience has shown to be of use for individuals; they should, at the earliest moment, procure accurate information respecting the state of the public

health in their districts, and they should forthwith concert measures suited to the population, locality, etc., of the district over which they preside, for the provision of effective and *immediate* medical succour on the outbreak of the disorder. A few explanatory words on some of these interesting topics, and we cheerfully commit their consideration to all intelligent practitioners.

In order to procure a valuable view of the state of health, districts should be allotted to the members of the medical committee, consulting as much as possible the delicacy to be observed in avoiding anything like intrusion, or encroachment on circles of practice or connexion. The districts being thus distributed, the returns of sick should be made in a tabular form, indicative of the age, sex, previous medical history, *such as having passed through any epidemic*; trade, habits, and constitution, should be particularly noted, and any disposition to hemorrhagic tendency, by epistaxis, hemorrhoids, &c., carefully remarked. The vast importance of attending to these particulars, towards the elucidation of the susceptibility to, and immunity from, contagious disorders, is justly enforced by all the great writers who have studied epidemic diseases. The practical value of these observations may also be inferred to a certain extent, from the fact, that oilmen, having been found to escape visitations of the plague, the external use of olive oil became a prophylactic, and it is said to be a powerful one against that disorder. Butchers are said to enjoy a similar privilege. On the other hand, by some inexplicable cause, bakers almost invariably fall the most frequent and early victims to its ravages. It was the immunity of the Gloucestershire ostlers from small-pox, as observed by Jenner, that led to the memorable and beneficent discovery of vaccination. We trust we need press this point no further.

On the preservative measures to be recommended to individuals, some relate to the regulation of regimen, clothing, etc. The entire of the precepts usually circulated under this head might, perhaps, be comprised in an emphatic advice—to avoid all known causes of digestive derangement, and to guard against sudden alternations of atmospheric temperature. There are, however, some prophylactic items which demand observation. In the different countries of Asia, baths, perfumes, powerful aromatics, the kindling of huge fires in public places, the burning of pastiles, and smoking of medicated vapours, have, as well as talismanic amulets and charms, been extolled as certain preservatives against infection. In Europe, in recent years, chlorine, a new disinfecting and preservative agent, had obtained the highest celebrity;

indeed, by the most scientific men, was looked upon as an infallible disinfectant. The history of the Russian cholera has, however, dispelled this, like many other illusions, chlorine and the chlorurets having in Moscow exerted not the least influence on the disease, which sprung up in the very midst of their emanations. It will, therefore, be a matter of consideration for medical boards, whether it be not advisable to return to the Guytonian method of fumigation by muriatic acid gas, evolved by pouring heated oil of vitriol on common salt. In Poland and Prussia, burnt stable litter is a favourite fumigation; in Russia, green juniper wood is used for the same purpose, and the vapour of kindled tar is similarly applied. While alluding to preservative measures, we may add, that a writer in the Quarterly Review suggests to physicians, the holding in their mouths a lozenge containing chloride of lime, while visiting cholera patients.

The next point relates to the organization of a system of effectual medical attendance for the poor inhabitants of a given district; and here the golden rule to be remembered is, that assistance to be effectual must be *immediately* rendered. In cholera the delay of half an hour is more irremediable than the sacrifice of a week in typhus fever. Now it must be borne in mind, that there will be, in any scene of the apprehended epidemic, classes of patients to be prepared for,—one, and unhappily a numerous class, consists of the miserable beings destitute of friends, home, and resources, who are either attacked in the streets, or expelled from their wretched haunts, or have no means of being supplied with domestic attention. For these patients assistance cannot be looked for from general hospitals, on account of the time lost in the conveyance; the exposure of crowds in long thoroughfares to the influence of a contagious malady, and the danger to the other occupants of these asylums. Common humanity must ever, we trust, also operate in excluding cholera patients from the parochial workhouses. Temporary hospitals must therefore be provided.

We should, however, deem it injudicious to prepare them on any extensive scale before the calamity appears, for in every place in which the sanitary precautions of ventilation, cleansing, &c., had been adopted in sufficient time, the progress of the malady was so slow that ample leisure was afforded for provision for the sick. We deem it right however, to extract the description of the excellent temporary fever hospitals constructed in Ireland during a recent epidemic fever from the *Report of the General Board of Health, Dublin, 1829*:—

## PLAN OF A TEMPORARY HOSPITAL.

“ Let a small piece of ground with a proper surface be marked out, 45 feet long and 16 feet broad; at each angle of this space, let a timber stud be placed of four inches square, standing six feet and a half above the surface. The whole line may then be marked out by other studs of the same height, of four inches by two inches, placed at intervals of from two to three feet, leaving convenient spaces for door ways. Along the heads of these studs so placed a frame of timber of four inches wide and one inch and a half thick is next to be fixed, to answer the purpose of a wall plate, on this plate properly secured, the rafters forming the roof are to stand, exactly over the studs, placed at as low an angle as circumstances may admit of, so as to make them as short as possible, and thus diminish the extent of the roof. The rafters may project five or six inches outside the plate, so as to let the water run from the roof clear of the walls; their backs should be grooved the entire length, for a purpose to be explained. Immediately under the wall plate, sufficiently large windows may be placed at convenient distances, formed to open for ventilation. The skeleton of the building now standing complete may be covered with linen, of a breadth to correspond with the intervals between the studs and rafters. It should be attached to their outer surfaces in the following manner; to the walls, by having the selvages of the linen stitched together and then connected to the studs by means of strips of timber, nailed exactly over the seam. Besides this contrivance for the walls, additional precautions should be taken in covering the roof, from its greater exposure to moisture and consequently liability to leak. For these precautions the rafters are already prepared, and the object may be obtained simply thus, by taking particular care that in nailing the strips over the seams on the backs of the rafters, these seams should be depressed into the bottom of the grooves, so that if afterwards any water should penetrate the linen at the stitching, it may be received by the groove, conducted along the rafters, and drop off harmlessly from its point. Should the linen not exclude all the rain which may fall upon the roof, it can easily, and without much expense, be covered with one or two coats of whiting, mixed with drying oil; this mixture if properly laid on, will exclude all damp. \* \* \* The floor of the building, 45 feet by 16 feet, is supposed sufficiently large to contain twenty beds of the usual size, leaving spaces of eighteen inches between them, and a passage of four feet wide in the centre. It is calculated that the expense of erecting such a building in any si-

tuation would not exceed from 20*l.* to 30*l.* In making this estimate, square pine timber, and close brown unsized linen, are the materials contemplated, as they appear to offer several advantages.”

These constructions are susceptible of being well warmed by flues running from the kitchen-grate or the water-boiler. They are, indeed, quite as warm as many stone buildings; and they possess the advantage that they may be burnt in order to prevent the chance of infection from this source when the disease has abated. Smaller structures of this kind may be erected if occasion should require, in central points in several subdivisions of districts, to serve as receiving houses for persons suddenly attacked, and perhaps for their temporary treatment. In the event of deaths of persons whose remains lie at the disposal of the Boards, interment is recommended not to be too precipitately performed, as in some cases remarked in Russia, and others in India, convulsions have taken place in the bodies of persons *apparently* dead; a phenomenon referred to by one of the French commissioners to adherent and, perhaps, struggling vitality. Rewards should be given to persons bringing *rapid* intelligence of the occurrence of fresh cases to the district medical attendant.

No rationally-constructed Medical Board will, we trust, be guilty of the folly of recommending families to provide remedies for their own treatment. *The disease will prevail in no district where medical attendance cannot be procured.* We have but one more suggestion to add, viz., that all the medicines placed at the disposal of the local Boards should be examined as to their purity, by some competent chemist. In Warsaw the calomel was so full of corrosive sublimate that it could not be employed; and the Cajeput oil now selling in many parts of London is, as we are credibly informed, little better than a mixture of oil of turpentine and camphor, tinged green by the introduction of metallic copper. M. Guibourt has indeed actually detected this metal in some specimens of the oil sold in Paris.

In drawing up the preceding advice and suggestions, we have confined ourselves to the subjects which were principally likely to form the matter of local deliberation. On the subject of quarantine we have not touched at any length, partly because we have reason to believe, that it is in contemplation to adopt just measures of severity on the parties concerned in any future neglect in enforcing the quarantine regulations. The question of the duration of the latent period in cholera we have not dwelt on, principally on account of the

uncertainty of the facts illustrative of the subject which have yet been obtained.

In conclusion we have to observe, that it was our intention to have wound up our observations on this disease by a review of the sanitary measures suggested in the proclamation from Whitehall. Had we done so we could have at least satisfactorily shown the total *impracticability* of the measures the Privy Council suggested. We are spared the necessity of this animadversion, by the publication of new recommendations by the Medical Board in its reformed constitution. In these we are told, that they now strongly deprecate all measures of coercion, which when tried on the continent had invariably been found productive of evil. In preference to the savage system they first countenanced, we now find them meekly and appropriately advising the cultivation of charitable conduct, and the acquiescence in the common feelings of human nature. We are rejoiced at this salutary change, and congratulate the British nation on its escape from that visitation, worse than a pestilence,—the enforcement of a Maltese code of plague regulations.

In the preceding narrative we have studiously avoided making any particular allusion to the existence of the blue cholera in Sunderland. Up to the moment of going to press we remained in anxious expectation of obtaining private information on the subject, but in this we have been entirely disappointed. By the official report, we learn, however, that eight new cases of the “*malignant*” disease had been reported within the two days preceding the 15th instant. A considerable number of milder cases had also occurred. We regret to add, that impatient at the restraint on the commerce of the port, the populace had begun to exhibit a most impatient and even angry feeling towards the few medical gentlemen who dared to pronounce the malady to be of the Asiatic character. One of the most rapidly fatal cases having occurred in an individual who had taken *Epsom salts* on the morning of the attack, Dr. DAUN published a notification cautioning the public against the use of that cathartic, and recommending warm laxatives, such as *rhubarb*, &c. to all who require aperient remedies. We are impatient to learn the influence of the severe cold of Wednesday night on the progress of the disorder. We do not deem it contradictory to the history of the Moscow epidemic to express our opinion, that until spring we shall have no destructive cholera in England.

\*.\* In the examination of the map it should be observed, that places which the malady has visited, are marked with a dot, and surrounded by a black circle.