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MEMOIR
ON THE
CHOLERA MORBUS
OF
INDIA.

BY P. F. KERAUDREN,

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“This Memoir is by far the most rational, unexaggerated, and impartial monograph concerning the Indian Cholera, yet presented to the public in a condensed and portable form. It contains all that is essential to be known of the symptoms, etiology, treatment of, and controversy respecting, that disease.”

The Lancet, July 2, 1831.

TRANSLATED FROM THE FRENCH.

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TRANSLATOR'S PREFACE.

THERE needs no apology for this translation of M. Keraudren's Memoir. The original was *written* at a period when the facts which it contains, and the impressions derived from the researches of the distinguished author, were fresh upon his mind. At that time the Memoir was distributed only amongst the naval and colonial medical officers of France, but the near approach of the cholera to this portion of Europe, has lately induced him to *publish* it for the general good. Introduced to public notice in this country with the strong recommendation which is attached to the present title, and with a full conviction that it deserves that recommendation, a translation of the pamphlet is now made into English. It is not right that either the profession or the public should be kept from the opportunity of bestowing a calm and unfettered consideration of the views it contains.

It need only be added, that M. Keraudren has long been known to the medical public by his exertions as a member of the important institutions with which he is stated to be connected. His official situation in the French marine service has afforded him invaluable sources of information on the subject of epidemic and contagious dis-

eases, and of these he has fully availed himself. Had his Memoir appeared sooner, the choice of Keraudren himself conjectures) would have been with greater interest.

The translation has been made with great

LONDON, July 9th, 1831.

PREFACE TO THE MEMOIR

THE diseases of warm climates are generally of an extremely acute character, whether the causes of disease in those climates are more intense, or the patients themselves more susceptible, than is the case in colder regions.

The observation which Hippocrates thus made in regard to the diseases of warm climates, applies still more strongly to Asia and Africa.

Again; in the description of the crises and critical periods of disease, this illustrious philosopher was equally correct. In Europe the more tedious progress and the less energetic character of diseases, have induced physicians, who in other respects men of remarkable erudition, to entertain a very great and beautiful conception.

The maladies of tropical countries are, in pathology, the greater quadrupeds, and the cetacea, are in a

gascar and Batavia, the tropical dysentery, and the Indian cholera, are, in Europe, destitute of the same violence, comparatively innocent in the mortality they occasion, and brought with less eelerity to a fatal termination. Indeed the yellow fever of America is still a stranger to the majority of European nations. I should not, however, be justified in concluding from this difference in degree that the diseases themselves are pathologically dissimilar, although it is undoubtedly true that the more we study the treatment of equatorial diseases, the newer and more extensive are the views in nosography and therapeutics which we acquire. To those physicians who are engaged in seafaring pursuits, this species of comparative medicine is especially worthy of attention, and from their labours chiefly it is, that it must eventually derive its celebrity.


Meantime it may be of advantage to assemble scattered facts, and to collect together the materials necessary for the future execution of so important a design.

THE
INDIAN CHOLERA.

A DISEASE still more terrible than the yellow fever appeared on the banks of the Ganges in 1817. After having devastated Persia, it showed itself in Syria, and now threatens all Europe with desolation. Mountains—rivers—the ocean itself—in vain opposed its course. It has raged on board our merchant-ships in the Indian sea; it has penetrated into our possessions at Pondicherry and Bourbon; and at Manilla it attacked the crew of one of our armed vessels. These places still continue to be the prey of this affliction, and it is to be dreaded that our navies will henceforward meet it in many a situation.

The extraordinary phenomena which mark this disease, the great and speedy mortality which attends it, the peculiar disposition to invade, successively, new countries, which it manifests, occasioning in each the same disastrous effects, have appeared to me to constitute sufficient reasons why it should be submitted to the express consideration of the medical profession.

The subject of the following pages is, therefore, the *Cholera Morbus*, or *Mordechi of Eastern India*.



GENERAL PHENOMENA OF THE CHOLERA.

It is only by the observation and analysis of individual facts that we can obtain a knowledge of the distinguishing phenomena of diseases, but by their appropriate assortment and general grouping, we can effect a perfect picture of any pathological affection.

In the first place, therefore, and before I attempt to trace the series of symptoms which constitute and characterize the *Mordechi*

of the East, I shall lay before my readers some cases, collected in India by M. Saint Yves, surgeon of the Royal Navy, and correspondent of the Museum of Natural History of Paris. I shall not separate their treatment from the description of the symptoms; as, by connecting them, the necessity for repeating the cases will be prevented when I come to the section which will relate to the treatment of the affection. The subjoined cases are given in M. Saint Yves' own words.

CASE I.

Madame S., of lymphatic and nervous temperament, of a thin and debilitated conformation, and labouring under disease of the womb, breakfasted on rice, as was her usual custom. Immediately afterwards she experienced tension of the epigastrium, which was quickly followed by the several symptoms of the *cholera morbus*. These continued to increase after 10 A. M. I was called in at 11 P. M., and learned that, in the interval, she had been attended by a Bengalese physician, who had given her *brandy*, and had also administered the tinctures of *mint* and *lavender* at short intervals, but without success. The patient had then vomited eight times, and had had twenty involuntary stools. When I saw her she experienced intense epigastric pain, burning thirst, sensation of scorching in the stomach and intestines, respiration interrupted, pulse small, intermittent, and almost insensible, cramps of the lower extremities, and general prostration of strength, and exhibited a Hippocratic countenance. She was incapable of voluntary motion, and lay in the supine position, except while the cramps were present. Her extremities were cold, her skin was dry, and she was passing viscous stools, of a black colour. I prescribed a mixture with *laudanum* and *camphor*, a spoonful to be taken every quarter of an hour. The next morning the pulse was increased in fulness and frequency, the heat was re-established, she perspired abundantly, and the evacuations were suspended. The same mixture was continued every hour. In the evening her condition was natural, and she had passed one sufficiently consistent stool. She now only complained of weakness, and was allowed to drink *Madeira* and *water*. On the third day she was entirely convalescent. Her subsequent nourishment consisted of *sago*, rendered aromatic by *canella*; and before her meals she was given a small glassful of a bitter wine.

CASE II.

S. L., of bilious temperament and irritable disposition, of robust constitution, small stature, and threatened with a bilious affection, took some hippo powder in the morning ; in the evening five grains of *calomel* ; and the following morning twenty grains of *jalap*, with two drachms of *cream of tartar*. Soon after taking this purgative he was seized with the *cholera morbus*. At noon, when I was called in, he had vomited six times, and had passed fifteen stools. I found him in the following condition : dreadful pain and tension of the epigastrium, ardent thirst, respiration slow, pulse frequent, hard, and small, with painful cramps of all his limbs. He constantly shifted his posture, was extremely weak, and perspired copiously. I ordered a mixture with *laudanum*, *camphor*, and *ether* ; and in the evening he was sufficiently recovered to walk about his room, complaining only of lassitude, with dryness of the mouth, and want of appetite. He came himself to visit me the next morning. I prescribed *arrow-root*, flavoured with *canella* ; and directed him to take a little *bitter wine* before his meals. His appetite soon returned, and his health is completely re-established.

CASE III.

Madame C., of thin and weak conformation, breakfasted on rice, and in half an hour was attacked with *cholera morbus*. Tincture of *mint* and *lavender* was repeatedly given her. I was called in at 5 P. M., at which time she had had from ten to a dozen stools. Her epigastrium was acutely painful, and she suffered dreadful sickness of stomach. She breathed slowly, her pulse was frequent and small, and she constantly changed her position. I directed a mixture of *ether* and *orange-flower water* to be taken in spoonful every half-hour. At 10 P. M. the epigastrium was exquisitely painful, but there was no vomiting. Her breathing was interrupted, and her pulse was small, with burning sensation in the abdomen, ardent thirst, cramps of the limbs, and prostration of strength. She lay in the supine posture, fainted frequently, and passed involuntary dejections : her countenance was decidedly *hippocratic*. A mixture was then ordered, containing *laudanum*, *camphor*, and *sulphuric ether*, a spoonful to be taken every quarter of an hour. The next day the cholera had disappeared ; but

as she continued weak, thin and pale *sago*, flavoured with *canella*, was allowed, and in two days her health was re-established.

CASE IV.

Mademoiselle H., of sanguine temperament and robust constitution, of the age of puberty, and having menstruated once, after eating at breakfast some unripe jujube fruit, was quickly attacked with the following symptoms. Epigastrium tense, and sensible to pressure; no vomiting, nor any alvine evacuations; painful nausea; pupils dilated; respiration painful and interrupted; pulse frequent, hard, and contracted; cramps; continual restlessness; copious sweating; and great anxiety. A spoonful of *laudanum*, *camphor*, and *ether*, was given every quarter of an hour, and the epigastrium was rubbed with *camphorated oil*. The symptoms soon abated; and in the evening she was much better. The next morning she was allowed *sago*, seasoned with *canella*; and was advised to take a glass of *bitter wine* before going to rest. In the evening she vomited two lumbrici, in consequence of which, on the third day, a *vermifuge purgative* was prescribed. No more worms, however, were evacuated; and her health is since completely restored.

CASE V.

[This, and the subsequent cases, were collected by Dr. Lefevre, chief surgeon of H. M. S. *Cleopatra*, during and after his stay in Manilla.]

On the 9th Jan. 1822, at 2 P. M., a sailor named Chevenne, æt. 45, of bilious temperament, after having eaten merely some soup and bouilli, became suddenly giddy, and would have fallen, had he not received immediate support from the bystanders, who perceived his condition. Immediately after, severe vomiting of bitter and acid matter set in, which irritated the throat. Involuntary dejections of liquid bilious matter occurred at the same time. The vomiting was only effected with great efforts; the breathing was quick; there was great pain in the stomach and belly, with cramps in the gastrocnemii muscles and the legs generally, hiccup, spasms of the pharyngeal muscles, and general convulsions, so severe that six men could scarcely restrain him. He shrieked

aloud. His pulse was rather full, but accelerated and hard, and the whole body was bathed in sweat.

A mixture containing 60 drops of *laudanum*, 45 of *ether*, 33 of *sugared water*, to be taken in spoonful every minute; and *dry frictions* to be assiduously performed over the body.

A part of the mixture was rejected, and a small *enema* was then administered. At 5 P. M. he was calm again, the pulse less hard, though frequent, the vomiting and purging gone, and the pain more endurable; but the thirst continues, and he perspires profusely.

Rice water to drink.

He slept at two intervals, from 8 P. M. to midnight. The pulse was then weak, and the patient quite overcome with fatigue.

To take, every second hour, a spoonful of a mixture composed of *laudanum* and *ether*, of each 15 drops, *peppermint water* 1 drachm, tincture of *gentian* 20 drops, and *water* 4 ounces.

On the second day the patient had slept since midnight, and passed urine. He complains of great weakness, but his appetite returns.

To have soup thrice daily.

On the third day he was perfectly well.

CASE VI.

Henri Caledec, a sailor, æt. 45, of weak and broken-down constitution, was attacked on the night of the 1st of February with vomiting of bitter matter, and copious dejections, accompanied with intense pain of the stomach and belly, which became yet greater on pressure; urine suppressed; mucous and bitter vomiting, with occasional dejections of a similar kind; hiccup; cramps of the lower extremities and hands; pulse extremely small, quick, and intermittent; respiration painful and short.

A mixture, composed of 15 drops of *ether* and 10 of *laudanum*, in 2 ozs. of *sugared water*, to be taken at once.

Mixture rejected, and again repeated, a spoonful at a time, with warm rice-water. A small emollient injection was also given. The vomiting, hiccup, and cramps continued, and extreme weakness supervened.

A mixture of 2 drachms of *mint-water*, 15 drops of *ether* and *laudanum*, 2℥ of tincture of *aloes*, in 3 ozs. of infusion of *camomile*;

a spoonful to be taken every quarter of an hour. Dry frictions to the limbs.

At noon no improvement.

Ammoniacal liniment to the epigastrium, to be followed by a *blister* in two hours.

At 4 P. M. the scene was evidently closing; all remedies had failed; the countenance became totally altered, the pulse imperceptible, and the voice choked; and at 7 P. M. he breathed his last.

CASE VII.

Stephen —, a sailor, æt. 26, breakfasted, as usual, at 7 A. M., on bread and weak coffee, and a small quantity of rum. At 9 A. M., after having been thrown into perspiration by a rather laborious exertion, he exposed himself to the air, and soon became unwell. At noon he vomited some half-digested food; and soon afterwards, a quantity of matter of a bitter taste. The stomach and belly became painful. Diarrhœa then occurred, of mucous, inodorous fluids, in consistence and appearance like mucilage of gum arabic. Considerable weakness; skin natural and dry; face of a pale yellow colour; pulse very small, nearly imperceptible; respiration short and frequent; voice feeble, and enunciation difficult.

Hot *tea*, with *sugar*, was given; and afterwards *rice-water*.

2 P. M.—Cramp of one of the *gastrocnemii* muscles; and the other was soon similarly affected. Vomiting and purging continue, but rather more moderate. Intense pain in the stomach and abdomen.

To have 20 drops of *ether*, in a little *sugared water*. Infusion of *flax-seed* for drink, to be taken in small quantities; and a small injection of the same materials.

3 P. M.—Ether not rejected. Abdominal pain diminished, but the cramps are more violent, and extend to the toes, and have occurred in other parts of the body, especially the neck, creating such violent pain that the patient cries out. His voice is, however, weak; and he complains of feeling very cold; pulse insensible at the wrist; respiration short and hurried.

To have 30 drops of *ether*.

4 P. M.—Slept a little. At 6 P. M. symptoms rather of a better kind; the pulse and heat have increased; the pains of the extremities diminished; but the head feels painful and heavy.

At 8 P. M. passed urine for the first time since the attack.

2d day.—Has slept well; complains only of fatigue; is convalescent.

SYMPTOMS.

It may be readily perceived that the preceding cases are strongly analogous to those communicated to the Royal Academy of Sciences by M. Deville.

I shall now endeavour, by an analysis of these cases, and from the scrutiny of the reports of different physicians who have observed this disease in the Isle of Bourbon, in India, and on board the men-of-war, to present a view of the symptoms strictly peculiar to the Indian *cholera morbus*. These I believe to be as follows:

Sudden.

The attack not preceded by any premonitory symptoms; often occurring after meals, or during the night.

Head-ache and pain of stomach.

Vomiting;—first, of alimentary substances; and, subsequently, of bilious, serous, and mucous matters.

Numerous involuntary dejections, of a grey or white colour, and rarely black or yellow.

Ardent thirst, and clammy sweat; pulse small, light, and contracted.

Great anxiety.

Cramp, supination, convulsions, trismus, and tetanic rigidity.

Alteration of the countenance.

Coldness of the extremities and trunk.

Hiccup.

Fainting; pulse and action of the heart almost imperceptible.

Voice weak and hoarse.

Respirations few.

And, finally, death.

It results, also, from the history of this disease, that it sets on by a state of spasm sufficiently violent to cause death in two, four, or six hours, or even in a few minutes, if immediate assistance be

not obtained. BUT, HAPPILY, ALL THESE SYMPTOMS MAY YIELD, ALMOST INSTANTANEOUSLY, TO THE PROMPT ADMINISTRATION OF ANTISPASMODIC AND ANODYNE MEDICINES.

This state of spasm and intense concentration of the malady seldom lasts longer than twelve hours, although, it is true, it has been known to be prolonged even an entire day, patients having been cured at that length of time by the description of remedies we have just mentioned. The duration of the entire disease varies, again, according to the intensity of the attack. The progress of the disease is, occasionally, more tardy than it was at Bengal, if we may judge from the cases observed at Bourbon, and on board vessels during their voyage. When reaction sets in, and the heat returns to the surface, an indication is afforded that the spasm has ceased, and that antispasmodic medicines (and those of an analogous kind) are no longer to be employed.

The phenomena peculiar to the *cholera morbus* diminish with the return of heat; but if the patient's strength be exhausted, if the belly continue tense and painful, if the stools are of bad quality, if drowsiness and delirium supervene, death takes place in four or five hours. On the contrary, when the abdominal pains abate, when the respiration becomes more tranquil, the heat is returning, and a moderate sleep is enjoyed, the disease terminates happily within seven hours, seldom or never exceeding this term.

In general the prognosis in the *cholera morbus* is of a gloomy description. Nevertheless, the diminution of the abdominal pain, of the vomiting and purging, the re-establishment of the natural temperature, a gentle moisture of the skin, peaceful sleep, discharge of urine, and the tinging of the stools with bile, are symptoms of a most favourable kind. On the contrary, intense pain of the bowels, excessive evacuations, suppression of urine, the supine posture, hiccup, giddiness, coma, convulsions, fainting, weakness and hoarseness of the voice, coldness of the body, and insensibility of the pulse, are omens of the worst description.

ETIOLOGY, OR CAUSES OF THE CHOLERA.

It has been considered that the last epidemic of Bengal was, previous to the period of its occurrence, a stranger to the country. The disease, however, is there known to the natives by the appellation of "*mordechi*," and by the Europeans as "*mal de chien*."

Bontius (*De morbus Indorum*) believed it to be a common affection in these countries: "*Etiam cholera hic familiariter agros infestat.*" According to Dellon, a French physician, who resided in India for many years, this disease was frequently seen there, and often caused death in a few hours. Dr. Lind says that the *mordechi* is a very common and dangerous disease in the East Indies. Lastly, it appears that an analogous epidemic raged in Bengal, in 1762. The most dreadful symptoms were, according to Le Begue de Presle, continual vomiting of pituita, or thick white and transparent phlegm. Thirty thousand negroes and eight hundred Europeans were its victims.

The Atmosphere.—It is a task of as much difficulty as importance to determine in an absolute manner the causes of diseases. As to those from which the *cholera morbus* has originated, the most contradictory opinions have been entertained. When a multitude of individuals are simultaneously attacked by the same malady, it is, doubtless, true, that its producing causes are of a general kind, or at least common to a great proportion of the population. For this reason it is that epidemics are usually attributed to the condition and influence of the atmosphere, which, of all morbid causes, is that to which mankind is most generally exposed.

An elevated temperature of the atmosphere has always appeared to be one of the indispensable requisites for the generation of *cholera morbus*, at least in its epidemic form. Yet the *mordechi* has shown itself in India, Persia, Syria, &c., under all diversities of atmospheric temperature; and this is one of the circumstances connected with the disease which seems at variance with the phenomena of the common *European cholera*, which occurs during the heat of summer and autumn. At Bengal, it was at first believed that the disease was occasioned by the warm and moist weather which prevails during the rainy season, about which time the disease commenced its ravages. But then the Europeans would have been its particular victims, whereas it is notorious that the natives were first attacked. Moreover, the disease has experienced no interruption to its continuance from vicissitudes of the seasons, having raged during the winter months of 1817-18. Indeed, after the cessation of the rains it became still more terrible than it was during the wet season. Again, a still greater degree of heat and more abundant rains may prevail in the same climates

without occasioning similar epidemics. Neither is the nature of the soil, nor emanations from marshes, essential and direct causes of the *mordechi*. It is asserted that the disease first appeared on the miry banks of the Ganges; but it has since reappeared and raged with fury in elevated places,—places perfectly dry, and free from stagnant waters.

Food.—The causes of this disease have also been sought for in the nutriment of the natives, and particularly in the bad quality of the rice, which constitutes the principal part of their food. In truth, the rice-harvest had been of a very inferior kind immediately before the disease made its appearance. A fact which tended to corroborate this opinion was, that the Europeans were then spared. But eventually those who eat no rice were attacked, and the epidemic continued after a new harvest had been collected.

In this state of uncertainty the adulteration of *table oil* was accused of having produced the calamity. The Bengalese are notorious for their perfidy and avarice, and an immense quantity of castor oil having been manufactured some time previously, and finding no purchasers in the market, the proprietors, to rid themselves of so valueless a commodity, mixed it with the other oils intended for domestic purposes, especially the oil of mustard, of which the natives daily consume considerable quantities. It is sufficient to add, that this suspicion has never received the least confirmation.

However the fact may be, the mode of living among the Hindoos and Eastern nations in general, is of a nature well calculated to contribute to the production of this disease. The former, as is well known, abstain constantly from animal food, some of them only partaking occasionally of fish. Their food, essentially, is composed of vegetables and fruits which have not yet arrived at maturity. Dry rice is the basis of their nourishment, and they usually add to this a handful of cool herbs, to which they are very partial. The flowers and stalks of different species of *nymphæa*, and the core, flowers, and green fruit of the banyan-tree, &c., are much sought after. They make but one or two repasts daily, and as the nutritive quality of their food is so meagre, they consume a proportionately greater quantity. It is true that their food is ordinarily seasoned plentifully with spices and aromatics, which correct, to a certain extent, the cold nature of their vegetable diet; but, on the other hand, the too frequent use of these acrid and

heating substances must also stimulate, and finally irritate, the mucous membrane of the stomach.

In accordance with the simplicity of their solid aliments, the only drink of the Bengalese is water, especially that of the Ganges, where this can be procured, although it is always impregnated with mud. It is well known that the Koran interdicts the use of wine and spirituous liquors.

But, doubtless, neither the exclusively vegetable diet, nor the privation of animal food and fermented liquors, could have operated in subjecting Europeans to the Indian *cholera*. For besides that they were attacked, proportionally, in considerably smaller numbers, some of them lived with the natives and followed many of their customs. Others, again, observed MODERATION in all things, and used a mixed regimen, and these, ALMOST TO A MAN, ESCAPED.

Clothing, &c.—The nature and quantity of the aliments may, then, be the determining causes of the malady; indeed, it is often seen to supervene immediately on the ingestion of food. On the other hand, although I do not ascribe more than a very indirect share in its production to the concomitant moisture and heat of the atmosphere, I must not say as much of the temperature of individuals themselves, and of the influence, under certain circumstances, of relatively cold air. The Hindoos are in general badly clothed and lodged, and usually lie on the ground. Their frames, dilated by the heat, are more than ordinarily exposed in these climates to the serious accidents which sudden refrigeration of the skin is liable to occasion. Indeed, it is not without reason that the suppression of transpiration from the surface of the body passes current as one of the habitual causes of the diseases of hot countries. It, doubtless, contributes, in no slight degree, to engender and perpetuate dysenteric fluxes,—affections which, in these climates, are of the most common and most fatal character, and which bear no distant analogy to the *cholera morbus* itself. The close and well-known sympathy which exists between the skin and the gastro-intestinal mucous membrane,—chilling of the air, especially when it succeeds an elevated temperature, causes the surface of the body to contract, and the internal fluids to lose their natural warmth, while the spasm which affects the skin is transmitted to the entire system, as is manifested by rigors and general trembling.

After a lengthened study of the causes of idiopathic tetanus, physicians have been forced to admit that it may be either produced, or aggravated, by a simple breeze, or the slightest motion of the air. But who is it who can give a satisfactory account of the qualities which the air may acquire under certain circumstances? Generally speaking, we understand its physical properties, but we are almost completely ignorant of the mode in which it co-operates in the production of numerous diseases.

Thus, either the impression occasioned by a certain degree of cold, whether proceeding from general diminished temperature, from scanty vesture, or ill-closed dwellings, or from indigestible, acrid aliments, raw and unripe vegetables, the use of pure cold water for drink, or baths, venereal excesses, and exposure to the cold moist air of night, exciting a primitive spasm of the skin, and affecting, concurrently, the digestive canals,—appear to be the *determining causes* of this fatal affection.



PHYSIOLOGY AND PATHOLOGY.

APPEARANCES AFTER DEATH.

The religion of the Hindoos and their veneration for the dead concur to prevent the prosecution of necroscopic researches on the bodies of the deceased natives in Bengal. Nevertheless, the English physicians have opened several bodies, and they have usually met with the following morbid alterations:—

Brain.—In the brain decided marks of congestion have existed, the sinuses and veins being gorged and distended with black blood, which sometimes was extravasated over the entire cerebral mass.

Lungs.—Some parts of the lungs were hepatised to the first degree, and their posterior surface was usually of a deep-brown colour.

Stomach and Intestines.—The state of the stomach and intestines varied according to the period when death supervened. If this event was of early occurrence, little change was remarked; the mucous membrane was injected as if by the dilatation of its natural vessels; some spots were occasionally found on its surface, but these were usually quite superficial, and readily disappeared. When the disease was more protracted, the inflammatory appearances were more strongly marked; the brown or black spots could no longer be effaced, and they appeared to occupy the entire thick-

ness of the several tunics. The great intestines were constantly pale, and no trace of bile was found in the alimentary canal; but it is asserted by several observers that its internal surface has been frequently found covered with a viscous matter, which they have compared with potter's clay.

At the Mauritius, M. Guillemeau thus describes his necroscopic observations:—*Encephalon* sound; *lungs* natural; right side of the *heart* full of black blood; left cavity empty. The *stomach* presented various alterations; either its vessels were injected, or it exhibited strong signs of inflammation, and lesions of the mucous membrane were occasionally seen in different parts of the organ, especially near its orifices, which sometimes appeared contracted in calibre. The liquids contained in its cavity were unchanged. The small intestines were in general healthy, while the coats of the *large intestines* were, as frequently, thickened. These latter phenomena were intense in proportion to the duration of the illness.

I shall here give an analysis of the *post-mortem* inspections, made by Dr. Labrousse, of ten negroes who died of the epidemic within twelve hours at the Isle of Bourbon.

After death, the *body*, exhibiting no appearance of putrefaction, was generally attenuated and lank, notwithstanding the robust formation of the patient previous to his decease.

In some, the *brain* presented no alteration; in others, on the contrary, its substance was preternaturally soft; the longitudinal sinus was gorged with blood, and the superior ventricles contained a small quantity of sero-sanguinolent fluid.

The *lungs* were unaltered; the *pericardium* contained but little serum; the *heart* was rather larger than usual; the *coronary vessels* were always gorged with very black blood; the *left ventricle* was empty, and the *right* usually filled with black coagulated blood. No adhesions were noticed.

The *gastro colic epiploon* and the external surface of the *intestines* and *mesentery* exhibited slight traces of inflammatory action, and their vessels were strongly distended.

The *gall bladder* was much distended, and contained thick, black bile. The *hepatic*, *cystic*, and *choledochus ducts* were nearly doubled in volume. The *liver*, *pancreas*, and *kidnies* offered no peculiar appearance. The *bladder* was extraordinarily contracted and perfectly empty. We found the *stomach* in some instances distended with gas; in many cases it was empty; in

others it contained a viscous, white or greyish liquid, and sometimes worms. The *gastro-intestinal mucous membrane* was healthy in some individuals; in others it was intensely inflamed, the traces of which affection increased in intensity from the *pylorus* to the *rectum*. The other tunics (except in the jejunum and ilium) participated in the inflammation, and their cavity frequently contained a sero-purulent fluid, and worms of the lumbrici kind.

The examination of ten other blacks, who died on the fourth day of their illness, after vomiting, and purging of stools of the most heterogeneous kinds, accompanied by cardialgia and colic, presented nearly the same phenomena in the three *splanchnic cavities*, except that the inflammation was more intense. Gangrenous spots were seen in the *small intestines*, and the matters contained in their cavities were the same as those passed by stool.

Such are the results of the examinations after death. What conclusions are we to derive from the data thus afforded?

In India, the English physicians considered the disease to be spasmodic and nervous. At the Mauritius, Dr. Michel took it for a typhoid affection. M. Labrousse regards it as a kind of ataxo-dynamic fever; M. Gouvier, government physician at Pondicherry, is the only author who describes the disease as a gastritis, although this is the sole analogy which should present itself to the mind of any physician practising in the arena of the epidemic. The questions, then, come to be decided, "Did the state of the stomach and intestines announce true inflammation of these organs?" "Did the patients really die of a gastroenterite?"

The examinations of dead bodies inform us well and sufficiently of the actions and changes which occur at the *close* of existence; but do they point out as clearly what took place at the *commencement*, or what passes in the progress of a disorder? The anatomical inspection only proves the organs to be no longer such as they were during the first morbid stage, that which is the most important to be understood, as it primitively constitutes the disease, and as it is during that period of the disease that remedies can be applied with the greatest hope of success. After that period, the pathological affection is no longer the same: it has degenerated. The tendency to death, and, finally, the cessation of organic action, induce changes more or less alien to the peculiar nature of the malady in its vigorous condition.

Although the word *irritation* is rather undefined, and still

leaves much to be desired, it expresses, better perhaps than any other, that state which immediately precedes the development of inflammatory action. Inflammation always pre-supposes a pre-existing irritation; but inflammation is not always its necessary result; for it varies according to the nature of the irritating cause, and the part to which that is applied. For example, when the cause is *moral*, it can only affect the nervous part of the organ, and then no inflammation (at least primitively) supervenes, although the existence of pain would seem to declare its presence. If the irritation do not at once affect the sanguineous vessels, the ordinary phenomena of inflammation may not develop themselves. The ingenious illustration of the effects of a sting, is exact for all the cases in which the inflammatory action succeeds. But cases occur in which the pressure of the foreign body does not give rise to either inflammation or suppuration; and this event is more frequent in the internal irritations, which do not depend on a mechanical cause.

Again; is not inflammation capable of terminating spontaneously, or of being arrested by other means than the employment of anti-phlogistics properly so called? It is not without reason that the propriety of resolving, discussing, and repercussive medicines has been admitted; but these remedies, especially the last, are all endowed with a certain energy. Meanwhile it will not be disputed that these remedies are capable, in certain cases, of being extremely useful, whether for preventing inflammation, or arresting, at once, its progress, and its previous result. Undoubtedly medicine would be more powerful if we possessed the means of discussing, resolving, or displacing an inflammation threatening to disorganize a viscus so essential to life. But if the means we employ are not *always* efficacious, they at least *sometimes* succeed, especially in the treatment of external diseases.

Finally; though these means did not always produce the desired changes, still it should not thence be concluded that the inflammatory state never yielded to their influence, nor even to the power of substances which would appear to us to possess entirely contrary properties. A wide interval lies between the emollients and the repercussives; nevertheless inflammation is advantageously combated by these two opposite genera of remedies. Has it not frequently happened that excitants, evacuants, &c. administered internally, have themselves produced revolutions or

revulsions of the most salutary kind? The application of these means is, without doubt, a matter of some delicacy, or even danger; but it is not the less true, that as inflammation does not always succeed irritation, irritation does not always require the effusion of blood, whether by lancet, leeches, or any other mode of detraction.

The nature of the means employed for the cure of cholera is not less opposed to the idea of its being an exclusively phlogistic disease. In fact, if it be nothing but a gastritis, or gastroenteritis, how does it happen to be so frequently arrested in its progress—all its accidents to be obviated, and its cure so speedily effected, exclusively by the administration of exciting remedies, such as *ether*, *laudanum*, and the like? It may be stated in objection, that the number of deaths has surpassed that of the successful cases. But still, what multitudes of patients have received no assistance at all, or have received it too late to do them effectual service. How many, again, died after being treated by the native Bengal practitioners, who neither prescribed *ether* nor *laudanum*. However considerable, in fact, the number of victims, it is, nevertheless, demonstrated, that many patients who have been in the most desperate condition, have been restored to health by these medicines; and it is by no means probable that so much and such rapid success would have been thus obtained, if the malady was primitively of an inflammatory type; or, in other words, had been an inflammation of the gastro-intestinal mucous membrane. The *cholera* is, certainly, an affection kindred to gastritis; but are these two diseases the same? The *eastern cholera* causes death in two, four, or six hours. Of all inflammations, there is not one which destroys life so quickly. Even the most corrosive substances are more tardy in their phlogistic effects. Moreover, it is affirmed, that no trace of inflammation was found in the alimentary canal, of those who were, so to speak, struck down by this awful affliction, as if by a thunderbolt.

A sufficiently remarkable peculiarity in this affection is, that the bile, which shows itself rarely in the matters passed by stool, or vomiting, also is not seen in the alimentary canal after death. The course of the bile is equally suppressed in spasmodic icterus. In that disease the dejections are, also, white, or pale-coloured, and an argillaceous matter has been found in the intestines, similar to that already spoken of as having been seen in the dissections of the cholera cases.

The first stage of this disease, then, appears to be essentially nervous or spasmodic. It is true, that the nerves—though much studied of late years as to their structure and functions—have not yet revealed, by any alteration in their tissue, the manner in which they are injured in the more violent and dangerous diseases. But does it hence follow, that they are absolutely passive in all pathological affections? What doubt can exist but that the pneumogastric and trisplanchnic nerves, which preside over the functions of the organs interested in this disease, participate, in some manner, with the disorder of these organs? The acute tortures of the patients are, in fact, a sufficient proof of this; and as the nerves are the conductors of sensation and motion, it is also by them that the spasm, communicating itself from the abdominal viscera to the diaphragm and heart, retards, and at length annihilates, the exercise of the respiratory and circulatory systems. How else can we account for the rapid mode of death which supervenes in six, or four, hours, or even, according to the testimony of some observers, in twenty minutes?

I consider, therefore, that these nerves, and their principal ramifications, are the seat of the spasm of the gastric organs which constitutes the first period of the disease.

That spasm predominates at the commencement, is proved by the symptoms already enumerated. If, again, by the action of remedies, or the unassisted efforts of nature, the patient is restored to health, this also concurs to indicate the solution of spasm, and the return to the peaceable and natural state of the functions. The colics are less vehement; the vomiting is diminished; the stools are less frequent; the temperature increases, and sleep steals on the patient. The moisture of the skin, the spontaneous discharge of urine and bilious dejections, all simultaneously announce the termination of the spasmodic condition of the skin, the urinary organs, and the excretory canals through which the bile finds a passage.

The *mordechi* must, then, be, primitively, nervous or spasmodic, and its almost instantaneous cure by antispasmodics and anodynes cannot be otherwise explained. Its action appears to have been more violent among the Indians, because, perhaps, they are of a more nervous constitution, and are less robust than the Europeans. However this may be, the danger is increased in proportion to the duration of the malady. Thus, Pison says, "*Si ante viginti*

quatuor horas non evadunt, succumbunt." After this period a change takes place; the symptoms of the disease are absolutely not the same; those of adynamia may indeed be observed, but I do not believe that this condition is of a febrile character. When febrile symptoms are witnessed, the previous disease was not simple spasm, or it has consecutively degenerated into inflammation of the digestive membrane. Then, however, when inflammation exists after the spasmodic state, the organic alterations observed in inflammations are easily induced, and thus the *mordechi*, though primitively nervous, or spasmodic, may eventually be converted into gastro-intestinal inflammation.

TREATMENT.

The treatment of diseases which run a precipitous course, admits of no temporizing measures; and of all pathological affections, the *mordechi*, or *cholera*, is perhaps, the most acute. Without doubt, the physicians who first were called on to give succour to the early cases of this disease, were *not* capable, if they *hesitated* in the choice of their remedial agents. They sought to appease the vomiting by various *alcoholic* liquors, by the employment of *opium*, *ammonia*, *calomel*, different *purgatives*, and even *emetics*. The appearance of bile in the dejections was considered a favourable symptom, and indicative of a happy termination of the malady. It was thought that the plan pointed out by nature was that of administering *cathartics*; but it was entirely forgotten that evacuations must be performed in proper time, in order to make them a relief, or to render them of any critical importance.

But is it not to be apprehended, that the administration of evacuants, when discharges have already been too frequent and abundant, may have the effect of exhausting still more completely the remaining strength of the patient, and hastening the development of the inflammation which ordinarily succeeds the spasmodic condition. No argument, at any rate, can justify the employment of *emetics*, even of *ipecacuana*. Such practice is a most false and desperate application of the dangerous axiom "*Vomitus vomitu curatur.*" In fact, remedies of this description have *always increased* the intensity and mortality of this disease. The sudden invasion and violent nature of the symptoms of the *mordechi* will always occasion numerous victims, before medical assistance can

be obtained, or a favourable change take place. The spasm with which the *cholera* sets in, may, as we have already stated, cause almost instant death by being propagated to the heart, and arresting the circulation. Again, MM. Deville, St. Yves, and others, have cut short, at once, the most formidable symptoms, by the use of *opium* and *ether*. Results, thus instantaneous, *indicatio a remediis*, add still further to the belief—indeed, prove beyond a doubt—that this malady *commences* with spasmodic or nervous disorder.

In the European *cholera morbus*, diluents and demulcents composed the principal part of the treatment in a majority of cases. Nevertheless, some physicians, deeming the disease to be of an inflammatory nature, have advised the *detractio of blood*, by venesection. But it is not enough in any case to advise methods of treatment. It is also necessary to demonstrate the practicability of their nature. *Bleeding* may certainly be practised with impunity in the average cases of *cholera morbus* in Europe; but such an operation, frequently useless in these cases, is not always free from danger. For example, when the disease is occasioned by aliments taken in too great a quantity; or, by aliments which are of an indigestible kind. But when the malady rages with its utmost violence, as it did at Bengal, the patient is in a few hours reduced to the most deplorable state; the pulse is small and weak, even to insensibility; the respirations grow tardy; the dejections are involuntary; and the body is chilled to an icy coldness. Are we to bleed in such cases? *Bleeding* is not practicable, and impartial observers have shown us that the operation was attempted in vain, and that no blood flowed. To practise this operation successfully, the patient must retain, or recover, a slight degree of warmth, and the action of the heart and arteries must be of at least a sensible degree of strength. Are we not compelled to act according to this fact in the most desperate wounds, in asphyxia by submersion, &c.? It thence follows, that when the body is cold, the respiration slow, and the pulse imperceptible, the *detractio of blood* would be pernicious, even if it were perfectly practicable. We must then have recourse to those remedies which have been successfully used under these circumstances, and we must postpone *the bleeding* to the period when re-action, restoring heat to the entire surface of the body, gives greater activity to the respiratory organs and the sanguineous system.

Nevertheless, if it be necessary to commence by opposing spasm, it is equally essential to avoid inflammatory results.

A just medium must, then, be observed, and this is secured by a *mixed* or *compound* treatment. Thus, at first, we should administer *demulcents* and *antispasmodics*,—means which, if effectual, will render all others superfluous; while, on the other hand, their employment will be abandoned if no good result is obtained, and then the practitioner will have recourse to *emollients*, *antiphlogistics*, and *revulsives*, or, in a word, to the antiphlogistic measures proper for gastro-intestinal inflammation.

It is not surprising when patients are in a perpetual state of vomiting, and reject all *fluids* given them to drink, that it should be imagined that refusing them liquids will effectually restrain the vomiting. I have seen this false principle put in practice, but the error was quickly perceived, and was no longer persevered in. Nevertheless it must be admitted that the return and perseverance of the vomiting are much encouraged by the ingestion of large quantities of fluids. In equatorial countries, especially, the stomach bears but impatiently the presence of a great volume of warm diluent drink. The Indians, whether from prejudice or disgust, refuse all our *infusions* and *ptisans*.

But, however this may be, *mucilaginous*, *gummy*, or *gelatinous* substances, should be given in drinks or potions, along with the *antispasmodic* remedies. Of these the *diffusible* are by far the most suitable—such as *Hoffman's liquor*, or *sulphuric ether*—a remedy which has already been productive of great success. This mode of treatment would certainly be by no means appropriate in cases of true inflammation; but it also seems as if its probable dangers had been greatly exaggerated: for since the action of these remedial agents is fugitive to a certain degree, they cannot induce the same inconvenient results as medicines the effects of which are fixed and persistent.

The Manilla physicians did not use *ether*, but gave *camphor* in combination with *opium*. The following is the formula which they adopted, and which constitutes an item in the series of instructions published in that colony—unhappily so much a prey to this disease:

Camphor, four grains,

Laudanum, seventy drops,

Rectified spirits of wine, one ounce.

Mixt the entire with an equal quantity of boiling water.

This mixture was given in a single dose, which was repeated every sixth hour, until some abatement of the principal symptoms was perceptible.

When the patients were in the state of extreme weakness or collapse, but the half of this dose was prescribed,—repeated every third hour.

Now the mixture containing *ether* and *laudanum* completely fulfils the proposed indication, and the *camphor* appears to me to be a superfluous, if not a dangerous, remedy. A substance so acrid and fiery, must, when placed in contact with the mucous membrane of the stomach, favour the development of the inflammation so essential to be avoided. Indeed, if this remedy have been administered with impunity, not to say success, it is an additional proof in favour of the arguments which I have so frequently adduced to show, that the first period of the disease is of a spasmodic kind, and unconnected with inflammatory action.

The quantity of *laudanum* above directed appears to me to be too liberal. I should fear that so large a dose might contribute to produce drowsiness, delirium, and engorgement of the cerebral vessels.

If the patient have experienced no relief after the administration of some doses of *ether*, we should not hesitate in adding to it an opiate preparation, such as *laudanum*. The happy effects of this remedy in the *European cholera* are well known when a free course has been allowed, for a certain period, to the evacuations. It causes the spasm of the stomach to cease, produces an effort of expansion which brings on diaphoresis, and, if sleep supervene, the patient awakes in the most satisfactory condition. As Pison has remarked, “Adeo nihil tutum ni somnum omni industriâ concilias.” I even believe that there is no reason to apprehend any unpleasant effects from the separate administration of *opium*, whether in the liquid or the solid form; and I would, of preference, recommend the watery solution of the extract of *opium*, in some mucilaginous liquid—the narcotic action of this substance not being capable of developing itself while the spasm is severe, as has been proved in the treatment of many other convulsive diseases. Rousseau’s *opium*, the action of which is milder, in consequence of its being deprived of the resinous principle, on this account would merit the preference. Are there not cases, moreover, in which the *opium*, while it dissipates the irritation, prevents, at the

same time, the inflammatory state which would otherwise supervene?

Once for all, I would again remind my readers that it is the *spasm* not the *inflammation*, which is the cause of death in the speedily fatal cases, viz., those ending in two, four, or six, hours. Besides, the employment of these remedies need not prevent the conjoint fulfilment of other indications.

Thus, then, all the means of dissipating or displacing the spasm, of moderating the violent pain, of opposing the tendency towards concentration and congestion in the interior organs,—all these should simultaneously and promptly be put in execution. Amongst the number of external applications which seem capable of effecting these objects, baths appear to me to inspire much deserved confidence, because the spasm first manifests itself on the surface, and its immediate effect is the speedy annihilation of the calorificity essential to the support of life. What can there be better suited to substitute a movement of expansion for that condensing power which is directed on the epigastric centre and its nervous connections? I would, moreover, wish, as a mode of increasing the action of the *baths*, to dissolve in the water, heated from 86° to 90° Fahrenheit, a sufficiently large quantity of *common salt*, in order that the stimulating action over the skin should be greater; pediluvia containing *mustard*, sinapisms, blisters, and the *actual cauterium*, are also revulsives, which should be employed. Frictions, long continued over the surface of the body, are also apt means of keeping up, or recalling, the necessary warmth, and of procuring a more equal distribution of sensibility. Dry frictions, with a warm towel, or a piece of flannel, are, I consider, preferable to those practised with liquids, even of the alcoholic kind, since the consequent evaporation of itself produces great cold.

As it is of great importance in this terrific disease to act instantly, in order to obtain prompt results, the immediate application of *boiling water* to the back of the feet, has been substituted for other vesicatories and rubefacients of more tardy action. It seems that in the late epidemic, the practice so familiar to the Indians in the time of Thevenot and Dellon, of *cauterizing the soles of the feet* with a red-hot iron, was neglected; a process of the efficacy of which Dellon was so convinced that, in the narrative of his voyages to India, he asserts, that having been himself attacked by this desperate disorder, he was cured by this mode of cauterization.

reasonable to hope that the cardialgia, vomiting, and diarrhoea, in a word, that the symptoms principally dependent on cholera, will yield to the employment of soothing, antispasmodic, and revulsive, remedies. Thus, then, in the first stage, if the patient either succumbs to the nervous or convulsive state, or if the symptoms are dissipated, as seen in the particular cases I have mentioned, and the health is re-established by a mild and moderate

was also the mode of treatment partly followed by M. le Huët in H. M. S. *Cybele*, and by M. Lefévre in the *Uranie*. On the 14th of August 1817, the first of these vessels returned from a cruise on the Chinese sea, and laid-to at Malacca, where fresh provisions were laid in for the crew. She again weighed anchor on the 18th, and continued to cruise in the Straits. On the 24th of the 4th day after her departure, several of the crew were seized with vomiting, bilious dejections, and evacuations, which obliged them to quit their watch. The violence of the phenomena, the pallor of the countenance, the weakness of the pulse, the coldness of the extremities, and the utter prostration of strength, excited the utmost alarm. It being impossible to mistake the nature of a fixed irritation in the digestive organs, notwithstanding the variety of the symptoms, M. Huët had recourse to *soothing and aperient drinks*. He employed rice-water injections, and opium infusion, and caused *oily embrocations* to be applied to the abdomen. These simple means were often sufficient to calm and moderate the evacuations; but if the violence of the symptoms continued, M. Huët gave *ether* and *opium* with

On the 22d January, 1822, His Majesty's frigate *Cleopatra* was in the Manilla road, Philippine Islands. On the 23d she was attacked, and she immediately showed itself on board, and on the following days, the number of men attacked became so great, that on the 7th day after her departure for Macao, Courson de la Ville Helio, commander of the frigate, was obliged to return for her departure for Macao. The number of cases had risen to 32, and seven had died. Eight days after her departure from Manilla, no new cases had occurred. The details of the disease are described by M. Lefévre will be found among the cases mentioned in the commencement of this memoir. I shall here limit myself to the quotation of one of his remarks: "I could not," he says, "persevere long in the employment of *soothing drinks*. From

these I obtained but little benefit, and the alarming condition of the patients forced me to have prompt recourse to *sedatives* and *diffusible antispasmodics*."

When the cessation of spasm, characterized especially by the return of heat, does put an end to the disorder, the concretions become less frequent, or are suppressed. The state of the patient is still dangerous; the epigastrium and abdomen continue painful and tense; and we may presume that a concomitant or consecutive inflammation of the gastro-intestinal mucous membrane exists. We must, then, attempt to combat this inflammatory disposition by *soothing drinks*, either *nitrous* or slightly *acidulated*, and by *emollient applications* to the abdomen, and by antiphlogistic remedies.

Evacuations of blood have not seemed to me practicable at the commencement of this disease, and during its cold stage they could only weaken still more the circulation, and oppose the return of the warmth and reaction which contribute so much to the preservation of the patient. Venesection, which is usually abstained from in the *European cholera*, although its performance is usually unattended with evil results, may occasion the instant destruction of the patient, in a situation where life only depends upon the remnant of vital heat which remains. But when the phenomena are no longer essentially nervous, it is wrong to ascribe the sequelæ to fever of an adynamic kind. The fever, in truth, if any exist—the weakness, the tension, and the sensibility of the abdomen, now belong to the inflammation of the stomach and intestines. Therefore, if the patient be young, and of good constitution, and of European birth, if the temperature of the body sustain itself, or become re-established; if the evacuations be diminished without any proportionate amelioration of the patient, the application of *leeches*, or *cupping-glasses*, on the parts adjoining the seat of the pain, will effectually contribute to moderate the irritation, and dissipate the inflammatory state of the abdominal viscera.

Neither must we abandon the use of revulsives, which are equally necessary now as in the first stage of the disease. For this purpose, *sinapisms* to the feet, or *blisters* to the legs or thighs, may be usefully employed. It is in the second period, especially, that happy results are obtained from *blisters*, and even from the use of *escharotics* applied to the epigastrium, by means, for example, of a sponge dipped in *nitric acid*. Nevertheless *cauterization*, by

fire, appears to me to be much more sure and efficacious than the action of the mineral acids.

Warm-baths may also find a place in the treatment of this disease. They are especially appropriate in the painful and inflammatory conditions of the abdominal viscera. M. Labrousse has had frequent occasion to appreciate their good effects.

The *mordechi* was now and then complicated by the presence of worms, but no such affection existed in the majority of cases, and worms were seldom found in the dead bodies. It is erroneous, therefore, to attribute to them a direct agency in the production of the disease, and they consequently afford no particular indication to be observed in its treatment. It was not with such an idea that the English physicians used *calomel*, but because they believed it a fit remedy for combating irritation and the inflammatory disposition. Indeed, the acuteness of this disease does not allow us to produce salivation, which they regard as one of the most important conditions of the action of this medicine in the affections against which they habitually use it. At any rate, when the patients have passed worms, it is not irrational to join the mild *muriate of mercury* to the purgative proper to be used after inflammation has subsided.



IS THE CHOLERA CONTAGIOUS?—PREVENTIVE MEASURES.

That department of medicine which has for its object the prevention of diseases, is by no means the least useful or important. It points out to individuals the precepts to be followed for their protection against threatened evils, and it embraces the highest physical and political considerations,—the precautions necessary to turn aside or arrest the ravages of popular diseases, whether epidemic or contagious. How, indeed, could this conservative art remain inactive amid such great calamities? Even though the measures it should propose were inefficacious or superfluous, they would, at least, have the great advantage of giving courage to the multitude, of keeping alive its hopes, and pointing out to it the termination of the evils with which it is afflicted or menaced.

Is then the *mordechi* or *Indian cholera* contagious, or simply epidemic? The latter character, at least, cannot be denied to it.

But has it at the same time evinced the property of spreading itself by contagion ?

In the examination of this question, it is necessary, in the first place, to disembarass ourselves of the confusion occasioned by similarity of words, which, though apparently different, conduct to the same conclusion. Thus the *European cholera* is certainly not a contagious disease, and the controversy did not exist,—the question was not even proposed,—at the time of the epidemic of which Sydenham has left us the history, nor even during the previous periods when *cholera* was epidemic in the East Indies. But at the same time it must be remembered, that the physicians who have admitted the contagion of this disease, did not consider it as *cholera*, but as an adynamic or typhus fever,—a classification which does not appear to us to be founded on just grounds. We cannot perceive the febrile nature of the *Indian cholera* any more than of the same disease in temperate climates.

The English physicians at Calcutta and Madras have decided against the contagious nature of this disease, in this respect,—that it did not appear to be propagated by actual contact. At the Mauritius, where it broke out at the time of the arrival of his Britannic Majesty's ship the *Topaz*, in November 1819, they were divided in opinion on the subject. In the *Cybele* and *Cleopatra* there was no reason for admitting the contagious nature of the disease. Nevertheless, it should not be forgotten, that this last vessel had not the *cholera morbus* on board when she watered at Manilla, and that it ceased quickly after she left the roadstead. Notwithstanding this, the superior authorities attached to the French colony at Bourbon, taking timely warning from the ravages of the epidemic in the Mauritius, neglected no precaution to oppose the introduction of the malady. Yet, despite every barrier, it penetrated into the colony. Some say it was brought thither by individuals who had clandestinely disembarked. The disasters at the Mauritius, however, had created such alarm, that measures were taken as well for the management of the epidemic, should it arrive, as for preventing its introduction. A lazaretto had been constructed, and the patients of Saint Denis were successively removed to this asylum. At the same time a cordon was established around the town; the colonists in the adjoining places were cut off from all connexion and intercourse with it, and the disease commenced and finished within its walls. Not only did it

not spread itself in the other parts of the island, but the total number of the patients amounted but to 295, while at the Mauritius it reached to 20,000. We may then consider the disease of Bourbon to be contagious, since the sequestration of the sick seems to have bounded or arrested its progress.

If similar preparations had been made at the Mauritius, even at the moment of the invasion of the disease, the mortality would not, perhaps, have been so dreadful. When a measure is not adopted, its possible results are of course problematical; but we are not entitled to say that its employment would have been useless. But is an epidemic malady always the same? Can it not be more or less modified by the situations in which it breaks out, and by numerous other circumstances? Contagion is regarded by many as a simple phenomenon, invariable and constant in its effects. For my part, I regard it, on the contrary, as being of a most complicated nature, fickle and variable in itself and its products. It has been observed, for example, that the *cholera morbus* was less fatal in elevated places and under low temperatures of the atmosphere. I also do not doubt that many diseases which are simply epidemic in their origin, proceed till they acquire the property of communicating themselves by contagion, when the numbers of sick and dead have swelled to a large amount. If a crowding together of a certain number of healthy individuals is sufficient for the rapid generation of serious maladies, why should not the nature of diseases become aggravated in proportion to their multiplicity? Thus, supposing that the *cholera morbus* or *mordechi* is not always contagious, it might still acquire that character in certain cases and in some localities, or by a greater accumulation of its productive causes. Small-pox is not commonly contagious with the vaccinated, yet it has been proved by many cases, that when small-pox rages as an epidemic, it may attack, though in an irregular and almost harmless manner, those persons who had previously been subjected to the influence of the cow-pox. While the English physicians concur in denying the contagiousness of *cholera*, in the restricted sense of the term, they still relate that the troops attacked with this disease communicated it to the inhabitants of the towns through which they marched; and they add, that a brigade was quickly freed from it when divided into numerous detachments.

Still, there is nothing in the phenomena or the nature of the

mordechi which appears susceptible of transmission from one individual to another. Spasm constitutes its first period; a gastrointestinal inflammation the second; but what is there of a contagious nature in spasm, or in inflammation? At any rate, irritation is the only process which we can suppose to favour the propagation of the first stage from one person to another. But on the other hand, it is evident, that in many eminently contagious diseases, such as the hospital, ship, and jail fever, changes produced by inflammation are commonly found after death. It is very probable that the hospital, naval, and prison typhus will never cease to be considered as contagious maladies. The inflammatory nature of a disease does not, therefore, exclude the idea of its being also contagious. It has indeed often been remarked, that septic miasms make their first impression on the stomach and intestines.

As occurred on other occasions, when diseases of another kind were manifestly imported into a particular place, so we see here, the explosion of the *cholera morbus* coinciding with the arrival of vessels. At Mauritius it broke out almost immediately on the arrival of his Majesty's ship *Topaz*; and when it appeared at Bourbon, it was after several men had clandestinely disembarked and found their way into the island. It is possible, at least, that the *cholera* might not have penetrated into the Mauritius and Bourbon if these communications had not taken place. This would suppose the existence on board these vessels of a material principle capable of propagating the disease. It could not spread itself among the population without leaving its former limits or focus of infection. This focus then is, whatever may be said to the contrary, capable of extension and multiplication. Moreover, infection, in whatever sense this word be understood, already supposes the existence of a malady transmissible in some manner, if not by direct contact.

Dr. Labrousse has followed, almost step by step, the route of the *cholera morbus* from the place of debarkation to the interior of the town of St. Denis, and he shows us that it took seventeen days to traverse a distance of three hundred yards. He relates, that two sick blacks having been removed to the place called Le Chaudron, the disease penetrated into two dwellings, and attacked six blacks in the one, and two in the other. The inhabitants, terrified by these events, at once insulated these individuals, and thus arrested the progress of the disease in that part of the island. The

same physician says, that in the house of a woman named Mamédy, a black was taken ill of this disorder. The Negress with whom he lived took care of him during the short time he had to live. Scarcely were his eyes closed, when she returned to her master's house, a quarter of a league from the place where the deceased was lying. Next morning she was herself attacked, and communicated the disease to a black in the same house, and to a slave in its vicinity.

The same physician informs us, that the prisoners in the jail, who were employed in the removal of the sick and dead bodies, all died in the discharge of this office; that at the lazaretto, two hospital servants alone escaped the contagion; that in the hospital, the *cholera* patients communicated the disease to the servants and other patients. Lastly, he asks, "By what prodigy is it that this disease, if truly epidemic, has had its ravages confined to a certain spot, and its further progress arrested by a cordon of armed men?"

The fact which I am about to relate is another proof of the efficacy of sanatory measures in restraining this affliction. In 1822, the approaches of the *cholera morbus* induced M. de Lesseps, the French consul in Aleppo, to take refuge, with all who chose to accompany him, in a garden at a little distance from the town. His asylum was surrounded by walls and a wide trench. It had but two doors or gates, and while the scourge was abroad, he admitted nothing from the outside without previously subjecting it to the precautions observed in the lazarettos. This colony of at least 200 persons, and composed not only of Europeans, who were more or less habituated to the climate, but also of several natives, had not a single case amongst them; while, in eighteen days, the *cholera* swept off four thousand persons in the town.

According to what precedes, we are entitled to attribute a contagious nature to the disease. If these considerations are not sufficiently convincing, if they leave our minds any longer in a state of uncertainty, it is because the question scarcely admits of a more complete and positive solution. But then, when we look at the proofs in favour of the inverse proposition,—namely, that of non-contagion,—we shall find them of an almost equally positive nature, and thus we rest in doubt. Which side, then, must the physician choose? He can only exclaim with the Roman orator, "Valeant cives mei, valeant; sint incolumes!" &c., and renounc-

ing the vain attempt, and conceiving and explaining every-thing, he will no longer consult aught but the public safety.

It is not, as we have already said, contagious diseases alone which call for the aid of a good medical police. Epidemics also depend on general causes, which affect a greater or smaller number of the population, and always render legislative and executive measures necessary. Finally, even sporadic maladies have their prophylactic treatment; and in the history of pathological affections, the physician does not limit himself to the exposition of their mode of cure, but points out also the preservative treatment. But how can we prevent or arrest the ravages of a disease which, like the *cholera morbus*, bursts forth in a moment, and strikes almost immediate death? It appears to me that, in this case, the danger is too great, too imminent, to permit of long discussions on the contagious or non-contagious character of the malady. Prompt action is necessary. We must not dread going a little too far if we are sure to reach our object.

Why is there such a prejudice against lazarettos and quarantine laws? The sanatory regimen pursued in Marseilles with such scrupulous exactitude, gives rise to no clamour, but is, on the contrary, the object of respect and public satisfaction. Must we recall to mind the deplorable periods when some cutaneous diseases, such as leprosy and elephantiasis, were common over Europe to such an extent, that hospitals for the reception of the lepers were essential to the public safety? No doubt can exist but that these establishments have essentially contributed to the banishment from amongst us of these plagues of human nature. Now-a-days, the spirit of *system* would, doubtless, oppose the execution of this great measure, on the ground that these maladies are not contagious. But it is familiarly known that they are perpetuated by hereditary transmission,—a particular mode of contagion not less dreadful than any other. No hesitation was then felt in shutting up, not only for a few days, but for their entire lives, the unhappy subjects of the leprosy, and thus the European blood was successfully purged of a virus with which we might have ourselves been contaminated, but for the sagacious severity of our ancestors. This rigorous, but essential, legislation is still in vigorous action in many of our colonies, where leprosy is common, especially among the blacks; and it is only by preventing

the cohabitation of the diseased with untainted individuals, that successive generations have been guarded from the wretchedness which such a malady entails upon its subjects and on many others besides.

The sanatory regimen prescribed by the law of the 3d March, 1822, and by the royal ordonnance of the 7th of August following, are, in general, applicable to the *cholera morbus*, should it threaten to introduce itself by our maritime communications. The example of what occurred at Bourbon, the happy conduct of M. de Lesseps at Aleppo, permit us to believe that it will not be impossible to prevent its spreading among the inhabitants of our sea-ports; it would, perhaps, find more facility in entering by our inland frontiers; but in that case, isolation and sequestration might still retard its march, abridge its duration, and diminish the number of its victims.

The immediate precautions to be adopted in a town menaced by so awful an epidemic, should be the prompt opening of lazarettos for the isolation of the first patients; for this is the strongest barrier which can be opposed to diseases reputed to be of a contagious character. The medical men should at the same time point out to the authorities, and the public, the probable causes of the disease, and the means which each should observe for counteracting, or avoiding, their influence. Finally; if, unhappily, the propagation or restriction of the malady have not been effected, nothing remains to be done but to imitate the excellent order established by the English in Madras, for information respecting which I am indebted to Dr. Conwell, member of the Bombay Board of Health. Two men in each street were charged with removing the patients into the hospitals, which establishments were so multiplied, that there was one for every three streets; so that the assistance necessary for the unhappy patients was administered with the utmost certainty and promptitude.



CONCLUSION.

From the facts just reported, and from the history and treatment of this disease, we may, I believe, deduce the following corollaries:

The *mordechi* is the *cholera morbus*, but an epidemic more rapid, more violent, more frequently fatal, and, perhaps, more readily transmissible.

The spasmodic state, perceptible in the *European cholera* at the onset, is more manifest in that of *India*, and permits the early administration of calming and revulsive remedies with greater chance of success.

When the heat of the body maintains itself, or is restored, we should exclusively attempt the prevention, or opposition, of the gastro-intestinal inflammation, by antiphlogistics, revulsives, &c.

It is dangerous for vessels to water, and stay, in a port which has recently been a prey to the *epidemic cholera morbus*, as is proved by the history of the frigate *Cleopatra*.

Finally, the measures prescribed by the sanitary laws appear to have prevented the invasion and arrested the progress of the Eastern disease.

THE END.

b. JZE. 23
1881



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