

Commercial. No. 38 (1883). Further reports by Surgeon-General Hunter on the cholera epidemic in Egypt. [In continuation of "Commercial no. 29 (1883)."].

Contributors

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COMMERCIAL. No. 38 (1883).

FURTHER REPORTS

BY

SURGEON-GENERAL HUNTER

ON THE

CHOLERA EPIDEMIC IN EGYPT.

[In continuation of "Commercial No. 29 (1883)."]

Presented to both Houses of Parliament by Command of Her Majesty.
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Further Reports by Surgeon-General Hunter on the Cholera Epidemic in Egypt.

No. 1.

Sir E. Malet to Earl Granville.—(Received August 28.)

My Lord,

Cairo, August 20, 1883.

WITH reference to my despatch dated the 6th instant, I have the honour to forward to your Lordship a Report addressed to me by Surgeon-General Hunter upon his tour of inspection in the districts which have been principally affected by the cholera.

Dr. Hunter has found evidence of the existence (1) of an epidemic of typhus prior to the outbreak of cholera, and (2) of cholera previous to the outbreak at Damietta; and he entertains grave suspicions of cholera having been endemic in Egypt since the epidemic of 1865.

I have, &c.

(Signed) EDWARD B. MALET.

Inclosure 1 in No. 1.

Surgeon-General Hunter to Sir E. Malet.

Sir,

Cairo, August 19, 1883.

IN the postscript to my Report of the 6th instant, which I did myself the honour of addressing to you, I expressed my intention of visiting the towns and villages situated on the banks of the Damietta branch of the Nile.

This duty occupied me from the 9th to the 11th instant inclusive. The railway traffic, consequent on the Quarantine Rules in force at Alexandria, was so restricted as to necessitate a special service being placed at my disposal by the Egyptian Government. The facilities thus afforded me enabled me to get through an amount of work which, even under ordinary circumstances, must have occupied some considerable time.

I was accompanied in my inspection by Mr. Gibson, Chief of the Cadastre, Major MacDonald, Military Attaché to the Agency, and Mr. Consular Assistant Cameron, my Secretary.

I inspected the following towns and villages:—

Tanta, Kafr Zayat, Mahallet-Kebir, Mansura, Talkha, Damietta, Gogar, Samanood, Shibin-el-Koom, and Benha, each and all of which have been visited by the epidemic wave, but are now happily free from it.

Although much had been done, by surface cleansing to put the places in some order, more especially at Tanta, which had had the benefit of Dr. Sidki Bey's capable administration, I found in every place ample testimony of that gross violation of all sanitary laws, which, unfortunately, is only too prevalent, go where you may, in this country. The rivers and canals in Egypt, instead of being protected, as they should be, from pollution, are ordinarily made use of as the easiest and readiest means of disposing of all dead animals, excreta, and refuse and filth of every kind and description.

If a small factory be erected on the banks of the river, the privies, as a matter of course, are built over the stream. It never seems to have struck any one that there was any other way of disposing of filth accumulation.

It was from the Damietta branch of the Nile that Mr. W. Goodall succeeded in removing 568 carcasses of cattle which had died of typhus, besides numerous portions of others which were all in a more or less advanced state of decomposition. In his Reports addressed to the Minister of the Interior, and which I have had an opportunity of seeing, he gives in detail the measures which he adopted for their removal and disposal by burial; and adds that the stench arising from the bodies was so intense as not unfrequently to cause attacks of fainting among the burying parties.

The cemeteries which I visited, with rare exceptions, gave off disgusting odours and cannot but be prolific sources of disease.

At Benha, for example, the dead, in numerous instances, were put into hollow structures (about 6 feet by 4 feet, and the floors of which are on the ground level), made of sun-dried bricks and mud, with a hole at one end through which the dead, one after the other, as occasion may demand, are thrust till the place is filled. During the intervals, this aperture is likewise closed by sun-dried bricks or mud. In the daytime, with a hot sun pouring on them, they can be little better than ovens, and the stench given off may be imagined. This cemetery is in close proximity to the town, and a couple of these so-called graves had been prepared for the reception of the dead within 50 yards of the hospital. My first duty on returning to Cairo was to call the attention of the Conseil Supérieur, at its meeting held on the morning of the 16th instant, to the disgraceful condition of this cemetery, and I readily obtained the sanction of the Council to the place being at once closed, and to a new cemetery being laid out on a site to the east of the town.

The hospitals, as a rule, were in a more or less tumble-down, dirty condition, impregnated with foul odours, and containing beds filthy in the extreme; they were, in fact, noisome places, utterly unfit for the reception of human beings. The hospital at Tanta alone may be exempted from this sweeping condemnation. Formerly a Government school building, it had been converted into a cholera hospital, and it was intended to utilize it in future for the accommodation of the general sick. Though it possesses radical defects of construction for hospital purposes, it was clean and in good order, and was a marked improvement on anything of the kind I had yet seen. It was, however, empty.

The medical administration was simply deplorable. I took the opportunity of examining the hospital registers. Here, as in everything else which met my observations under this administration, matters were as bad as bad could be. The simple narration of the mode in which registration is obtained in the smaller towns and villages may be sufficient.

It is quite rare and exceptional for persons suffering from disease to be seen during life by a medical man, unless it be a few of the better class, such as the Copts, Jews, Greeks, and richer Moslems.

The village barber is the registrar. He never, unless by chance, sees a patient during life. His functions apparently only come into operation after the death of the sick person, and, according to the statements made to him by the relatives or friends of the deceased, he enters on his register what he considers to be the cause of death, and then grants a permit for burial.

It is on such a system as this that the vast majority of the mortuary returns of the country is based!

For some time previous to starting on this tour my thoughts had frequently taken a direction somewhat as follows:—

This country has been visited by five epidemics of cholera since that of 1831, namely, in 1848, 1850, 1855, 1865, and 1883.

Diarrhœa is very common and fatal, and conditions for the development and spread of endemic and epidemic disease abound everywhere.

What is this disease which is here called "diarrhœa," and is so lethal?

With my mind possessed by thoughts such as these, I began to make cautious inquiries from medical men and others long resident here, and I found that cases of "cholérine," as by a euphemism they term the disease, are not unknown, and have been seen by one and another from time to time.

Dr. Sonsino, an able and scientific man practising in Cairo, informed me that he had met with one or two instances, and that his cousin, Dr. Ambron, who had been long resident in this capital, but who was now temporarily absent in Italy, had informed him that he also had come across one or more cases. Dr. Sonsino has

written to Dr. Ambron for the necessary details, and I am daily looking for his reply.

Next, I was told by Dr. Sonsino, that instances had been reported as having occurred for some years past at Alexandria, and that he would write to a friend of his, Dr. Sierra, for information. In due course the reply from Dr. Sierra was received and is inclosed.

On perusal it will be seen that cases of "cholérine" have been noticed for some years past in Alexandria, by other doctors as well as by himself, "not with any frequency; say, perhaps, two or three every year." By the term "cholérine" Dr. Sierra means "vomiting, and very copious diarrhœa, accompanied with a marked weakness of pulse, hollowness of the eye cavities, and difficult reaction."

Dr. Sierra further makes reference to a report that two cases of cholera had been received into the European hospital in May last; this latter statement I shall take the opportunity of verifying on my visit to Alexandria.

Dr. Sierra's facts are of great value; his conclusions, however, I cannot accept.

It was also intimated to me (from a source which I have forgotten) that cases of cholera had occurred at a Greek school in Damietta previous to the outbreak of the 22nd June.

Possessed of this information, I prosecuted careful inquiries among the towns and villages I visited, and while doing so, ascertained, to my great surprise, that an epidemic of typhus had existed in the Delta during the early part of this year, and prior to the outbreak of cholera.

I further came to the conclusion that many of these so-called cases of diarrhœa were really examples of what in India we should call cholera.

At Damietta, after some little trouble, my diligence was rewarded, and I had the satisfaction of testing the truth of the statement made to me:—

1. Two Coptic priests (named Sadarros Yusuf and Gergis Hanna), after being carefully interrogated, informed me that a Coptic boy, named Hanna Gergis, aged 5 years, belonging to their school, had died of all the symptoms of cholera on the 17th June.

2. A Greek priest, Michael Herodiades, whose statement was corroborated by the Deacon, at the Greek school, said that last May one of their scholars, Anton Nicolaïdes, aged 8 years, was attacked at Damietta with excessive vomiting and prostration, but had no purging. The priest could give no details as to the suppression of urine. The lad was taken by his mother to Mansourah, where he died in twenty-four hours.

At Shirbeen I accidentally met with Dr. Dutrieux, a medical practitioner of Alexandria, who is employed by his Excellency Shereef Pasha in making inquiries into the cause and origin of the epidemic, and on discussing the question I discovered that his investigations had led him to conclusions similar to my own.

Shortly after my return to Cairo I received the following telegram from him, dated the 13th instant: "I have been to Feraskor to get serious information as to date of cholera at Damietta; returned to Damietta expressly to verify. Have received declarations in five cases: Two Greek children died 27th April; one day's illness, cyanosis, aphony, algid state, no vomiting, no diarrhœa. Another Greek child, ill about six months; vomit, cramps, aphony, algid state, without diarrhœa; death after six days. Arab barber, ill two or three days, towards end of April, after vomit and diarrhœa. Arab shop-keeper, dead after twenty-four hours' vomit and diarrhœa. These facts are positive.—DUTRIEUX."

I also inclose a copy of Dr. Dutrieux's Report on the above cases, dated Belkas, the 15th August.

These facts are very significant and of the first importance. They lead to the conclusion that cholera, be it called by whatever name it may, as Asiatic, epidemic, sporadic, cholera "nostras," cholérine, &c., has existed in Egypt for some time past, and that in many instances the diarrhœa, which is so common and deadly, is but a form of cholera.

As there are varying degrees of fever, so in like manner there are varying degrees of cholera. It may manifest itself, in an endemic or epidemic area, as a slight looseness of the bowels only, readily amenable to treatment, or as a sudden paralysis of the vaso-motor system of nerves, which may rapidly end in death, and is beyond the reach of any known therapeutic agent.

In order to obtain as much information as possible on the subject above referred to, instructions have been issued to the medical officers recently arrived

from England to institute cautious and careful inquiry in the districts under their charge and to report the results to me.

In the face of such facts as the above, it is hardly worth while to discuss the oft-repeated and as often-refuted story of the importation of the disease from India into Egypt by Mohammed Khalifa, a stoker of the steam-ship "Timor;" but if it were, I might call attention to the inclosed Report—"Le Choléra de Damiette en 1883, Origine et Développement." Par Ahmet Chaffey Bey et Salvatore Ferrari." These two medical gentlemen, firmly convinced of the importation of the disease into Egypt from India, instituted an inquiry into the matter, with the full anticipation of obtaining a confirmation of their opinions. Instead of this, they are forced to the conclusion that the disease had not been so imported, and that there existed in the deplorable unsanitary condition of Damietta itself sufficient cause, as they believe, for the origin and development of the disease. To their Report is added an Appendix on the chemical and microscopical examination of the water at Damietta, which shows that the water drunk by the inhabitants has been in a state of putrefaction. The Nile water at Cairo, I may here add, was, in July, prior to the rise of the river, and at the time of the outbreak of the epidemic, also found, on being subjected to chemical and microscopical examination, to be undergoing putrefactive changes.

While this Report has been under preparation I have received from Dr. Ambron, as also from Dr. Sonsino himself, statements showing that each had had under observation in Cairo a case of cholera, the former gentleman in 1867, the latter in 1873.

Dr. Ambron says: "I am not quite sure of the year, but I believe it was in 1867, that I saw a case in the person of Dr. Giovanni Martini, who being called out at night to an accouchement, wrapped himself up in a woollen scarf which he said he had used only during the epidemic of 1865. A few hours later he was seized with fainting, then with vomiting and diarrhœa, and had all the phenomena of cholera with the algid state, and aphony, but recovered."

Dr. Ambron, like the majority of the medical men in this country, is a firm believer in the importation of the disease from the delta of the Ganges, and unless it can be so traced, he declines to accept what would seem to me to be the evidence of his own senses. It is this fixed idea of importation that renders inquiry so difficult, and causes all the believers in such a hypothesis to ignore testimony which to an unbiassed mind would be plain and clear. It does not fall to every one's lot to be able to shake off preconceived opinions, as in the case of Dr. Dutrieux, Dr. Sonsino, and a few others whom I could name, and to accept facts as they see them; could they do so, I cannot avoid the conclusion that little difficulty would have been experienced in supplying the links in a chain, which probably, at this distant period, will never be found.

I inclose some data taken from the official Returns of the death-rate in Cairo, in 1881 and 1882, and from some of the hospitals visited in my tour.

Dr. Sonsino supplies me with the following instance:—

"Tomaso Bonassi, of Leghorn, lapidary, was seized with 'cholérine' on the 13th May, 1873, and suffered from diarrhœa, vomit, algid state, and sunkenness of the eye cavities. He recovered after twenty-four hours.

"In November 1874, the same man, while an invalid from an abdominal abscess (in the walls of the abdomen), was again attacked with 'cholérine,' much more severely than the first time, but recovered, and is now in good health."

I also take the opportunity of drawing attention to some highly interesting atmospheric phenomena, which have come to my notice, as having occurred during the epidemic of 1865, and also during the epidemic of the present year.

Mr. R. Borg, Her Majesty's Vice-Consul in Cairo, who has devoted much of his time to sanitary matters, informed me that "when cholera was at its height in 1865, in the capital, the sky was lead-coloured, the atmosphere oppressive, so as to render breathing rather difficult at times, and the town of Cairo, as seen from the Mokattan Hills, seemed to be enveloped in a spherical cloud of thick mist during three consecutive days." He also observed that the sparrows deserted the town, and did not return until the epidemic was on the decline.

These observations have been verified by others.

Dr. Gilbert Kirker, M.D., medical officer of Her Majesty's ship "Iris," has, at my request, been good enough to forward me some instructive meteorological data made by him during last June and July, at Port Saïd, Alexandria and Damietta; a copy of these is inclosed.

The chart for the month of June is the more important, as it was at that time that the epidemic broke out. His views are more definitely expressed in a letter addressed to the Editor of the "Egyptian Gazette," dated Port Saïd, 28th July, 1883, and published in that journal on the 1st August. He states that the meteorological phenomena antecedent to, and during the outbreak at Damietta, may be divided into two periods: during the former period (28th May to the 23rd June), the winds were variable, many of the nights were almost or quite still and cloudless; the humidity of the air being excessive, at one time on the 12th, 13th, 14th, and 17th June being at saturation point (100), the average varying from 91 to 92; and there was no rain. In the latter period, from the 23rd June to the 6th July, the relative humidity was only 78 and 82, at 9.30 A.M. and 11 P.M. On the 24th June the sea breeze was established, the wind blew during the day from the north-west, veering round towards the south-west during the night and early morning, and there were no calms.

I am able, by the kindness of Brigade Surgeon McDowell, A.M.D., Sanitary Officer of the Cairo district, to forward a copy of his Report, to the effect that when the epidemic was at its height on the 23rd July, a very peculiar condition of the atmosphere was observed; a yellowness of the air, somewhat of the nature of a fog; and it was quite calm. The sparrows, it was noticed, had deserted the place, and did not return till the 26th July. On the night of the 23rd July the cholera first attacked the British garrison at Kasr-en-Nil, Abassieh, and the Citadel.

It is curious to note that the Arabic phrase for cholera is "the yellow air" (el-hawa-el-asfar), and that the fact of birds deserting a place at such periods has also been remarked by the natives.

This Report has now reached such a length that I must bring it to a close, and defer what I have to state to another occasion. The facts, moreover, to which I have drawn attention, appear to me of so much importance that I feel no delay should occur in bringing them to the notice of Her Majesty's Government.

I have, &c.

(Signed) W. G. HUNTER, M.D.,
Surgeon-General, on Special Duty.

Inclosure 2 in No. 1.

Dr. Sierra to Dr. Sonsino.

(Translation.)

Dear Sonsino,

Alexandria, July 31, 1883.

I HAVE no written notes wherefrom to answer your question; I must trust to my memory; but I am sure that what I remember and shall tell you, I remember well. After the small epidemic of 1866 I sometimes saw cases of cholera in Alexandria. I do not remember having attended to such cases all through the year, but I certainly saw some during the summer. During summer and especially in the season of water-melons and fruit it is common enough to have cases of gastric disorder; pains in the stomach, diarrhœa, and vomiting have always been very frequent in that season and especially among the lower orders, but I do not call this cholera. By cholera I mean a copious vomiting and diarrhœa, accompanied by a marked fall in the pulse, agitation, sinking of the eyes. Without, however, being able to fix the exact date, I remember having seen a Jewess with these symptoms where they lasted more than eighteen hours, and where the reaction was very difficult to bring about. I also remember that when I had such a case in my practice and mentioned it to a colleague, I was told that similar cases had occurred in the town; but never more than two or three cases in a year. I never saw any cases of sporadic cholera, cholera nostras. I have lately questioned some doctors of the town, and have been told that a few congeneric cases have been noted by them also. In the European hospital two cases were admitted in May, which the Sisters told me showed choleraic symptoms. One of these died, the other was cured; he is now in the hospital with other ailments. These are the facts which have come under my observation. I should not like, however, that any one wishing to draw deductions in order to demonstrate any theory, should separate these facts from my opinions on them. Let me explain myself. I do not think that the existence of cases of cholera can be a sufficient reason for those who study epidemiology to admit on that account that the present epidemic arose in the country; cholera nostras and cholera occur often enough in large cities, such as Paris and perhaps

in others, the death statistics of which are not published in the newspapers, and for that reason I do not think that it can be inferred that the germ or micrococcus of cholera is developed and lives in those countries by means of these few isolated cases. But on the other hand, the breaking out of a true and real epidemic which afterwards communicates itself through human contact to other countries, and which travels from place to place, is a sufficient reason for admitting that the contagious germ arose in the place first infected, saving only the necessity of showing whether this infection took place by importation or arose antothonically. Importation should, so to speak, be proved by careful inquiry before being admitted; yet, on the other hand, the theory of the production of the germ on the spot leads to conclusions which are perhaps even rasher still from the point of view of scientific logic; it would lead, as I believe, to affirming that the contagious germs are produced spontaneously, a statement of which there is as yet no proof derived from experiment.

Nor can the spontaneous generation of the *contagium* be proved from the fact that the choleraic germ is often produced at the mouth of the Ganges. The ferment exists there, and reproduces itself in greater abundance than elsewhere under certain conditions of dampness, &c. It has been urged that the same circumstances and conditions are found at Damietta as in India,—marshy soil, low water, carcasses of animals that have died of bovine typhus;—but doctors who have lived long in Egypt know that while the above-mentioned cosmo-telluric conditions are found often enough at this season at the mouth of the Nile—we have before now had to deplore the accumulation of carcasses in the river—cholera has, nevertheless, not broken out in Egypt.

I certainly have no intention of pronouncing for either of the contending theories. I know that I am not in a position to attempt the solution of so difficult a problem, even if it were only that I have not the necessary knowledge of the places and the opportunity to make the necessary investigations. But I think that the present state of science urges us to be extremely reserved in affirming either theory, if we wish to act in the rigorously scientific manner in which the Tyndals, Pasteurs, and other great men proceed in their investigations as to ferments and their propagation.

As you truly say, we doctors of Alexandria are indeed very busy; you, in fighting the enemy; we, in preparing you for the fight, organizing District Committees, establishing ambulances, Committee meetings, drawing up plans, &c. I am now busy for the European Hospital, where I now am *ad interim*.

I have had some experience of cholera cases in my own hospital. A man who came sick from Cairo—the case ended fatally; cyanosis was very marked, the pulse was *nil*, the fall in the temperature of the body was extreme, as also was the difficulty of breathing, there was not much diarrhoea or vomiting, there was no reaction. Two other cases were less intense; the watery evacuations were but small in quantity. Reaction soon set in, and perhaps they will recover. The same mild symptoms have been noted elsewhere in other cases. This would perhaps warrant a belief that the *virus* has become weakened, and that we in Alexandria may be spared a violent epidemic.

No centres of infection have as yet shown themselves in any quarter of the town, in the neighbourhood of the cafés, where the disease has attacked people. It is true that disinfection is being performed, but I do not think that even now the operation is carried out with the care and rigour required for stamping out and destroying the contagious germs, and much less that it was so carried out at first.

(Signed) SIERRA.

Dr. Dutrieux to Chérif Pasha.

Excellence,

Belcasse, le 15 Août, 1883.

J'AI l'honneur de vous adresser le Rapport annoncé par ma dépêche du 13 courant sur les investigations médicales auxquelles je me suis livré à Feraskour et à Damiette, et qui ont abouti à des résultats aussi importants qu'imprévus.

Parti de Cherbin pour Ras-el-Khalig dans l'après-midi du 11 courant, j'y suis arrivé vers 4 heures. Le train s'arrêtant en ce point j'ai dû aviser aux moyens de gagner le plus promptement possible Feraskour. Le mauvais vouloir des Cheikhs des villages de Sirou, Dahali, Barachié, Kafr-Sinnawi, et Kafr-Arab a été tel que je n'ai pu m'y procurer aucune monture. J'ai dû me résoudre à faire à pied le trajet de Sirou à Feraskour. Je n'ai pu trouver à Sirou qu'un jeune fellah qui ait consenti moyennant salaire, à porter ma caisse à médicaments jusqu'à Barachié; j'ai porté moi-même mon valise jusque-là. Entre Barachié et Kafr-Sinnawi j'ai pu engager deux Bédouins, qui se sont chargés de mon bagage. Je suis arrivé en vue de Feraskour à 8 heures et demie du soir, après plus de trois heures de marche, ininterrompue de long du Bahr-el-Cherawi. J'ai été l'objet à Feraskour des attentions les plus hospitalières du Directeur de la maison Patrino, et ces attentions m'ont été précieuses, épuisé de fatigue comme je l'étais.

Les Cheikhs des villages susmentionnés paraissent ignorer qu'il existe une Circulaire Ministérielle, datant de plusieurs années, leur recommandant de prêter aide et assistance à tous les étrangers qui y feraient appel en passant dans leurs villages, à moins que ce ne soient des marchands venant dans ces villages pour l'intérêt de leurs affaires personnelles. J'ai eu beau dire sur mon passage que j'étais un "Hakeem-el-Miri" (Médecin du Gouvernement). Cette déclaration a produit l'effet contraire à celui que j'en attendais. J'ignore si c'est la peur des cordons qui continue à obséder les Cheikhs, ou s'ils ont des motifs secrets de contrarier les investigations des médecins du Gouvernement.

Dans la journée du 12 courant j'ai fait mes observations médicales à Feraskour. J'y ai obtenu, par hasard, de M. Antonio Patrino, employé de la maison Patrino, et parent du chef de cette agence importante, des indications et des informations si précises concernant la ville de Damiette, et l'époque à laquelle les premiers cas de choléra y auraient apparu, que je me suis décidé à me rendre sur les lieux pour vérifier les faits. M. A. Patrino est un habitant de Damiette; il ne fait que passer quelque mois à Feraskour.

Parti de Feraskour, à cheval, le 13 au matin, je suis arrivé à Damiette après un trajet de deux heures. M. A. Patrino m'accompagnait.

Voici le résumé des déclarations si importantes que j'ai recueillies :—

1. Le Vendredi qui a précédé la Pâque Grecque (le 27 Avril) les deux enfants de M. Kyriako Joanni, employé au service de l'Eglise Grecque, âgés l'un de 4 ans, l'autre de 5 ans, sont morts en vingt-quatre heures. Tous deux sont devenus noirs (cyanose). Ils avaient la peau très froide (algidite). Ils avaient la voix éteinte (aphonie). Ils n'ont eu ni vomissements, ni diarrhée.

Ces détails textuels m'ont été donnés par le frère aîné de ces enfants, jeune homme de 25 ans environ, M. Joanni Kyriako, en présence de M. Patrino et du prêtre Grec, M. Pappamichaël.

Je n'ai pu recueillir sur ce fait intéressant aucun autre renseignement positif.

(Il est bon de remarquer, dès maintenant, que des cas de ce genre ont été signalés par les auteurs qui ont écrit sur le choléra, sous le nom de "choléra sec foudroyant." "Quelques-uns périssent même," dit le Dr. Desnos, "sans que les évacuations aient eu lieu, par le seul fait de la violence de l'anxiété épigastrique et des crampes.")

2. Une semaine après la Pâque Grecque, vers le 6 Mai, par conséquent, un fils d'un nommé Nikolaïdi, âgé de 8 ans, a présenté les symptômes suivants : vomissements, puis des crampes, peau très froide, aphonie. Il n'a pas eu de diarrhée, du moins à la connaissance de mes trois interlocuteurs. Il est mort après six jours de maladie en tout, à Mansourah, où on l'a porté vers le quatrième jour.

J'ai recueilli ces détails sous la dictée de mes interlocuteurs, qui, pour désigner les crampes, emploient l'expression "el tetano" et le mot "spasmus."

3. Un barbier Arabe, très connu à Damiette, nommé Abdou, est mort vers le 29 Avril, après avoir été pris de vomissements et de diarrhée. En tout, il n'a été malade que deux à trois jours. Le jour de sa mort même, il serait encore allé à sa

boutique. M. Patrino connaissait ce barbier chez qui il allait souvent se faire tailler la barbe. Tous les voisins de ce barbier lui ont dit qu'il est mort de vomissement et de diarrhée. M. Joanni Kyriako confirme cette déclaration de M. Patrino.

4. Un indigène, marchand de tabac, nommé Bedri, est mort environ deux semaines après la Pâque Grecque, vers le 13 Mai, après avoir été pris de diarrhée et de vomissements. Ce fait m'est affirmé par mes trois interlocuteurs, qui ajoutent que Bedri, le matin même du jour où il est mort, vaquait à ses affaires dans son magasin.

5. Enfin, M. A. Patrino déclare que toujours vers la Pâque Grecque, deux femmes Grecques, habitant la même Okelle que lui à Damiette, y ont été malades pendant deux jours, de vomissements et de diarrhée ; elles se sont ensuite rétablies.

Je considère ces faits comme démontrant que le choléra existait à Damiette dès la fin du mois d'Avril (de même qu'il existait au commencement d'Avril à Mahallet-Damara sur le Bahrel), comme l'ont établi les recherches dont j'ai fait un exposé succinct dans mon deuxième Rapport. Le résultat de mes investigations comporte les conclusions suivantes :—

1. Le choléra qui a apparu épidémiquement à Damiette le 22 Juin n'y a pas été importé.

2. Il existait, bien avant le 22 Juin, sur plusieurs points de la Basse-Égypte, des foyers cholériques.

3. L'épidémie cholérique qui sévit en Égypte n'est pas le choléra Asiatique ; c'est un choléra local.

Je me réserve de développer longuement ces conclusions dans mon Rapport terminal.

(Signé) DR. DUTRIEUX.

(Translation.)

Excellency,

Belcasse, August 15, 1883.

I HAVE the honour to submit the Report I stated that I was writing in my despatch of the 13th instant, on the medical investigations I have made at Feraskour and Damietta, which have been no less unexpected than important.

I left Cherbin for Ras-el-Khalig on the 11th instant in the afternoon, and arrived about 4. As the train went no further I had to do what I could to get to Feraskour as soon as possible. The Sheikhs of the villages of Sirou, Dahali, Barachieh, Kafr-Sinnawi, and Kafr-Arab showed such ill-will that I could get no beast there ; so I had to go on foot from Sirou to Feraskour. At Sirou I only found a young fellah, who, on payment, consented to take my medicine-chest to Barachieh ; I had to carry my own trunk as far as that place. Between Barachieh and Kafr-Sinnawi I succeeded in hiring two Bedouins, who carried my baggage for me. I arrived in sight of Feraskour at half-past 8 in the evening, after more than three hours' continuous walking along the Bahr-el-Cherawi. At Feraskour I enjoyed the hospitality of the resident director of MM. Patrino and Co., which was most welcome to me, as I was exhausted with fatigue.

The Sheikhs of the above-mentioned villages seem quite ignorant of the Ministerial Circular issued some years ago, ordering them to give assistance to all strangers passing through and standing in need of it, except to the traders coming to the villages on their business. It was no use telling them that I was a "Hakim-el-Miri," or Government doctor. This statement produced an effect the contrary of what I expected. I do not know whether the Sheikhs are still afraid of the "cordons," or whether they have secret reasons for opposing the investigations made by the Government doctors.

On the 12th I collected at Feraskour information on medical points. I happened to get from M. Antonio Patrino, in the service of MM. Patrino and Co., and a relation of the head of that important firm, evidence and information respecting Damietta, and the date of the first cases of cholera, of so precise a nature that I decided to go there to verify the facts of the various cases. M. A. Patrino lives at Damietta, he was only passing a few months at Feraskour.

I left Feraskour on horseback on the morning of the 13th, and got to Damietta in two hours. M. A. Patrino came with me.

The following is the substance of the important statements I obtained :—

1. On Friday before the Greek Easter (27th April) two children of M. Kyriako Joanni, employed in the service of the Greek Church, aged 4 and 5 years respectively, died in twenty-four hours. Both turned black (cyanosis). The skin was

very cold (algiditis). Both lost their voices (aphony). They did not vomit, nor did they have diarrhœa.

These details were given to me by the elder brother of these children, a young man of about 25, M. Joanni Kyriako, in presence of M. Patrino and the Greek priest, M. Pappamichaël.

I did not succeed in getting any other reliable evidence concerning this interesting case.

(It should be here observed that cases of this kind have been noticed by writers on cholera, under the name of "dry malignant cholera." "Some die," says Dr. Desnos, "even before the evacuations have commenced, merely from the violence of the epigastric spasms and cramps.)

2. A week after the Greek Easter, about the 6th May therefore, a son of a man called Nikolaïdes, 8 years old, showed the following symptoms: vomiting, then cramp, very cold skin, aphony. He had no diarrhœa, at least so far as the persons I questioned knew. He died, after an illness of six days in all, at Mansourah, where he was carried on the fourth day.

These details I took down from the actual words of my informants, who used the words "el tetano" and "spasmus" to designate cramp.

3. An Arab barber, called Abdou, well known at Damietta, died about the 29th April, after being attacked by vomiting and diarrhœa. He was ill about two or three days in all. It seems he even went to his shop the day he died. M. Patrino knew this barber, and often went to him to be shaved. The barber's neighbours all told M. Patrino that he (the barber) died of vomiting and diarrhœa. M. Joanni Kyriako confirmed M. Patrino's statement.

4. A native tobacco-seller, called Bedri, died about a fortnight after the Greek Easter, towards the 13th May, after having been attacked by diarrhœa and vomiting. This fact was confirmed by the three persons I interrogated, who added that even on the morning of the day he died Bedri was able to do his business at his shop.

5. Lastly, M. Patrino states that two Greek women living in the same Okelle as himself at Damietta were ill for two days at about the Greek Easter with vomiting and diarrhœa; but they afterwards recovered.

I hold that these facts prove that cholera existed at Damietta as early as the end of April (just as it existed at Mahallet-Damara on the Bahrel at the beginning of April), as shown by the investigations of which my second Report is a short narrative.

The following deductions may be made from the results I obtained:—

1. The cholera which became epidemic at Damietta on the 22nd June was not imported thither.

2. Cholera-centres existed long before the 22nd June in several places in Lower Egypt.

3. The cholera epidemic raging in Egypt is not Asiatic cholera, but a local cholera.

I hope to expand these deductions fully in my final Report.

(Signed) DR. DUTRIEUX.

Inclosure 4 in No. 1.

"Le Choléra de Damiette en 1883. Origine et Développement."

Rapport adressé au Conseil Sanitaire Maritime et Quarantenaire d'Égypte, par Ahmet Chaffey Bey et Salvatore Ferrari.

Damiette, le 24 Juillet, 1883.

LES deux Commissions Médicales dont les Soussignés faisaient partie, et qui sont arrivées à Damiette le 24 Juin, 1883, pour vérifier l'existence et la nature de la maladie qui sévissait dans cette ville, ayant déclaré que c'était le choléra épidémique, le Conseil Sanitaire Maritime et Quarantenaire, dans la séance du 27 Juin, m'a chargé de me rendre à Damiette pour chercher d'établir l'origine de l'épidémie cholérique.

M. le Dr. Ferrari, Directeur de l'Office Sanitaire de la ville de Damiette a été invité à se joindre à moi pour accomplir la mission qui m'a été confiée par le Conseil.

Forts de cette confiance, et pénétrés de l'importance qui se rattache à l'éclaircissement de ce sujet, nous nous sommes livrés à des recherches longues et minutieuses,

dont nous consignons le résultat dans le Rapport que nous avons l'honneur de soumettre à l'appréciation du Conseil.

§ I.—*Aperçu Médico-Topographique et Hydrographique de la Ville de Damiette.*

A une distance d'environ 13 milles avant que le Nil ne se jette dans la Méditerranée, la ville de Damiette est sise sur la rive est de ce fleuve. Le sol sur lequel cette ville, baignée par les eaux mêmes de la rivière, est bâtie, est formée d'alluvions nilotiques. La ville dans sa construction et sa position nous présente la forme d'un fer à cheval très prononcé, dans la courbe duquel le courant de la rivière subit un temps d'arrêt assez long et à l'époque de l'abaissement de l'eau du Nil, l'eau de la mer y fait irruption.

La ville est composée de constructions très anciennes, infiltrées d'humidité, excessivement serrées, la plupart tombant en ruine, ne possèdent pas de cour, et celles parmi elles qui ont l'air d'en avoir, possèdent des espèces de vestibules étroits, humides et obscurs. Cela se rapporte aux habitations des gens aisés tandis que la généralité des habitations ne sont en réalité que des caves presque souterraines auxquelles on peut appliquer le mot *cloaques*. Ajoutons en outre une troisième sorte d'habitations très répandues dans le pays; ce sont les huttes cabanes formées avec de la paille, de la boue, et des excréments d'animaux.

Les rues sont très étroites, tortueuses, le soleil y pénètre avec difficulté. Aucun boulevard, ni place publique, ni jardin.

La ville présente une superficie qui peut être calculée par une longueur d'un kilomètre environ, sur presque 600 mètres de largeur.

Le chiffre de la population de Damiette est d'après le dernier recensement de 35,000 habitants.

C'est une population Égyptienne presque homogène, à peine mélangée avec un millier d'éléments Syrien et quelques rares Européens.

En dehors de quelques négociants et peu de cultivateurs de riz, les professions dominantes ici sont celles de marins et de pêcheurs.

La religion prédominante est la Mahométane.

Toute cette population y compris même les riches indigènes se nourrit presque exclusivement de poissons et de riz. Une grande partie d'indigents donne la préférence à une sorte de poisson pourri et salé qui s'appelle *fissikh* (hareng).

La seule boisson consommée par les habitants est l'eau. Les riches en font leur provision pour sept mois de l'année remplissant des citernes d'eau puisée au Nil pendant sa crue. Mais les habitants qui ne possèdent pas de citernes, boivent pendant toute l'année de l'eau puisée soit à la rivière, soit au *haligh* ("canal") qui traverse la ville du côté est.

La ville de Damiette possède soixante Mosquées et quatre bains publics; les uns et les autres contiennent un nombre considérable de latrines publiques dont les égouts déversent ainsi que ceux des habitations particulières d'un côté dans le Nil et de l'autre dans le *haligh*.

Il y a une caserne vide, une manufacture en ruine, point d'école, un seul hôpital possédant un médecin et un pharmacien.

Les cimetières sont nombreux et servent aussi à l'enterrement des morts venus de tous les environs; ces cimetières entourent la ville à la façon d'une ceinture et occupent surtout le côté nord, de façon qu'ils se trouvent du côté du vent dominant et quelques-uns se trouvent au vrai centre des habitations.

Au centre de la ville on constate aussi l'existence d'un grand dépôt de poisson pourri dont il a été parlé plus haut, ainsi que des dépôts ("*daouar*") servant de magasin aux peaux fraîches destinées à l'exportation et dont il existe actuellement une certaine quantité. Mais ce qui frappe le visiteur en parcourant la ville, c'est le nombre d'enclos en ruine ("*kharabels*") échelonnés sur tous les points de la ville et comblés de monceaux d'immondices; on en a compté jusqu'à trente-quatre dans un seul quartier. Outre ces grands dépôts d'immondices il existe à la droite de la porte de l'okelle des Juifs un grand puit plein de matières fécales dont on opère le curage au moyen d'une machine élévatoire de celles dont on se sert à la campagne pour arroser les champs ("*sakia*"), le produit du curage coule dans des rigoles à ciel ouvert et se déverse dans des grands égouts des bains publics déversant à leur tour dans le fleuve.

L'on constate encore tout le long des rues et ruelles l'existence de petits monceaux excrémentiels.

Les deux Commissions Médicales, qui sont arrivées à Damiette le 24 Juin,

pour constater l'existence de la maladie, avaient observé cet état innouï d'insalubrité, et ce n'est que depuis leur départ que l'on a commencé à balayer les rues principales.*

La ville de Damiette, telle que nous venons de la décrire, forme une espèce d'île baignée à l'ouest par le Nil, à l'est par le grand Lac Menzaleh, au sud par le Canal Enanieh, qui part du Nil pour verser dans le lac; la ville est en outre traversée dans toute sa longueur par le haligh cité plus haut.

Tous les terrains cultivables au milieu desquels Damiette se trouve, sont des risières dont la superficie peut être évaluée à plus de 3,000 feddans.

Ajoutons que chaque année à une époque déterminée, il se forme ici une grande foire qui réunit près de 15,000 personnes qui encombrent la place pendant huit jours consécutifs. Nous faisons noter en passant que l'agglomération a été augmentée cette année surtout à l'occasion du recrutement de soldats.

§ II.—*État Sanitaire de la Ville avant l'Épidémie.*

Pendant le cours de plusieurs mois aucune maladie épidémique n'a été constatée sur les habitants, et ce n'est que durant la semaine qui a précédé le 22 Juin que nous avons remarqué annoté sur le cahier de la mortalité de la ville, le diagnostique souvent répété de "catarrhe gastro-intestinal-aigu."

Mais à défaut de maladies épidémiques sévissant sur l'homme, il est à remarquer que l'épizootie meurtrière du typhus bovin a toujours régné dans cette localité; et chose plus digne encore de remarque, c'est que l'épizootie qui ruine actuellement toute l'Égypte a été notée pour sa première apparition à Damiette et Rosette.

§ III.—*Écllosion de l'Épidémie du Choléra à Damiette.*

Pour établir la date précise de l'écllosion du choléra à Damiette, il aurait fallu pouvoir arriver à connaître la première personne qui fut atteinte de la maladie. Or, l'attention du médecin-en-chef de Damiette (le seul que la ville possède) n'a été attirée sur l'existence d'une maladie grave que lorsqu'il a remarqué sur le cahier de la mortalité de la ville que le nombre en devenait insolite; ce ne fut que le 23 Juin qu'il fit cette remarque, et invita par lettre M. le Dr. Ferrari à s'unir à lui pour procéder à la vérification des faits laissant croire qu'il s'agissait du choléra, tandis que l'augmentation du chiffre de la mortalité était déjà significatif dès le 22 Juin, puisque, d'un qu'il était le 21, il fut de quatorze le lendemain.

Cela ne peut manquer de laisser supposer que les quatorze morts du 22 devaient être atteints pendant un, deux, ou trois jours auparavant; et si l'on pouvait rapporter la cause de leur décès à la maladie qui a continué depuis à sévir dans le pays, nous nous trouvons portés à le croire par le fait que le 22, vers le soir, M. le Dr. Ferrari a visité un malade présentant les symptômes de vomissements et diarrhée aqueuse très abondante. L'individu rentrait chez lui transporté sur un baudet, et il est mort pendant la nuit.

Étant donc obligés de considérer ce cas comme le premier officiellement établi, nous dirons que ce malade était un homme âgé de 80 ans, nommé Boutros Hanna Issa, Syrien établi dans le pays depuis de longues années, janissaire du Consulat de France, extrêmement pauvre, vivant dans une seule pièce basse et humide avec une famille de sept personnes.

Mais l'opinion publique à Damiette est portée à considérer comme premier malade atteint de l'épidémie, le nommé Hassan Nour-el-Din, dont nous devons donner ici une petite biographie. C'est un individu de 45 à 50 ans, Égyptien natif de Damiette, habitant continuellement cette ville, se déplaçant très rarement, maçon de profession. Cet individu avait quitté Damiette le matin du 21 Juin pour se rendre à Mansourah; avant son départ il ne se sentait pas malade, et toute sa famille n'avait

* Au mois de Février dernier, M. le Dr. Ferrari, Directeur de l'Office Sanitaire de Damiette, adressait au médecin-en-chef de la ville, la note suivante (traduction de l'Arabe):—

"Étant chargé de présenter au Conseil Sanitaire Maritime et Quarantenaire d'Égypte un Rapport sur l'état sanitaire de la ville, je viens de parcourir les rues et les points principaux de la cité. J'ai constaté qu'elle est toute entière dans un état d'insalubrité remarquable. Toutes les rues sont pleines de boue et d'immondices à l'état de putréfaction, donnant des odeurs méphitiques. En plusieurs points, il existe de vrais monticules d'immondices, et des ruisseaux d'eau altérée émanant également des odeurs infectes pouvant faire naître sans doute des maladies graves. Dans ces mêmes ruisseaux sont jetés des cadavres de chiens, donnant aussi des odeurs impossibles à sentir, comme il y en a au voisinage de l'Eglise Catholique et de la maison de M. Kahil, &c.

"J'ai en outre constaté l'existence d'un grand puit plein de matières excrémentielles, dont on fait le curage pendant le jour à l'aide d'une sekia. Enfin toute la ville se trouvant dans un état singulier d'insalubrité, et vu l'approche de la saison d'été, je vous demande en votre qualité de médecin, ce qui résultera de toutes ces émanations, et si les règlements sanitaires permettent la persistance d'un pareil état de choses!"

remarqué chez lui aucune indisposition; ce n'est que le lendemain, 22 Juin, que l'individu a commencé à être indisposé à Mansourah, et le Samedi, 23 Juin, il a pris le chemin de fer à Talha pour retourner à Damiette. Pendant tout ce temps il pouvait encore marcher et il n'avait ni vomissement ni diarrhée; mais arrivé à la station de Ras-el-Khalig, il a été surpris par la maladie, et son état s'est aggravé jusqu'à son arrivée à Damiette; là on a été obligé de le porter à bras d'homme de la station jusqu'à la maison, où il est rentré le 23 Juin, avant le coucher du soleil, et il a succombé vers la moitié de la nuit et fut enterré le lendemain, Dimanche, 24 Juin.

Cette opinion n'est pas à rejeter, en ce sens que cet homme pouvait bien être au moins un des premiers contaminés.

De ces deux malades on ne peut pas non plus connaître l'intervalle qui a séparé ces présumées premières attaques des suivantes, ni le nombre de celles-ci, attendu que le matin du 23 Juin l'on enregistrait déjà une mortalité de vingt-trois personnes. Nous le répétons, ce n'est qu'après constatation de cette nouvelle augmentation, que le médecin de la ville uni à M. le Dr. Ferrari ont commencé à voir des malades; ils en ont vu sept dans la matinée du 23 Juin; c'est alors aussi que des télégrammes portaient de Damiette pour Alexandrie signés de plusieurs Consuls, et notamment par M. le Dr. Ferrari, pour annoncer qu'une maladie, probablement le choléra, existait à Damiette.

En conséquence, deux Commissions Médicales: l'une déléguée par le Conseil d'Hygiène, et l'autre par le Conseil Sanitaire Maritime et Quarantenaire, sont arrivées le 24 sur les lieux, et, après constatation, ont déclaré que c'était le choléra régnant épidémiquement.

Donc, sans vouloir rien préciser quant à la date exacte de l'éclosion de cette maladie, nous croyons pouvoir la porter à deux ou trois jours avant le 22 Juin, époque correspondante aux journées 16, 15, et 14 du mois de Chaban—c'est-à-dire, à l'époque de l'évacuation de la foire qui durait depuis huit jours. Mais en nous rapportant à la brusque augmentation de la mortalité nous sommes amenés à croire que, dans tous les cas, l'éclosion de la présente épidémie s'est faite brusquement dans la ville de Damiette.

Cette éclosion a eu lieu dans le quartier Souk-el-Ribeh, qui est un des plus insalubres et des plus populeux de la ville; la maladie s'y était en quelque sorte localisée pendant les trois premiers jours de son développement, et de proche en proche a fini par s'étendre graduellement aux autres points de la ville; à ce propos nous faisons remarquer de suite que jusqu'aujourd'hui la maladie n'a fait que de rares victimes parmi les domestiques nègres, dans quelques-unes des maisons formant la longue façade ouest de la ville donnant sur le Nil, et habitée par la classe aisée.

Enfin la maladie qui nous occupe, usant de son caractère épidémique, s'est déjà propagée en montant le cours du Nil, et la voilà régnant dans plusieurs localités de la Basse-Égypte.

§ IV.—*Caractère et Marche de l'Épidémie régnante.*

L'épidémie du choléra qui sévit à Damiette depuis le 22 Juin a suivi une marche ascendante jusqu'au 1^{er} Juillet courant, jour où elle a atteint son point le plus culminant.

Dans sa marche ascendante la maladie a présenté des caractères franchement épidémiques, attaquant les personnes sans distinction d'âge, ni de sexe, ni de race, toutefois sans avoir atteint jusqu'ici aucun Européen, foudroyant parfois les attequés, mais en guérissant aussi sans aucune médication, souvent guérissant par les moindres soins et très souvent résistant à tout traitement.

Dans les attaques, la diarrhée est le symptôme prédominant dans le Tableau cholérique; les vomissements s'y associent sans persistance; les phénomènes algides ne sont pas intenses; les crampes aussi s'observent moins souvent.

Depuis le 1^{er} Juillet la maladie après être restée quelques jours à l'état stationnaire, a suivi sa courbe descendante. C'est alors que les cas sont devenus plus bénins, moins foudroyants, cédant plus souvent au traitement; mais la période de réparation a présenté alors des caractères incomplets et irréguliers, et nous avons observé souvent le passage à l'état typhoïde; depuis quelques jours l'on observe que la période de réparation se termine par une crise consistant dans l'apparition d'une éruption érythémateuse qui dure de vingt-quatre à quarante-huit heures, et dont la disparition est suivie par la guérison complète.

A cette date l'épidémie est en pleine décroissance; les attaques sont devenues rares dans la ville, mais on en constate encore dans les environs.

Dans la courbe que l'épidémie a suivie, il est impossible à nous et à qui que ce soit hors de nous, de savoir et de dire quel était le nombre des attaques par rapport au chiffre de la mortalité journalière.

L'épidémie dans sa marche a présenté plusieurs oscillations plus ou moins sensibles en augmentation ou diminution, nous avons remarqué que les journées calmes et chaudes favorisaient sa marche, tandis que les journées fraîches et ventilées étaient toujours suivies d'une diminution de la mortalité.

Quant au fait de l'individu mort en deux heures sans avoir eu ni diarrhée ni vomissement, la mort a eu lieu au milieu d'accès convulsifs, et le médecin a posé la diagnostique éclamptique.

§ V.—*Naissance de l'Épidémie.*

Étant aujourd'hui établi que la maladie qui s'est développé soudainement à Damiette, le 22 Juin, 1883, ou à peu près, est le choléra épidémique, il y a un grand intérêt à pouvoir arriver à connaître si ce choléra est le résultat d'une importation ou d'origine locale.

En essayant d'entrer dans des détails relatifs à la résolution de ce problème, nous nous rendons bien compte de l'importance qui se rattache à l'éclaircissement de ce sujet, eu égard aux considérations puissantes de la santé et de la vie des hommes, et des intérêts élevés de leurs relations sociales, politiques, et commerciales. Aussi avouons nous de suite que nous ne prétendons pas être arrivés sur ce point à des résultats incontestables, ni à dissiper toute incertitude à cet égard.

En effet, nous avons vu au chapitre 3 que malgré la soudaineté du développement de l'épidémie, nous sommes portés à croire que cette soudaineté n'est qu'apparente; nous avons vu également la difficulté pour ne pas dire l'impossibilité, où nous nous sommes trouvés pour remonter jusqu'au premier individu atteint, et de nous assurer des circonstances sous l'influence desquelles la maladie l'aura frappé, et cela à cause du triste système sanitaire suivi ici, qui fait que le médecin dans une ville comme Damiette ne peut s'apercevoir de l'existence d'une épidémie qu'alors que celle-ci aura fait de nombreuses victimes, et par la même cause l'on ne pourrait pas suivre le progrès du mal dans les personnes qui en auront été successivement atteintes.

Nous nous trouvons donc placés simplement devant deux hypothèses, dont nous nous contentons d'énumérer les arguments qui militeraient en faveur de chacune d'elles, en tâchant toutefois d'accorder à chaque argument la valeur qu'il mérite.

(a.) Le choléra qui s'est développé le 22 Juin, 1883, à Damiette, a-t-il été importé dans cette localité d'un pays où il régnait endémiquement ou épidémiquement?

Nous qui avons récemment observé trois épidémies consécutives de choléra à la Mecque—1878, 1881, et 1882—et avons démontré avec des preuves presque matérielles que la maladie fut importée au Hedjaz pour chacune des trois épidémies, étions jusqu'ici grands partisans de l'importation, et nous n'aurions point hésité un seul instant à nous déclarer en faveur de cette hypothèse à propos de la présente épidémie, si les faits que nous avons minutieusement recherchés pour arriver à ce but, présentaient la moindre authenticité.

S'il fallait s'en rapporter seulement au Rapport adressé par son Excellence Salem Pacha à Son Altesse le Khédive à la date de Juillet courant, la question serait de suite résolue. Notre ancien Maître de Pathologie à l'École de Médecine du Caire, et ancien Délégué Égyptien à la Conférence Internationale de Constantinople, a déjà déclaré que le choléra a été importé à Damiette, s'appuyant en cela sur les conclusions de la Conférence à laquelle il a assisté il y a dix-huit ans passés.

En effet, les conclusions de la Conférence Sanitaire Internationale de Constantinople sont affirmatives à ce sujet; et il n'est encore survenu, du moins à notre connaissance, aucun fait scientifique nouveau qui pût le modifier.

Mais ces conclusions sont déjà vieilles de plus de dix-huit ans, et nous avons la confiance qu'à l'occasion de la présente épidémie, la science y trouvera des éléments nouveaux pour asseoir cette question sur de nouvelles bases. L'on peut être d'ailleurs en droit de se demander si les conclusions d'une Conférence Internationale étaient réellement indemnes de toutes considérations politiques, commerciales, ou sociales, et si, comme cela se passe aujourd'hui à nos yeux, chaque Délégué à la Conférence ne demandait pas à son Gouvernement respectif, des instructions à propos de certaines questions importantes dont il ne pouvait pas assumer la responsabilité vis-à-vis de sa nation.

Pour ne parler que de notre propre Délégué Égyptien à la Conférence, ne voyons-nous pas celui-ci s'abstenir de voter avec l'unanimité quand il s'est agi de répondre à la question suivante posée par la Conférence? "Dans le cas où une

épidémie de choléra, venant par la Mer Rouge, se manifesterait en Egypte, l'Europe et la Turquie étant d'ailleurs indemnes, ne conviendrait-il pas d'interrompre temporairement les communications de l'Égypte avec tout le bassin de la Méditerranée ?" (Adopté à l'unanimité moins Salem Bey.) Cependant, M. le Dr. Salem Bey, actuellement Salem Pacha, était ailleurs d'accord avec l'unanimité sur le caractère contagieux et transmissible de la maladie.

Mais en nous tenant toujours sous le poids de l'autorité des conclusions de la Conférence, il faudra pour que le choléra soit importé à Damiette qu'il y fut apporté par des personnes malades ou des objets contaminés, les uns et les autres venant cette année des Indes, où en effet le choléra régnait un mois à peine avant son éclosion à Damiette.

Faisant abstraction de la manière bonne ou mauvaise par laquelle les mesures sanitaires quaranténaires ont été prises dans les ports Égyptiens contre les provenances de Bombay, Calcutta, et Java, nous avons fait des recherches minutieuses et assidues en vue de nous mettre sur la piste d'un voyageur ou d'un colis de marchandise qui se soit introduit à Damiette par une voie quelconque. Nous avons fait même remonter nos recherches à plusieurs mois avant l'éclosion de la maladie, et voici tout ce que nous avons pu obtenir à ce sujet :—

Le 21 Février, 1883, un Afghan, nommé Sultan Mohamed, fils de Sardar, est arrivé à Damiette du Caire et parti pour Jérusalem.

Le 7 Mars un Boukariot, nommé Nour, fils de Mohamed, est arrivé à Damiette de Port-Saïd, voie du Lac, et parti pour Jérusalem.

Le 24 Mars huit Afghans sont arrivés du Caire et parti pour Jérusalem.

Le 29 Mars un Afghan, nommé Hadgi Amin, fils d'Arsselain, venait du Caire, et parti pour Jérusalem.

Le 24 Avril un Indo-Persan, nommé Aly, fils de Hazrat-Nour, est arrivé à Damiette du Caire, et parti pour Jérusalem.

Le 20 Mai un Afghan, nommé Hadgi Mohamed, fils de Darouich, est arrivé à Damiette de Jaffa (Syrie) et parti pour le Caire.

Le 7 Juin un Boukariot, nommé Hadgi Nazir, fils de Khoda-Wardi, est arrivé à Damiette, venant du Caire, et parti pour Jérusalem.

Enfin, pour la conformité des renseignements obtenus, notons ici que le 24 Juin un groupe de Boukariotes est arrivé à Damiette, provenant de Jaffa (Syrie). Les six personnes principales dans ce groupe sont celles dont nous donnons les noms : Abdel-habib, fils de Mohamed ; Chérif Abdel Nour ; Chiar Mohamed, fils d'Abdel Moufid ; Gohar, fils de Soltan ; Fadlaldin, fils de Amin, et Badaoui Woukrim. Ces deux dernières personnes sont deux Indoustans.

Le médecin-en-chef de la ville de Damiette, Ali Effendi Ghibril, m'affirme que ce groupe d'étrangers était au nombre au moins de vingt personnes, avec leurs femmes et leurs enfants, et qu'ils seraient arrivés à Damiette le Jeudi 21, tandis que le Bureau des Passeports ne les a inscrits que vers le 21. Mais en contrôlant la date exacte de leur arrivée à Damiette par voie de mer au Bureau Quarantenaire, il a été constaté que le jour de leur arrivée était bien le 24 Juin, et que le nombre des voyageurs était de vingt et une personnes ; mais sur ce nombre il n'y en avait que six étrangers, Boukariotes et Indoustans, dont nous avons donné les noms ci-dessus, tandis que le reste des voyageurs était des Juifs, y compris le Rabbin Achil-ben-Benjamin et son fils et des indigènes Égyptiens.

Mais la ville de Damiette n'a pas seulement une entrée par son port de mer. Des marchandises et des étrangers peuvent y pénétrer par la voie du lac. Il serait donc possible, vu sa proximité de Port-Saïd, et les relations journalières et continues qu'elle entretient avec ce dernier port, que des marchands étrangers, ou de simples ouvriers de Port-Saïd, de ceux qui travaillent à bord des bateaux venant des Indes, se soient introduits à Damiette, et y aient apporté la maladie.

On a dit qu'au moment de la foire du Chekh Abou-el-Maati qui a amené à Damiette 15,000 persons environ, on a constaté la présence de deux marchands arrivés tout récemment de Bombay. Cette information nous est parvenue par un billet de la part de M. le Dr. Ardouin Bey, qui la tient lui-même d'un médecin Anglais, personne très respectable et digne de foi. L'on comprend l'empressement que nous avons mis pour aller aux informations auprès des négociants Notables de la ville, et voici ce que le Notable Saïd-el-Lozi croit pouvoir affirmer à ce sujet : "Durant la foire on n'a jamais constaté la présence d'aucun négociant ou marchand Indien, ni vendeur de marchandises Indiennes ; mais on a vu un étranger, coiffé à la façon des derviche, et vêtu assez proprement, qui s'est entretenu avec plusieurs personnes d'ici, et qui déclarait à tout le monde être venu du Caire, qu'il habite depuis sept ans."

Enfin M. le Dr. Flood, médecin de l'Hôpital de Port-Saïd, qui est comme nous grand partisan de l'importation de la maladie qui règne épidémiquement à Damiette et avait cru un moment, et nous aussi, avoir trouvé la clef de l'énigme, s'est-il empressé d'adresser à son Excellence Salem Pacha à la date du 5 Juillet le Rapport qui a été communiqué à toute la presse locale, et dont nous reproduisons ici le passage suivant :

J'ai l'honneur de communiquer à votre Excellence les résultats de mes investigations :

"Le 18 Juin débarqua à Port-Saïd du steamer Anglais 'Timor' venant de Bombay et allant à Naples et Gênes, un chauffeur nommé Mohamed Khalifa, natif de la Haute-Égypte, qui partit immédiatement pour Damiette. J'adresse à votre Excellence la réponse reçue aujourd'hui du Gouverneur de Damiette, à deux dépêches qui lui furent adressées sur ma demande, au sujet de Mohamed Khalifa, par son Excellence le Gouverneur-Général du Canal. Bien que n'étant pas entièrement satisfaisantes pour expliquer le développement d'une épidémie de choléra à Damiette, elles permettent cependant d'admettre le fait de l'importation du mal par Mohamed Khalifa.

"Peut-être des cas cholériques se sont-ils manifestés à bord du "Timor" après son départ de Bombay, et par conséquent le Sieur Khalifa se serait trouvé à son arrivée à Port-Saïd dans la période d'incubation de la maladie; n'est-il pas possible également que cet homme ait été atteint de diarrhée cholérique en arrivant à Damiette?"

Le Rapport de M. le Dr. Flood n'est parvenu à notre connaissance que le 9 Juillet par la voie de la presse, et admettant avec l'auteur la possibilité que des cas de choléra pouvaient s'être manifestés à bord du "Timor," que le Sieur Khalifa se serait trouvé à son arrivée à Port-Saïd dans la période d'incubation de la maladie, et qu'il était possible également que cet homme ait été atteint de diarrhée cholérique en arrivant à Damiette, nous allions applaudir aux efforts de notre confrère de Port-Saïd et crier victoire avec lui. Aussi nous sommes-nous empressés de procéder immédiatement à une enquête minutieuse sur les faits et gestes de Mohamed Khalifa, laissant à d'autres le soin d'examiner les circonstances dans lesquelles la reconnaissance et l'arraisonnement du navire "Timor" se sont faits dans tous les ports Égyptiens qu'il a parcourus depuis Suez jusqu'à Port-Saïd, ainsi que les mesures qu'il aura subies en arrivant à Naples et Gênes. (Voir Annexe No. 1.)

A cet effet ce sont réunis le 9 Juillet à l'Office de Santé et d'Hygiène de la ville de Damiette, le Dr. Ahmad Nadim Effendi, Inspecteur Sanitaire de la ville; Aly Effendi Ghibril, médecin-en-chef de la localité; Ahmet Bey Chaffey, Délégué Quarantenaire d'Égypte; Spiridion Cosséry, commis de l'Office Quarantenaire de Damiette; et Spiridion Passiour, Notable de la ville, et ont fait appeler le Sieur Mohamed Khalifa, qui s'est présenté en personne devant eux et a fait la déclaration suivante :

"Il est de la Moudirieh Kéné (Haute-Égypte) âgé de 32 à 34 ans, a quitté depuis sept ans son pays; il a été longtemps employé à Port-Saïd au service de la Compagnie du Canal comme chauffeur, s'est engagé depuis deux mois comme chauffeur à bord d'un bateau Anglais dont il ignore le nom qui partit pour Bombay. Le bateau y a séjourné trois semaines, pendant lesquelles Mohamed Khalifa ignore l'existence d'aucune maladie à Bombay. Ensuite le dit bateau est parti de Bombay dans des bonnes conditions hygiéniques chargé de coton et de riz; il n'avait aucun passager à l'exception de son équipage qui s'est toujours bien porté, et durant une traversée de vingt jours de Bombay à Port-Saïd personne n'a été malade. Une fois à Port-Saïd et son engagement fini, il quitta le bateau pour aller à sa maison dans laquelle il est resté quatre jours. Ensuite il s'est disputé avec un soldat cavalier du Gouvernement, il fut alors arrêté et mis en prison pendant trois jours, au bout desquels il fut exilé de la ville comme mauvais sujet, par ordre du Gouverneur, et il est alors parti à bord d'une barque pour Damiette, voie du Lac, où il est arrivé après une traversée de vingt heures dans la matinée du Dimanche, 24 Juin, 1883. En descendant en ville il a fréquenté le café du nommé Salem-el-Sandoubi; il s'est alors soûlé et il fut mis en prison pour quelques heures. Il est resté à Damiette jusqu'au 1^{er} Juillet, 1883, jouissant d'une bonne santé. Vers la fin de la journée du 1^{er} Juillet il se sentait pris de vomissement et de diarrhée qui lui passèrent le lendemain sans aucune médication."

Les docteurs présents ont visité après cette déclaration le Sieur Mohamed Khalifa, et ils ont constaté que bien qu'il se trouvait encore convalescent, l'état de sa santé était satisfaisant.

Comme il résulte de la déclaration de Mohamed Khalifa même, que la date de son départ de Port-Saïd et de son arrivée à Damiette ne correspond point au 18 Juin

comme l'affirme M. le Dr. Flood, la dépêche suivante fut expédiée le même jour à M. Dr. Pestrini à Port-Saïd :—

“Informez-vous auprès Gouverneur Port-Saïd quel jour on a exilé Mohamed Khalifa et répondez-moi vite.

(Signé) “CHAFFEY BEY.”

Et Pestrini répondait par la dépêche suivante :—

“Mohamed Khalifa fut exilé de Port-Saïd le 18 Chaban, égal 23 Juin.

(Signé) “PESTRINI.”

L'on voit de suite que M. le Dr. Flood s'est confondu entre le 18 Juin et le 18 Chaban. (Voir Annexe No. 1.)

De l'analyse et de l'appréciation des faits précités nous nous trouvons actuellement et jusqu'à preuves authentiques dans l'impossibilité de nous prononcer en faveur de l'hypothèse de l'importation du choléra de cette année à Damiette, et nous nous voyons forcément conduits à consulter les conditions cosmiques, telluriques, et sociales ordinaires ou accidentelles au milieu desquelles le choléra s'est développé épidémiquement dans cette localité.

(b.) Le choléra qui s'est développé le 22 Juin, 1883, à Damiette, a-t-il pu y naître spontanément sur place ?

Il ressort de l'exposé que nous avons tracé dans les chapitres 1 et 2 de ce Rapport, qu'en dehors des tristes et permanentes conditions d'hygiène qui font de Damiette le type des villes immondes, nous avons :

1. Une embouchure d'un fleuve tari par une sécheresse prolongée, mettant à sec ses bords et plusieurs parties de son lit vaseux et fermenté sous l'action d'un soleil ardent.

2. Ce fleuve charriant pendant plus d'une année (pour les faire emmagasiner dans le coude que forme la rivière précisément à Damiette) des milliers de cadavres d'animaux échouant sur ses bords fangeux et se putréfiant sous l'influence d'une température chaude et humide.

3. Ce fleuve reçoit en outre ici les écoulements des égouts, le détritux animaux et végétaux, et les immondices de toute sorte que le courant est incapable d'emporter, empêché en cela par le flux des vagues de la mer.

4. Les miasmes produits par toutes ces putréfactions se réunissent ici aux effluves végétaux provenant des marécages, du sol éminemment organique, et surtout des vastes rizières qui entourent la ville.

5. L'eau de ce fleuve a servi aux besoins de la plupart des habitants et de plus de 15,000 personnes venues de différents points de l'Égypte, et qui ont encombré la ville pendant huit jours consécutifs à l'occasion de la foire de Chekh Abou-el-Maati. Cette eau a été analysée par le chimiste expert de la ville d'Alexandrie. (Voir Annexe No. 2.)

6. Durant ces huit jours d'agglomération, des véritables orgies ont été commises exclusivement sur la chair des animaux morts de typhus et dont les peaux remplissent actuellement des grands magasins dans la ville et ses environs.

7. C'est immédiatement à l'issue de la foire que l'épidémie a éclaté.

8. Les journées des 19, 20, et 21 Juin ont été signalées ici par une élévation brusque de température.

9. La maladie a fait son éclosion principalement dans le quartier le plus insalubre et le plus peuplé, habité par des indigents, se servant exclusivement de l'eau de la rivière et du halig.

10. La maladie est restée localisée pendant longtemps à Damiette avant de se propager, et sa propagation a eu toujours lieu dans des localités sises toutes sur le bord du fleuve, et par des personnes malades émigrants de Damiette : témoins le fait des villes de Port-Saïd, Alexandrie, Ismaïlia, Suez, &c.

11. La courbe que l'épidémie a suivie dans sa marche ici est insignifiante dans son intensité, comparativement aux épidémies de choléra qui ont régné ici en 1865 et 1866.

12. La diminution sensible du nombre des attaques observées à la suite de l'enfouissement opéré par Mr. Goodall de presque un millier de cadavres et de débris d'animaux qui encombraient le fleuve.

13. La coïncidence mathématique et presque miraculeuse de l'abaissement subi de la mortalité avec l'arrivée ici des nouvelles eaux de la crue du Nil.

14. Enfin que l'épidémie est déjà à cette date presque éteinte à Damiette à la suite de la mise en exécution d'une partie des mesures qui ont été prescrites.

Ces faits sont-ils probants et assez concluants en faveur de la seconde hypothèse ; en ce sens qu'ils démontrent que les mêmes conditions cosmiques et hydro-telluriques qui président à la genèse du principe cholérigène dans le Delta et sur les bords du Gange, se sont trouvés accidentellement cette année dans le Delta et sur les bords du Nil ?

Nous avouons ne pas avoir l'autorité nécessaire pour nous prononcer à ce sujet, et nous les soumettons à titre d'observations à la future sanction de la science.

Nous devons enfin relater ici, sans vouloir en tirer aucune conséquence pratique, un document officiel qui a rapport avec le sujet qui nous occupe. C'est la dépêche suivante envoyée par son Excellence le Gouverneur de Damiette à la Maïah à la date du 26 Juin (traduction de l'Arabe).

"Les recherches faites relativement aux causes de l'apparition de la maladie à Damiette ont démontré que c'est le résultat de l'entassement des gens à la foire de la Mi-Chaban, se jetant à manger les pastèques, les concombres, et les fisikhs ; mais, grâce à Dieu, l'on constate un état d'amélioration."

§ VI.—Mesures prises à propos de la présente Épidémie.

L'on remarque au chapitre précédent qu'une partie des mesures prises pour étouffer l'épidémie dans son premier foyer est resté illusoire. A ce propos il est nécessaire d'entrer dans quelques détails explicatifs.

Disons d'abord, et sans le moindre esprit de flatterie, que ce ne sont pas les ordres formulés et donnés journellement tant de la part du Ministère que des Conseils de Santé, qui ont fait défaut à ce sujet, non plus que les instances du corps médical existant ici auprès des autorités exécutives.

C'est donc dans l'esprit d'impartialité qui nous a guidés jusqu'ici, que nous allons énumérer les mesures qui ont été exécutées, et celles qui ne l'ont pas été du tout ou incomplètement ou tardivement :—

1. Nous devons déclarer ici que depuis leur établissement jusqu'au moment de leur suppression les cordons sanitaires établis autour de Damiette n'ont pas fonctionné à la satisfaction générale.

2. La plus importante mesure qui consiste à faire évacuer les quartiers populeux et populaciers, infectés surtout de la maladie, n'a point été exécutée, malgré l'existence de tout ce qui était nécessaire pour l'exécution.

3. La mesure la plus rationnelle qui consistait à combler avec de la terre et de la chaux en les clouant ou même murant, toutes les latrines des mosquées et des bains publics, n'a eu qu'un semblant de commencement d'exécution, et ce semblant même à fini par disparaître au bout de quelques jours.

4. Aucune hutte ni cabane n'a été brûlée, ni abattue, ni désinfectée.

5. Ce serait une erreur de croire qu'on a pu réussir après un commencement d'exécution, à détruire par le feu les effets des malades morts de choléra.

6. Aucune maison n'a été blanchie à la chaux.

7. Vu la difficulté où l'on se trouvait de faire régulièrement le balayage et l'arrosage des rues, il a été jugé bon de couvrir le sol de la ville avec une couche épaisse de sable ; cette mesure, qui a été suivie d'excellents effets, ne fut complètement exécutée que dans ces derniers jours.

8. L'enterrement des morts n'a pas cessé de se faire dans les cimetières sis au centre même des habitations ; là et ailleurs il ne faut jamais croire que quelqu'un oserait jeter du chlorure de chaux sur les cadavres.

9. A propos du plâtrage prescrit dans ces circonstances pour fermer hermétiquement l'extérieur des tombeaux, des personnes officielles et dignes de foi affirment que les préposés à l'exécution de cette mesure préféreraient vendre le plâtre et la chaux. D'ailleurs, à quoi servirait le plâtrage d'un caveau quand il doit être réouvert autant de fois dans la journée qu'il y a de morts dans une famille ?

10. Les médecins envoyés ici n'étaient qu'au nombre de quatre qui tout en donnant preuve de dévouement, de zèle, de capacité, et de courage en travaillant jour et nuit, les uns tombant malades parfois sans vouloir cesser de travailler, suffisaient à peine à leur rude tâche. Aussi nous nous faisons un devoir d'exprimer ici au nom du public des félicitations sincères à MM. les Drs. Ahmed Nadim Effendi, Mohamed Amin Effendi, Kassim Mohamed Effendi, et Hassan Hassan Effendi.

Nous pouvons en dire autant du zèle et du dévouement du seul pharmacien qui fut envoyé ici, M. Ahmed Effendi Hamdi, qui a su faire face jour et nuit à toutes les exigences de la situation.

11. Nous devons faire constater qu'outre l'insuffisance de la quantité du premier

envoi de médicaments et de désinfectants ici (80 kilog. de chlorure de chaux), le second envoi est resté hors du cordon pendant trois jours avant de pouvoir entrer en ville.

Nous regrettons d'être forcés, au nom de la vérité et pour le bonheur du pays, de dévoiler des faits que nous aurions été très heureux de ne pas constater.

Nous terminons en faisant des vœux sincères qu'un avenir très prochain profitera de l'expérience du passé pour épargner de nouveaux malheurs, et que l'Égypte avant de réformer ses institutions sociales et politiques, commencera par celle qui est la base de toutes : l'hygiène.

(Signé)

DR. AHMET CHAFFEY BEY.

DR. SALVATORE FERRARI.

Annexe No. 1.

(Traduction de l'Arabe.)

A son Excellence le Président du Conseil Sanitaire Maritime et Quarantenaire, Alexandrie.

J'ai l'honneur de porter à votre connaissance qu'il résulte des recherches faites au sujet de Mohamed Khalifa, chauffeur, qu'il était parti de Port-Saïd pour Bombay, le 25 Avril, 1883, à bord d'un bateau Anglais nommé "Timor," qui a quitté Bombay à destination de Port-Saïd le jour du 31 Mai, 1883, et est arrivé à Port-Saïd le jour du 19 Juin, 1883. Le dit chauffeur a débarqué à Port-Saïd, et s'est rendu à son domicile, puis il est parti pour Damiette le 23 Juin, 1883, et n'est plus revenu.

Le chef des chauffeurs a déclaré que le dit Mohamed Khalifa ne s'était pas rendu à Damiette avant son dernier voyage.

(Signé)

LE GOUVERNEUR DE PORT-SAÏD.

Annexe No. 2.

Le Soussigné, Ibrahim Moustapha, chimiste expert, désigné par son Excellence Hassan Pacha Mahmoud, Président du Conseil Sanitaire Maritime et Quarantenaire, à l'effet de procéder à l'examen chimique et microscopique de l'eau de Damiette, rapporte ce qui suit :—

L'eau était contenue dans six bouteilles en verre, placées dans une caisse en fer blanc; deux bouteilles étaient cassées et les quatre autres étaient cachetées avec de la cire rouge par un cachet illisible.

J'ai ouvert les quatre bouteilles et constaté que l'eau est peu limpide et qu'elle bleuit le papier rouge de Tournesol.

J'ai procédé à l'analyse de la manière suivante :—

1. J'ai ajouté, dans un verre d'essai, à une partie d'eau quelques gouttes d'azotate d'argent contenant de l'acide azotique en excès. L'eau ne s'est pas troublée.

2. Dans un verre d'essai j'ai ajouté à une quantité d'eau quelques gouttes de la solution de chlorure du Baryum. L'eau ne s'est pas troublée.

3. J'ai ajouté à une partie d'eau, dans un verre d'essai, quelques gouttes de la solution d'acétate de plomb. Il n'y a pas eu ni trouble ni précipité.

4. A une partie d'eau j'ai ajouté un peu de la solution de nitro-prussiate de soude. Il ne s'est pas produit une coloration violette.

5. J'ai ajouté à une partie d'eau quelques gouttes de la solution d'oxalate d'ammoniaque. Il ne s'est pas produit un précipité.

6. J'ai ajouté à une partie d'eau une solution de chlorure d'ammonium, j'ai filtré la solution et mélangé le liquide filtré avec une solution de phosphate de soude et un peu d'ammoniaque. Il ne s'est pas formé un précipité.

7. J'ai ajouté à une partie d'eau la liqueur de Bohlig. Il s'est formé un léger précipité blanc.

8. J'ai ajouté à une partie d'eau un peu de réactif Nessler. Il s'est formé un léger précipité brun rouge.

9. J'ai fait bouillir de l'eau dans un ballon en verre avec quelques gouttes de la solution de potasse caustique et j'ai approché de l'ouverture du ballon une baguette mouillée avec de l'acide chlorydrique. Il y a eu un nuage blanc autour de la baguette.

10. J'ai fait bouillir de l'eau dans un ballon en verre et j'ai approché de l'ouverture du ballon un papier trempé préalablement dans une solution de fuchsine traité par l'acide sulfurique. Le papier, de blanc qu'il était, est devenu rouge.

11. Dans une capsule de porcelaine j'ai ajouté à 100 centim. cubes d'eau quelques gouttes de chlorure d'or jusqu'à ce que l'eau eût acquis une teinte jaunâtre, j'ai fait bouillir le liquide. Il y a eu un dépôt noirâtre, et la couleur du liquide est devenue violette.

12. J'ai déterminé la dureté de l'eau par la méthode hydrotimétrique. J'ai trouvé que le degré hydrotimétrique de l'eau est de 17.

13. Dans une capsule de platine tarée j'ai évaporé et desséché au bain-marie 100 centim. cubes d'eau, j'ai complété la dissécatation à l'étuve de Wasing à la température de 120 degrés, j'ai mis la capsule au plateau de la balance. Il a fallu pour faire l'équilibre 0.048 gr.

14. J'ai calciné le résidu de l'évaporation obtenu dans l'opération 13, j'ai laissé la capsule se refroidir puis j'y ai ajouté une solution de carbonate d'ammoniaque, j'ai évaporé à siccité complète, j'ai mis la capsule dans le plateau de la balance. Il a fallu pour faire l'équilibre 0.027 gr.

15. J'ai ajouté, goutte à goutte, à 100 centim. cubes d'eau presque en ébullition, une solution de permanganate de potasse contenant un gramme de sel pour un litre, et par conséquent 1 centim. cube de la solution représente 5 millig. de matière organique —il a fallu 4 c.c. 3 pour produire la coloration rouge.

16. J'ai mis sur le porte-objet de microscope une goutte de liquide trouble qui s'est déposé au fond des bouteilles, et après l'avoir couvert du couvre-objet je l'ai examinée au microscope (grossissement 500), j'ai observé: (1) les débris des matières végétales et chlorophylles; (2) des infusoires principalement de l'ordre Vibron.

Signification des Données obtenues et Conclusion.

Il résulte :

Des essais 1, 2, 3, 4, 5, 6 que l'eau soumise à l'examen ne contient pas de traces appréciables, ni de chlorures, ni de sulphates, ni de sulphures alcalins, ni de sel de magnésies soluble.

Des essais 7, 8, et 9 que l'eau contient de l'ammoniaque (à l'état de liberté ou de combinaison) en quantité appréciable.

De l'essai 10 que l'ammoniaque est au moins en partie à l'état de liberté.

De l'essai 11 que l'eau contient une quantité considérable de matières organiques.

De l'essai 12 que l'eau au point de vue de la dureté est normale.

De l'essai 13 que les matières solides contenues dans l'eau sont dans la proportion de 0.048 gr. pour 100 centim. cubes, ce qui donne pour un litre 0.480 gr.

De l'essai 14 que la proportion des matières organiques contenues dans l'eau est 0.021 pour 100 centim. cubes, et celle des matières fixes est de 0.027 gr., ce qui donne pour un litre d'eau: matières organiques 0.210 gr.; matières fixes 0.270 gr.

De l'essai 15 que la proportion des matières organiques pour 100 centim. cubes 0.0215 gr., ce qui donne pour un litre 0.215 gr., résultat tout à fait identique avec celui de l'essai 14.

De l'essai 16 que l'eau, outre que les infusoires Vibron, infusoires qui ne sont observés que dans les macérations, contient des matières en putréfaction.

En résumé :

1. La proportion des matières minérales contenue dans l'eau analysée est normale, puisqu'elle n'est que de 0.270 gr. par litre—l'eau potable peut en avoir jusqu'à 0.500 gr. par litre.

2. Elle contient une très grande quantité de matières organiques probablement d'origine animale, vu la présence de l'ammoniaque dans l'eau.

3. Elle contient des matières en putréfaction.

4. Elle contient des infusoires surtout de l'ordre Vibron et des débris de végétaux.

De ce qui précède et attendu qu'une des conditions essentielles pour que l'eau soit potable est "d'être privée de matières organiques capables d'entrer en putréfaction," je crois avoir le droit de conclure que l'eau soumise à l'examen est impropre à la consommation publique.

(Signé)

IBRAHIM MUSTAPHA.

Alexandrie, le 21 Juillet, 1883.

P.S.—L'examen microscopique mentionné dans ce Rapport a été fait en présence de son Excellence le Dr. Abbate Pacha.

I. M.

Annexe No. 3.

Excellence,

Suez, le 17 Juillet, 1883.

En réponse à votre lettre en date du 12 courant, j'ai l'honneur de vous exposer ce qui suit :

Le vapeur Anglais "Timor," commandé par Mr. John Anderson, arriva dans ce port le 17 Juin dernier vers les 6 heures du matin, provenant de Bombay après dix-sept jours de traversée, et ayant à son bord trente hommes d'équipage, chargement divers; il ne fit aucune opération commerciale avec ce port. Aussitôt l'arrivée de ce steamer, je me suis rendu comme d'habitude le long du bord, pour remplir les formalités quaranténaires; je demandais au capitaine les patentes de santé qui lui ont été délivrées par l'Autorité Sanitaire où il avait touché, patentes que j'ai trouvées nettes et en parfaite règle, sans aucune annotation. Je demandais en outre au commandant si pendant la traversée il y avait eu des malades ou des décès à bord et s'il avait eu quelques communications ou autres en mer. Sur sa réponse négative, je priai le commandant de me présenter toutes les personnes de son équipage, que j'ai trouvées en parfaite santé. Après avoir accompli ces formalités, conformément aux ordres reçus du Conseil Sanitaire Maritime et Quarantenaire pour les provenances de Bombay, j'ai soumis ce steamer à vingt-quatre heures d'observation quarantenaire aux Sources de Moïse.

Le lendemain à la même heure, c'est-à-dire à l'expiration de l'observation précitée, le navire rentra en cette rade et je me rendis à bord ordonnant la désinfection; ensuite je repassai sous visite médicale rigoureuse les personnes du bord tout en les confrontant avec les articles (registres du bord), et les ayant trouvées jouissant d'une santé satisfaisante, j'ai admis le susdit steamer en libre pratique, tout en renouvelant mes questions au commandant, lequel répondit favorablement et accepta de signer l'arraisonnement.

Le même jour le steamer "Timor" entra dans le Canal à midi, c'est-à-dire que le 18 Juin le navire ne pouvait pas être arrivé à Port-Saïd, comme le déclare M. le Dr. Flood, par son Rapport qu'il a adressé au Conseil de Santé et d'Hygiène Publique et duquel votre Excellence s'est empressée de me transmettre copie; mais le "Timor" arriva à Port-Saïd le 19 Juin à 4 heures et demie du soir, ainsi que cela est constaté par la note qui m'a été remise, sur ma demande, par la Compagnie du Canal de Suez.

Ayant donc constaté l'irrégularité des dates citées par le Dr. Flood en donnant des informations à son Conseil, sur l'arrivée à Port-Saïd du navire susmentionné, je profite de cette occasion pour vous donner, Excellence, des explications sur la phrase dont M. le Dr. Flood s'est permis de se servir dans son Rapport, c'est-à-dire: "Peut-être y a-t-il eu des cas de choléra à bord du 'Timor' après son départ de Bombay."

A ce sujet je m'empresse de vous informer, Excellence, que lorsque je donnais pratique au steamer susindiqué non seulement j'ai constaté l'existence du nombre de l'équipage sur la déclaration du commandant, mais sans vouloir y prêter aucune foi, je demandais aussi, comme cela a été d'usage de tout temps, tous les papiers du bord sans exception, parmi lesquels je trouvai le rôle d'équipage qui était conforme à la déclaration faite.

Par conséquent, ayant constaté que la santé du bord était parfaite et sans le moindre soupçon de convalescence, il est non seulement impossible, mais tout à fait inadmissible que des cas de choléra aient eu lieu à bord du "Timor" après son départ de Bombay, attendu que s'il y en avait eu, celui qui pendant la traversée aurait été atteint de la maladie sans succomber, ne pouvait certes se trouver à bord en parfaite santé à l'arrivée à Suez, et, s'il en avait été victime, le reste de l'équipage ne pouvait être en cohérence avec celui porté sur le rôle.

De sorte que le Sieur Mohamed Khalifa ne pouvait pas se trouver dans la période d'incubation cholérique, parce qu'il ne se trouvait pas à bord au milieu des gens qui n'étaient ni atteints ni morts de cette maladie. Bien plus, que l'incubation cholérique ne peut exister sur une personne atteinte pendant vingt-cinq jours environ, temps employé du jour de son départ de Bombay au jour de son arrivée à Damiette.

Or donc, je peux conclure que ce n'est pas Mohamed Khalifa qui a fourni à Damiette le foyer d'infection déclaré par M. le Dr. Flood, mais il est presque positif

que comme il régnait déjà à Damiette le choléra nostras sporadique comme le mentionna M. le Dr. Flood, c'est le même choléra nostras qui, se développant sur une plus vaste échelle a changé de forme, et a pris la forme épidémique probablement en conséquence des mauvaises conditions hygiéniques existantes à Damiette.

Veuillez, &c.

Le Directeur,

(Signé) DR. FRED. A.

Son Excellence Hassan Pacha Mahmoud,
Président du Conseil Sanitaire Maritime et
Quarantenaire, Alexandrie.

(Translation.)

"The Outbreak of Cholera at Damietta in 1883. Its Origin and Spread."

*Report to the Maritime Sanitary and Quarantine Board of Egypt, by Ahmed Chaffey Bey
and Salvatore Ferrari.*

Damietta, July 24, 1883.

THE two Committees, of which the Undersigned were members, and which came to Damietta the 14th June, 1883, to ascertain the existence and nature of the disease which was raging in that town, having pronounced it epidemic cholera, the Maritime Sanitary and Quarantine Board instructed me at its meeting of the 27th June to go to Damietta to inquire into the origin of the cholera epidemic.

Dr. Ferrari, Director of the Health Office at Damietta, was asked to join me in fulfilling the mission confided to me by the Board.

Relying on the confidence thus placed in us, and thoroughly appreciating the importance of the matter, we made long and minute inquiries, the result of which will be found in the Report which we now have the honour to submit to the Council.

§ I.—*Topographical and Hydrographical Sketch of the Town of Damietta, from a Medical Point of View.*

The town of Damietta is on the east bank of the Nile, about 13 miles above where it runs into the Mediterranean. The soil on which the town, which is actually washed by the waters of the river, stands is Nile alluvium. The construction and lie of the town is in shape like a horse-shoe, in the curve of which the current is considerably delayed, and at the period of the low water of the Nile the sea runs back into it.

The town consists of very ancient buildings, saturated with damp, very crowded, for the most part in ruins, without any yards, and those which look as if they had yards have only a sort of narrow hall, which is both damp and dark. This is the case with the dwellings of the moderately well-to-do, while the greater number of the houses are in reality nothing more than mere underground cellars, which could well be called cesspools. Besides these there is a third kind of dwelling very common throughout the country, namely, the huts or cabins made of straw, mud, and animal excrement.

The streets are very narrow and crooked, the sun hardly ever shines into them. There is no boulevard, public place, or garden.

The surface covered by the town may be about 1 kilom. long by nearly 600 metres wide.

According to the returns of the last census the population of Damietta is 35,000.

The population is of the Egyptian race, almost unmixed; the Syrian element is represented by hardly a thousand individuals; there are but very few Europeans.

There are a few merchants and rice growers, but the principal occupations are those of the sailor and fisherman.

Mohammedanism is the dominant religion.

The whole population, including even the rich natives, feed almost exclusively on fish and rice. A large proportion of the natives prefer a kind of rotten salt fish called "fissikh" (herrings).

The only drink is water. The rich fill their cisterns with the water of the high Nile, and thus lay in a supply for seven months; but those who have no cisterns drink throughout the year water which they draw from the river, or from the haligh (canal) which runs through the eastern part of the town.

There are empty barracks, a factory in ruins, and one single hospital with one doctor and one chemist; there is no school.

There are many cemeteries; they are used for the burial of bodies brought from the whole neighbourhood; these cemeteries surround the town like a belt, and lie more especially on the north side; they are thus on the side of the prevailing wind, and some are in the very midst of the houses.

In the middle of the town there is a large depôt of the rotten fish mentioned above, besides places ("daouar") for storing raw hides for exportation, of which there is even now a certain amount. What strikes the visitor as he goes through the town is the number of ruined enclosures (kharabeh) which are found in lines in all parts of the town, and are filled with heaps of filth; there are as many as thirty-four in one single district. Besides these great deposits of filth there is to the right of the door of the Jews' "okelle" a large well full of faecal matter, which is emptied by means of an elevator like those used in the country for watering the fields (sakiah); what is taken out runs along open gutters into the large drains from the public baths, which fall into the river.

All along the streets and alleys there are little heaps of excrement, &c.

Both the Medical Committees which came to Damietta on the 24th June to investigate the existence of the disease had already noticed this unheard-of want of sanitary precaution, and it was not till after their departure that the principal streets were first swept.*

Thus it will be seen that the town of Damietta is almost an island washed on the west by the Nile, on the east by the great lake of Menzaleh, on the south by the Enanieh Canal, which runs from the Nile into the lake; further, the haligh mentioned above runs right through the town.

The cultivable ground, in the midst of which Damietta stands, is laid out in rice fields covering somewhat more than 3,000 feddans.

Moreover, at a certain season every year there is a great fair which brings together more than 15,000 persons, who are crowded into the place for eight consecutive days.

We must also notice that the amount was this year greater than usual, especially at the time of the recruiting.

§ II.—*Sanitary State of the Town before the Epidemic.*

For several months the inhabitants have suffered from no epidemic disease, and it was only in the week preceding the 22nd June that we observed in the bills of mortality of the town "acute gastro-intestinal catarrhe" repeatedly entered as the cause of death.

But to make up for the freedom from human epidemics, we must observe that the fatal malady of bovine typhus has long continued in this region; and it is still more worthy of note that the disease which is now ravaging all Egypt appeared first at Damietta and Rosetta.

§ III.—*Outbreak of the Cholera Epidemic at Damietta.*

To establish the precise date of the outbreak of cholera at Damietta, we had to find out who was first attacked. Now the attention of the chief doctor at Damietta (the only one in the town) was not drawn to the presence of any grave malady until he observed from the bills of mortality that the death-rate had become unusually high; it was not until the 23rd June that he noticed this, and wrote a letter to Dr. Ferrari asking him to assist in ascertaining the facts of the case, which led him to suspect cholera, as the mortality had risen in a significant manner from the 22nd June; on the 21st it stood at one and reached fourteen on the next day.

There is no doubt that the fourteen people who died on the 22nd must have been attacked one, two, or three days before; and if their death could be traced at all to the disease which has since then raged in the country, we should have it confirmed by

* In February last, Dr. Ferrari, Director of the Health Office at Damietta, sent the following, now translated from the Arabic, to the principal Doctor of the town:—

"Having received instructions to report to the Maritime Sanitary and Quarantine Board of Egypt on the sanitary state of the town, I have been through the streets and principal parts of the town. I have ascertained that the whole place is in a remarkably unhealthy state. All the streets are full of mud and putrifying filth, which gives out deadly smells. In many places there are regular heaps of filth and streams of tainted water, which also gives out horrible smells, which may certainly produce serious illnesses. The dead dogs are thrown into these streams, and produce abominable stench, such as may be smelled near the Catholic Church and M. Kabil's house, &c.

"I have also discovered a large well full of faecal matter, which is emptied by day with a sakiah. Throughout the town, in fact, there is a singular want of sanitary precaution; and, as summer is coming on, I should like to ask you, as a doctor, what can be the result of these emanations, and if the sanitary regulations permit the existence of such a state of things!"

the fact that on the 22nd, towards evening, Dr. Ferrari visited a patient who was suffering from vomiting and a very abundant watery diarrhoea. The individual was being brought home on an ass; he died during the night.

Being thus obliged to look upon this as the first case officially established, we will add that the patient was a man of 80, called Boutros Hanna Issa, a Syrian, established here for many years, a janissary of the French Consulate, living in extreme poverty in one low damp room with his family of seven persons.

But public opinion at Damietta looks upon a man called Hassan Nour-el-Din, of whose life we subjoin a short biography, as having been first attacked by the epidemic. He was 45 or 50 years of age, an Egyptian born in Damietta, who had always lived in that town, and had left it rarely; he was a mason by trade. He had left Damietta on the morning of the 21st June to go to Mansourah; he did not feel ill before leaving, and no member of his family had noticed that he was in any way unwell; he began to feel unwell at Mansourah on the following day, that is on the 22nd, and on Saturday, the 23rd June, he took the train at Talka to go back to Damietta. All this time he was still able to walk, and had neither vomitings nor diarrhoea, but on reaching the station at Ras-el-Khalig he was overtaken by the disease, and got worse and worse till he arrived at Damietta, where they were obliged to carry him on men's shoulders from the station to his house, which he reached on the 23rd June before sunset; he succumbed about midnight, and was buried next day, Sunday, the 24th.

The opinion that this man may well have been among the first who came under the infection should not be rejected.

The date of these two deaths do not enable us to fix the interval which elapsed between these supposed first attacks and those that followed, as on the 23rd June the death-rate was already shown by the registers to be twenty-three. We must here repeat that it was only after this fresh augmentation had been noticed that the doctor of the town and Dr. Ferrari began to see the sick; they saw seven on the morning of the 23rd June; telegrams were then also sent from Damietta to Alexandria, signed by several Consuls, and in particular by Dr. Ferrari, announcing that a disease, probably cholera, had appeared at Damietta.

The result was that two Medical Committees, the one sent by the Board of Health, and the other by the Maritime Sanitary and Quarantine Board, arrived on the spot on the 24th, and after inquiry, declared that it was epidemic cholera.

Without being too precise as to the exact date of the outbreak of this disease, we think we may take two or three days before the 22nd June as the date; that is, the 16th, 15th, and 14th of Shaban, which was the time that the people left after the eight days' fair. But bearing in mind the rapid rise in the mortality, we are inclined to believe that in any case the present disease broke out suddenly at Damietta.

It broke out in the district of Souk-el-Ribeh, one of the most unhealthy and most densely populated in the town; the disease was, to a certain extent, localized there for the first three days of its spread, and gradually crept out thence to the other parts of the town; and we would here note that up till now the malady has found but few victims among the negro servants, in some of the houses forming the long frontage west of the town facing the Nile, and inhabited by the moderately well-off.

Finally, the disease, behaving like a true epidemic, has spread itself along the Nile Valley, and is now supreme in many places in Lower Egypt.

§ IV.—*Nature and Progress of the present Epidemic.*

The cholera epidemic, which has raged at Damietta since the 22nd June, continued to increase up to the 1st July, on which day it reached its highest point. As it thus increased, the malady showed every characteristic of an epidemic, attacking all, without distinction of age, sex, or race; it has not, however, as yet, attacked any European; it sometimes kills almost instantaneously; at others, the sufferer recovers without the aid of any medical treatment, often with the least care; but very often the disease resists all remedies.

Diarrhoea is the predominating symptom with persons attacked by the cholera; vomiting is also noticed, but it is not persistent; the phenomenon of algidity is not very marked; cramps also are less often to be noticed than is usual.

But since the 1st July the disease decreased after remaining some days stationary; cases thenceforward became milder, were less sudden, and yielded oftener to treatment. But recovery then became incomplete and irregular, and we have often noticed cases which passed into the typhoid state; for some days now it has been observed that the period of recovery ends in a crisis, at which an erythematose eruption,

lasting from twenty-four to forty-eight hours, appears; when it disappears the cure is complete.

The epidemic is now rapidly diminishing; attacks are already rare in the town, but still occur in the neighbourhood.

In tracing the course pursued by the disease, it is impossible for us, and for anybody else, to know and to say in what proportion the number of attacks stands to the number of deaths per diem.

The epidemic has shown, during its course, several more or less sensible undulations of augmentation and diminution; we noticed that calm hot days increased its violence, while the mortality always fell after fresh windy weather.

With regard to the individual who died in two hours without either diarrhoea or vomiting, death took place during a convulsive fit; and the doctor states the cause to be "eclampsis."

§ V.—*Origin of the Epidemic.*

As it is now established that the disease, which arose suddenly at Damietta on or about the 22nd June, 1883, is epidemic cholera, it is of the greatest interest to try to ascertain if this cholera is the result of importation or is of local origin.

When endeavouring to go into the details which are wanted for solving this problem, we do not forget the importance of this matter in relation to many grave questions connected with the health and lives of men, and with the highest interests of their social, political, and commercial relations. We will at once state that we do not pretend to have arrived at any incontrovertible conclusion, or to have dispelled all doubt on the subject.

Indeed, we showed in chapter 3 that, notwithstanding the suddenness of the spread of the epidemic, we are inclined to the belief that this suddenness is only apparent; we also saw how difficult, nay, how impossible, it is to get at the first case of attack, and to be sure of the circumstances in which the disease was contracted; and that because of the bad sanitary system followed here, under which the doctor in such a town as Damietta cannot become aware of the existence of an epidemic until it has already had many victims; for the same reason it is not possible to study the progress of the disease in its successive victims.

Thus we stand confronted by two hypotheses: we will merely enumerate the arguments in favour of each, endeavouring, however, to give its due weight to each argument.

(a.) Was the cholera which appeared on the 22nd June, 1883, at Damietta, imported thither from some country where it already existed in an endemic or epidemic form?

We recently watched three consecutive outbreaks of epidemic cholera at Mecca—those namely of 1878, 1881, and 1882—and showed well nigh material proof that the malady was each time imported into Hedjaz; we were therefore till now great partisans of the theory of importation, and would not have hesitated for a moment to have pronounced in favour of importation in the present case also, had the facts which we searched for most carefully, in order to arrive at this conclusion, appeared in any way reliable.

Could one rely exclusively on the Report addressed to His Highness the Khedive by his Excellency Salem Pasha in the present month, the question would be solved at once. Our ex-Professor of Pathology at the School of Medicine at Cairo, and ex-Delegate for Egypt at the International Conference of Constantinople, has already declared that the cholera was imported at Damietta, relying on the conclusions adopted by the Conference in which he took part eighteen years ago.

The conclusions adopted by the International Sanitary Conference of Constantinople are no doubt in favour of such an assertion; and, so far as we know, no new scientific fact has been discovered to modify it.

But these conclusions are already more than eighteen years old, and we are confident that in the present epidemic science will find evidence which will lead to this question being placed on a new footing. Moreover, we have a right to ask whether the conclusions of such an International Conference were really free from all political, commercial, and social considerations, and whether, as we see is the case to-day, each Delegate at the Conference was not in the habit of asking his Government for instructions on such important questions as he could not assume the responsibility of.

To speak only of our own Egyptian Delegate at the Conference, did we not see him refuse to vote with a unanimous majority on the following question proposed by

the Conference?—"In case a cholera epidemic should reach Egypt by way of the Red Sea, and Europe and Turkey should escape the contagion, would it not be right to interrupt temporarily all communication between Egypt and the whole Mediterranean basin?" (adopted unanimously with the exception of Salem Bey); yet Dr. Salem Bey, now Salem Pasha, was at one with the majority as regards the contagious and transmissible nature of the malady.

But even if we grant all authority to the conclusions drawn by the Conference, it is necessary, in order that cholera should have been imported into Damietta, that it should have been brought there by sick people or by contaminated articles, having come, both of them, from India during the current year, in which country cholera prevailed hardly a month before it broke out at Damietta.

Without inquiry as to the extent to which the measures of sanitary quarantine against arrivals from Bombay, Calcutta, and Java were properly enforced in Egyptian ports, we made minute and assiduous investigations in view of coming upon the track of a traveller or of a bale of merchandize coming into Damietta, no matter by what route. We even pushed our inquiries back to many months before the outbreak of the malady. The following is all the information we could collect:—

On the 21st February, 1883, an Afghan, called Sultan Mohamed, son of Sardar, came to Damietta from Cairo and left for Jerusalem.

On the 7th March a Boukariote, named Nour, son of Mohamed, arrived at Damietta from Port Saïd by the lake route, and left for Jerusalem.

On the 24th March eight Afghans arrived from Cairo, and left for Jerusalem.

On the 29th March an Afghan, called Hadgi Amin, son of Arsselain, came from Cairo, and left for Jerusalem.

On the 24th April an Indo-Persian, called Ali, son of Hazrat-Nour, came to Damietta from Cairo, and left for Jerusalem.

On the 20th May an Afghan, called Hadgi Mohamed, son of Darouich, came to Damietta from Jaffa, in Syria, and left for Cairo.

On the 7th June a Boukariote, called Hadgi Nazir, son of Khoda-Wardi, came to Damietta from Cairo, and left for Jerusalem.

Lastly, to complete the information, we must note that on the 24th June some Boukariotes came to Damietta from Jaffa, in Syria. The six principal people among them are those whose names follow: Abdel-habib, son of Mohamed; Chérif Abdel Nour; Chiar Mohamed, son of Abdel Moufid; Gohar, son of Soltan; Fadlaldin, son of Amin; and Badaoui Woukrim. These last two are natives of Hindustan.

The chief doctor of the town of Damietta, Ali Effendi Ghibril, assured me that these strangers were at least twenty in number with their wives and children, and that they came to Damietta on Thursday, the 21st, whilst the passport office entered them about the 21st. But in verifying the exact date of their arrival at Damietta by sea at the quarantine office it appears certain that they did indeed arrive on the 24th June, and that the number of travellers was twenty-one; but there were but six strangers among them, namely, the Boukariotes and natives of Hindustan, whose names we gave above; the rest were Jews, including the Rabbi, Achil-ben-Benjamin, and his son, and native Egyptians.

But Damietta can be approached otherwise than by sea. Merchandize and strangers can come thither by way of the lake. It is so close to Port Saïd, and its daily relations with that port are so continuous, that it would be possible for foreign merchants, or even for simple workmen of Port Saïd from among those who work on board the ships coming from India, to have entered Damietta, and to have brought the disease with them.

It has been said that during the Fair of Sheikh Abou-el-Maati, which brought some 15,000 people to Damietta, two merchants were present in the town who had just come from Bombay. This information was given to us in a note from Dr. Ardouin Bey, who in his turn had it from an English doctor, who was very respectable and worthy of belief. It is easy to understand with what zeal we sought information from the merchants, Notables of the town; the following is what the Notable Saïd-el-Lozi thinks he is able to be positive about: "During the fair no Indian merchant or tradesman appears to have been present, neither anybody selling Indian goods; certainly a stranger was seen, with a turban like a Dervish's, and tolerably well dressed, but he spoke to many people of the town, and told everybody that he had come from Cairo, where he had lived for seven years."

Lastly, Dr. Flood, doctor at the Port Saïd hospital, who, like ourselves, is a great partizan of the theory of the importation of the disease now prevailing as an epidemic at Damietta, had, as we also had, for a moment thought that he had found the key to

the enigma, wrote a Report to his Excellency Salem Pasha on the 5th July, which Report has been communicated to the whole of the local press, and from which we quote the following passage:—

"On the 18th June a stoker called Mohamed Khalifa, a native of Upper Egypt, landed at Port Saïd from the English steamer 'Timor,' from Bombay for Naples and Genoa: he left immediately for Damietta. I inclose to your Excellency the answer, received this day from the Governor of Damietta, to two telegrams sent to him at my request about Mohamed Khalifa by his Excellency the Governor-General of the Canal. Although they are not sufficiently satisfactory to explain the spread of a cholera epidemic at Damietta, they are enough to warrant the fact of the importation of the malady by Mohamed Khalifa being admitted.

"Perhaps cholera-like cases had taken place on board the 'Timor' after she left Bombay, and consequently Khalifa would, on reaching Port Saïd, have been in the incubation period of the disease; is it not equally possible that this man may have been seized with choleraic diarrhœa when he got to Damietta?"

Dr. Flood's Report came to our knowledge on the 9th July in the newspapers; and admitting with its author the possibility that cases of cholera may have taken place on board the "Timor," that Khalifa may have found himself in the incubation period of the malady when he got to Port Saïd, and that it was likewise possible that he may have been seized with choleraic diarrhœa on reaching Damietta, we were about to applaud the efforts made by our colleague of Port Saïd, and cry victory with him. We therefore hastened to make searching inquiry into the facts of Mohamed Khalifa's case and into his movements, leaving to others the duty of examining the circumstances in which the "Timor's" sanitary inspection and bill of health had been managed in all the Egyptian ports which she passed between Suez and Port Saïd, as well as her treatment on reaching Naples and Genoa. (See Annex No. 1.)

With this view the following persons met at the Damietta Health and Sanitary Office on the 9th July: Dr. Ahmad Nadim Effendi, Sanitary Inspector of the town; Aly Effendi Ghibril, chief doctor of the place; Ahmet Bey Chaffey, delegate of the Egyptian Quarantine Board; Spiridion Cossery, clerk at the Damietta Quarantine Office; and Spiridion Passiour, Notable of the town; they called Mohamed Khalifa, and he personally appeared before them and made the following declaration:—

"He is from the Moudirich of Kéné (Upper Egypt), is between 32 and 34 years of age, left his own country seven years ago; he has been long employed at Port Saïd in the service of the Canal Company as a stoker, and hired himself two months ago as a stoker on board an English ship, of which he does not know the name, and which left for Bombay. The ship stayed there three weeks, during which time Mohamed Khalifa was not aware of the existence of any disease at Bombay. The ship then left Bombay, in good sanitary condition, laden with cotton and rice; there were no passengers besides the crew, which was in good health all the time, and during the voyage of twenty-one days from Bombay to Port Saïd no one was ill. When he reached Port Saïd and his engagement was finished, he left the ship and went to his house, where he stayed four days. Then, having had a quarrel with a cavalry soldier of the Government he was arrested and put in prison for three days, at the end of which he was exiled from the town, by the order of the Governor, as a bad character, and he then left for Damietta by boat, via the lake, and arrived there, after a voyage of twenty hours, on the morning of Sunday, the 24th June; 1883. On reaching the town he went often to the café called 'Salem-el-Sandoubi;' he then got drunk and was put in prison for some hours. He remained at Damietta till the 1st July, 1883, in good health. Towards the end of the 1st July he was seized with vomiting and diarrhœa, which passed off on the following day without medicine."

The doctors present examined Mohamed Khalifa after this declaration, and found that, although still convalescent, the state of his health was satisfactory.

As it was shown by the declaration of Mohamed Khalifa himself that the date of his departure from Port Saïd and his arrival at Damietta did not correspond with the 18th June as Dr. Flood affirms, the following telegram was dispatched the same day to Dr. Pestrini at Port Saïd:—

"Ascertain from Governor Port Saïd what day Mohamed Khalifa was exiled, and answer quickly.

(Signed)

"CHAFFEY BEY."

And Pestrini answered by the following telegram:—

"Mohamed Khalifa was exiled from Port Saïd on Shaban 18, equals the 23rd June.

(Signed)

"PESTRINI."

It will be seen at once that Dr. Flood mistook the 18th June for 18 Shaban. (See Annex No. 1.)

Seeing these facts, we now find it positively impossible to pronounce in favour of the importation of the cholera of this year into Damietta, and we are therefore obliged to consider the cosmic, telluric, and social conditions, ordinarily or accidentally existing, in which the cholera developed itself there as an epidemic.

(b.) Could the cholera which appeared at Damietta on the 22nd June, 1883, have developed spontaneously?

From the narrative which we have given in chapters 1 and 2 of this Report, it appears that, in addition to the lamentable permanent sanitary conditions which make Damietta the type of filthy cities, there were:—

1. The mouth of a river dried up by a prolonged drought, which laid bare its banks and a part of its bed, the mud of which had fermented under the action of a powerful sun.

2. This river carried down for more than a year (and collected them in the angle which the river forms at Damietta) thousands of carcasses of animals which stranded on its slimy banks, where they putrefied in the damp and heat.

3. The river receives at the same place the outflow of the drains, animal and vegetable detritus, and filth of every kind which the current cannot carry away, as it is stopped by the waves of the sea.

4. The miasma produced by all this putrefying matter joins the vegetable effluvium coming from the marshes, from the soil which is full of organic matter, and from the rice-fields which surround the town.

5. The water of this river was used by the greater part of the inhabitants and by more than 15,000 people from different parts of Egypt who filled the town for eight consecutive days on the occasion of the fair of Sheikh Abou-el-Maati. This water has been analyzed by the chemical expert of the town of Alexandria. (See Annex No. 2.)

6. During these eight days that these people were crowded into the town, there were veritable orgies at which nothing was eaten but the flesh of animals which had died of typhus, and of which the hides now fill the large warehouses in the town and the neighbourhood.

7. The epidemic broke out immediately on the conclusion of the fair.

8. The 19th, 20th, and 21st days of June were marked by a sudden rise in the temperature.

9. The disease appeared principally in the most unhealthy and most populous parts of the town, which are inhabited by poor people who use only the water of the river and of the halig.

10. The disease remained localized for a long time at Damietta before it spread itself, and the spread always happened in places situated on the banks of the river, and by means of sick who had emigrated from Damietta; witness the towns of Port Saïd, Alexandria, Ismaïlia, Suez, &c.

11. The rise and fall of the epidemic here is insignificant compared with that of the epidemics of 1865 and 1866.

12. The notable diminution in the number of seizures observed after Mr. Goodall had buried nearly 1,000 carcasses and fragments of animals which choked up the river.

13. The mathematical and almost miraculous coincidence of the fall in the mortality with the arrival here of the fresh water of the rising Nile.

14. Lastly, the epidemic has now almost died out in Damietta after the execution of a part of the measures which had been ordered.

Do these facts prove the second hypothesis conclusively, in the sense that they show that the same cosmic and hydrotelluric causes which are present at the beginning of an outbreak on the delta and banks of the Ganges were this year present on the delta and banks of the Nile?

We admit that we do not possess the necessary authority to pronounce on this point, and we submit it in the shape of observations for the future judgment of science.

We must, lastly, quote here, though without drawing any practical conclusions from it, an official document relating to the subject under consideration. It is the despatch sent by his Excellency the Governor of Damietta to the Maiah on the 26th June (translated from the Arabic):—

“The investigations made as to the causes of the outbreak of the disease at Damietta have shown that it was the result of the crowding together of people at the mid-Shaban fair, who partook incontinently of water-melons, cucumber, and fisikhs; but, thank God! there is now an improvement.

§ VI.—*Measures taken with regard to the present Epidemic.*

It has been noticed in the preceding chapter that the measures taken to crush the epidemic at its first focus were in part useless. On this head it is necessary to give some explanatory details.

We readily acknowledge, and that without any intention of flattering, that the fault lay neither with the orders drawn up and given each day by the Ministry and the Sanitary Boards, nor with the requests made by the medical body here to the executive authorities.

In the same impartial spirit which has hitherto guided us, we are now about to enumerate the measures which were carried out, and those which were not, or which were executed imperfectly or after delay :—

1. We must now declare that the sanitary cordons formed round Damietta did not work satisfactorily from the time they were established to that when they were withdrawn.

2. The most important measure, which consisted in clearing the populous and low quarters which were most infected by the disease, was not carried out, in spite of the existence of everything necessary to carry it out.

3. The most rational measure, which consisted in filling up the latrines of the mosques and public baths with earth and lime, and then nailing, or even walling them up, was only begun for show, and even this show was kept for a few days only.

4. No huts or cabins were burnt, pulled down, or disinfected.

5. It would be an error to suppose that it was possible after the first to burn the goods of patients who died of cholera.

6. No house was whitewashed.

7. In view of the difficulty experienced in having the streets regularly swept and watered, it was thought well to cover the soil of the town with a thick layer of sand; this measure, which had an excellent effect, was only completed within the last few days.

8. The burial of the dead in cemeteries in the midst of the dwellings never ceased; and neither there nor elsewhere did any one venture to throw chloride of lime on the corpses.

9. As regards the cementing ordered in these circumstances in order to close up hermetically the outside of the tombs, it is credibly affirmed by officials that the persons whose duty it was to carry out this measure preferred to sell the plaster and lime. Besides, what would be the use of cementing a vault which has to be opened as many times in the day as there are deaths in a family?

10. There were only four doctors sent here, and they were scarcely able to get through the hard task that was before them, although they gave proof of devotion, zeal, ability, and courage by working day and night, and although some of them would not stop working when they fell ill. We hold it a duty to express now, in the name of the public, our sincere congratulations to Drs. Ahmed Nadim Effendi, Mohamed Amin Effendi, Kassim Mohamed Effendi, and Hassan Hassan Effendi.

We can say as much of the zeal and devotion of the only druggist who was sent here, M. Ahmed Effendi Hamdi, who was able both by night and day to meet all requirements.

11. We must also state that not only was there an insufficient supply of medicines and disinfectants sent here at first (80 kilog. of chloride of lime), but also that the second supply stayed outside the cordon three days before it could be brought into the town.

We regret to be obliged, in the name of truth and for the good of the country, to disclose facts which we should have been happy not to have had to state.

We finish our Report by a sincere wish that the near future will profit by the experience of the past, in order to avoid fresh misfortunes, and that before reforming its social and political institutions, Egypt will reform its sanitary institutions, which are the basis of all.

(Signed)

AHMET CHAFFEY BEY, *Dr.*
SALVATORE FERRARI, *Dr.*

Annex No. 1.

Translation from the Arabic.)

To his Excellency the President of the Maritime Sanitary and Quarantine Board at Alexandria.

I have the honour to inform you that from the investigations which have been made about Mohamed Khalifa, stoker, it appears that he left Port Saïd for Bombay on the 25th April, 1883, on an English ship called the "Timor," which left Bombay for Port Saïd on the 19th day of June, 1883. The said stoker disembarked at Port Saïd and went to his house, thence he went to Damietta on the 23rd June, 1883, and has not returned.

The head stoker declares that the said Mohamed Khalifa did not go to Damietta after his last voyage.

(Signed) THE GOVERNOR OF PORT SAÏD.

Annex No. 2.

The Undersigned, Ibrahim Moustapha, chemical expert, nominated by his Excellency Hassan Pasha Mahmoud, President of the Maritime Sanitary and Quarantine Board, to make a chemical and microscopic analysis of the water of Damietta, reports as follows :—

The water was contained in six glass bottles placed in a tin box; two of the bottles were broken, and the four others were sealed with red wax, the impression of the seal was not legible.

I opened the four bottles and found that the water was not clear, and that it turned red litmus paper blue.

I proceeded to analyze the water in the following manner :—

1. I added to some water in a test tube a few drops of azotate of silver, containing an excess of azotic acid. The water did not become turbid.

2. I added a few drops of a solution of chloride of barium to some water in a test tube. The water did not become turbid.

3. I added a few drops of acetate of lead to some water in a test tube. There was neither turbidity nor precipitate.

4. I added a little solution of nitro-prussiate of sodium to some water. There was no violet colour shown.

5. I added a few drops of solution of oxalate of ammonia to some water. No precipitate was produced.

6. I added to some water a solution of chloride of ammonium, I filtered the solution, and mixed the filtered liquid with a solution of phosphate of sodium and a little ammonia. No precipitate was formed.

7. I added some of Bohliger's liquid to some water. A slight white precipitate was formed.

8. I added to some water a little of Nessler's reagent. A slight reddish brown precipitate was formed.

9. I boiled some water in a glass flask with some drops of solution of caustic potash, and I placed near the opening of the flask a rod wetted with hydrochloric acid. There was a white cloud round the rod.

10. I boiled some water in a glass flask, and I placed near the opening of the flask a piece of paper which had been previously dipped in a solution of fuchsine treated with sulphuric acid. The paper which had been white became red.

11. I placed 100 cubic centim. of water in a porcelain capsule, and added a few drops of chloride of gold, so that the water became of a yellowish tint, and I then boiled the liquid. There was a black deposit, and the water became violet.

12. I determined the hardness of the water by the hydrotimetric method, and I found that the hydrotimetric degree of the water was 17.

13. I evaporated and dried 100 cubic centim. of water in a weighed capsule of platinum; I completed the desiccation in a Waring drying apparatus at a temperature of 120 degrees. When I placed the capsule in the scales, the weight was found to be 0.048 grammes.

14. I calcined the evaporation residue obtained in operation 13, I allowed the capsule to cool, and then I added a solution of carbonate of ammonia. I evaporated it until completely dry, and I placed the capsule in the balance. The weight was 0.027 grammes.

15. I added, drop by drop, to 100 cubic centim. of water nearly boiling, a solution of permanganate of potassium, containing 1 gramme of the salt to the litre, so that 1 cubic centim. of the solution would represent 5 millig. of organic matter—4 c.c. 3 were needed to produce a red colour.

16. I placed on the microscope stage a drop of the turbid water deposited at the

bottom of the bottles, and after having placed a covering glass over it I examined it through the microscope (magnifying it 500 diameters), and I observed: (1) fragments of vegetable matter and chlorophyl; (2) infusoriæ, principally of the order *Vibrio*.

Signification of the Results obtained, and Conclusion.

The result of the experiments is—

Of experiments 1, 2, 3, 4, 5, and 6, that the water submitted to examination contains no appreciable traces of chlorides, sulphates, alkaline sulphides, or soluble salt of magnesia.

Of experiments 7, 8, and 9, that the water contains ammonia (free or in combination) in appreciable quantities.

Of experiment 10, that the ammonia is at least partly free.

Of experiment 11, that the water contains a considerable quantity of organic matter.

Of experiment 12, that the hardness of the water is normal.

Of experiment 13, that the solids contained in the water are in the proportion of 0.048 gr. to 100 cubic centim., or 0.480 gr. to the litre.

Of experiment 14, that the proportion of organic matter contained in the water is 0.021 in 100 cubic centim., and that of fixed matter 0.027 gr., which gives for a litre of water: organic matter, 0.210 gr.; fixed matter, 0.270 gr.

Of experiment 15, that the proportion of organic matter for 100 cubic centim. is 0.0215 gr., which gives for one litre 0.215 gr., a result identical with that of experiment 14.

Of experiment 16, that the water contains putrefying matter besides the infusorial vibriones, which are only observed in infusions.

In fine:

1. The proportion of mineral substances contained in the water analyzed is normal, as it is only 0.270 gr. to the litre; drinkable water may contain up to 0.500 gr. to the litre.

2. The water contains a great quantity of organic matter which is probably of animal origin, seeing that there is ammonia in the water.

3. It contains putrescent matter.

4. It contains infusoriæ, especially those of the order *Vibrio*, and fragments of vegetable substances.

From what precedes, and seeing that one of the essential conditions for water to be fit to drink is that "it should be free from organic matter capable of putrefying," I think that I may fairly conclude that the water submitted to examination is unfit for public use.

(Signed) IBRAHIM MUSTAPHA.

Alexandria, July 21, 1883.

P.S.—The microscopic examination mentioned in this Report was made in the presence of Dr. Abbate Pasha.

I. M.

Annex No. 3.

Sir,

Suez, July 17, 1883.

In reply to your letter of the 12th instant, I have the honour to communicate to you the following information:—

The English steamer "Timor," commanded by Mr. John Anderson, arrived at this port from Bombay on the 17th June last about 6 A.M., after a passage of seventeen days; she had a crew of thirty men and a mixed cargo; no business was transacted by the ship in this port. As soon as this steamer arrived I went on board as usual to transact the customary quarantine business; I asked the master for the bills of health which had been given him by the sanitary authorities where he had last touched, and I found the bills clean and in order, without any note. Further, I asked the master if there had been any illness or any deaths on board during the voyage, and whether he had spoken, &c., any other ship at sea. On his replying in the negative, I asked the master to bring all the officers and crew before me, and I found them all in perfect health. When these formalities had been gone through I sent the steamer to Moses' Wells for twenty-four hours of quarantine of observation, in accordance with the orders received from the Maritime Sanitary and Quarantine Board for vessels coming from Bombay.

The next morning at the same hour, when the above-mentioned time of observation had expired, the ship returned to this anchorage, and I went on board to order the ship to be disinfected; I then subjected all those on board to a strict medical examination, confronting them with the statements in the ship's papers, and, finding them all in perfect health, I admitted the above-mentioned steamer to free pratique, after repeating my questions to the master, who gave favourable answers, and signed the bill.

The same day at noon the steamer "Timor" entered the Canal, and it could not, therefore, have reached Port Saïd on the 18th June, as Dr. Flood states in his Report to the Public Health and Sanitary Board, of which your Excellency sent me a copy; but the "Timor" reached Port Saïd on the 19th June at 4.30 P.M., as shown by the note sent to me at my request by the Suez Canal Company.

Having thus shown the errors in the dates given by Dr. Flood in the information he furnished to the Board relative to the arrival of the above-mentioned steamer at Port Saïd, I take the opportunity of giving your Excellency some explanations in regard to the phrase of which Dr. Flood makes use in his Report, viz., "Perhaps there were cases of cholera on board the 'Timor' after she left Bombay."

On this subject I hasten to inform your Excellency that when I gave pratique to the steamer already mentioned, I not only verified the number of the crew by the declaration of the master, but without trusting to that I asked, as has always been done, for all the ship's papers, amongst which I found the ship's articles, and they agreed with the declaration made.

So that Mohamed Khalifa could not have been in the period of incubation, because he had not been on board with people who had been attacked by cholera, or who had died of it. Besides, the incubation cannot last in a person who has been attacked for twenty-five days, which was about the time from the day he left Bombay to the day he reached Damietta.

I am therefore justified in concluding that it was not Mohamed Khalifa who furnished the centre of infection as stated by Dr. Flood; but it is nearly certain that, as sporadic endemic cholera already existed at Damietta, as mentioned by Dr. Flood, the endemic cholera developing on a large scale changed its nature and took the shape of epidemic cholera, probably on account of the bad sanitary condition of Damietta.

I have, &c.

(Signed) DR. FREDA, *Director*.

His Excellency Hassan Pasha Mahmoud,
President of the Maritime Sanitary and
Quarantine Board, Alexandria.

Inclosure 5 in No. 1.

1. DEATH-RATE for Cairo, 1881 and 1882.—(Taken from the Official Returns as furnished by his Excellency Dr. Salem Pasha.)

	1881.	1882.
Deaths from—		
“Maladies infectueuses”	4,880*	5,392†
“Catarrh gastrique et intestinal”	1,902	2,583
Total	6,782	7,975
Deaths from all causes	14,597	17,290
Percentage of deaths from—	Per cent.	Per cent.
“Maladies infectueuses”	33½	31½
“Catarrh gastrique, &c.”	13½	15
“Dysenterie”	12·9	13½
Typhoid fever	7·5	10
Population of Cairo (1882 Census) .. .. .	..	368,000
Death-rate per 1,000	39·67	46·98

* Of this total of 4,880, 1,097 deaths were from “fièvre gastrique et typhoïde,” and 35 from typhus, and 1,889 from “dysenterie.”

† Of this total of 5,392, 1,472 were from “fièvre gastrique et typhoïde,” and 46 from typhus, and 1,993 from “dysenterie.”

2. EXTRACTS from Hospital Registers.

TANTA.

Average monthly mortality, 160.

	June 1882.	June 1883.
Out of 171 deaths from all causes there were, from diarrhoea	31	..
Out of 156 deaths from all causes there were, from diarrhoea .. .. .	..	34

MANSOURAH.

	1882 (five Months) January to June.	1883 (five Months) January to June.
Deaths from—		
Bowel complaints	30	50
All causes	450	470

DAMIETTA.

	1882 January to July.	1883 January to July.
Deaths from—		
Bowel complaints	82	65
All causes	492	580

N.B.—Dysentery, which is very prevalent and fatal, is not included in above totals of deaths from bowel complaints.

SAMANOOD.

1883. June 1 to 30.—Out of 40 deaths from all causes, 26 were from diarrhoea.

SHIBIN-EL-KOOM.

	1882.			1883.		
	May.	June.	July.	May.	June.	July.
Deaths from diarrhoea	35	15	43	16	37	Cholera.
Total of deaths from all causes ..	57	44	73	54	56	

Inclosure 6 in No. 1.

METEOROLOGICAL Summary for June 1883.

Barometric Pressure, reduced to mean sea level at 32° F.

9.30 A.M.				11 P.M.			
Highest .. .. .	..	..	29.99 on June 3rd.	Highest .. .. .	..	..	29.99 on 3rd.
Lowest .. .. .	..	..	29.81 „ 15th.	Lowest .. .. .	..	..	29.83 on 15th.
Average .. .. .	..	..	29.91	Average .. .. .	..	..	29.91

Temperature in the Shade.

Dry bulb—				Dry bulb—			
Highest .. .. .	..	..	90.2 on 24th.	Highest .. .. .	..	..	79.2 on 23rd.
Lowest .. .. .	..	..	74.5 on 10th.	Lowest .. .. .	..	..	72.2 on 6th.
Average .. .. .	..	..	76.5	Average .. .. .	..	..	74.9
Wet bulb—				Wet bulb—			
Highest .. .. .	..	..	78.9 on 17th.	Highest .. .. .	..	..	77.8 on 23rd.
Lowest .. .. .	..	..	72.2 on 10th and 27th.	Lowest .. .. .	..	..	70.7 on 26th.
Average .. .. .	..	..	74.8	Average .. .. .	..	..	73.4

Maximum thermometer—

Highest .. .. .	..	..	..	..	81° on 23rd.
Lowest .. .. .	..	..	..	..	75° on 6th and 7th.
Average .. .. .	..	..	..	..	78°

Minimum thermometer—

Highest .. .. .	..	..	..	..	77° on 21st and 24th.
Lowest .. .. .	..	..	..	..	69° on 4th and 7th.
Average .. .. .	..	..	..	..	73°

Mean temperature for the month .. 76°

Hygrometric state of the Atmosphere.

Dew point—			
Highest ..	..	..	78.7 on 16th.
Lowest ..	..	..	67.0 on 25th.
<hr/>			
Average ..	..	..	73.8
Relative humidity, satur. P. = 100—			
Highest ..	..	..	100 on 18th.
Lowest ..	..	..	71 on 25th.
<hr/>			
Average ..	..	..	91

Dew point—			
Highest ..	..	..	76.9 on 23rd.
Lowest ..	..	..	67.3 on 26th.
<hr/>			
Average ..	..	..	72.3
Relative humidity, satur. P. = 100—			
Highest ..	..	..	100 on 12th 13th, 14th, and 17th.
Lowest ..	..	..	75 on 26th.
<hr/>			
Average ..	..	..	92

Winds.

From N. by E. to E. for eight days.
 „ E. by S. to S. for two days.
 „ S. by W. to W. for eight days.
 „ W. by N. to N. for eleven days.

From N. by E. to E. for nine days.
 „ E. by S. to S. for four days.
 „ S. by W. to W.
 „ W. by N. to N. for fifteen days.
 Calm, two days.

Cloud.

9.30 A.M.—

Present on twenty days; cumuli; mean amount.
 Cloudless on nine days.
 No observation, two days.

11 P.M.—

Present on nine days; cumuli.
 Cloudless on twenty-nine days.

Rain.

None.

None.

Place.

Port Said, 1st to 17th, and 24th to 30th.
 Alexandria, 19th to 23rd.
 Off Aboukir, 18th.

Port Said, 1st to 16th, and 24th to 30th.
 Alexandria, 18th to 22nd.
 Off Damietta, 17th to 23rd.

Remarks.—The most marked character in the weather of this month was the great humidity of the atmosphere up to the 23rd here. Many of the nights during that time were almost or quite still and cloudless, while the air was filled with a saturating moisture.

(Signed)

GILBERT KIRKER, M.D.,
 Surgeon, R.N.

“*Iris*,” at Port Said, August 7, 1883.

*METEOROLOGICAL Summary for July 1883.**Barometric Pressure, reduced to mean sea level, 32° F.*

9.30 A.M.				11 P.M.			
Highest ..	..	..	29.95 on 2nd.	Highest ..	..	..	29.95 on 1st.
Lowest ..	..	..	29.73 on 17th.	Lowest ..	..	..	29.71 on 17th.
<hr/>				<hr/>			
Average ..	..	..	29.84	Average ..	..	..	29.83

Temperature in the Shade.

Dry bulb—				Dry bulb—			
Highest ..	..	..	81.6 on 25th.	Highest ..	..	..	80.3 on 17th.
Lowest ..	..	..	75.9 on 7th.	Lowest ..	..	..	74.8 on 1st.
<hr/>				<hr/>			
Average ..	..	..	78.8	Average ..	..	..	77.7
Wet bulb—				Wet bulb—			
Highest ..	..	..	77.9 on 15th.	Highest ..	..	..	77.7 on 17th.
Lowest ..	..	..	71.8 on 4th.	Lowest ..	..	..	71.1 on 4th.
<hr/>				<hr/>			
Average ..	..	..	75.6	Average ..	..	..	75.3

Maximum thermometer—

Highest	..	..	..	..	83° on 27th.
Lowest	..	..	..	..	77° on 1st.
					<hr/>
Average	..	..	..	..	80°

Minimum thermometer—

Highest	..	..	..	78° on several days towards end of month.
Lowest	..	..	..	73° on 1st to 7th.
<hr/>				<hr/>
Average	..	..	..	75°

Mean temperature for month .. 78

Hygrometric state of Atmosphere.

Dew point—				Dew point—			
Highest ..	..	..	77.3 on 13th.	Highest ..	..	77.2 on 17th.	
Lowest ..	..	..	68.8 on 4th.	Lowest ..	..	68.3 on 4th.	
Average ..	..	..	73.5	Average ..	..	73.7	
Relative humidity, satur. 100—				Relative humidity—			
Highest ..	..	..	94 on 14th.	Highest ..	..	95 on 10th.	
Lowest ..	..	..	74 on 17th.	Lowest ..	..	78 on 19th and 20th.	
Average ..	..	..	84	Average ..	..	87	

Winds.

From N. by E. to E. on five days.	From N. by E. to E. on four days.
„ S. by W. to W. on fifteen days.	„ W. by N. to N. on twenty-six days.
„ W. by N. to N. on eleven days.	Calm, one day.
Mean force, 1 to 2.	Mean force, 1 to 2.

Clouds.

Present, twenty-five days; cumuli; amount 2.6.	Present, twenty-four days; cumuli; amount, 3.6.
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Rainfall.

None.	None.
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Place.

Port Saïd, 1st to 30th.	Port Saïd, 1st to 29th.
Off Alexandria, 31st.	Off Damietta, 30th and 31st.

Remarks.—There was a marked sameness in the weather throughout this month, one day scarcely differing from another. The extreme variation of barometric pressure was only 0.24; the temperature gradually rose 5 degrees, and the relative humidity was moderate, and varied 20 per cent.

The winds were very regular in force and direction, blowing in the morning, moist and cool, from between west and south across Lake Menzaleh, and going round, about 10 A.M., between west and north.

The latter winds, as a rule, fell about midnight, but sometimes they blew through the twenty-four hours. There were nearly always cumuli in the sky, and especially about sunrise and sunset.

(Signed) GILBERT KIRKER, M.D.,
Surgeon, R.N.

“*Iris*,” at Port Saïd, August 6, 1883.

Inclosure 7 in No. 1.

Brigade Surgeon McDowell's Report to Surgeon-General Hunter.

ON the afternoon of the 23rd July, at about 5.20, a marked change in the atmosphere took place, the air became heavy and murky, a condition best expressed by the French word “lourd;” there was little or no wind, the meteorological state afterwards showing that there was much less “force” in the wind on this date than on any other during the month. The existing haze was of a yellowish colour, suggesting the Arabic name for cholera, the translation of which means “yellow air.” In addition to these atmospheric phenomena, which I and many others observed, several people have informed me, notably Surgeon C. Hampden Dixon, A.M.D., that on the day in question birds seemed to have deserted the city, or when still present, all signs of activity among them were suspended. On the night of the 23rd cholera appeared amongst our men at Kasr-en-Nil, the Citadel, and at Abbasieh. I forward you a temperature chart for that day.

(Signed) E. G. McDOWELL,
Brigade Surgeon, Army Medical Department.

Cairo, August 17, 1883.

TEMPERATURE Chart for the 23rd July, 1883.

Barometer, mean ..	..	..	..	..	..	753.55
Temperature, Fahrenheit—						
Minima—						
Morn ..	..	..	..	..	..	66.3
Noon ..	..	..	..	..	..	66.7
Evening ..	..	..	..	..	..	89.8
Maxima—						
Morn ..	..	..	..	..	..	88.3
Noon ..	..	..	..	..	..	95.5
Evening ..	..	..	..	..	..	100.9
Mean ..	..	..	..	..	..	84.50

Humidity, mean	..	..	..	..	..	..	43
Evaporation, mean	..	..	..	..	..	..	2.7
Rain	..	..	..	..	..	..	2.7
Wind—							
Morn	..	..	..	..	..	N. E.	
Noon	..	..	..	..	..	N. W.	
Evening	..	..	..	..	..	N. E.	
Force	..	..	..	..	..	..	4.069
Ozone, mean	..	..	..	..	..	..	4

No. 2.

Surgeon-General Hunter to Earl Granville.—(Received December 12.)

My Lord,

London, December 11, 1883.

I HAVE the honour to forward your Lordship a complete Report on my mission to Egypt, and regret exceedingly the delay which has occurred in its preparation.

The delay has in some sense been unavoidable, consequent on the necessity of having to wait for further information on several points, notably, among others, official information of the march of the cholera epidemic and the resulting mortality.

I may observe that I do not attribute the delay to any neglect on the part of the Conseil de Santé at Cairo to supply me with the desired information, but rather to what I imagine to be their disinclination to close their Report as long as it was known that cholera existed in Alexandria and other places.

Should such be the reason, I much fear, unless I am greatly mistaken in the correctness of my views on the origin of cholera in Egypt, that the Report of the Conseil is not likely to be received for an indefinite period.

With all deference, I think it would have been as well to close the Report when the epidemic activity ceased, and that was, in my opinion, antecedent to my departure from Cairo.

The epidemic having come practically to an end, and my health being indifferent, I determined to avail myself of the discretion accorded me in your Lordship's telegram of the 11th September to Sir Edward Malet to quit Egypt, which I did on the 17th September.

Consequent on the vexatious Quarantine Regulations put in force by the powers of the Mediterranean littoral, I was compelled to take the long sea route, and did not reach London until the 30th September.

In my second Report (dated Cairo, 19th August, 1883) I expressed my intention to visit Alexandria. This purpose I carried out on the 21st August, and remained in that city until the afternoon of the 27th.

I should have wished to prolong my stay in order to pursue my investigations, but the expected arrival of the medical officers and subordinates from India on the following day necessitated my return to Cairo.

During my stay in Alexandria, Mr. Consul Cookson, C.B., Mr. Vice-Consul Mieville, and Dr. Mackie, C.M.G., Consular Surgeon, rendered me every assistance in my inquiries. To the last-named, and to Mr. Cornish, C.M.G., Director of the Alexandria Waterworks, I am deeply indebted for much information, their local knowledge being invaluable to me.

I inspected the city on two or three occasions, and also the waterworks, and had the system of water supply carefully and thoroughly explained to me by Mr. Cornish.

I also visited the several hospitals and ambulances, and the Gabara barracks, extemporized into a hospital for the reception of cholera cases.

I also inspected the Mustapha Pasha Palace at Ramleh, which had been used as barracks and hospital by the troops of the Army of Occupation, but which on appearance of cholera had been wisely abandoned.

From Deputy Surgeon-General Fox, A.M.D., and the staff of the various hospitals, I received a courteous welcome and much useful information.

The Deaconesses, the European and the Greek hospitals, are institutions of which any city might well be proud.

The only hospital belonging to the Egyptian Government in Alexandria is the Arab Hospital. Though inferior to the hospitals above referred to, and presenting defects in construction, yet in management, order, and cleanliness it contrasted most favourably with other Government hospitals I had seen; its principal medical officers, Drs. Varenhorst and Scheiss, are men of reputation and standing in their profession.

My inspection of the city disclosed a state of things which, regarded from a sanitary point of view, can only be characterized as deplorable.

I purposely avoid entering into details, and shall leave them to be dealt with in a special Report which I intend making, embracing suggestions for the sanitary improvement of the city.

I may here mention, however, that there are no public latrines except those of the mosques, which are quite inadequate to meet the demands of the native population; as a consequence, the poor are driven to make use of the streets, gullies, and open spaces for natural purposes.

A portion only of the city is sewered, and the sewers are unventilated. To windward of the city, thirteen public sewers, exclusive of many private drain pipes, are constantly discharging their contents on the beach of a tideless sea. The house connections of the privies with the sewers are free; how perfectly free is well illustrated by the following incident, narrated to me by Dr. Mackie, an incident which would be amusing were it not for its serious significance:

The main sewer of the city in consequence of faulty construction and neglect had become choked. One of the first duties of the Extraordinary Sanitary Commission was to cleanse this sewer, and afterwards to disinfect it by burning sulphur in it. The sulphurous gases, the products of the combustion, readily found an entrance into the houses and created much alarm amongst the residents, who imagined that they were visited by "el-hawa-el-asfar" (the yellow air, or cholera) in person.

This affords excellent proof that the house connections are the ventilators of the sewers.

During an interview which I had with the President of the Executive Sanitary Commission I drew his attention to the necessity of the ventilators, which had been closed about five years before, being reopened. This, he said, had long been his wish, but that he had been unable to accomplish it, owing to the opposition of certain of the European inhabitants. He, however, expressed his intention of acting on my advice.

The exigencies of the time had, as in Cairo, given origin to an Extraordinary Sanitary Commission, the initiative in the matter being taken by Mr. Consul Cookson.

It was composed of representative members of the different nationalities resident in the city, and was presided over by his Excellency Omar Pasha Loutfi, an able and energetic man, who had received a part of his education at King's College, London.

The Commission has done excellent work, and has the satisfaction of feeling that its labours contributed largely towards mitigating the epidemic scourge.

Alexandria, with a population (according to the last census) of 217,972, lost during the epidemic from cholera about 850 souls up to the 31st October.

On the 18th August the death-rate reached its maximum of fifty-one, and after slight fluctuations declined.

During the past month and up to the present date the disease continues to cling to the city, but the daily death-rate is low—about two per diem.

It is deserving of remark that on comparing the dates of the first appearance of cholera in Alexandria in the epidemic of 1865 and of 1883, a difference of three weeks only is found to exist.

In 1865 the first case occurred on the 12th June, and in 1883 on the 3rd July; and, moreover, the outbreak in both epidemics took place in the village of Karmoose, in the quarter known as No. 4, which is the most unhealthy part of the city. These facts lend support to Dr. Cunningham's statement, that "the cholera appears in the same place on or about the same date in different years." (Memorandum on Cholera in Egypt, dated 9th July, 1882.)

It would be interesting to inquire into the reasons for the comparative immunity enjoyed by Alexandria during the last epidemic, and I venture to offer the following suggestions in explanation:—

1. For some weeks during the recent rebellion the population of the city was greatly diminished.

2. The acts of incendiarism, which caused such a great destruction of property, were not unalloyed evils, as they caused large open spaces to be left, previously occupied by buildings covering ground having an area of more than 100,000 square metres. These open spaces permitted the access of the sea breeze into places where light and air had hitherto been little known.

3. A pure water supply.

4. The thorough cleansing of the city and the sanitary precautions adopted by the Extraordinary Sanitary Commissions appointed, one after the bombardment, and the other on the outbreak of the epidemic, as noted above.

The conclusions above arrived at are supported by Mr. Mieville, who has paid much attention to sanitary matters, and whose opinion is entitled to consideration.

Alexandria enjoys an excellent position, with a full exposure to the sea breeze, and, were its sanitary arrangements good, should be a healthy city.

In my last Report I drew attention to the fact, that cholera had existed in Egypt not only some months previous to the outbreak at Damietta on the 22nd June, but also years antecedent to that time, and I verified this statement by facts which had come to my personal knowledge, and by facts communicated to me by certain medical gentlemen, viz., Drs. Dutrieux, Sonsino, Ambron, and Sierra.

I also referred to a statement of Dr. Sierra, that two cases of cholera had been received into the European Hospital at Alexandria in May last, and I expressed my intention of verifying this on my visit to Alexandria.

I have not for a moment contemplated holding any of the gentlemen who have supplied me with the information bearing on this important question responsible for the inferences I have drawn. I am deeply indebted to them for the facts they have communicated, but the inferences are my own. I have thought it necessary to make this statement, as from circumstances which have come to my knowledge I am led to believe that some of them labour under the impression that I have committed them to opinions which they do not share.

It is manifest that the information supplied by Dr. Ambron, for example, while of value in itself, is much too scanty to base any opinion on except that the case he makes reference to is one of cholera. It is the aggregate of the information obtained, which stands out in such significance, and leads to the conclusion that cholera was endemic in Egypt before the recent outbreak.

When visiting the European Hospital I had the satisfaction of meeting Dr. Sierra, and he very kindly placed me in the way of obtaining the required information, and subsequently furnished me with the details of the cases, which with all other documents are herewith attached.

One case was admitted under Professor Fongeron on the 5th June, 1882, and recovered; the other case under the care of Professor Courtier on the 17th April, 1883, and ended fatally. (Annex 1.)

These cases are designated as cholericiform; Dr. Mackie has, however, to my thinking, more correctly described them as two typical cases of cholera.

Dr. Mackie, at my suggestion, kindly made further inquiries, and obtained from several medical gentlemen practising in Alexandria statements of cases which had come under their personal observation.

To Dr. Mackie himself I am indebted for notes of four cases which fell under his own observation. Two in the summer of 1881; another in the summer of 1872, which ended fatally; a fourth in the summer of 1872 or 1873, in one of the sisters of the Deaconesses' Hospital. (Annex 2 and 3.)

Dr. Kartulis furnishes a suspicious case as having occurred in September 1881. (Annex 4.)*

Dr. Mamlouk, in his letter dated the 27th August, 1883 (Annex 5), mentions two cases—one of a suspicious character, which had occurred about eight years previously; another, a typical case of cholera about four years previously.

Dr. De Castro, in his letter to Dr. Mackie, dated the 5th September (Annex 6), states that in 1866 he observed several cases of cholera, which he considered as a residue of the epidemic of the previous year, and he observed that new comers were more susceptible than the residents. Six or seven years ago he saw a case which recovered. About three years previously a case came under his observation and recovered. This patient had had a former attack in 1865. The second attack resembled the first, and presented all the phenomena of cholera.

* This case appears to me to be one approaching in character choleraic type of Peshawur fever described by Surgeon-Major Curran ("Indian Annals of Medicine," vol. xviii, 1876).

Another case he had under his care two years previously in a woman who had arrived the preceding day from Naples. It ended fatally.

Another case occurred in September 1882, in the captain of a ship recently arrived from Italy.

Dr. De Castro considers these to be cases of sporadic cholera, of which similar examples may be seen in the large towns of Europe; that they resemble cases of Indian cholera, but differ from them in being less grave, less fatal, and by their non-tendency to propagate themselves even in the absence of all sanitary precautions.

Dr. Demech states in his letter dated Alexandria, the 3rd September, 1883 (Annex 7), that there had been an outbreak of cholera in Upper Egypt, which came from the Soudan through Dongola and Wady Halfa, reaching Korosko in November 1872.

He states that since 1865 not a summer passed without his seeing one or two cases more or less severe of cholera nostras, but in 1866 he had two fatal cases in Europeans in Mansourah.

This concludes the information I obtained on this highly important subject from medical practitioners in Alexandria.

On my return to Cairo, and since my arrival in England, I have received further evidence bearing on this matter.

Dr. Fouquet, in a letter addressed to Mr. Albert Ismalun, Director of the Meteorological Observatory at Cairo, which letter the latter gentleman has kindly forwarded me (Annex 8), states that he had under his observation in September 1881 a very grave case of cholera nostras, which closely resembled Asiatic cholera. The patient recovered.

Dr. Haddad, in a highly interesting communication, dated Assiout, September 5, 1883 (Annex 9), which he has favoured me with, shows that diarrhœa has been a frequent disease for many years past. He adds that Dr. Mazurakis, in December 1882, had a patient who died with symptoms of vomiting, purging, cramps, and collapse, after ten or twelve hours. He states that diarrhœa has been a very frequent disease every summer, and that the Government registers show the mortality from this disease to be very great, being as much as one-third of the mortality from all other diseases combined.

At Assiout, Dr. Haddad states that a man who arrived from Cairo on the 28th July when the epidemic was at its height, and who died of cholera the following day, was entered in the Government registers under the head of "Choleric form."

The inhabitants of Assiout laughed at this being considered the first case of cholera which had occurred there.

The presence of cholera in Assiout is not recognized in the Government Register until the 31st July, when two cases are recorded.

Further, Dr. Haddad gives it as his opinion that cholera was not imported from Lower Egypt, even supposing importation ever occurred. He concludes by saying:—"How many years it has existed here I cannot say, as I have neither the means nor the time to institute proper inquiries."

I may here say that I had arranged with Dr. Haddad to investigate this matter, but, as I was leaving the country, I deemed it unadvisable to allow him to do so. Dr. Haddad, being an able man, and a cautious and careful observer, and possessing a thorough knowledge of Arabic, was eminently qualified for such work.

If the Report of Dr. Haddad be considered side by side with the letter from Dr. Demech, and the statement of M. Chevalier to Surgeon-Major McNally—"that cholera had existed in the Fayoum (Upper Egypt) six years ago"—I think it will be admitted that there are some grounds for the belief that cholera has existed in Upper Egypt since 1872.

In a Memorandum, dated Cairo, September 19, 1883 (Annex 10), Dr. Rabitsch reports a typical case of cholera which occurred in the summer of 1878 or 1879 in Cairo.

I have next to draw attention to a letter from Dr. Patterson, Her Majesty's Consular Surgeon, Constantinople, dated Constantinople, September 24, 1883 (Annex 11), in which he states that he practised for thirteen years in Egypt, from 1855 to 1868, both in Cairo and Alexandria.

Dr. Patterson states that he was well acquainted with the large districts between Kafr Zayat and Suez, and also the districts of Mansourah, Zagazig, and other places where cholera has recently prevailed.

He affirms that he cannot recall a year during that time without several well

marked cases of cholera having come under his notice, and which were conveniently classed under the head of "Cholera Nostras."

Further on, he says that no one acquainted with the disease could doubt that cholera—by whatever name it might be designated—was endemic in Egypt.

Again, he says:—"Every year at that time there was a cholera panic, and not without reason; and we seemed yearly to be on the eve of a cholera epidemic, yet no one thought of attributing it to an Asiatic or Indian origin, and there was no proof that the disease was infectious."

I have previously stated my intention of requesting the staff of medical officers employed in Egypt to institute inquiries as to the existence of diarrhœa and cholera in the districts where they were stationed, antecedent to the officially declared outbreak on the 22nd June at Damietta, and to report the results to me. Owing to the rapid decline of the epidemic, the Egyptian Government no longer found it necessary to retain the services of these gentlemen, and, consequently, but little time was given them to make the necessary inquiries.

I have, however, received from some of them valuable information, more especially from Surgeon-Major McNally, Madras Medical Service, in charge of Zagazig and district, and from Mr. Honman, in charge of Mahallet-el-Kebeer and district.

In a letter addressed to me, dated Cairo, September 1, 1883 (Annex 12), Surgeon-Major McNally reports as follows:—

(As his Report contains much matter not pertinent to the question at issue, I think it better to forward that portion only of his letter contained in paragraph 4: "Origin of Epidemic.")

He shows that in the villages in the neighbourhood of Zagazig diarrhœa with vomiting had existed since the previous January, and had proved fatal to 200 persons; that great mortality had taken place from cholera at Chibin-el-Kom prior to the report of its occurrence at Damietta; that in certain villages in the neighbourhood of Benha, cholera had appeared before the reported outbreak at Damietta, and in one village the deaths were said to have numbered more than fifteen a-day; and, finally, that M. Chevalier, an engineer, had informed him that he had known cholera to exist at Fayoum (Upper Egypt) six years ago, and also in other parts of Egypt, during past years.

The existence of cholera was not officially recognized in Mahallet-el-Kebeer until the 16th July, when three deaths were reported, and yet Mr. Honman, in his letter, dated Mahallet Kebera, the 30th August (Annex 13), states that numerous cases of cholera had occurred in Mahallet before that date, that diarrhœa was a common complaint in the town, and that for a month before the outbreak the cases had been most severe and intractable; that at Miniett-el-Samanoud and other villages there had been an epidemic in the month of May, as many as four a-day dying out of a population of 4,000; that the deaths had been registered under the head of "Diarrhœa," and had been so numerous at Miniett that the Cadi of the town had forbidden the use of the drum at funerals, in order not to draw attention to the number of deaths, and that although on one day there were twenty-nine deaths, the fear of a cordon caused the fact to be suppressed.

It will be observed that all the facts above noted were communicated by medical men as the result of their personal experience and observation, and all being men of position and standing in their profession.

The next and last piece of evidence I have to bring forward in support of the above is that obtained from an official enjoying a high position under the Egyptian Government, who told Sir Evelyn Baring—"We all know that cholera has been constant here and generally follows the cattle plague, but we are told to say nothing about it."

A careful perusal of the documents and letters attached, of which the above are abstracts, together with the facts communicated to me by Drs. Sonsino, Ambron, Sierra, and Dutrieux, to which I drew attention in my second Report, *satisfactorily prove to me that cholera has existed in Egypt in an endemic form since the epidemic of 1865, and probably anterior to that period, as shown by Dr. Patterson.*

The epidemic of 1883 was consequently the outcome of the disease which existed endemically in the country.

Dr. Dutrieux's conclusion, that cholera centres existed long before the 22nd

June (date of outbreak at Damietta) in several places in Lower Egypt, is confirmed by the data furnished by Surgeon-Major McNally and by Mr. Honman.

The evidence, considerable as it is, was collected in a few weeks. Had longer time been at my disposal, I believe it might have been materially added to. There is one significant feature as to the sources of my information. It was all, or rather nearly all, obtained from medical men not in the employ of the Egyptian Government. The inference consequently is, that either the Government medical officers had failed to recognize the disease, or else that they maintained a strict silence on the matter.

This inference may be considered a harsh one. The time has arrived, however, when it is essential that all that bears on the origin of the late epidemic should be put plainly. It has been shrouded so long by collateral and incidental considerations, that I feel I should ill represent what I believe to be the facts by obscurity of language.

Cholera is recognized by a certain group of symptoms, and it is merely begging the question to say that a particular case coming under observation, though presenting all the phenomena of cholera, cannot be cholera, because there is no evidence of importation, and that it "does not propagate itself in the absence of all hygienic precautions." (See Dr. De Castro's letter.)

Dr. De Castro, the Delegate of the Italian Government, is an able and experienced officer, and is, moreover, a representative man. I have a great respect for his opinion, but I regret that I am unable to accept his conclusions. I presume Dr. De Castro would not refuse to accept the evidence afforded by certain symptoms, which indicated that he had before him a case of pneumonia, and no other disease, because he could not trace its cause, and then proceed to designate it by some other name; nor would he, after witnessing inoculation by small-pox virus, proceed to pronounce the resulting phenomena not those of small-pox, because the disease did not propagate itself.

Inoculation was formerly practised to a large extent in Lower Bengal and other parts of India, but is now happily being rapidly displaced by vaccination. Frequently years would elapse without the disease spreading among the community. Would it be fair to argue from this that the phenomena resulting from the inoculation process were not those of small-pox, because they did not propagate themselves? A terrible awakening would probably await those who held such opinions in the shape of an epidemic outbreak that would decimate the population. Here I am speaking of a disease, the contagion of which is recognized as being perhaps the most virulent known, whereas cholera, in my opinion and in that of many others, is a non-contagious disease, and consequently not likely to spread from individual to individual, as Dr. De Castro evidently expects it to do.

The cause of the spread of cholera and diseases of the zymotic type depends on certain epidemiological laws not yet well understood, but which I shall have occasion to refer to further on.

In the nomenclature of disease in India the term "cholera" is only permitted to be used when speaking of the existence of a certain group of symptoms; when these are recognized, the official return is "cholera." Choleraic diarrhœa has, for good and sufficient reasons, for some years past been struck out of the Returns. Were the same rule applied to Egypt in the registration of disease much confusion would be avoided, and such terms as "cholérine," "cholera nostras," "choleriform," &c., applied to modified forms of cholera, would cease to exist.

If the cases communicated in many of the attached documents be not cases of true cholera, but rather of cholérine and cholera nostras, then Bombay ought no longer to be regarded as a seat of endemic cholera, for the majority of the cases I have seen there, during intervals of epidemic activity, were cases of so-called "cholérine," "cholera nostras," &c., and they did not propagate themselves.

These several forms of the disease differ in no essential particular either clinically or pathologically from one another, and therefore ought to be registered as cholera.*

* "Opinions on this subject" (cholera at New Orleans and in the Basin of the Mississippi) "have, however been very much governed by the notions entertained by different observers of the nature of the disease. How diversely this has been regarded is well illustrated by the certificates returned in the cases of death from it in New Orleans. The following nomenclature was indifferently employed by various practitioners: cholera morbus, cholera spasmodica, cholera sporadica, cholera nostras, apparently cholera, cholera Asiatica (the latter term infrequently). It is admitted, however, that the malady designated by these several names was one and the same disease." (Note C, Memorandum on the prevalence of choleraic disease in the Basin of the Mississippi in 1873, in Reports of the Medical Officer of the Privy Council and Local Government Board, No. 5, New Series.)

Dr. De Castro also states in his letter that if the cases which had come under his observation were cases of cholera, then cholera existed in many of the large cities of Europe. Here I agree with him, for I feel little doubt that examples of cholera are of not infrequent occurrence in many of the cities and towns of Europe, not excluding the British Isles. In certain parts of the Russian Empire cholera is affirmed to be endemic.

The fact of cholera having been endemic in Egypt altogether disposes of such vague and inaccurate hypotheses as to its origin by importation, through Mahamed Halifa, stoker of the "Timor,"* by the Indian contingent during the late war; and the most recent of all (the two former having been allowed to die out), its introduction by coal trimmers and stokers employed on board steamers running between Bombay and Port Saïd.

This last theory has very recently been put forward by Dr. Mahé, a French physician, delegated by the French Government to inquire into the cause and origin of the epidemic. This allegation is being investigated by Her Majesty's Government, though the necessity for doing so seems to me doubtful, considering that conditions already existed in abundance in the country itself to account for the origin and diffusion of the epidemic, not in the Delta alone, but also in towns and villages in Upper Egypt, far removed from the line of traffic between Egypt and India.

Moreover, cholera has never been shown to have been imported from the Indies to Egypt, or to Europe. It is not of course denied that cholera occurs on board ship, but the tendency is to its spontaneous disappearance during a voyage. As the Sanitary Commissioner with the Government of India has remarked that since 1865 Egypt has not suffered once until now; Aden, which is still nearer to India, has never suffered to any extent. Only twice since 1865 has there been a slight outbreak there.

But cholera has prevailed in different parts of Europe in ten different years since 1865. It is endemic in parts of the Russian Empire, yet no alarm is expressed by other countries.

The English sailing-vessels, the "Persia" and the "North Wind," are often loosely quoted as having introduced cholera from the Indies into Jeddah in 1865. They sailed from Singapore with Javanese pilgrims, touching at Aleppy on the Malabar coast, and at Makallah on the southern coast of Arabia, and reached Jeddah.

The voyage in one case was about fifty days, and in the other about eighty. There was no cholera among the pilgrims until the vessels were anchored at Makallah, where new passengers were shipped. Cholera was prevalent during the early part of the year in various towns on the Hadramant coast, and it is reasonable to suppose that Jeddah became infected by the cholera diffusing itself along the land. But in no case can the disease be proved to have been imported from India, and in every alleged instance of such importation the allegation has failed to bear examination.†

Further, on examination of the Returns of cholera for Bombay, it is shown that during 1882 a total of 192 deaths occurred, as against 529 in 1881, and that 120 deaths were registered during the first six months of the present year; consequently, Bombay, against which complaint is chiefly made, had been, during the eighteen months preceding the epidemic in Egypt, more free from cholera than usual, and the disease existed in a form which Dr. De Castro and others of his way of thinking consider as unlikely to have propagated itself.

I will now proceed to call attention to the germ theory of disease as applied to cholera, and see what grounds there are for such an hypothesis.

Happily in India the idea is being exploded less perhaps among the senior

* The following telegram from Sir E. Malet to Her Majesty's Government on this point is of the highest importance:—

"Cairo, July 11, 1883, 11 25 A.M.

"Following from Main, Consular Agent, Damietta, with reference to the alleged importation of cholera from Bombay by Mohamed Halifa:

"Mohamed Halifa, for some years inhabitant Port Saïd, shipped as fireman on board steamer "Timor." Made voyage to Bombay, returning 18th ultimo: all on board in perfect health. Obtained discharge at Port Saïd, and commenced course of drunkenness and excess. This continued four days, when he was imprisoned by Governor of Port Saïd, and finally expelled by that official on 23rd ultimo, and arrived at Damietta on 24th, when he recommenced same course of excess, and was imprisoned on 25th. He is now at liberty, and apparently in perfect health. This disposes of theory, as epidemic broke out at Damietta on 22nd."

† See "British Medical Journal," 11th August, 1883.

members of the medical services than among the junior, the reverse of what is generally stated. A cholera germ is supposed to be a microscopic organism, capable of being imported from the country of its birth, "the Valley of the Ganges," to other and distant countries in various ways, as in or on the person of individuals, by clothing, by cargo on board ships, &c., and that on being so imported into a country, provided a suitable soil, condition or conditions exist, it will develop and propagate itself, and from time to time manifest its presence by outbreaks of the disease which have wrought such sad and terrible destruction among populations.

The more advanced advocates of this theory state, moreover, that fresh outbreaks in European countries require for their production fresh importation of germs from India, as the soil of Europe is not propitious to their cultivation and existence. They consequently always look for fresh cases of importation from India to account for any epidemic visiting a country, and refuse to accept evidence of the existence of the disease unless it can be so traced.*

A germ has never yet been proved to exist in connection with cholera. Its existence is assumed, partly because certain micro-organisms have been found in connection with certain maladies of an infectious or contagious character, and which have been pronounced by those who lend support to the germ theory of disease to stand in a causal relation to them.

Without waiting to discuss this part of the question, let us see how the matter stands in relation to cholera.

Dr. Timothy Lewis and Dr. Douglas Cunningham, two able and competent medical officers attached to the Sanitary Commission in India, have for some years past had their attention directed to the discovery of a specific organism in connection with cholera, and their investigations have been conducted with the care, skill, and patience which such an inquiry demands. They subjected the blood, the dejecta, the interior surface of the intestines, and other structures of the body to the most careful microscopic examination, with only negative results. With regard to the blood, they found under the microscope a rapid development and multiplication of bioplastic bodies in a state of activity, which they thought might account for the numerous bodies of a like nature observed in cholera evacuations.†

Their Report then proceeds to give in detail seventy-nine experiments conducted under chloroform on the lower animals, more especially on dogs, by injecting into their veins or abdominal cavity normal evacuations, solutions of choleraic evacuations, some in a fresh state, others decomposed (twenty-two days old), and other organic solutions.

Taken together, these experiments did not afford any evidence in favour of the existence of a specific poison contained in cholera excreta peculiar to them alone, and giving rise to special phenomena. Drs. Lewis and Cunningham consider "they have a most important practical bearing on sanitation, seeing that they point most distinctly to the influence of decomposing organic matters in the production of intestinal lesions."

These researches, conducted conjointly by Drs. Lewis and Cunningham until 1878, were subsequently carried on by Dr. Cunningham alone during Dr. Lewis' absence in Europe on leave.

Dr. Cunningham, in a very interesting paper "On the development of certain microscopic organisms occurring in the intestinal canal," which is a continuation

* The most thorough of the supporters of this latter view is perhaps Dr. Arkhangel'sky. His opinions are well worthy of attentive perusal, and I give them as expressed by himself in his account of the great cholera epidemic of 1852-55 in Russia (see Note A, p. 172, of the Reports of the Medical Officer of the Privy Council and Local Government Board, New Series, No. 5).

† Dr. Tholozan, Physician to the Shah of Persia, in writing of this epidemic, states that it arose in the Kingdom of Poland, and was consequently of European origin." Dr. Arkhangel'sky then proceeds to state: "Such a conclusion will not bear investigation. Is it, for instance, possible to talk of the European origin of potatoes, when it is historically known that they were originally introduced from America, and that they do not exist in an uncultivated state in Europe? Should the cultivation of potatoes under certain circumstances be prohibited they would soon disappear from the Continent of Europe, and for their fresh cultivation in Europe it would be necessary to introduce them afresh either from America or from other places where their cultivation had been continued, or it would have been necessary to find out a place in Europe in which, in spite of this general prohibition, they might have been secretly cultivated. This new spread of potatoes throughout the whole of Europe from such a place which had preserved the remnant of their cultivation would it have given the right to assert that potatoes are of European origin? Evidently not. On the same principle it is impossible to talk of the European origin of Indian cholera."

† (See Appendix C) "Eighth Annual Report of the Sanitary Commissioner with the Government of India," 1871. "Microscopical and Physiological Researches into the Nature of the Agent or Agents producing Cholera," by T. R. Lewis, M.B., and Dr. D. Cunningham, M.B.

and extension of the investigations on the organisms found in cholera excreta, covers a large area, including animals as well as men in health and disease.

The paper is illustrated by carefully prepared drawings of the objects.

It shows that microscopic parasitic organisms are by no means uncommon in excrementitious matter; that they increase in numbers under known conditions; that certain parasitic forms may be specially associated with particular forms of disease, without holding any causal relation to them. In the human subject, both in health and disease, they are frequently present in varying numbers. That they are destroyed by fermentative changes in evacuated human excreta, but during the fermentation of animal excreta they undergo developmental processes; after this they appear not only in a new form, but with new powers, for even alkaline human excreta are then unable to destroy them. The introduction of the reproductive parasitic element to the human body takes place through the air chiefly, but when so introduced it seems to be quite innocuous. "The paper," says the Army Sanitary Commissioner, "is an excellent example of an inquiry carried out simply to ascertain the facts, but it is easy to see that, if such an investigation were to be undertaken, with a view of showing what theory it might be made to support, a good deal more than the truth might have been got out of it."*

The negative results arrived at by these able and competent microscopists left the field open for other observers, and the French Government, and subsequently that of Germany, each dispatched scientific missions to Egypt, during the recent epidemic, to make special investigations. Though it has not been publicly allowed, there is but little room to doubt that the officers of the French Mission have failed to discover any specific organism in connection with the disease,† thus confirming the results arrived at by Drs. Lewis and Cunningham.

The German Mission, at the head of which is Dr. Koch, is said, on the other hand, to have been more successful and to have discovered the cholera germ, a bacteroid body, having a rod or stave-like formation, and consequently a bacillus.

Dr. Koch, however, in his Report, dated Alexandria, the 17th September, 1883,‡ is much more cautious in his remarks, and definitely states that he looks upon the experiments hitherto conducted as merely of an initiatory character, and expressly states that it is not to be assumed that these micro-organisms are the actual causes of the disease, and suggests that further observation may show that they are mere concomitants.

The writer of an article on this subject in "The British Medical Journal" of the 27th October, 1883, states: "For ourselves, judging from the evidence after very careful perusal of the text, we are inclined to fall in with the latter view, and even to add that thus far sufficient data have not been adduced to warrant our assuming that a specific kind of micro-organism has been discovered in cholera."

Dr. Koch also failed to reproduce the disease in the lower animals, as in mice, fowls, monkeys and dogs, either by pure cultivations on which they were fed or by inoculation.

It may be unnecessary for me now to express an opinion on the value of this discovery of Dr. Koch's, but I may be permitted to say that I quite concur in the opinion expressed by the writer of the above article. I believe the bacilli discovered by Dr. Koch in the intestinal canal of persons who have died of cholera are the result of decomposition, and that the evidence of this is to be found in the Report itself. It must also not be lost sight of, that although some of the necropsies were conducted immediately after death, yet there is a microscopic death during the algide stage of cholera which is antecedent to "real death," the cadaveric odour often being perceptible during life.

The above is a résumé—a very imperfect one I will allow—of the more important published accounts regarding microscopic and other investigations made to discover the cholera germ. Their results, it must be admitted, are not encouraging. I shall next proceed to draw attention to certain broad facts which confirm the results hitherto arrived at by scientific investigation, and tend to the conclusion that in cholera we have to deal with a non-contagious disease.

* An abstract of Dr. D. Cunningham's Researches, from which these remarks have been taken, will be found on p. 71, vol. xii, "Report on Sanitary Measures in India."

† Since this was written the Report of the French Commission has been published. It is dated Paris, the 12th November, 1883, and is addressed to the Minister of Commerce by Dr. Straus. There is nothing in the Report, however, which necessitates any alteration in what I have stated.

‡ See "Deutscher Reichs Anzeiger," "Königlich Preussischer Staats Anzeiger," No. 241, Berlin, 13th October, 1883.

Dr. Goodeve states :*—

"The majority of medical men in India, accustomed to see cholera year after year, to be in constant intercourse with the cholera sick, and to see the general immunity of hospital attendants and of themselves, doubt the contagiousness.

"The disease seldom spreads from bed to bed in a ward; on the contrary, when people are attacked in hospital, they lie generally in a distant corner or in another ward. I have noticed this over and over again, and though I have been connected with the large hospital of the Medical College of Calcutta for many years, I do not recollect any spreading to the nearest or neighbouring patients. I should, as far as my own experience goes, say that cholera does not spread from the sick to the whole by any rapidly-acting emanation. Dr. Morehead's observations support the view of the non-spreading of cholera in hospitals through contagion. They were carefully conducted through three epidemics in Bombay, and though he refrains from drawing positive conclusions, his facts are not in favour of contagion. In England, in spite of some suspicious instances, the washers of soiled linen and bedding do not seem to have suffered out of proportion to others.

"In Dr. Baly's Report, he analyses the reported cases of contagion from this cause, and shows that out of thirty-five reported cases seven only seem to support the contagion theory. It is remarkable that the washers of large collections of linen soiled by cholera patients in many large hospitals did not suffer seriously in 1849. Dr. Waller Lewis' Report to the Board of Health in 1849 shows the error of the assertions of contagion as regards the case of a number of washerwomen reported to have caught the disease by washing soiled linen, and whose cases he personally investigated.

"I think that those who are in the habit of seeing much of cholera will not be inclined to think that there is much potency at all events in fresh cholera discharges. It has been my lot in numerous epidemics to see many cases at a time and for a long time in my own wards, to see the beds, the sheets, the hands of attendants, the floors frequently, nay, constantly, soiled with discharges, to see the utter impossibility of providing fresh beds and fresh blankets, &c, for every case, to see abundant opportunities for the diffusion of the poison from the discharges, and yet, as mentioned under the head of "Contagion," not to see cholera spread in the wards.

"If fresh cholera discharges were so virulent, every bed next to a cholera bed would be a bed of the disease, every bed and metal bed-pan would be a source of cholera to every succeeding patient. My own observation is, that no such evil results. The hospital sweepers, whose duty it is to remove all the discharges, do not suffer out of proportion to others."

Surgeon-General J. M. Cunningham, Sanitary Commissioner with the Government of India, states :†—

"From the record of about 8,000 attendants on cases of cholera in India, it is proved that they suffer no more than other people living in the same place. There is no danger in attendance on cholera cases."

"No one has any grounds for fearing a cholera patient who may be under the same roof, and we may, unharmed, render him any service.

Pettenkofer states :‡—

"If the house has already become a source of infection, the unaffected inmates will not gain the least protection, no matter how carefully they avoid the patient; on the other hand, if the house be not a centre of infection, and the patient has caught the disease somewhere else, the patient himself cannot be regarded as a source of infection in the house."

M. Jules Guérin, the eminent French epidemiologist, is also of opinion that cholera is a non-contagious disease.

In Calcutta it has been the practice for many years past to treat all cases of cholera in the general wards of the hospitals: no source of danger to other patients under treatment was contemplated, nor did any danger ever arise.

The practice was only discontinued in the General Hospital on a building in

* See article "Epidemic Cholera," "Reynold's System of Medicine," vol. i.

† Memorandum on the Cholera in Egypt, 9th July, 1882 (?) 1883.

‡ "Cholera: How to Prevent and Resist It," by Dr. Max von Pettenkofer. Translated by Thomas White-side Hime, A.B., M.B., 1883.

the grounds becoming vacant, into which the cholera patients were placed, more as a matter of convenience, however, than for any other reason.

My personal experience of cholera in India is in accordance with the opinions above expressed. The professorial staff, a large body of students and attendants of Grant Medical College and the attached hospital, Jamsetjee Jijeebhoy, Bombay, who were more or less in frequent communication with cases of cholera, and many of whom were also engaged from time to time in performing *post-mortem* examinations, appeared to enjoy comparative immunity from the disease without any special precautions being taken.

Experience gained during the recent epidemic in Egypt confirms still further these facts. It was no uncommon thing to hear from medical officers and others that their clothing and person had been covered with the discharges from cholera patients, which had been allowed to become dry: yet no evil results followed.

Circumstances which I need not here more particularly refer to rendered it necessary that the British officers serving with the Egyptian army should attend on the cholera sick, wash the bodies after death, according to Moslem usage, and afterwards bury them, and yet in no single instance, if I am correctly informed, did they contract the disease.

From the Table annexed (Annex 14), it will be seen that the attendants on the cholera sick in the several hospitals in Egypt suffered but slightly, except those of the British Army Hospital at Cairo.

The attendants in the hospitals of the British army consisted of sisters and men of the Army Hospital Corps. Among the former not one was attacked, while among the latter 9.1 per cent. contracted the disease. The explanation of such a marked disparity in the number of attacks, not only as between the sisters and the men of the Army Hospital Corps, but also in regard to the numbers attacked in other hospitals, is to be found in fear, one of the most potent factors in the causation of cholera in individuals. Numerous examples of this might be quoted from experience in India. A military officer only the other day informed me that when cholera attacked the men of his regiment quartered at Meerut many years ago, so many of the attendants (men's comrades) contracted the disease that natives were substituted for them, not one of whom became affected.

That fear, with other causes, had much to do with the high percentage of attacks among the men of the Army Hospital Corps, is, I believe, not much a matter for doubt.

I might multiply instances in proof that cholera does not spread from the sick to the healthy, but feel it to be unnecessary.

If the correctness of these views were but generally acknowledged, we might confidently look with hope to no longer witnessing a people panic-stricken owing to their ignorance of the true nature of the disease, a wife or sister no longer prohibited from attendance on a husband or brother attacked with cholera, and countries no longer framing useless and obnoxious Rules and Regulations with the object of protecting themselves against the introduction of a contagion which has no existence, instead of devoting their energies to sanitary work, the true bulwark against an invasion of cholera.

On it being reported that an epidemic of plague or cholera had broken out at Damietta on the 22nd June, a Commission, deputed to investigate the matter, reported, after a few hours' inquiry, that the disease was cholera of the Asiatic type, *but found it impossible to come to any conclusion as to its genesis.* From Damietta, according to the daily bulletins subsequently issued by the Conseil de Santé, the disease spread to Mansourah and Port Saïd, which it attacked simultaneously on the 24-25th idem. It next attacked Samanoud on the 1st July, then Chirbin and Alexandria on the 3rd idem, Manzaleh, Talka, and Chibin-el-Koom on the 11th idem, Mit Gamhr and Zifta on the 12th idem, Chobra and Gizeh on the 15th idem, and reached the Boulak quarter of Cairo on the 16th idem, when three fatal cases were recorded.

From Cairo it reached Beni Souef on the 20th idem, and then gradually spread over Upper Egypt as high as Keneh, near the first Cataract.

Tantah, occupying not only a mid-position with regard to the Delta, but also to the Rosetta and Damietta branches of the Nile, was attacked on the 19th idem. Benha, midway between Cairo and Tantah, along with Kafr Zayat, on the Rosetta branch, and Ismaïlia and Suez on the 23rd idem, Zagazig and Rosetta on the 28th, and Damanhour, about half-way between Kafr Zayat and Alexandria, on the

6th August. Beyond this it will be needless for me to trace the diffusion of the disease generally over the Delta.*

If the above description of the cholera march be followed on a map it will be seen that it did not, as is usually stated, take a southerly course down the Damietta branch of the Nile to Cairo, and then a northerly course up the Rosetta branch to Alexandria, but rather an erratic course, following no particular route either by water or by rail, and appearing in distant places on one and the same day: thus, it was at Alexandria, extreme north-west, and at Chirbin, north-east, about 20 miles south of Damietta, on the 1st July; at Ismailia, in the extreme east, and at Kafr Zayat in the west, on the 23rd July, so demonstrating that its production and diffusion were the result of some general influence and independent of any traffic routes, and confirming in a remarkable manner the views I have enunciated of the existence of the cholera poison in numerous centres antecedent to the outbreak at Damietta.

It has become almost a matter of common observation in India, that even when cholera is severe in a district it is generally confined to a small proportion of the villages. This has been amply confirmed in Egypt. I am unable to give the precise number of villages attacked, as in the official bulletins they are every now and again lumped together as "autres villages." But if a good-sized map be taken and contrasted with the Returns, it will be seen how few villages were attacked in proportion to their number, without any restriction being placed on the intercourse between them.

Immediately the outbreak at Damietta became known to the Conseil de Santé steps were taken to apply the system of "cordons sanitaires" to the town, disregarding the experience gained of their worthlessness in former epidemics in preventing the spread of the disease. On Mansourah and Chirbin being declared infected, cordons were placed also round them, and subsequently a like proceeding was adopted by Alexandria, and she endeavoured to cut herself off from the rest of Egypt.

The history of cordons in Egypt is the history of cordons and quarantine in India. It was found impracticable to isolate "the infected place" from the rest of the country.

The cordons, although carried out as humanely as practicable, were intolerable, and it is notorious that people found ready means of passage through their lines.

The disease, however, was not to be arrested in its progress, and its appearance in the rear of the cordons rendered their retention ridiculous, and they were consequently one after another withdrawn. The application of cordons to the towns officially declared infected was specially inapplicable under the circumstances of the existing epidemic, as the disease already existed in numerous other places in the Delta, as has been previously explained.

Cordons which are adopted on all occasions in Egypt, with the view of carrying out the theoretical idea of stopping human intercourse, have created so much suffering among the people, that they are regarded with horror and detestation. The feeling is universal among the fellahen, and leads them to conceal sickness and hide their dead, lest a cordon should be placed around their village.

Cordons not only effect no good purpose while causing much suffering, but do great harm by confining people within an infected area which they ought to avoid. It is on this very principle that the removal of troops out of an infected area is based, and if the military principle be right, and proofs innumerable can be adduced that it is, it surely must be wrong to apply a diametrically opposite system to the civil population.

Their lives and welfare equally demand our consideration and forethought, and if the further experience which the Egyptian Government has gained of the inutility and injustice of applying cordons to infected towns leads them to prohibit the practice in future, the physical and moral suffering occasioned by them will not have been endured in vain.†

* I am indebted to Mr. James Gibson, the Inspector-General of the Cadastre in Egypt, for the plan from which the above description is taken. It was prepared by him from the official bulletins daily issued by the "Conseil de Santé." The official bulletins, I would here take the opportunity of observing, give only the number of deaths, and not of attacks, neither do they give any information as to sex or age.

† The last attempt to introduce quarantine rules into a cantonment in India is so instructive that I have thought it well to call attention to it here. The statement is taken from the "Eighteenth Annual Report of the Sanitary Commissioner, 1881, with the Government of India," section 6, paragraph 140.

"In several instances during the course of the year attempts were made by local authorities to obtain sanction

It has been stated that the production and diffusion of the epidemic depended on general influences.

It will be as well I should now proceed to state more precisely what these general influences and conditions were.

Egypt proper is a small country. It includes the Delta and Upper Egypt as high as Assuan. Its area of cultivated land is said not to be larger than Belgium. Its population, however, according to the most recent census (1882), amounts to 6,798,280, and is consequently about $1\frac{1}{4}$ millions in excess of that of Belgium. Its soil, which is very fertile, is an alluvium, "the gift of the Nile," and is rich in decomposing organic matter. The people are essentially agriculturists, and lead an out-door life. Manufactories, though increasing, are comparatively few. The rainfall is very scanty, being limited at Cairo to a few showers during November, December, and January. At Alexandria the rainfall, though heavier than at Cairo, is insignificant, amounting, during the last four years, to only 32 inches, or an average of 8 inches a-year, and it occurs between November and April in each year.

The sky is generally cloudless. The air is dry, the dews are heavy, the prevailing winds are northerly. The country is consequently dependent on the Nile for its water supply. The river about the middle of June is at its lowest level. After this period it begins to rise, and on attaining its maximum height about the middle of September again gradually falls, until it attains its minimum level in June. The water is drunk by the people unfiltered. There being practically no rain the subsoil water levels must necessarily follow the Nile level, that is to say, be at their lowest in June and their highest in September. The soil and the water have been polluted through countless generations, and the alluvium is almost as absorbent as a sponge.

Chemical and microscopic examination of the water at Damietta showed that in July it was undergoing putrefactive changes, as stated in my second Report. I have been favoured by M. Albert Ismailun, the Director of the Khedivial Laboratory at Cairo, with the results of a chemical and microscopic examination of the water at Cairo (Annex 15), from which it will be seen that it likewise, in July last, contained living organisms in considerable numbers, and among them bacterioid bodies, and had more the character of pond water than that taken from a running stream.

This polluted water was drunk by the people unfiltered, and to this circumstance, and also the fact of the poorer classes having freely indulged in the practice of eating the flesh of the cattle which had died of typhus, must be ascribed the prevalence of bowel disorders in the country.

For the various reasons above-named, viz. (1) density of population, (2) polluted soil, (3) impure air, (4) impure water, (5) eating diseased meat, (6) prevalence of bowel disorders and of endemic cholera also, the state of health of the people was such as to render them specially noxious to any epidemic influence, and were it not for the out-door life which the fellaheen lead, it is probable the recent cholera outbreak would not have been so long delayed.

Although cholera attacks the strong as well as the weakly, yet experience proves that the debilitated and cachectic are peculiarly predisposed to its influence. This is well illustrated by what occurred among the British troops at Ramleh. "Of the fourteen attacked," writes Deputy Surgeon-General Fox, "eleven were sick in hospital of enteric fever, dysentery, and diarrhoea, and the remainder were in poor health and debilitated."

for the enforcement of quarantine with the object of controlling cholera. For example, in September the commanding officer introduced what were virtually quarantine restrictions into the Jullundur Cantonment, with the object of protecting the residents from the disease during a period of its prevalence in the neighbouring town."

As this procedure was not only a violation of the cholera regulations in force, but also at variance with the practice which has been found to be most satisfactory all over the country, it was immediately countermanded by his Excellency the Commander-in-chief. "No reasons," it was stated, "have been advanced in favour of relaxing this rule at Jullundur, which might not be applied to any other cantonment during a time of cholera prevalence; and in view of the very strong opinion expressed by competent authorities, that no benefit can be derived from the enforcement of quarantine, and the strict orders that have from time to time been issued against its establishment," it was ordered that "all restrictive measures may, in the present instance, be limited to preventing the military as well as native establishment and followers from visiting any places in which cholera exists, all such places being, as far as practicable, put 'out of bounds.'"

The quarantine restrictions were thus immediately withdrawn, and although the disease was very prevalent in the town and neighbourhood of Jullundur, the cantonment almost wholly escaped. Had the quarantine restrictions been sanctioned in this instance, it need hardly be said that the exemption of the cantonment would have been attributed to the action of the local authorities, and the case would have been cited as evidence of the value of quarantine as a protection against cholera.

I shall next consider certain meteorological states which existed during the outbreak and preceded it. Before doing so, however, it will be interesting to refer to like phenomena which have been frequently observed not in India only, but also in Europe, in connection with cholera.

Mr. Glaisher, in his Report on the Meteorology of London during the three cholera epidemics of 1853-54, of 1832, and of 1848-49, says: "The three epidemics were attended with a particular state of atmosphere, characterized by a prevalent mist, thin in high places, dense in low: during the height of the epidemic in all cases the reading of the barometer was remarkably high and the atmosphere thick. In 1849 and 1854 the temperature was above its average, and a stillness of air amounting almost to calm accompanied the progress on each occasion. In places near the river the night temperatures were high, with small diurnal range, a dense torpid mist and air charged with many impurities, a deficiency of electricity, and, as shown in 1854, a total absence of ozone, most probably destroyed by the decomposition of the organic matter with which the air in these situations is strongly charged."*

Without entering into details, I may say that in India outbreaks of cholera are usually found associated with high temperature and a moist, stagnant atmosphere, inducing much languor and depression and a stifled feeling, and the Punjab, with its dry climate and sparse rainfall, affords no exception to this rule.

Dr. Roche, in writing of the outbreak of cholera at Kotree, Scinde, in September 1869, which, as regards climate, is, perhaps, even drier than that of the Punjab, states the atmosphere to have been during the month unusually sultry, still, and moist, with a high temperature.†

In Egypt a similar condition of the air was observed. Dr. Kirker, in his account given *in extenso* in my second Report, shows that antecedent to the outbreak at Damietta the sky was cloudless, the temperature high, the air exceedingly moist for several days, being at saturation point, 100°, and almost motionless, the direction of the wind being south instead of north, as is usual.

Peculiar states of the atmosphere, as observed by Mr. Borg in connection with the epidemic of 1865, and by Brigade-Surgeon McDowall on the outbreak among the British troops at Cairo, have already been drawn attention to in my second Report.

Since then I have received additional evidence bearing on this subject. Surgeon Prendergast, A.M.D., informs me that on the day of the outbreak of cholera among the British troops at Ramleh (the 3rd August) there was a high temperature, the air approached saturation point, the wind, which for many weeks before had blown, as usual, from the north, slowly dropped, the heat became intense, attended with a feeling of oppression. The ripples died off the sea, leaving it as glassy as a quiet pool. The sky, usually studded with cirrhi, was cloudless. Now and then a faint breath of wind sprang up from the south-east, and as suddenly died away. *Men who had served in India remarked that there was cholera in the air, and at 10:30 A.M. the first case was reported.*

Another pertinent illustration is given by Dr. Kirker in his Report of the recent cholera outbreak at Chatby.

This village of 2,000 inhabitants, though distant from Alexandria but a quarter of a mile, and in constant communication with it, had been free from the disease up to the 15th or 16th October. Its sanitary condition was extremely bad. It is situated in a hollow, but is open to the north and the influx of the sea-breeze. "On the 19th September the prevalence of the north-westerly winds was broken. Then followed a period of variable winds, the easterly and southerly ones being the most frequent. The rain on the 9th and 10th October may be taken as marking the termination of this period and the starting-point of another. In the second, from the night of the 10th to the night of the 15th October, the wind, which was always nearly light, varied from east to west only round by south." Frequently at night there was no wind at all, and the temperature rose from a maximum of 70° on the 10th to 84° on the 15th. . . . "Now, I believe," continues Dr. Kirker, "that the stagnancy of the air over Chatby, owing much to its low and sheltered position, especially during the period from the 10th to the 15th October, forced the disease into existence, and that the influence of the motionless atmosphere was assisted by the rise in temperature and by the moisture of the ground following the rain on the 9th and 10th." . . . "Again, the fact that the disease reappeared in Alexandria

* See article, "Epidemic Cholera, Reynold's System of Medicine," vol. i.

† "Lancet," 28th July, 1883.

at or near the time it more violently struck Chatby, points to a common exciting condition such as the weather, and discredits the theories of mere local causation, such as proximity of the tanneries or cemeteries." (See Inclosure 1 in No. 2.)

The frequency with which atmospheric phenomena have been observed in connection with outbreaks of cholera leads to the conclusion that they stand in close relation one to the other. Whether that be as cause and effect is perhaps hard to say. It is probable that it is to a combination of certain conditions of a cosmoteluric character of air, soil, and water (filth, as in Egypt, being a powerful factor), that the development of the epidemic is due. Given, as in Egypt, endemic centres, the peculiar atmospheric state noticed would probably act as an exciting cause in the immediate production of the disease. Its diffusion, as has been shown by the late Dr. Bryden,* being the result of the overflow of the poison from the several centres invading, through the medium of the atmosphere, other parts of the country, where it finds a congenial condition for its further development.

It is not only interesting but instructive to compare the dates and course taken by the epidemics of 1865 and 1883. The epidemic of 1865 began on the 11th June and ended on the 15th August. The first place attacked was Alexandria. On the 18th June it appeared at Tantah and Cairo, on the 26th idem at Rosetta, Damietta, and Mansourah, and on the 4th July at Beni Souef, and from thence on into Upper Egypt.

The epidemic of 1883 broke out on the 22nd June and ended about the middle of September, except in Upper Egypt. A "recrudescence" of the disease, as it is termed, took place at Alexandria, and continued into November to an insignificant extent. The first place to be attacked was Damietta; next in order (officially) came Mansourah on the 25th idem, Alexandria the 3rd July, Cairo the 16th idem, Beni Souef the 1st August, and thence spread into Upper Egypt.

The above dates show that the same place was attacked on or about the same time in each epidemic, and that, if anything, the disease spread with rather less rapidity during the recent epidemic than it did in 1865, although facilities for travel had much increased.

The outbreaks at each period corresponded to a Nile about its minimum level, and their cessation to a Nile advancing towards its maximum, or to what may be called the dry and wet season respectively. The dry season must here be considered as a relative term. It should not be lost sight of that I am speaking of a Delta where the dews are very heavy, and the alluvial soil of which absorbs moisture like a sponge.

That the arrest of the epidemics is due to the inundations there is not, I think, much room for doubt. It is only those who have witnessed an inundation of the Nile who can realize the enormous extent of land which is laid under water. The water washes and cleanses the soil from its organic impurities, and so destroys a powerful factor in the generation of the cholera. The enormous volume of water brought down by the river and the powerful current induced carry the accumulated filth of the preceding nine months to sea, and so effectually disposes of it. It is indeed a beneficent stream, and one ceases to wonder it should come when at its full to be eulogized by the fellaheen as "Nil Sultani."

As a rising Nile must necessarily reach Upper Egypt earlier than the Delta, it seems almost a contradiction in terms to speak of the cholera poison being destroyed by the inundation in the Delta, when at the same time the epidemic was overrunning Upper Egypt. The explanation is, however, at hand. In order to prevent injury to the maize crops in Upper Egypt from the rising Nile, the water is carefully excluded from the canals and reservoirs, and so the land is not subjected to the inundation until a period subsequent to that of the Delta.

If there be any truth in the opinion which I have expressed on the causation and nature of cholera, the worthlessness of quarantine and the medical inspection regulations issued by the Local Government Board for the prevention of the spread of the disease will be apparent. It is not by such means as these that its introduction into a country can be arrested. Though quarantine be adhered to with singular tenacity by many countries, yet it is a satisfaction to know that many epidemiologists, both English and Foreign, have come to consider it as useless to protect a country from an invasion of the disease. England takes the lead in opposing quarantine, it is said, because she is actuated by selfish motives with regard to her commerce. A more fallacious statement was never promulgated. England is supported in her action by the opinion of a large body of scientific men, British and

* See Dr. Bryden's Reports of 1874 and 1876.

foreign, who have made cholera their study, and are fully competent to deal with its problems.

It has also been stated, in order to discredit the action of England on this important international question, that "her theories are one thing, her practice is another;" and those who make this assertion point to the quarantine set in force at Cyprus, Malta, and Gibraltar in justification of their opinions.

The explanation is simple enough if they would but see it. Those places were placed in quarantine to obviate quarantine probably of a more rigid character being set in force against them by other countries. While England is thus acting in accordance with the majority of scientific opinion, it is Italy who steadily sets her face against the opinion of her own Delegate (Dr. Semmola), as expressed at the Vienna Conference in 1874, and insists on a rigid quarantine against all vessels arriving from India and Egypt.

The theory which brought quarantine into operation is found more and more impracticable of execution with the requisite rigour in these days of rapid and constant communication between the East and the West. The method resorted to of confining the healthy and the sick together in lazarettos is opposed to modern teaching and experience, and instead of acting as intended in repressing disease tends to develop and foster it. A system which puts restrictions on personal liberty, induces physical and moral distress, and seriously embarrasses trade, without fulfilling the object for which it was instituted, ceases to have a *raison d'être*, and ought to be abolished. Accepting the view of a specific entity in connection with cholera, the methods which are adopted for its destruction under the existing system of quarantine are irreconcilable with modern experiment and investigation. To destroy a germ requires, it is said, a heat of about 250°, and for the destruction of its spore a much higher degree of heat is required. Moreover, one part of a fluid containing bacilli mixed with one part of a 5 per cent. watery solution of carbolic acid, and allowed to stand for fifteen minutes, will, it is believed, reproduce themselves,* and yet a person is supposed to be disinfected after he has been momentarily exposed to the fumes of a little chlorine gas! Thus a false sense of security is engendered, highly dangerous to the individual himself and to the community at large.

The way in which quarantine rules were applied during the year by the International Quarantine Board at Alexandria were so capricious as to be ridiculous had not such highly important interests been involved. Under an impulsive alarm of the sudden increase of cholera at Bombay the Board, on the 14th May, 1883, declared that place infected, and it was only after urgent remonstrance of their action being premature and injurious that on the 1st June the Board decided to remove the quarantine on all vessels leaving Bombay after the 13th of that month; that is to say, the Board instituted quarantine against Bombay when all the while Egypt was infinitely more infected with cholera than Bombay. But more than this, while the cholera epidemic was raging in Egypt, on the 22nd July quarantine was reimposed against all arrivals from Bombay. A British officer, a passenger by one of the Peninsular and Oriental Company's steamers, with a clean bill of health, from Bombay, was refused permission to land at Port Saïd in October, although two certificates were put in, signed by medical officers, to the effect that he was suffering from heart disease and debility, and that to proceed to sea would be attended with danger to his life. It was only on Her Majesty's Agent at Port Saïd taking the responsibility upon himself that the officer in question was enabled to land in a country in which cholera existed. Sir Evelyn Baring, on arrival from Bombay at Suez on the 10th September, by a Peninsular and Oriental Company's steamer, was refused permission to land, on the plea of a suspicious death having occurred on board during the voyage, although the Medical Officer duly certified that the death had been caused by chronic dysentery, and it was only on his Excellency Chérif Pasha intervening that the necessary permit to land was granted. Contrast these incidents with the fact that when reinforcements were dispatched to the Soudan via Suakin, in October-November, the troops were, on arrival, at once permitted to land, although quarantine was in force at the time.

The truth is, British interests are so inadequately represented on the Board that it is only by a series of fortuitous circumstances that we can obtain a majority of opinion in our favour. Thus our influence, which should be paramount on the Board, considering the enormous political, financial, and sanitary considerations we

* See a statement of Mr. Watson Cheyne's, referred to by Dr. C. Theodore Williams, the "Lancet," 25th August, 1883.

have at stake, often comes to be dependent on chance, and, as a rule, we are out-voted on questions of vital importance to the country.

The opinions of the Board, I regret to say, are warped by considerations other than those which should govern their deliberations.

As the reasons which brought the Board into existence have ceased, there does not seem to me to be any longer grounds for its retention. Although called the International Quarantine Board, it is in no sense an international undertaking, but is of Egyptian origin, and was instituted in 1881 by a Decree of the Khedive.

That such proposals would give rise to international jealousies is not improbable; but these are of secondary importance when considered in the light of our own interests, both political and sanitary. Moreover, that much opposition would be encountered from the Egyptian sanitary authorities must be taken as a matter of course, when the considerable pecuniary interest they have in the continuance of the system is not lost sight of.

If, then, cordons and quarantine and a system of medical inspection be useless to prevent the spread of cholera, it may be asked on what means would I rely? My answer is, in sanitation; on pure soil, pure water, wholesome food, and on cleanliness of persons and of houses—cleanliness in every form and shape. If the enormous sums of money which quarantine has cost this country had been applied to sanitation, it is scarcely too much to state that cholera might have been stamped out of Europe and India, and have become a memory of the past.

It will be impossible for me here to submit in detail the measures I would advise in regard to Egypt; such a statement would be beyond the scope of a communication such as this. I may, however, indicate briefly conditions which urgently demand attention:—

1. Prevention of the pollution of the rivers and canals.
2. The introduction of public latrines into towns and villages.
3. The introduction of a system of sewerage into the cities and towns applicable to their several conditions. (A system suitable to Alexandria would be inapplicable to Cairo, and still more so to a town like Damietta.)
4. An inquiry into the condition of the cemeteries, with a view to a more carefully regulated and better method of disposal of the dead, without invading the religious prejudices of the people.
5. The introduction of an improved system of registration and of vital statistics.
6. The institution of sanitary laws.

These propositions cover an enormous area, and could only satisfactorily be dealt with on the spot. A Commission has, I am informed, been appointed to inquire into the sanitary needs of the country. Its constitution I am unacquainted with, but no Commission for the purpose can be considered complete unless it has among its members a sanitary officer and a sanitary engineer. Experts only can be competent to deal with the numerous problems which must almost constantly arise in the course of the inquiry. That such experts are necessary is evidenced in "the Report of the Commission sent to Alexandria to examine into the cause of the late Outbreak of Cholera there," dated the 5th November, 1883, and forwarded under cover of Sir Evelyn Baring's despatch, dated Cairo, the 26th November, 1883.

The Commission does good work in drawing attention to numerous grossly unsanitary conditions which prevail, but their Report should be much farther reaching than this. It fails in that it omits to draw attention to the faulty construction of the sewers, the absence of any breaks in the house connections, the polluted condition of the foreshore, and other nuisances of an equally dangerous character which are inimical to the public health. The truth is, the members of the Commission, while devoting their attention to matters of conservancy, have lost sight of nuisances which, being hidden from view, are thus more dangerous to the public health.

It is painful to find how speedily the lesson taught by the recent epidemic has been lost on the Conseil de Santé and its officials. How incompetent the Board was to deal with the late epidemic has already been reflected on by me, and is matter of public notoriety. Since then, as reported by Mr. Clifford Lloyd, the Board has again signally failed in its duty. It would be useless, therefore, to hesitate longer in reconstituting the Board, or else in adopting some such measure as was shadowed out in the scheme for the reorganization of the Egyptian medical service submitted by me to his Excellency Chérif Pasha.

The retention of the existing Board merely tends to throw discredit on the Egyptian Government, whose true interests lie in replacing it by an Executive which would render efficient service.

The results of sanitation in the Presidency of Bombay are very striking. The city itself, from being originally regarded as the grave of Europeans, shows a death-rate but little in excess of many towns in the British Isles—the death-rate for 1881—not exceeding 27·87 per mille; whereas the death-rate in Cairo for 1881 was 39·67, and for 1882, 46·98 per mille.

The Army Sanitary Commission, in their Memorandum for 1881, quote the cholera mortality Returns for the previous thirty-four years, and divide the series into two groups of seventeen each, as sanitary work has more or less been done during the last seventeen years. The results of the comparison are very striking. From 1848 to 1864 the cholera mortality of the Island of Bombay was 37,454; while from 1864 to 1881, including the famine and scarcity period (when the city was crowded with starving refugees), there were only about 11,000 deaths from this terrible disease, or less than a third. These figures even, the Commission add, do not show the whole gain to public health; "because, while the registration has been improving with advance of sanitary work, and so exhibiting a more accurate enumeration of cholera deaths than could be attained in the first seventeen years of the period, the population of the city has been rapidly increasing of late years, leading to an increase of crowding, and the cholera death-rates to population in the earlier years were hence much greater than the actual cholera deaths would show at first sight."

The important position which Egypt occupies as the highway between the East and West, and its proximity to Europe, require that its sanitary condition should be as good as practicable; and by inaugurating, and in the course of time completing, sanitary reforms, the Government of His Highness the Khedive would reap the blessings of existing and future generations.

I have, &c.

(Signed) W. G. HUNTER, M.D., F.R.C.P.,
Surgeon-General (Retired).

Annex 1.

Memorandum by Dr. Sierra.

Les renseignements sur les deux cas cholériformes traités à l'Hôpital Européen, j'ai dû les tirer en partie des registres de l'hôpital même, pour ce qui a rapport aux médicaments donnés; en partie de M. le Dr. Valentin, qui a observé le second cas—le médecin de l'hôpital qui les a traités étant absent.

Premier Cas.—Tombolato Francisco, Italien, âge, 70 ans; profession, forgeron. Entre le 5 Juin, 1882. Les personnes qui l'accompagnent disent qu'il est adonné à la boisson. La soeur directrice de la salle dit qu'il présentait vomissements, diarrhée, voix éteinte. Les vomissements et la diarrhée ont été très abondants chez lui; la faiblesse générale était remarquable. Dans le cahier d'ordonnance du 6 Juin je trouve que le médecin lui a prescrit quatre soupes au bouillon comme nourriture, une potion laudanisée, du cognac.

Le 7, les mêmes médicaments et du vin de quinquina; comme nourriture, la demi-ration, qui est composée de thé ou café au lait, soupes, poulet ou viande, légumes. Les 8, 9, 10, mêmes prescriptions. Il sort guéri le 20.

Le rétablissement du malade si prompt, pour autoriser le médecin traitant à lui permettre de la nourriture dès le second jour et du vin de quinquina le troisième, me fait croire qu'il s'agissait d'un cas de cholérine.

Deuxième Cas.—Guzzo Giovanni, Italien, âge, 44 ans; profession, courtier. Entre le 17 Avril, 1883.

M. le Dr. Valentin, qui voyait le malade à son entrée, à la place du médecin de l'hôpital, interpellé par moi, m'a raconté avoir trouvé le malade froid, cyanosé, sans pouls, aphonique, avec diarrhée et vomissements. Il y avait anurie. Les renseignements qu'il avait pris des personnes qui accompagnaient le malade étaient qu'il avait mangé une grande quantité de fèves, que l'on voyait dans les vomissements.

La première prescription fut d'infusion de tilleul avec acétate d'ammoniaque et éther sulfurique, boisson, avec cognac.

Le 18, la même prescription est répétée.

Le 20, les vomissements continuaient. La diarrhée avait complètement cessé—il y avait au contraire constipation opiniâtre. Le cahier du jour porte les prescriptions suivantes :—

Pot. antiémétique de Riverio, lavement purgatif, cognac.

Le Dr. Valentin n'a plus vu le malade, sur lequel il avait porté le diagnostic "choléra nostras." La persistance des vomissements et de la constipation, qu'il sait pourtant avoir accompagné le malade jusqu'à la mort, pourrait faire croire qu'une invagination intestinale soit survenue. Le malade mourût le 24 Juin. On n'a pas fait d'autopsie.

Depuis le 20 je ne fais pas les prescriptions médicales parce que le registre n'a pas été trouvé.

(Signé) DR. SIERRA.

Le 25 Août, 1883.

[These seem to me two typical cases.—J. MACKIE]

(Translation.)

I was obliged to take my information on the cholera-like cases treated at the European hospital partly from the hospital books, as regards the remedies administered; partly from Dr. Valentin, who observed the second case, the hospital doctor who treated them being absent.

First Case.—Tombolato Francisco, an Italian, 70 years old; iron worker by occupation. Came in on the 5th June, 1882. Those who brought him said he was addicted to drink. The sister in charge of the ward says he had vomiting, diarrhœa, and loss of voice. The vomiting and diarrhœa were very abundant; the general weakness was remarkable. From the diet and prescription book of the 6th June I find that the doctor ordered him beef tea four times as food, the last portion with laudanum and brandy.

On the 7th, the same prescription and quinine wine; as food, half rations, which consists of tea or *café au lait*, soup, chicken or meat, vegetables. On the 8th, 9th, and 10th, the same prescription. He left cured on the 20th.

The rapid recovery of the patient, which justified the doctor in allowing him food even on the second day, and quinine wine the third, make me think that it was a case of cholera.

Second Case.—Guzzo Giovanni, an Italian, 44 years old; broker by occupation. Came in on the 17th April, 1883.

Dr. Valentin, who saw the case on coming in, instead of the hospital doctor, questioned by me, told me he found the patient cold, with cyanosis, no pulse or voice, with diarrhœa and vomiting. Stoppage of urine. The people who brought the man said he had eaten a great quantity of beans, which were seen in the vomit.

The first prescription was infusion of lime-tree flowers with acetate of ammonia and sulphuric ether, as a potion, with brandy.

The 18th, the same prescription.

The 20th, the vomiting still continued. The diarrhœa had completely ceased; there was, on the contrary, obstinate constipation. The day book has the following entry :—

Riverio's anti-emetic potion, purgative injection, brandy.

Dr. Valentin did not see the patient again; he considered it a case of "endemic cholera." The obstinate vomiting and constipation, which he knows went on up to death, might lead to the belief that the intestine had doubled over itself ("invagination intestinale"). The patient died on the 24th June. There was no *post-mortem* examination.

I do not give the prescriptions beyond the 20th, as the book cannot be found.

(Signed) DR. SIERRA.

August 25, 1883.

Annex 2.

Dr. Mackie to Dr. Hunter.

Dear Dr. Hunter,

Alexandria, August 25, 1883.

The three choleraic cases which fell under my observation, and of which I spoke to you, were as follows:—

Two in the summer of 1881, adult women—one a Maltese, other a Syrian—living in the Atharine quarter of this town, a quarter poisoned by latrines and sewers. The Maltese was very ill, and continued in a dangerous state for a day or two: incomplete aphonia, cramps, sunken eyes, cold skin, vomiting, purging, very scanty secretion of urine, which was several times tested by my assistant, Dr. Murison, and found very albuminous.

The other case (Syrian) was not so severe.

In the summer of 1872 I saw, in consultation at Ramleh (the summer residence then of Alexandrians), a fatal case of cholera in a Greek lady in good circumstances. Four medical men saw this case together; it created a little alarm, as there was no epidemic prevailing at the time; and, if I remember rightly, two of the medical men were sent on the part of the Board of Health to the consultation to see if it was really cholera.

These are all which I can remember as having come under my own observation, but my papers and diaries and notes of all rare cases having been burned, I give only what I am sure of from memory.

The other cases of which we were told I am endeavouring to have particulars of for you to-day.

Yours sincerely,
(Signed) J. MACKIE.

Annex 3.

Dr. Mackie to Dr. Hunter.

Dear Dr. Hunter,

Alexandria, August 25, 1883.

I am reminded to-day (since my letter to you of this morning) of another case of severe choleraic symptoms which fell under my own observation in 1872 or 1873, viz., one of the sisters of the Deaconesses' Hospital. She was very ill, and suffered very severely for a short time; so much so that, having seen her during the latter part of the day, I was sent for to see her again during the night. She recovered.

This case and the lady at Ramleh (fatal case) both happened in two of the healthiest localities about Alexandria. The Deaconesses' Hospital is situated outside the town, in a large airy, dry, and, in 1872, very open neighbourhood.

Yours sincerely,
(Signed) J. MACKIE.

Annex 4.

Dr. Kartulis to Dr. Mackie.

My dear Dr. Mackie,

Alexandria, August 15, 1883.

I did not see to-day Dr. Zancarol to remind him about the two cases of cholera he saw two years ago, but I found in my books, which I saved in our hospital, a case seen by myself two years ago in the house of Mr. ——— (where we made the consultation of that case of the dislocation of the arm joint, end of the Rue ———). The case was as follows:—

The brother of Mr. ———, a young man aged about 24 years, was in the morning of the 13th September, 1881, at Gabari, shooting, in very good health. His previous history is that he was from about three years before syphilitic. From the 2nd September till that day (13th September) he used to be with me and other gentlemen shooting every morning, and he was in very good health. Immediately at 9 o'clock he felt bad, and I sent him home. When I returned to see him I found

him in a very bad state. Diarrhœa began, and the stools they had a watery light rose-coloured appearance, although the vomitings were watery and light green coloured; severe pains in the stomach regions; he could not pass water, cold perspiration on the whole body, although the temperature under the æxilla was 39.0 C. I made him an injection of morphia, hot bottles, and supposing it as a case of pernicious fever with choleraic symptoms, I gave him quinine and salicylic acid in powders.

Further particulars I did not notice. At 9 o'clock of the same evening I returned, and I found him better, but only on the next day he did pass water.

This case I hold as one of pernicious fever, but I could not explain the fact of anuria and the absence of previous fever attacks. Dr. Hunter can ask Dr. Sierra, too, because he saw, as I think, something like to my case.

Yours, &c.
(Signed) DR. KARTULIS.

Annex 5.

Dr. Mamlouk to Dr. Mackie.

Mon cher Mackie,

Alexandrie, le 27 Août, 1883.

Depuis huit ans environ, je ne me rappelle pas dans quel mois de l'été, un de mes clients, nommé Akad, âgé de 28 ans, habitant le quartier Souk-el-Samak, dans une maison basse, humide, a été atteinte d'une fièvre intermittente tierce régulière. Les préparations de quinine sous plusieurs formes pendant plusieurs jours ont été inefficaces.

Le malade a été atteint d'un accès très violent. Le stade de froid a été accompagné de vomissements et diarrhées abondants, algidité, cyanose, aphonie, anurie, transpiration abondante.

Les stimulants, et les injections hypodermiques de quinine m'ont réussi, et ce stade de froid avec tous ses symptômes ont duré pendant quatorze heures de temps. La fièvre a tout à fait disparu après. Le malade jouit aujourd'hui d'une bonne santé excepté il souffre de temps en temps de quelques névralgies qui disparaissent avec un peu de quinine.

(Pendant la fièvre la rate a été peu tuméfiée.)

Depuis quatre ans environ une dame de mes clients a été atteinte d'une diarrhée et vomissements très intense avec aphonie, algidité, anurie, transpiration abondante, cyanose, crampes à l'estomac et dans les jambes, soif ardente (mais la diarrhée n'était pas rigiforme). Les stimulants, les frictions réussirent. La malade a eu une réaction régulière après vingt-quatre heures, et cet état a été suivie par un gastricisme qui a disparu complètement après quelques jours.

Dans ce dernier cas j'ai appelé en consultation les Drs. Palli, Ardouin Bey, Parissis, et votre assistant de l'époque.

(Cette dame habitait sur la Place Popolani, dans la première ruelle à droite, première maison, troisième étage, âgée de 26 ans. Ce cas a eu lieu pendant l'été.)

Je me rappelle encore d'autres cas analogues qui font défaut à ma mémoire.

Aussitôt que je m'en souviendrai je vous en ferai part.

Votre, &c.
(Signé) DR. MAMLOUK.

(Translation.)

My dear Mackie,

Alexandria, August 27, 1883.

About eight years ago—I do not remember in what month of the year—one of my patients named Akad, 28 years old, living in the Souk-el-Samak quarter, in a low damp house, was attacked by a regular intermittent tertiary fever. Preparations of quinine in various forms given several days running had no effect.

A crisis supervened. The cold stage was marked by abundant vomitings and diarrhœa, algidity, cyanosis, loss of voice, stoppage of urine, abundant perspiration.

Stimulants and hypodermic injections of quinine succeeded; the cold stage, with all these symptoms, lasted fourteen hours. The fever afterwards quite disap-

peared. The patient now enjoys good health with the exception of a slight neuralgia every now and then, which disappears with a little quinine.

(During the fever the spleen was somewhat swollen.)

About four years ago a lady, a patient of mine, was attacked by a very severe diarrhoea and vomiting, accompanied by loss of voice, algidity, stoppage of urine, abundant perspiration, cyanosis, cramp in the stomach and legs, burning thirst (but the diarrhoea was not like rice-water). Stimulants and friction were successful. The patient had a normal reaction in twenty-four hours, and this stage was followed by a gastric attack which completely disappeared in a few days.

In the last case I called in for a consultation Drs. Palli, Ardouin Bey, Parissis, and the assistant you then had.

(This lady lived on the Popolani Square, first turning to the right, first house, third floor; she was 26 years old. The case happened in summer.)

I remember some other analogous cases, the details of which I do not, however, remember.

When I remember them, I will let you know of them.

I am, &c.

(Signed) DR. MAMLOUK.

Annex 6.

Dr. de Castro to Dr. Mackie.

Monsieur et très honorable Confrère,

Alexandrie, le 5 Septembre, 1883.

Vous désirez savoir combien de cas de choléra j'ai observé à Alexandrie depuis 1865. Je regrette de ne pouvoir pas vous en fournir des relations bien précises, parce que, comme vous le savez, ma maison, mes livres, et mes notes, ont été détruites par l'incendie de l'année passée.

Je dois dire d'abord qu'en 1866 j'ai observé plusieurs cas de choléra que j'ai considéré comme continuation de l'épidémie de 1865. A ce propos on avait remarqué que les personnes qui venaient du dehors étaient plus facilement atteintes par la maladie. Les résidents, pour ainsi dire, vaccinés par le choléra de 1865, étaient moins disposés que les fuyards à prendre la maladie de l'année suivante. Je me rappelle d'avoir fait mention de ces cas dans la "Lancetta Medica Egiziana."

Il y a six ou sept ans, j'ai constaté un cas de choléra chez le Directeur des Bains Pallion, près de l'actuel Consulat Anglais. Guéri alors, il est mort quelques années plus tard. J'ai parlé de ce cas au Conseil Sanitaire International.

Un second cas je l'ai observé il y a à peu près trois ans dans la personne de M. Puyer Kofer, négociant. Il demeurait Place des Consuls, dans une maison très salubre. Il est digne de remarque que ce monsieur avait été soigné par moi en 1865, également pour choléra. La seconde fois il avait présenté, comme la première, tous les phénomènes de choléra. Depuis lors il se porte parfaitement bien.

Troisième cas. Femme du peuple, arrivée le jour précédent de Naples, a présentée, il y a deux ans, des phénomènes cholériques. J'ai fait l'autopsie de cette femme à l'Hôpital Européen. D'après mes souvenirs et ceux de M. le Dr. Funaro, à l'autopsie nous n'avons trouvé aucune altération microscopique pour expliquer la mort. Il n'existait aucun soupçon d'empoisonnement.

Quatrième cas. M. Guidi, ex-Capitaine de Marine, actuellement courtier maritime, le jour même de son arrivée d'Italie, en Septembre 1882, a présenté des phénomènes de choléra, vomissements, diarrhée, crampes, défaillances. Il se sentait mal avant d'entrer dans le port d'Alexandrie. Il a attribué sa maladie au froid, étant resté plusieurs heures de la nuit sur le pont du navire, pour observer la comète de cette époque.

J'ai considéré ces cas comme sporadiques et peu importants. Vu les circonstances de leur manifestation, j'étais parfaitement sûr que la maladie ne se serait nullement propagée. J'ai jugé bien autrement graves les premiers cas observés à Damiette. Dans les rapports adressés à mon Gouvernement, j'avais déclaré tout de suite que la maladie se serait propagée au reste de l'Égypte.

D'ailleurs, il est un fait bien connu que même dans les grandes villes d'Europe on constate tous les ans des cas de choléra, ressemblant à s'y tromper au choléra Indien, dont ils diffèrent par la moindre gravité au point de vue de la mortalité, et

par la non tendance à la propagation, malgré l'absence de toute précaution hygiénique.

Agréé, &c.
(Signé) D. DE CASTRO,
Délégué Sanitaire d'Italie.

(Translation.)

Dear Sir,

Alexandria, September 5, 1883.

You wish to know how many cases of cholera I have noticed at Alexandria since 1865. I am sorry not to be able to give you very exact information, because, as you know, my house, my books, and my notes were destroyed at last year's fire.

I should begin by saying that I saw many cases of cholera in 1866, which I looked upon as a continuation of the epidemic of 1865. It was noticed that persons coming from outside were more open to attack than others. The inhabitants, vaccinated, so to speak, by the cholera of 1865, were less liable to catch the disease of the following year than those who had fled. I remember mentioning these cases in the "*Lancetta Medica Egiziana*."

Six or seven years ago I noted a case of cholera, namely, the manager of the Pallion Baths, near the present English Consulate. He recovered, but died a few years after. I spoke of the case to the International Sanitary Board.

About three years ago I noticed a second case, that of M. Puyer Kofer, a merchant. He lived in the Place des Consuls, in a very healthy house. It may be noted that I treated this same gentleman for cholera in 1865. On the second occasion he had, as on the first, all the symptoms of cholera. Since then he has been perfectly well.

Third case. A woman of the people, who arrived the day before from Naples, had symptoms of cholera two years ago. I performed the *post-mortem* examination of this woman's body at the European Hospital. According to my recollection and that of Dr. Funaro, the examination showed us no microscopic change which could account for death. There was no suspicion of poisoning.

Fourth case. M. Guidi, ex-Captain in the Navy, now a ship-broker, the day of his arrival from Italy, in September 1882, showed symptoms of cholera: vomiting, diarrhœa, cramps, collapse. He felt ill before reaching the port of Alexandria. He attributed his illness to a chill, as he had stayed several hours on the deck at night to see the comet of that year.

I looked upon these cases as sporadic, and of but little importance. In view of the circumstances in which they occurred, I was perfectly sure that the disease would not propagate itself. But far otherwise did I consider the first cases at Damietta. In the Reports to my Government I said from the first that the disease would spread over all Egypt.

Moreover, it is a well-known fact that even in the great cities of Europe cases of cholera are noted every year which are so like Indian cholera that any one might well be mistaken as to them, for they differ only in being less often fatal, and by their having no tendency to propagate themselves, notwithstanding an absence of all hygienic precautions.

I have, &c.
(Signed) D. DE CASTRO,
Italian Sanitary Delegate.

Annex 7.

Dr. Demech to Dr. Mackie.

Dear Dr. Mackie,

Alexandria, September 3, 1883.

In reply to yours of last night, I am sorry I cannot give you detailed particulars, as my notes are burnt.

I went up the Nile for the outbreak of cholera in the Soudan in September 1872, and, when reached, Korosko (Lower Nubia), where I had to station, I found that a sort of a cordon had already been established there since over one month, and another at Abu Hamet. Cholera came down from the Soudan through Dongola

and Wady Halfa, reaching Korosko the first days of November 1872. Lower Egypt escaped from the epidemic on that occasion for the good reason that the Gellabs, in order to avoid the vexatious sanitary cordons, made their way down to Cairo direct through the desert, evading intervening villages.

As to whether I did see cases of cholera nostras here or in the villages since 1865, I can state that not one summer did pass without my seeing one or two cases more or less severe. I do not, however, remember of having seen fatal cases since 1866, in which year I had two cases (Europeans) in Mansourah, and declared them then Asiatic cholera.

Yours, &c.
(Signed) DR. DEMECH.

Annex 8.

Dr. Fouquet to Dr. Ismalun.

Mon cher M. Ismalun,

(Received September 1, 1883.)

J'ai, en effet, observé au mois de Septembre 1881 un cas très grave de choléra nostras qui se rapprochait beaucoup par son aspect des cas de choléra Asiatique. Les différences étaient pourtant assez tranchées pour qu'il n'y eût pas d'erreur possible. Je tiens beaucoup à ne point donner l'observation pour des raisons spéciales dont l'une est que le cas ayant fait alors beaucoup de bruit, je commettrais une indiscretion médicale.

Agréez, &c.
(Signé) DR. FOUQUET.

(Translation.)

My dear M. Ismalun,

(Received September 1, 1883.)

It is indeed true that in September 1881 I observed a very serious case of "cholera nostras," which much resembled Asiatic cholera. The differences were, however, sufficiently marked to make any mistake impossible. I particularly object to make any observations on it for special reasons, one of which is that as the case made much noise at the time, I should thereby be guilty of a medical indiscretion.

I am, &c.
(Signed) DR. FOUQUET.

Annex 9.

Dr. Haddad to Dr. Hunter.

Sir,

Assiout, September 5, 1883.

I have the honour to remit to you the following Report.

Since the month of May last I find that many persons here have suffered from a malady presenting the following symptoms.

In some cases simple diarrhœa or profuse watery diarrhœa were the only symptoms, in others vomiting and diarrhœa were present, and, in a few cases, cramps and collapse were associated with the above-mentioned symptoms.

Often when evacuations have been observed they were found very watery and of a rice water colour.

In the beginning the great majority of these patients recovered, but in a few cases the disease proved fatal.

During the month of May and the beginning of June the disease was confined to the lower classes of people, and consequently it is very difficult to ascertain the exact date of several cases.

The following, however, are enough to prove its existence at that period.

Case 1. Fatima, the mother-in-law of Abdul Rahman Effendi Numus, the Omd of Assiout, was attacked some time about the middle of May with vomiting and diarrhœa, cramps, coldness of extremities, and blueness over her face. She died after a period of about twenty hours.

The evacuations were entirely watery and slightly white in colour.

Abdul Rahman Effendi and others state that, at the same time, other people

were attacked in a similar manner, including some of the members of his household, but that they recovered.

Case 2. Wardi Ali, a woman aged about 60, was attacked in a similar manner on the 12th May and died.

Case 3. Fatoum Ali Ahmet, attacked on the 20th May and died.

A few children and some men were reported to me to have died during the same month from a similar disease, but I was unable to authenticate the cases.

About the same period an event occurred which, owing to the peculiar circumstances attending it, is known to almost everybody here (Assiout).

It took place at El Wasta, a small village about 2 miles from Assiout, on the east bank of the Nile.

A man named Girges Sulieman, the Government Cashier of the village, another named Ibraihim Aacdouc, clerk to the former, and a third, named Omar Tuha, the Omd of El Wasta, were attacked by severe diarrhœa, vomiting, cramp, and coldness of extremities.

The first named died the day after being attacked, the two others recovered and are still alive.

They attributed the attack to secret poisoning, as is always the case when a death occurs suddenly and the cause is unknown, as was the case in this instance, as it occurred long before cholera was declared at Damietta, and consequently before they had it in mind here.

About the 20th June the malady became very frequent here, but was not more severe than before, but it prevailed among the people in general and attacked the upper classes, among whom many authentic cases can be certified to.

Mrs. Wisa Portor, wife of one of the wealthiest of the Coptic Notables, was severely attacked about the 17th or 18th June.

Two or three days after her daughter and son-in-law, Akruwk Janous Effendi, were attacked in like manner.

These people are now out of town, but I verified these statements from their friends and from Dr. Mazarakis who treated them.

Between the 20th and 26th June, that is before anything could have been imported here from Damietta, the following persons were attacked by the same illness:—

Shnonde el Mankabodi, assistant to the Superintendent of Nile steamers.

His sister, Mrs. Nashed Effendi Sidry.

Mr. Habib Shnonde.

Mr. Jadros Minyhirios, and many others.

All these mentioned read the newspapers and were astonished at being attacked by the same illness which had occurred at Damietta, being aware that it can only be caught by contagion.

Death from the malady seems to have been rare at that period, or, at least, among the well-off and well-known people, but the following cases prove that it was fatal in some instances:—

Abdo Butros, aged 20 years, the grandson of the storekeeper of the Government School here, died on the 15th Shahban (corresponding to 20th June) from an attack of diarrhœa and vomiting, lasting one night.

Sahida, a black servant of Mr. Ayoub Hanna, died on the 11th June from an attack of severe rice servent diarrhœa without vomiting, which lasted two days.

In addition to this the increased mortality during the months of May and June of this year, as shown by the Government registers, taken in connection with the large number of attacks, tends to show that mortality from the disease was more frequent than was heard of, otherwise there is no accounting for it.

Diphtheria seems to have existed, but only twenty deaths during the two months are recorded, as due to this disease.

The following is a comparative list of deaths during the months of the last three years, as registered in the Government books:—

	1881.	1882.	1883.
January	98	116	85
February	71	77	77
March	71	67	91
April	71	46	91
May	75	68	120
June	60	72	116
July	63	71	113
August	86	70	167

Already in March and April the increase is apparent, but in May and June the number of deaths is double that recorded during the same months in the previous two years.

The causes of death in May are registered as follows:—

Catarrh of the stomach	..	..	..	..	..	..	..	3
" intestines	..	..	..	..	..	..	..	20
Diarrhœa	..	..	..	..	..	..	..	14
Dysentery	..	..	..	..	..	..	..	2
								<hr/> 39
Other diseases	..	..	..	..	..	..	..	81
Total	..	..	..	..	..	..	..	<hr/>120

Those of June:—

Diarrhœa	..	..	..	..	..	..	..	19
Catarrh of intestines	..	..	..	..	..	..	..	14
" stomach	..	..	..	..	..	..	..	3
Dysentery	..	..	..	..	..	..	..	1
								<hr/> 37
Other diseases	..	..	..	..	..	..	..	79
Total	..	..	..	..	..	..	..	<hr/>116

The first case declared to be real cholera occurred in a man named Mustapha Keirul Dine, the son of the Chief Janissary of the Mudirieh. He came from Cair on the 28th July, and died next day, but a great number of people had noticed bo that time, or had experienced in themselves or in their families, the existence of a similar malady, and laughed at the idea of considering this the first case of cholera in Assiout, they having suffered from it during the last three months. Even this case is registered in the Government books as choleriform!

It is very curious to have to report that the proportion of deaths from cholera in Assiout has been always very low. In its highest days the number of deaths did not exceed twelve, and the total number for the last four months cannot be more than 250, while the number of attacks is enormous.

I am in a position to say that at least three-quarters of the whole population were attacked.

I did not enter a house or speak to a person without finding that nearly all the members of the family had been attacked more or less severely during the last four months.

I cannot account for the mildness of the attack here.

Assiout does not lack filth and dirt, and is by no means in a better sanitary condition than are the towns of Lower Egypt which I visited this year, and in which the epidemic made great ravages, and except that the Nile is higher and more free from dead animals and other infections, I see no reason to account for the low mortality.

I hear that many villages around here have suffered immensely; some of them are reported to be decimated by cholera; these, however, I have not visited, and consequently I cannot report on their sanitary condition.

Every observing man here testifies that diarrhœa has been a frequent disease every summer for many years past.

Dr. Mazurakis stated to me the case of a man named Mahommet, whom he treated for diarrhœa in December last. Next day the patient eat pickles and was taken with severe vomiting, cramps and collapse, to which he succumbed after ten or twelve hours.

In the Government registers more than the third part of deaths are attributed any time during the last five years to diarrhœa and gastro-intestinal catarrh, but these I avow are not to be relied on for diagnosis.

Now from the foregoing statements it appears to me certain that cholera could not have been imported here from Lower Egypt; even supposing that importation ever occurred, it certainly was not this year.

How many years it has existed here I cannot tell, as I have neither the means or the time to institute proper inquiries and acquire authentic proofs.

Careful and exhaustive enquiry here and higher up the Nile would, no doubt, clear up the matter.

With, &c.

(Signed) A. HADDAD, M.D.

Annex 10.

Memorandum by Dr. Rabitsch.

It was in the year 1878 or 1879, on a summer afternoon, that I was called hastily to a patient in the Hôtel du Mercure, Mansour Pasha Street, at Cairo. I found there a man about 60, of middle size, and as I did know him from former occasions, of a good constitution and regular habits of life. This time I found him in bed, agitating his limbs and turning from side to side. His face and hands were of a leaden hue, his eyes were sunk deep in their sockets; he was moaning in a rather hoarse voice, and complaining of a great oppression of the chest, and pains in his calves and feet, which was depending of a spasmodic contraction of the *gastrocnemii* and *sacri* on one, and the *flexores digitorum* on the other hand. He had had in the course of two hours about thirty liquid stools, some of the last I saw myself were quite colourless, and in the bottom of the pot there were to be found portions of agglomerated *epithelii*, highly imbibed with water. He had vomited also a slimy green liquid, without any trace of undigested food. The patient's pulse was scarcely to be felt, the heart had about 100 contractions in the minute, attributable in part, as I thought, to great muscular exertion. The skin was cold, and covered with a gluish perspiration. The temperature per rectum I did not examine. Having had under my care in 1866 at Vienna a hospital of cholera, with 88 beds, during six weeks, such tableaux were quite familiar to me, and I declared to the assistants that this was a cholera case, but being no epidemic in the country there was no fear neither for the patient nor for the persons present.

Rubbing of the limbs with cognac, administering of hot tea with the same alcoholic were immediately ordered, with but a slight relief of the patient, who continued to complain of the cramps in the calves and great thirst. I therefore made a slight injection of morphia in the calves, and permitted the patient every 10 minutes some fifty grammes of ice soda-water.

While these things were going on I inquired into the cause of the attack, but could find no plausible explanation of it. I was rather startled as I was informed the patient came from Djedda, but afterwards having ascertained that more than a month had elapsed since his arrival, my fear vanished, though I could not help to throw a good quantity of sulphate of iron in the water-closet. Next morning, on my visit, the patient was up and would submit to no medical restriction. He remained well. Except the morphia injection I employed no opium.

I returned often in the house to examine if any similar case would happen, but fortunately nothing like that took place.

(Signed) DR. RABITSCH.

Cairo, September 19, 1883.

Annex 11.

Dr. Patterson to Dr. Hunter.

*British Consular Hospital, Constantinople,
September 24, 1883.*

Dear Sir,

I have read with much interest your Report to Sir Edward Malet on the hygienic state of Egypt, and its relation to the outbreak of cholera. I practised in Egypt from 1855 to 1868, both in Alexandria and Cairo, and for ten years had the Health Administration of the Railway Transit under my charge. This included the large district between Kafr-Zayat and Suez, and the then outlying districts of Mansourah, Zagazig, Samanoud, and other places, where cholera has so lately prevailed. I can, from personal knowledge, in a large native and European practice, confirm the statements you have made, and the probable correctness of the inferences you have drawn.

That a form of cholera, by whatever name it may be designated, was endemic in Egypt, no one acquainted with the disease could doubt. I cannot recall a year during my residence in Egypt without several well marked cases of endemic cholera having come under my notice. They were conveniently classed as cholera nostras, but in no way to be distinguished from so-called Asiatic cholera. The symptoms were rice water purging and vomiting, cramps, leaden hue of skin, and cold clammy perspiration, pinched features, sunken eyes, and the characteristic dark

areolæ, husky voice, pronounced collapse, and perfect intelligence, followed, in non-fatal cases, by reactionary fever. That this form of cholera was produced by local conditions admitted of no doubt. It always occurred in the moist warm months of summer, when the canals were stagnant, and when fevers, dysentery, and ophthalmia most prevailed. Even in Cairo, then a comparatively drier climate than it now is, cases of this kind occurred, more especially at Old Cairo and Boulac. In further confirmation of the view of a local origin, I frequently directed attention to the fact that at the time of the yearly Tintah fair, numerous cases occurred, and much choleraic diarrhœa in that locality. Every year at that time there was a cholera panic, and not without reason, as the hygienic, or unhygienic conditions of the place, were atrocious. In the year of the bovine pest, a real "murrain of cattle," choleraic diarrhœa and sporadic cholera prevailed to an alarming extent. The canals were then stinking from the decomposing carcasses of cattle thrown in, and the water—which the people drank unfiltered—was alive with animalculæ, and the fœtid gases of fermenting animal and vegetable matters bubbled to the surface. Sudden collapse was a marked feature of the cases at that time, which were undistinguishable from true or Asiatic cholera, yet no one ever thought of attributing this to an Asiatic or Indian origin. We seemed yearly to be on the eve of a cholera epidemic, yet there was no proof that this form of disease was infectious, or communicable from person to person under ordinary conditions.

In 1865 cholera appeared in Cairo; it was supposed to have been introduced from Alexandria, where it had prevailed for some weeks. The first case occurred in my own practice in the person of an English engine driver at Boulac, shortly after his arrival from Alexandria. He died. Two days afterwards another engine driver was attacked, also after arriving from Alexandria. Within twenty-four hours after the second case there were several others amongst the English workmen at Boulac who had not been in Alexandria, and had had no communication with the first cases. This was elicited from a very searching investigation. The most striking facts were the suddenness and violence of the symptoms, and the rapid spread of the disease, for within forty-eight hours it broke out with equal violence at the other end of the city, near the Citadel, and other places, in a shorter time than seemed possible for infection to be conveyed from one human body to another. This all pointed to peculiar local conditions, even admitting the importation from Alexandria. I need scarcely add that in Cairo at that time the conditions known to be favourable to the production of cholera and its rapid spread, existed in their most concentrated form.

In 1871, a local epidemic of cholera burst out suddenly in the village of Hasskeui, on the Golden Horn—a suburb of Constantinople—under such conditions of mal-hygiene as probably seldom ever existed, and which had been pointed out to the municipal health authorities as certain to generate some form of epidemic. An Englishwoman was the first attacked. She died in a few hours. Eight hours afterwards two more English people were attacked, two streets off. I most carefully investigated all the relations of these families, and proved most conclusively that there had been no communication between the cases. In forty-eight hours the epidemic was in full swing over a large surface, and, as usual, the foulest localities presented the most, and worst, cases. The importation was, I think, attributed to the arrival of a Turkish man-of-war into the Golden Horn, but how an Englishwoman became the medium of infection was not stated. I could only conclude that this sudden outbreak was due entirely to the local conditions of filth, the collection of years. For months before, measles, hooping-cough, acute gastric affections, and sore throat had been unusually rife. In common with others, I had predicted something of the kind, and urged the necessity of improved sanitary measures.

I place these facts at your disposal; they may be useful at the present time of inquiry.

I express no opinion of the infectious, or communicable properties of Asiatic cholera, but I have been forced to the conclusion after much experience, that local conditions, such as described in your Report, do produce a form of disease so similar in all characters and symptoms to Asiatic cholera as not to be practically distinguished from it.

Yours, &c.
(Signed) JOHN PATTERSON, *Surgeon Superintendent.*

Annex 12.

Dr. McNally to Dr. Hunter.

Respecting the origin of epidemic two questions arise:—(1) Did the cholera epidemic originate at Damietta, or, if imported, spread from that town? and (2) Is cholera endemic in Egypt?

Time has not been sufficient for me to make anything like satisfactory researches under these heads, but some inconclusive evidence has been obtained that this epidemic did not originate at Damietta, and that cholera has previously been endemic in Egypt.

1.—(a.) Dr. Tsamis, of Shibin-al-Kom, informed his brother at Zagazig that there had been great mortality from cholera, which was not reported at Shibin-al-Kom prior to reports of its occurrence at Damietta.

(b.) Dr. Tsamis, of Zagazig, also states that he heard news of heavy mortality in neighbouring villages before cholera was reported.

(c.) Ramadan Effendi, Inspector in Railway Service, informed Mr. Cotterill, District Railway Engineer, that in certain villages in the neighbourhood of Benha, typhus [? enteric] and cholera appeared before reported outbreak at Damietta, and, in one village, deaths were said to have numbered more than fifteen a-day. He also stated that a Government Committee was sent to investigate this mortality, but he did not know result.

(d.) Some Greek merchants, acquaintances of Dr. Tsamis, state that in the month of January of the present year 200 people died of diarrhoea and vomiting in the course of a few days at the villages of Shiba and Nakariah, not very far from Zagazig. At Taïba, another village, it is said that sixty persons were ill at the time when cholera was reported at Damietta.

2. M. Chevalier, an engineer from Cairo who visited Zagazig, informed me that he had known cholera to exist at Fayum six years ago, and also in other parts of Egypt during past years

(Signed)

C. J. McNALLY, M.D.

Cairo, September 1, 1883.

Annex 13.

Mr. Honman to Dr. Hunter.

Sir,

Mehallet Kebira, August 30, 1883.

With reference to your letter of the 14th instant. In those towns or villages only where there are Europeans have I been able to obtain any reliable information. In Mehallet Kebira Mr. Thomas Knowles was attacked with cholera, as he says, on the 23rd May this year; he has studied medicine, and gives an accurate description of his symptoms. His wife was attacked later on in the height of the epidemic here, and died.

A pharmacist in the town, named Geohamy, gives me the names of people attacked before cholera was acknowledged in Mehallet; the date of their attack was the 14th July.

Mr. Geohamy also states that diarrhoea is a common complaint in this town, but that for a month before the outbreak the cases that had been under his treatment had been most severe and intractable.

This is all that I have been able to obtain in Mehallet from reliable sources; numerous cases have been given to me of people who were said to have died of cholera, but I never found any clear evidence upon investigating them.

I find in the death reports, a copy of which I inclose, an occasional death put down to typhus fever, one in January 1883 and the other in June 1883.

Although I have not been able to obtain any more conclusive evidence than the case of Mr. Knowles in Mehallet, I have, I consider, conclusive proof of the existence of cholera in the month of May in a town containing about 4,000 people, called Miniet Samanoud, on the opposite bank of the Nile to that of Samanoud.

On my visit to the villages and towns in my district on the banks of the Damietta branch of the Nile I was accompanied by Mr. George Thompson, of Samanoud, who acted as my interpreter; he told me that there had been an epidemic in this town of Miniet Samanoud in the month of May, as many as four a-day having

died then. He was particular about the date, because he was building a house on the banks of the Nile, opposite the town, and saw the funeral processions. I was also told, by a letter, two days ago, by the same gentleman, that three persons (relatives) had died in one house there, and that he knew of a fourth who had died about the same time of the same disease. Upon hearing this I went over to Miniet Samanoud, which is out of my district, and obtaining possession of their register, I found that the names of the people that were given to me were in the book, and that the cause of death had been put down as diarrhœa. Upon making more inquiries, I heard of the same cases from an educated native, who, without any leading questions being put to him, said that a man named Ashmawi-el-Wrag had died on the 13th May after an illness of three days, and that he had vomiting, purging, and cramps; the latter he describes as being very severe. This man's name is down in the register, and is one of the three persons that died in one house.

Another man, named Mittwali Dars, died of the same complaint, with the same symptoms, on the 27th May, also down in the register as having died from diarrhœa.

Hadra Bint Abdoorachman-el-Wrag died on the 7th June, 1883, the cause of death in the register being diarrhœa. She was a relative of the first named, and died in the same house.

Saïd Iba Abdoorachman-el-Wrag died on the 14th June, 1883. His name is down in the register. Cause of death, diarrhœa.

This same native, who corroborates the statements made to me by Mr. Thompson and a Greek gentleman, being at Miniet, said that so many died in June that the Cadi of the town forbade the use of the drum at the funerals, in case it should draw attention to the number of deaths taking place. The epidemic gradually increased, and although there was on one day twenty-nine deaths from cholera, owing to fear of the cordon being established these were concealed. Attacks of cholera took place as late as three days ago.

I was unable to take a full copy of the register, owing to want of time. In Samanoud diarrhœa was very prevalent amongst the European population, and unusually severe. I inclose a copy of the register of deaths there; by it you will see that there was evidently more deaths from all causes (in fact double), and especially from diarrhœa, during the month of June, and that cholera is acknowledged to have commenced as early as the 30th June.

(Signed) ANDREW HONMAN.

Annex 14.

TABLE showing the number of Hospital Attendants engaged in nursing Cholera Patients who were attacked by the Disease.

Hospitals.	Number of Attendants.	Number attacked.	Deaths.	Percentage of Attacks.
				Per cent.
<i>Cairo.</i>				
British Army—				
A. H. C.	196	18	14	9·1
Sisters	5	..	..	..
Ibrahim Pasha	44	..	..	..
Egyptian Army	49	2	1	0·9
Kasr-el-Ain	56*	6	1	3·3
<i>Alexandria.</i>				
British Army	7	..	..	..
General European	5†	1	1	·005
Deaconesses	9†	1	1	·009
Greek	Not stated	..	2 (?)	..
Arab	4	..	..	..

* This number includes sixteen students in attendance on patients.

† Exclusive of sisters.

‡ Including sisters.

The Reports on which this Table is based do not bear date beyond the 15th September, 1883.

Annex 15.

Memorandum by M. Ismalun.

Les études faites au Laboratoire Khédivial sur les eaux du Nil sont divisées en :—

Recherches Chimiques,
Recherches Micrographiques.

Bien qu'elles n'aient pu être suivies régulièrement que pendant les premiers jours de l'apparition de l'épidémie cholérique, elles présentent toutefois assez d'intérêt pour être relatées.

Recherches Chimiques.—En dehors des éléments normaux, on a recherché spécialement les nitrates, l'ammoniaque, l'acide sulfhydrique; mais jusqu'à présent ces corps n'ont pas été rencontrés.

Parmi les éléments anormaux trouvés les deux seuls intéressants sont :—

Les matières en suspension et les matières organiques.

Les matières en suspension sont principalement composées de l'argile et des matières organiques insolubles. (Dans les Tableaux ces matières organiques sont retranchées des matières en suspension.)

Les matières organiques indiquées dans les analyses sont le total des matières organiques solubles et des matières organiques en suspension.

L'origine et la nature de ces matières organiques ne sont pas encore bien expliqués. Cependant de nouvelles études suivies régulièrement font prévoir quelques résultats nouveaux.

Le dosage des matières organiques ne peut pas autoriser à conclure si l'eau est ou non nuisible à la santé, car il est évident qu'il y a une grande différence entre les produits organiques azotés provenant des décompositions putrides et les substances humides dissoutes dans l'eau; bien que l'absence de nitrates, d'ammoniaque et d'acide sulfhydrique semblerait à priori permettre de boire cette eau sans prendre la précaution de la filtrer.

Voici du reste les résultats de quelques analyses faites :—

(A.)

Eau du Nil. (Eau prise au Robinet et à la prise de la Compagnie.)				
		Date de la prise de l'Échantillon.		
		3 Mai.	7 Août.*	16 Août.
Composition par litre—				
Matières organiques totales	..	0·09489	0·17950	0·1630
Chaux .. .. .	..	0·00706	0·06180	0·0670
Magnésie .. ..	..	0·01700	0·02870	0·0212
Chlorure de sodium	..	0·04000	0·01750	0·0210
Acide sulfurique ..	..	0·01010	0·00920	0·0082
Acide phosphorique	..	..	..	0·0010
Sesquioxyde de fer	..	0·09240	0·04500	0·0320
Matières en suspension	..	..	0·47600	0·4750
Résidu insoluble calciné	..	0·05800	0·39800	0·1710

Le Caire, Septembre, 1883.

* Prise d'eau de la Compagnie Canal Ismatlieh.

(B.)

EAU du Nil. (Pont de Ghéziréh.)

	Date de la prise de l'Échantillon.			
	3 Juillet.*	10 Juillet.	16 Juillet.	7 Août.
Composition par litre—				
Matières organiques totales ..	0·04260	0·1810	0·25300	0·16590
Chaux	0·04030	0·0582	0·01226	0·01448
Magnésie	0·02126	0·0315	0·00700	0·00370
Chlorure de sodium ..	0·05850	0·0146	0·04150	0·03900
Acide sulfurique ..	0·00618	0·0102	0·01700	0·01500
Acide phosphorique ..	..	..	..	..
Sesquioxyde de fer ..	..	0·0215	0·01700	0·0262
Matières en suspension ..	..	2·1700	..	..
Résidu insoluble calciné ..	0·04920	1·9950	0·1680	0·0986

Le Caire, Septembre, 1883.

(C.)

EAU du Nil. (Eau du Khalig.)

	Date de la prise de l'Échantillon.		
	19 Août.†	19 Août.‡	19 Août.§
Composition par litre—			
Matières organiques totales ..	0·1930	0·1860	0·1740
Chaux	0·0740	0·0780	0·0760
Magnésie	0·0213	0·0206	0·0200
Chlorure de sodium ..	0·0583	0·0660	0·0710
Acide sulfurique ..	0·0089	0·0094	0·0089
Acide phosphorique ..	0·0038	0·0034	0·0031
Sesquioxyde de fer ..	0·0710	0·0670	0·0630
Matières en suspension ..	1·8237	1·7350	1·7140
Résidu insoluble calciné ..	1·0020	0·9880	0·9740

Le Caire, Septembre, 1883.

Recherches Micrographiques.—Les observations microscopiques ont été suivies du 5 au 19 Juin.

Deux litres d'eau pris au milieu du fleuve étaient filtrés et l'examen était fait sur le dépôt encore humide resté sur le filtre. Ce dépôt avait un aspect verdâtre comme s'il était composé plus spécialement de matières colorées par de la chlorophylle.

On y a toujours rencontré beaucoup de conferves, des diatomées et des desmidiacées. Mais ce qui au point de vue hygiénique pourrait être d'une certaine importance, est le fait d'y avoir trouvé des *Daphnia* dont quelques-unes seulement vivantes, et la plus grande partie représentée par des portions de carapace. Jamais telle quantité de *Daphnia* n'avait été observée dans l'eau courante du Nil, et l'on aurait pu supposer que cette eau provenait plutôt d'un étang que du fleuve.

Comme autre résultat intéressant, il fut encore trouvé des masses pointillées reconnues pour des *Micrococcus* ou *Spherobactérides*, d'autant plus que tout autour nageaient des *Microbactérides*, bien distincts au grossissement de l'objectif No. 8 à immersion de Verick.

Ces derniers avaient l'aspect du *Bactérium termo* tandis que les premiers seraient le *Bactérium punctum*, lequel, suivant certains observateurs, dérive des *Microbactérides*.

En admettant que parmi ces schizomycetes observés dans l'eau il n'existe pas de germes spéciaux aux maladies ou germes panthogènes, il est cependant évident que

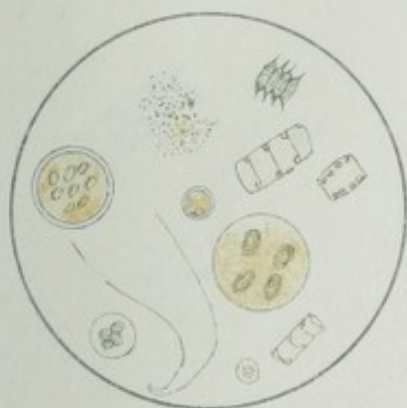
* Analyse faite sur eau filtrée.

† Fourn-el-Khalig.

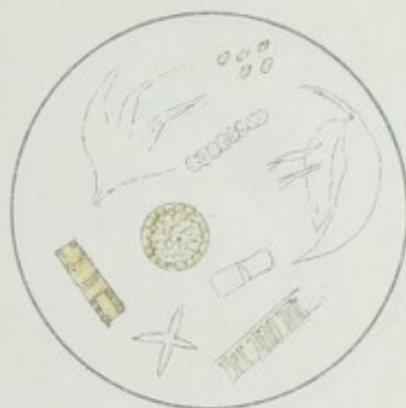
‡ Place Mansour Pacha.

§ Abassieh.

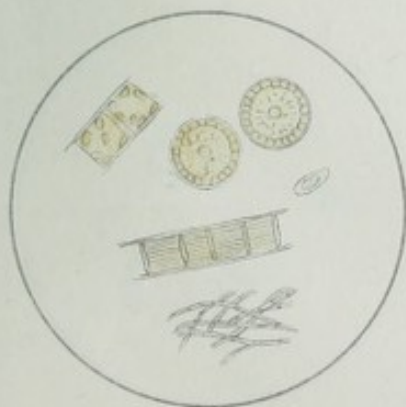
EAU DU NIL.



5 Juillet 1883.



6 Juillet 1883.



9 Juillet 1883.



10 Juillet 1883.

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

WASHINGTON, D. C. 20250

OFFICE OF THE ASSISTANT SECRETARY

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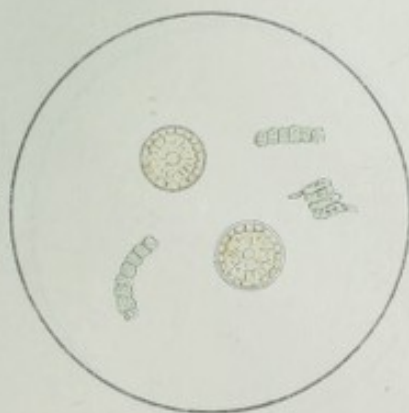
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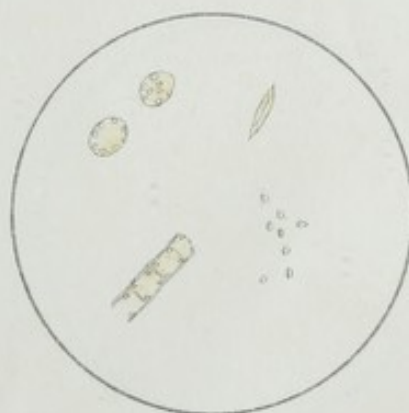
11 Juillet 1883.



12 Juillet 1883.



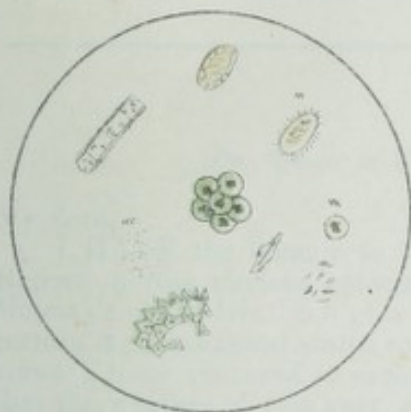
14 Juillet 1883.



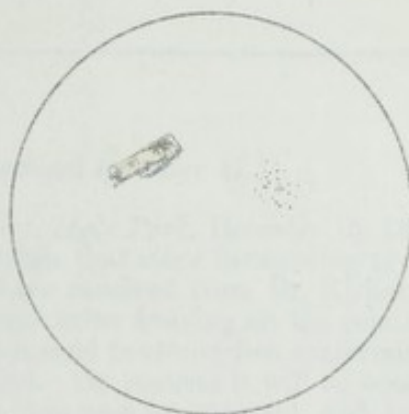
16 Juillet 1883.



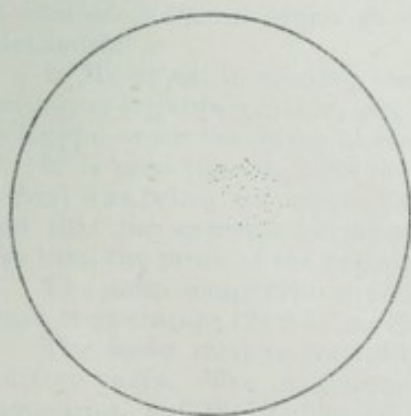
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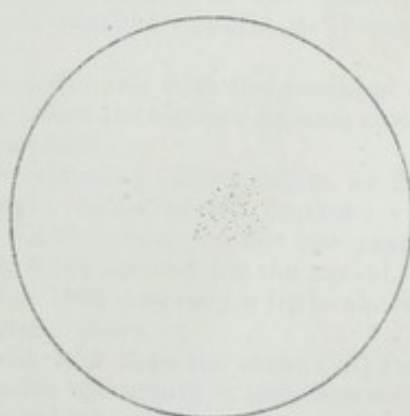
17 Juillet 1883.



20 Juillet 1883.



25 Juillet 1883



1^{er} Août 1883.

REV. 00. 043



la présence du *Bactérium termo* doit faire admettre que l'eau examinée semblait putride et par conséquent pouvait aider le développement et la propagation d'un germe pathogène.

Aussi n'avons-nous pas hésité à insister pour que l'eau, quel qu'en soit l'usage d'ailleurs, fût toujours bouillie et bien filtrée.

Les figures 1 à 12 sont le résultat des recherches faites pendant cette période.

Depuis le 20 Juillet les observations ont donné des résultats tout autres et d'intérêt différent. Cependant il est bon d'ajouter que les germes rencontrés précédemment n'ont plus été vus.

Le Directeur du Laboratoire,
(Signé) ALBERT ISMALUN.

Le Caire, le 12 Septembre, 1883.

No. 3.

Dr. Hunter to Earl Granville.—(Received December 17.)

My Lord, 21, Norfolk Crescent, Hyde Park, December 15, 1883.

I HAVE the honour to inform your Lordship that since forwarding my final Report on the cholera epidemic in Egypt I have received from Dr. Kirker, Her Majesty's ship "Iris," a highly important communication bearing on the relation of certain meteorological states to cholera, and which tend to strengthen materially the views I have ventured to express on this question. On perusal it will be observed that the weather of this year, especially in June, has been exceptional, and for the period of nine or ten days before the outbreak at Damietta was unique in its character.

I would, therefore, with your Lordship's permission, request that Dr. Kirker's "meteorological summaries" may be added to my Report.

I have, &c.
(Signed) W. G. HUNTER.

Inclosure 1 in No. 3.

Dr. Kirker to Dr. Hunter.

Sir, "Iris," at Malta, December 6, 1883.

I HAVE the honour to inclose you a copy of the meteorological summaries for the month of June, from 1870 to 1883 inclusive, which, by the kind permission of M. A. Pirona I have made from the meteorological register of the Observatoire et Station Météorologique de l'Impérial et Royal Institut Central de Vienne, at Alexandria.

1. My object in sending the inclosure is to furnish you with the means of comparing, as regards weather, last June—the month when the cholera became epidemic in Egypt—with the Junes of the previous thirteen years.

It is seen that in 1883 the mean barometric pressure (758.2 millim. = 29.851 inches) was below the mean (758.7 millim. = 29.871 inches) of the fourteen years; and that the extreme variation (5.1 millim. = 0.200 inches) for the one year was less than the mean of the extremes (7.6 millim. = 0.300 inches) for the period.

The mean temperature (24.4° C. = 75.9° F.) in 1883 was only a little above the mean temperature (24.0 C. = 75.2 F.) of the fourteen years.

The mean relative humidity (71) in 1883 was less than the mean (73) for the fourteen years. The maximum relative humidity for the month is not shown in the summaries, but the Tables of daily registration, which will be more particularly referred to afterwards, show that in 1883 it reached 96—the highest recorded in any month whatsoever since January 1876.

The mean relative amount of ozone (6.4) in 1883 is 13.5 per cent. less than the mean (7.4) for the fourteen years. On examination of the summaries of the ten months, January to October, it is seen that the mean relative amount of ozone for that period in 1883 is less by 17.0 per cent. than the mean for the same period in the seven years 1875 to 1881. The ozone observations do not extend further back than 1875, and the record for 1882 is incomplete.

The mean wind force for June 1883 is less than for any previous June for thirteen years. Again, the summaries of the ten months, January to October, show that the mean wind force for that period, in 1883, is 36·8 per cent. less than the mean for the same period in the twelve years 1870 to 1881. Only in 1877 has this period as low a mean wind force as in 1883.

2. In one of my former communications I pointed out that the nine days, from the 12th to the 20th June last, was a period of excessive relative humidity, with occasional stagnancy of the air, especially at night. Now, M. Pirona has the monthly Tables of daily registrations since 1876, and these show that the above period, as regards the combination of great moisture of the air and low wind force, is unique in the meteorological history not only of the month of June, but of the entire years since 1876. There are only about two periods of equal length in which the mean wind force was so low, one in January 1877, and another in December 1878, but in these periods the mean relative humidity and temperature were also low. There are several periods of greater mean relative humidity—though one of the highest maximums recorded occurs in the June 1883 period, but all of these had a much higher mean wind force.

3. In a Report which I wrote on the outbreak of cholera at Chatby, Alexandria, I said, "Now I believe that the stagnancy of the air over Chatby, owing much to its low and sheltered position, especially during the period from the 10th to the 15th October, forced the disease into existence; and that the influence of the motionless atmosphere was probably assisted by the rise of temperature and by the moisture of the ground following the rain on the 9th and 10th."

In connection with the time here referred to, M. Pirona's summaries show nothing particular for October 1883. The daily registrations, however, show that then (10th to 15th October) a fall in the force of the wind, and a change in direction from northerly to southerly took place. The only other October since 1876 in which a similar period occurred was that of 1877.

In conclusion, I think it may be safely said, that M. Pirona's observations give weight to the opinion that this year meteorological conditions had a strong influence in the generation of the cholera epidemic; for they show that the year 1883, particularly in the month of June, has differed even from its comparatively remote predecessors in the directions most favourable to disease.

I have, &c.

(Signed) GILBERT KIRKER, M.D.,
Surgeon, R.N.

Read with much interest, and forwarded.

(Signed) ERNEST RICE, Captain.

December 6, 1883.

Inclosure 2 in No. 3.

METEOROLOGICAL SUMMARIES for the Month of June 1870-83.

Year.	Barometer reduced to 0', 19 metres above sea-level.						Thermometer—Centigrade.											
	9 A.M.	3 P.M.	9 P.M.	Maximum.	Day.	Minimum.	Day.	Mean.	Maximum.	Day.	Minimum.	Day.	Mean of Maximum.	Maximum of Minimum.	Mean of Maximum and Minimum.	Minimum of Maximum.	Day.	Maximum of Minimum.
1870	Mms. 758.7	Mms. 758.6	Mms. 758.8	Mms. 762.6	6	Mms. 755.8	9	Mms. 758.7	24.1	25.4	23.1	24.2	29.7	3	20.0	3	26.0	22.4
1871	60.0	59.8	60.0	63.6	11	56.5	5	60.0	24.2	25.7	22.9	24.2	37.5	12	18.5	2	26.7	21.4
1872	59.5	59.2	59.2	63.7	1	56.4	22	59.3	25.0	25.7	23.5	24.7	40.0	4	19.1	3	27.0	21.9
1873	59.8	59.1	59.5	62.9	11	54.9	21	59.5	24.1	25.1	22.6	24.0	34.0	8	19.1	12	26.4	21.4
1874	59.1	58.7	59.3	65.0	1	55.6	20	59.0	23.9	24.5	22.5	23.6	31.1	24	18.6	1	25.4	21.7
1875	57.5	57.2	57.6	60.7	9	53.4	25	57.4	24.7	26.0	23.9	24.9	30.6	29	20.4	1	26.5	22.8
1876	59.4	59.0	59.4	62.0	3	57.0	28	59.3	25.1	25.4	23.3	24.6	36.4	7	18.3	2	26.9	21.1
1877	59.8	59.2	59.5	63.4	19	56.3	3	59.5	24.2	24.6	23.0	23.9	32.8	17	19.8	2	25.7	21.6
1878	57.8	57.6	57.7	60.6	12	53.0	28	57.7	23.9	24.9	23.1	24.0	29.8	28	20.6	10	25.6	22.0
1879	57.4	57.0	57.5	60.8	2	51.8	28	57.3	24.2	25.2	25.7	24.4	27.3	27	21.1	1	25.6	22.6
1880	58.0	57.8	58.0	63.3	1	52.8	20	57.9	25.5	27.2	23.9	25.5	33.9	20	18.3	1	27.6	22.4
1881	59.3	58.8	59.2	63.5	14	55.5	11	59.1	24.1	25.7	23.2	24.3	44.9	11	18.0	3	27.5	21.5
1882	59.6	59.2	59.6	63.9	6	55.6	13	59.5	22.7	24.3	21.7	22.9	35.0	9	18.0	4	25.0	19.9
1883	58.4	58.0	58.3	60.6	3	55.5	15	58.2	24.3	26.1	23.6	24.7	32.5	23	19.1	7	26.6	22.3

METEOROLOGICAL SUMMARIES for the Month of June 1870-83.

Year.	Relative Humidity. Sat. = 100.				Rain.				State of the Sky 0-10.		Ozone Scale 0-14.			Direction of Wind.												Force of Wind 0-8.								
	9 A.M.	3 P.M.	9 P.M.	Mean.	Quantity in Inches.	No. of Days.	Maximum.	Day.	No. of Obs.		Mean.	9 A.M.	3 P.M.	Mean.	N.	N.N.W.	N.W.	W.N.W.	W.	W.S.W.	S.W.	S.S.W.	S.	S.S.E.	S.E.	S.E.	E.	E.N.E.	N.E.	N.N.E.	Mean.	No. of Obs.		
									0.	10.																								
1870	80	76	87	81	..	..	..	..	76	..	1	..	..	..	20	17	25	15	15	3	..	..	..	1	4	..	..	1	3	8	3	1	..
1871	70	67	76	71	..	..	..	..	66	..	2	..	..	..	23	11	14	22	22	..	..	..	..	1	3	..	..	1	3	3	3	1	..
1872	68	68	74	70	..	..	..	..	76	..	1	..	..	..	12	41	8	9	4	..	..	..	..	..	..	..	..	..	1	3	3	1	..
1873	72	69	79	73	72	..	1	11	23	29	10	1	3	2	1	3	3	1	..
1874	75	73	83	77	..	..	..	..	83	..	1	..	..	..	22	22	29	9	1	..	..	..	..	..	..	..	..	..	..	3	3	1	..
1875	73	71	78	74	..	..	..	..	68	..	1	8-0	7-4	7-7	3	41	21	18	3	1	..	..	..	..	..	..	..	..	..	3	3	1	..
1876	64	67	76	69	..	..	..	..	57	..	1	8-0	7-7	7-8	20	29	10	6	1	1	..	..	1	6	1	..	..	..	..	1	3	1	..
1877	73	73	80	76	48	..	1	7-8	7-6	7-7	47	16	13	..	3	1	4	1	1	1	1	1	1	1	1	3	1	..
1878	76	73	81	76	29	..	2	7-9	7-9	7-9	80	15	31	6	3	1	2	2	2	1	..
1879	77	75	81	78	..	..	..	..	31	..	1	8-3	8-4	8-3	39	18	28	4	4	..	..	..	..	..	..	..	..	..	..	3	3	1	..
1880	74	69	81	75	..	..	..	..	67	..	1	7-6	7-6	7-6	34	12	27	3	2	..	..	..	..	..	..	..	..	..	..	3	3	1	..
1881	66	69	73	67	73	..	1	7-1	7-3	7-2	43	3	9	..	1	2	2	1	1	1	2	2	3	1	..
1882	69	65	75	69	66	..	1	6-6	6-6	6-6	28	15	21	1	1	1	1	2	2	1	..
1883	71	67	75	71	..	..	..	..	68	..	..	6-5	6-4	6-4	24	30	9	2	..	..	..	..	..	..	..	..	..	..	..	1	4	1	..

Lord E. Fitzmaurice to Surgeon-General Hunter.

Sir,

Foreign Office, January 15, 1884.

I AM directed by Earl Granville to acknowledge the receipt, on the 12th ultimo, of your General Report relating to your recent Mission to Egypt.

In returning to you his Lordship's thanks for the above communication, I am to take this opportunity of expressing to you Lord Granville's satisfaction at the energetic manner in which you executed your mission, and his appreciation of the great attention which you gave to the nature of the cholera epidemic and to all sanitary questions in Egypt, as well as the valuable information contained in the able and complete Reports which you have furnished on the subject.

Lord Granville does not doubt that these papers will contribute materially to the scientific knowledge of the character of the disease, and will claim a careful perusal by all those who take an interest in this important subject.

I am, &c.

(Signed)

EDMOND FITZMAURICE.

COMMERCIAL. No. 38 (1883).

FURTHER REPORTS by Surgeon-General Hunter on
the Cholera Epidemic in Egypt.

[In continuation of "Commercial No. 29 (1883)."]

*Presented to both Houses of Parliament by Com-
mand of Her Majesty. 1883.*

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