CHINA.

IMPERIAL MARITIME CUSTOMS.

II.—SPECIAL SERIES: No. 2.

MEDICAL REPORTS,

FOR THE YEAR ENDED 30TH SEPTEMBER 1894.

47th and 48th Issues.

PUBLISHED BY ORDER OF

The Inspector General of Customs.

SHANGHAI:

PUBLISHED AT THE STATISTICAL DEPARTMENT OF THE INSPECTORATE GENERAL OF CUSTOMS.

AND SOLD BY

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National Oceanic and Atmospheric Administration

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INSPECTOR GENERAL'S CIRCULAR No. 19 OF 1870.

INSPECTORATE GENERAL OF CUSTOMS,

PEKING, *31st December* 1870.

SIR,

1.—IT has been suggested to me that it would be well to take advantage of the circumstances in which the Customs Establishment is placed, to procure information with regard to disease amongst foreigners and natives in China; and I have, in consequence, come to the resolution of publishing half-yearly in collected form all that may be obtainable. If carried out to the extent hoped for, the scheme may prove highly useful to the medical profession both in China and at home, and to the public generally. I therefore look with confidence to the co-operation of the Customs Medical Officer at your port, and rely on his assisting me in this matter by framing a half-yearly report containing the result of his observations at.....upon the local peculiarities of disease, and upon diseases rarely or never encountered out of China. The facts brought forward and the opinions expressed will be arranged and published either with or without the name of the physician responsible for them, just as he may desire.

2.—The suggestions of the Customs Medical Officers at the various ports as to the points which it would be well to have especially elucidated, will be of great value in the framing of a form which will save trouble to those members of the medical profession, whether connected with the Customs or not, who will join in carrying out the plan proposed. Meanwhile I would particularly invite attention to—

a.—The general health of.....during the period reported on; the death rate amongst foreigners; and, as far as possible, a classification of the causes of death.

b.—Diseases prevalent at.....

c.—General type of disease; peculiarities and complications encountered; special treatment demanded.

d.—Relation of disease to { Season. / Alteration in local conditions—such as drainage, etc. / Alteration in climatic conditions. }

e.—Peculiar diseases; especially leprosy.

f.—Epidemics { Absence or presence. / Causes. / Course and treatment. / Fatality. }

Other points, of a general or special kind, will naturally suggest themselves to medical men; what I have above called attention to will serve to fix the general scope of the undertaking.

* * * * *

3.—Considering the number of places at which the Customs Inspectorate has established offices, the thousands of miles north and south and east and west over which these offices are scattered, the varieties of climate, and the peculiar conditions to which, under such different circumstances, life and health are subjected, I believe the Inspectorate, aided by its Medical Officers, can do good service in the general interest in the direction indicated; and, as already stated, I rely with confidence on the support and assistance of the Medical Officer at each port in the furtherance and perfecting of this scheme. You will hand a copy of this Circular to Dr. ....., and request him, in my name, to hand to you in future, for transmission to myself, half-yearly Reports of the kind required, for the half-years ending 31st March and 30th September—that is, for the Winter and Summer seasons.

4— * * * * *

I am, etc.,

(Signed) ROBERT HART,
I. G.

THE COMMISSIONERS OF CUSTOMS,—*Newchwang*, *Tientsin*, *Chefoo*, *Hankow*, *Kiukiang*, *Chinkiang*, *Shanghai*, *Ningpo*, *Foochow*, *Tamsui*, *Tainan*, *Amoy*, *Swatow*, and *Canton*.

TABLE OF CONTENTS.

The Contributors to this Volume are:—

C. C. DE BURGH DALY, M.B., B.CH. ..... Newchwang.

JAMES H. MCCARTNEY, M.D. ..... Chungking.

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DR. C. C. DE BURGH DALY'S REPORT ON THE HEALTH OF NEWCHWANG

For the Ten Months ended 31st March 1894.

IN the beginning of June 1893 I took over charge of this practice.

During the period under review the health of the foreigners has been good.

There were two births and one death. The fatal case was one of typhoid fever: the patient, an officer on board a steamer, arrived here on the 14th day of the illness; he was dressed and on deck. His temperature was 104°, and hæmorrhage from the bowel had already commenced.

The only other serious cases were one of phthisis and one of rheumatic gout.

Two of the residents suffered from tapeworm, and nearly all the children and some of the adults from round worm; one child passed from the bowel or vomited over 100 in 12 months.

Both the water and meat supply are a danger to the community. There is absolutely no foreign or native supervision over the meat furnished to residents and the shipping.

The drinking water provided for most of the residents is brought from a well some distance from the Settlement. That supplied to the shipping is, in many cases, taken from the river some miles above the Settlement; in others, as I have myself often seen, from the surface of the river opposite the native city. The water-boats are tied up among scores of native cargo-boats, above and below them, and whilst the surface water is scooped up in water baskets the crews of the cargo-boats are emptying their bowels and bladders. And yet Newchwang water is supposed to be fairly good, and is often drunk on board the steamers without being boiled and filtered.

The water used by residents for bath purposes and for ordinary use in the pantry and kitchen is not much better. This is taken from ponds in the Settlement, which ponds are to a great extent filled with the drainings from the surrounding fields and roads, necessarily soaked with animal and vegetable filth.

The foreign houses are built on a mudflat. The houses and compounds are in most cases raised above the level of the surrounding ground, which by a shower of rain is quickly converted into a swamp. There are only mud paths between most of the foreign residences, one of which is the school the children attend. These paths in wet weather can be more easily imagined than described.

If, as funds permitted it, the roads were improved, the swamps filled in, and the meat and water supply supervised and improved, this port would be not only more enjoyable but more healthy to live in.

By the kindness of Mr. Harbour Master ARMOUR I am enabled to append the result of meteorological observations for the last nine months.

METEOROLOGICAL TABLE, July 1893 to March 1894.

MONTH.	ANEROID BAROMETER.		NO. OF DAYS ON WHICH THE TEMPERATURE FELL BELOW						NO. OF DAYS ON WHICH THE TEMPERATURE ROSE ABOVE						No. of Days on which Rain fell.	Total Amount of Rainfall.	No. of Days on which Snow fell.	No. of Days on which there were Dust Storms.	No. of Days on which High Winds blew.
	Highest.	Lowest.	°F. -15	°F. -10	°F. 0	°F. 10	°F. 20	°F. 32	°F. 50	°F. 60	°F. 70	°F. 80	°F. 85	°F. 90					
1893.	*Inches*	*Inches*														*Inches*			
July.....	30.30	29.89	...	...	...	...	...	...	...	...	7	15	9	...	8	6.44	...	1	2
August.....	30.30	29.62	...	...	...	...	...	...	...	...	17	4	10	...	5	1.52	...	2	4
September...	30.55	29.97	...	...	...	...	...	...	2	13	15	...	...	...	6	3.03	...	1	2
October.....	30.83	30.10	...	...	...	...	...	9	11	8	1	...	...	...	6	1.50	...	1	9
November...	30.87	30.00	...	...	...	...	20	9	1	...	...	...	...	...	3	0.53	1	...	3
December ...	30.87	30.00	...	...	4	13	6	8	...	...	...	...	...	...	...	...	5	...	4
1894.																			
January.....	31.00	30.40	4	5	10	12	...	...	...	...	...	...	...	...	...	...	1	...	1
February.....	30.97	30.23	...	...	2	10	15	1	...	...	...	...	...	...	...	...	2	5	3
March.....	30.90	30.15	...	...	...	...	...	9	11	2	...	...	...	...	2	0.53	3	3	3

DR. JAMES H. McCARTNEY'S REPORT ON THE HEALTH OF CHUNGKING

For the Half-year ended 31st March 1894.

DURING the six months under review there has been no serious illness among the foreigners at this port. This no doubt can be accounted for (in part at least) by the remarkably cool summer and the absence in the mountains of many members of the community during the greatest heat in August. With the exception of two or three cases of chronic malaria and one case of measles, there has been entire freedom from illness among both the Customs staff and the missionary body. Taking into consideration that there are between 40 and 50 foreign residents in the city, this is not a bad showing for Chungking as compared with the other river ports. Chungking has always received the name from residents and those who have been residents as being very unhealthy. A large part of this criticism in the past has been unjust. Time will prove that with ordinary precautions in warm weather this port will become one of the healthiest on the river for foreigners. One resident has lived in Chungking for 30 years, while two others have been here off and on for a period of 12 years. If these people are to be taken as examples of Chungking's unhealthiness, we cannot decide that this port is more unhealthy than others on the river. Those who suffer most from malaria and other troubles are those who have only been here for a period varying from one to three years. The climate is warm and oppressive during the summer months, the oppressiveness being due to the dampness of the atmosphere. The winter months are quite foggy, the sun seldom being seen. As the thermometer never reaches freezing point in the winter, and as this is the time when the streets are the dirtiest, the absence of the sun, which retards the formation of malaria, can be regarded as a blessing in disguise. The high elevation of Chungking gives us perfect drainage, while swiftly flowing streams on three sides furnish excellent drinking water. It has been claimed that the rock on which the town is situated favours decomposition, and is therefore the source of the malaria with which we are troubled. I do not agree with this view. PARKES, in his *Hygiene*, says that when these rocks have been weathered and disintegrated they are supposed to be unhealthy. Such soil is absorbent of water; and the disintegrated rock of Hongkong is said to be rapidly permeated by a fungus, but evidence as to the disintegrated trap is really wanting. He further states that sites on these formations are usually healthy; the slope is great and the water runs off rapidly. However, I am rather inclined to take the view that our malaria is caused by the decomposition of the organic matter, which is piled up on the streets during the winter months, waiting for the spring rains to wash it away.

There was no return of the cholera which caused such destruction of life in 1892. No extra precautions were taken by the authorities, but still it did not recur, probably owing in

some measure to a mild summer and in a greater degree to the open and perfect system of drainage and good drinking water.

The only case of contagious disease among foreigners was one of measles, in an adult.

Among the natives small-pox has not been so prevalent as in the preceding six months, although there have been many cases. Measles is constantly with the Chinese here, much more so than small-pox, and on account of the scrofulous character of the larger per-centage of the children, it frequently leaves them with ulceration of the cornea. Chicken-pox is common, but not to such an extent as measles. The disease most frequently met with, and proving most fatal under the native treatment, is a form of intermittent fever, very pernicious in its character; the local name is *han-ping*. It prevails in the spring and summer months, and occurs periodically at the time of greatest heat. The natives regard it as the most fatal of all diseases, which, under this treatment, it has proved to be. It yields readily to full doses of quinine and tonic treatment.

During the half-year I encountered two cases of diphtheria, both in adults.

There were four cases of leprosy in the hospital, their stay varying from one week to two months. These were the only cases seen. Two were of the anæsthetic and two of the tubercular variety; all were treated with daily applications of gurjun oil in emulsion, alternated with applications of tincture of iodine. Internal treatment consisted of full doses of sulphate of quinine three times a day and iodide of potassium alternated with liquor strychniæ and vegetable tonics.

One patient left in less than a week because the others made it too unpleasant for him when they found out that he had leprosy. One of the remaining three stayed about three weeks; at the end of that time he showed marked improvement, but would not remain any longer. The other two cases are still in hospital; both patients are on a fair way to recovery.

The Chinese look upon leprosy as highly contagious, and will not allow a leper to mingle with them. The disease is endemic in certain localities farther west of Chungking, but extremely rare in this district.

The hospital has furnished abundance of surgical material, and as it gets better known will add largely to the interest in the work.

During the period under review there have been no deaths and but three births in the foreign community. I attended 10 or 12 native labour cases, all of which were instrumental. In one I found that the placenta had been retained for four days. Patient made a good recovery as far as I know. Of these cases three mothers and three children died: one was a case of eclampsia, and one of osteomalacia, in which the outlet was so narrow that it was impossible to do craniotomy.

Notes of a few surgical cases are given below:—

CASE 1.—Male, single; has been a strict vegetarian for 24 years; at present about 30 years of age. The enlargement of the glands of the neck and axilla seen in the accompanying lithograph was of several years' duration, without pain, and the only inconvenience from which he suffered has been from the motion

of the jaw in eating and talking. When seen he was extremely anæmic, and had a shrill, squeaky voice. The glands were all removed in two operations, each taking about 45 minutes. The patient made a slow recovery, and was discharged well in about one month.

Case 2.—The accompanying reproduction from a photograph shows a countryman, married, about 30 years of age. The growth began when he was a child, gradually enlarging until it reached the present size. It gave him little pain, but interfered with his eating and talking. It looked like a large warty growth, emitted a peculiar odour, and was pedunculated in its attachment. After its removal it was found to be of a soft fibroid variety, sponge-like in structure, with the meshes filled with a sebaceous material emitting a foul smell. The patient made a good recovery, and was much improved in appearance.

The following are notes of cases of excisions of hip-joints:—

I.—Boy, 16 years of age, scrofulous, with hip-joint disease of several years' standing; the joint has been discharging pus for two or three years. The patient was very anæmic, and it was decided that the only chance of saving his life was by an excision of the joint. I excised the femur below the lesser trochanter and cleaned out the acetabulum. The limb was packed in a fracture box and extension applied. The patient made a slow recovery on account of his condition. In three months he was discharged from the hospital cured, with about 3 inches shortening. He can stand on the leg, but cannot walk without the aid of a crutch.

II.—Dislocation of hip of long standing; attempts at reduction failed each time. Excised head of bone. Patient made a good recovery, with about 2 inches shortening. When discharged he could stand on his leg, and in three months after he could walk without the aid of a crutch.

III.—An adult, merchant; hip-joint disease of long standing, leg considerably shorter than its fellow. Patient greatly emaciated from the large amount of discharge. Excised the bone below the lesser trochanter. The wound would not heal on account of patient removing the weight, which allowed the glutæus to pull the bone through the wound. Operated second time, removing another small piece of bone. When he left patient could walk with the aid of crutches and was much improved in appearance.

IV.—Boy; had fallen out of a tree when a small child and injured his back. On account of the pain he lay with his leg flexed on his abdomen until it had become ankylosed. In this case removed only the head. The patient was discharged in about a month well. He had perfect use of his joint, and the last report from him said that his leg was in good condition.

For the following meteorological table I am indebted to Mr. W. N. LOVATT, of the Chungking Customs:—

METEOROLOGICAL TABLE, October 1893 to March 1894.

MONTH.	THERMOMETER.		BAROMETER.		RAINFALL.
	Highest.	Lowest.	Highest.	Lowest.	
1893.	° *F.*	° *F.*	*Inches*	*Inches*	*Inches*
October	81	60	29.38	29.12	2.63
November	69	43	29.46	29.20	2.29
December	64	40	29.44	29.26	0.62
1894.					
January	68	40	29.36	28.98	0.83
February	69	40	29.38	29.04	0.36
March	92	50	29.34	28.95	1.76

DR. E. A. ALDRIDGE'S REPORT ON THE HEALTH OF ICHANG

For the Half-year ended 31st March 1894.

THE following abstract is from the meteorological observations taken at the Custom House, Ichang (latitude, 30° 14′ 25″ N.; longitude, 111° 18′ 34″ E.):—

METEOROLOGICAL TABLE, October 1893 to March 1894.

MONTH.	THERMOMETER.				BAROMETER.		RAINFALL.	
	Highest.	Lowest.	Average Highest.	Average Lowest.	Highest.	Lowest.	No. of Days.	Quantity.
1893.	° *F.*	° *F.*	° *F.*	° *F.*	*Inches*	*Inches*		*Inches*
October	87.0	49.5	76.8	58.7	30.30	29.87	4	0.50
November	76.5	37.0	65.4	48.0	30.45	29.95	7	1.46
December	76.5	29.0	58.1	37.7	30.62	29.86	1	0.02
1894.								
January	60.0	31.0	48.7	36.6	30.56	29.85	6	0.84
February	76.0	29.0	55.6	38.1	30.50	29.80	7	2.19
March	87.0	33.0	63.3	44.7	30.70	29.72	8	3.57

On analysing the above record it is found that the average temperature has been about 54° F. The winter was unusually mild and pleasant. The rainfall for the six months under review was below the average, being only 8.58 inches, falling in 245 hours, making a total for the last 12 months of 45.74 inches, which fell in 581 hours.

The health of foreigners has been good, and there is nothing of medical interest worthy of report. The most serious case was one of dysentery, which, however, yielded to treatment.

During 12 months six cases of childbirth were attended, one of European parentage and five half-castes.

The doctor who had charge of the Church of Scotland City Dispensary having died last autumn, I have tried somewhat to carry on the work for the last six months, which, judging by the attendance, is a boon appreciated by the poorer natives.

DR. ROBERT H. COX'S REPORT ON THE HEALTH OF WUHU

For the Half-year ended 31st March 1894.

THE general health of the foreign community (now consisting of 64 persons) for the period under review has been below the average since my arrival six years ago. Malarial fevers, as usual, composed the majority of cases treated; and of these nearly all occurred in the autumn and early winter. This may be accounted for by the prolonged drought, only 3 inches of rain having fallen during the last three months of the year, causing the exposure of large tracts of marshy ground and paddy fields which in ordinary years are covered with water.

Two cases of pneumonia were treated. In one recovery was complete, but in the other fresh lung trouble was set up by a premature departure from the sick room, which resulted in bronchitis with asthmatic attacks, and has assumed a more or less chronic form.

A case of dysentery also occurred, and was treated by ipecacuanha and milk diet.

Two cases of "washerman's itch" of the scrotum, which came under observation, were successfully treated as follows:—

An ointment composed of boracic acid, acetate of morphia and lanolin was applied for two or three days, after which the patients were directed to wear drawers—the shape used for bathing—made of fine shirting, which, after being washed and before being worn, were to be dipped in a saturated solution of boracic acid in water and dried. This offers a free supply of the acid, in the form of powder or minute crystals, to the part, and may be used by those liable to the disease as a preventive measure in hot weather.

There were no epidemics, no births and no deaths.

Among the Chinese the sickness mentioned in my last Report continued till well into November, and in some cases did not appear to be restricted to the low-lying ground. I regret that no typical case came under my observation.

The following surgical cases may be worthy of detail:—

Amputation of the Thumb at the Carpo-metacarpal Joint.—A Chinese sailor on board a gun-boat, while working at a winch, had his sleeve caught by the cog-wheels, which also pulled in his right hand. When I saw him the thumb was almost completely severed at the head of the metacarpal bone, its only attachments being the adductor and extensor tendons, both of which had been pulled out a considerable distance, probably by the efforts of the patient to free himself. Under chloroform the thumb and metacarpal bone were removed by the oval operation, the flaps brought together with silk sutures and the wound dressed with iodoform. He was then sent on board the gun-boat and I have not heard from him since. The thumb of the other hand was double.

Plastic Operation for Restoration of Upper Lip.—A Chinese cook on board a rice steamer had been struck with a rice-bowl on the face, which cut the whole upper lip almost completely away, as with a sharp knife, and broke off at their necks his four upper incisor teeth. The lip was hanging by its left corner—a pedicle about ¼ inch in diameter—and the teeth were loose in the mouth, being only slightly attached to the lacerated gums. The teeth were removed by a few snips of a pair of scissors, and the cut surfaces of the lip washed in warm carbolic lotion and seven horsehair sutures inserted—three in the mucous membrane and four in the skin,—and a dressing of carbolic oil applied. The wound healed by first intention, and the resulting disfigurement, as far as the lip was concerned, was imperceptible at a short distance.

The following obstetric case may be of interest:—

Craniotomy for delayed Labour.—A multipara, aged 49, who had no living children for 15 years but one premature labour seven years ago, had been in labour four days previous to my being sent for. The liquor amnii had come away on the morning of the 2nd day, and in the evening all expulsive pains had ceased. During the 3rd day fœtal movements were said to have occurred, but were altogether absent on the 4th. On my arrival in the evening I found the patient with flushed face, temperature 99°.8 and pulse 100. The position of the fœtus was easily made out, as both the uterus and abdominal walls were flaccid, and a left occipito-posterior diagnosed. Neither fœtal movement nor heart-sounds could be detected. *Per vaginam*, the head was felt fairly well down in the pelvis; the caput succedaneum was boggy and crepitated on pressure. After the urine had been drawn off and the patient placed in the dorsal position, an attempt to deliver with Barnes's forceps proved unsuccessful. Craniotomy was therefore resorted to. A crucial incision was made in the presenting cranial walls with Denman's perforator, and the blades passed through, breaking up the brain substance. The head was then gradually delivered with Simpson's craniotomy forceps, aided by an occasional uterine contraction. The funis was found tightly wound round the neck of the fœtus—a female of full size,—and was ligatured and divided before the birth of the shoulders, which, though tardy, was accomplished by uterine efforts alone, excited by rubbing the uterus through the abdominal walls. No anæsthetic was used, but liquid extract of ergot with whisky was frequently given during the operation. There was good contraction of the uterus and no postpartum hæmorrhage. The vagina was irrigated with a solution of permanganate of potash, and a binder applied. A week later I found the patient up and engaged in household duties.

It is interesting to record that in the above case and in other labour cases attended I have noticed brown sugar among the drugs used by patients in this condition, while in the *Lancet* of 10th March 1894 the following appears:—

According to Professor Mosso and Dr. PAOLETTI, of Genoa, the best and simplest method of exciting uterine action in confinements is by giving sugar. In 10 out of 11 cases in which they tried it an ounce of sugar dissolved in half a tumbler of water produced a decided effect in from half to three-quarters of an hour. Sometimes a second dose was required in order to terminate the labour. The contractions were always of a regular, never of a tetanic, character.

The Chinese, however, appear to use it more after the birth of the child, probably with the object of preventing hæmorrhage.

I append an abstract from the Customs meteorological observations, prepared by the Harbour Master, Mr. A. W. KINDBLAD.

METEOROLOGICAL TABLE, October 1893 to March 1894.

MONTH.	THERMOMETER.		BAROMETER.		RAINFALL.
	Maximum.	Minimum.	Maximum.	Minimum.	
1893.	° *F.*	° *F.*	*Inches*	*Inches*	*Inches*
October	82.0	47.0	30.458	29.980	2.83
November	75.0	34.0	30.568	30.080	0.21
December	70.0	26.0	30.680	29.980	...
1894.					
January	63.0	24.0	30.625	29.925	1.19
February	74.0	29.0	30.651	30.090	0.22
March	78.5	31.0	30.574	29.800	5.14

DR. JOHN FRANCIS MOLYNEUX'S REPORT ON THE HEALTH OF NINGPO

For the Half-year ended 31st March 1894.

THE unusually dry weather which prevailed until late in December last had its disadvantages. There was a want of rain for flushing the water channels, and the phenomenally low state of the canals naturally brought about a condition of extreme stagnation, with accumulation of decayed vegetable and other deleterious matter. In the country districts the natives had grave apprehensions as regards crops, and their supply of water for drinking and other domestic purposes was curtailed and of a very insanitary character. This condition of affairs was the cause of much sickness in the rural districts during the months of November and December, and the hospitals in the city had many cases from the surrounding country.

Among foreigners the general health has only been moderately good, taking into consideration the fact that the period under notice does not include the unhealthy season.

There has been one death; and I am informed by the doctor who was in attendance that the case was a male child, 3 years of age. The cause of death was small-pox, and the child had never been vaccinated.

There was one birth.

SMALL-POX.

The city, surrounding villages and foreign Settlement experienced a severe epidemic. It is stated by natives and old foreign residents that there has been no epidemic so severe for the past 25 years. It is impossible to estimate the number of deaths among natives, but undoubtedly thousands have died. The mortality among children was very great. Adults, however, also died in large numbers. The fresh cases are now less numerous, but there is plenty of small-pox still in villages near the city.

Among foreigners, so far we have had five cases. In addition to the fatal case already alluded to (unvaccinated), there was a second case in the same family, of modified small-pox now convalescent. The latter child was vaccinated seven days before the appearance of the rash.

An officer was landed from a Norwegian steamer. The patient had a very mild attack, acquired in Kobe. By the courtesy of the Sisters of Charity I was able to convey the patient direct from the ship to their hospital, where he remained under treatment. The man had been vaccinated in infancy, and was re-vaccinated by me immediately upon arrival and discovery of the disease.

The female child of a Clerk in the Customs was removed on the 16th January to the Sisters' hospital. She had a mild attack of modified small-pox. The child had been vaccinated; age 12 years.

The infant daughter of another member of the Customs staff showed a small-pox eruption on the 13th March, and has since passed through a mild attack of modified small-pox. The child is now convalescent. She had been properly vaccinated less than two years ago.

Several of the Chinese members of the Customs staff have been prevented from attendance at the office owing to cases of small-pox existing in their families. Periodically such families

have been visited and attendance at the office, or otherwise, supervised. Prophylaction, by fumigation, etc., has, where practicable, obtained.

The number of foreigners in the Settlement itself is little over 60; so it will at once be noticeable that the per-centage attacked was uncomfortably high.

Vaccination.

It is satisfactory to record the readiness with which the foreign residents accepted re-vaccination, where desirable.

Many native children have been brought to me for vaccination, and last week 25 from surrounding villages were vaccinated at one sitting. Practically all the Chinese children in the mission schools have been vaccinated.

It seems to me very important that every native child operated upon should, without fail, be seen later on, so that vaccination itself should not be discredited by the Chinese, through children unsuccessfully vaccinated subsequently dying of small-pox.

Measles.

Commencing about the middle of November, we had a severe epidemic of measles, and many fatal cases were reported by itinerant missionaries from the surrounding country. At one time I had over 40 cases down in one institution. I am unable to record anything unusual as to the character of the epidemic, excepting that the mortality appears to have been very high among the native children; but as it ran on through mid-winter, doubtless sequelæ in lung and laryngeal troubles account for the high mortality.

Remittent Fever.

I have not seen many serious cases; but my time here, so far, does not include the usual fever months. Judging from the appearance of foreign residents of long standing, one would imagine that so-called "Ningpo fever" cannot resemble in severity the type one meets in Southern China.

Typhoid Fever.

After inspecting Ningpo and its surroundings, I expected to find typhoid a constant quantity. The water in common consumption, the arrangements as to night-soil and surface manuring, the fact that wells exist alongside corpses recently placed in open places, and the general unwholesomeness of local habits, all suggested this place as a typhoid stronghold. So far, I have not seen one case of typical typhoid fever; more than that, I have not seen a case which one could describe as closely resembling it. Unhappily, the views of the natives render sectio cadaveris undesirable, if not impossible; and as no case attended by me presented sufficient evidence to associate it with this malady, I am forced to conclude that, during the months under consideration, typhoid fever in Ningpo is not so frequent a trouble as in many places where sanitary science is not only understood in high places but has a practical outcome in legislative enactments.

Malarial fever of a low remittent type—in which the temperature is always above normal, and any reading over 102° unusual—is commonly called "typhoid" by the general public. Such fever is very persistent, running on at times for as long as two months. I have noticed, as sequelæ, three cases of enlargement of the parotid glands, and two cases where, after apparent convalescence, suppurative phlebitis has been followed by sloughing and gangrene of the tendo Achillis and other tendons. I do not believe that there is any intestinal typhoid lesion in this fever, and regard the term in common use, "typho-malarial fever," as misleading, and calculated to shelve exact diagnosis.

Erysipelas.

One very severe case occurred. It should, perhaps, be regarded rather as a surgical than an idiopathic case.

The patient (a member of the Customs staff) had suffered from otorrhœa and had had a small aural polypus. A week after his return to duty he had a rigor, and subsequently developed erysipelas of an alarming type. The temperature in a few hours rose to 104°.8; and from the 26th January to the end of second week of February the fever persisted, and the condition of the patient was at times alarming. The peculiarity of the case consisted in the persistence of high temperature for over 14 days, in spite of large doses of quinine, brandy, phenacetin and ultimately cold sponging. Incisions in scalp, etc., very slightly affected temperature. As so commonly happens, the cervical glands gave the first indications of the trouble. The well-known treatment by large doses of tincture of perchloride of iron and regular and large doses of brandy (always with the nourishment) was pursued throughout; quinine was also exhibited in large doses. The mean temperature for the first 14 days (the highest and lowest in each 24 hours being taken) was 102°.1 for 28 registrations.

Surgical Memoranda.

Undoubtedly the Chinese in this district support surgical interference very well. They are, as soon as their confidence is secured, highly satisfactory subjects. In my opinion they are less prone to inflammatory action than foreigners, and they are unquestionably more patient and endure pain with at least equal courage. The rapidity of healing processes with the natives surprises me. It appears to me that bone development after fracture is very rapid by comparison.

My most interesting surgical cases have been:—

A compound comminuted fracture of the thigh (junction of the lower and middle third), the result of a bullet wound. The man was admitted to hospital 14 days after injury. The aperture of entrance was enlarged and a counter-opening made, and upwards of 20 ounces of purulent pus evacuated. After consultation I decided not to amputate, though the chances were against saving the limb. The man now has union, with shortening of $1\frac{1}{4}$ inch. There is still some necrosed bone to come away.

A suicidal laceration of the larynx and œsophagus reached me several days after infliction of injury. There was much sloughing of the parts of the œsophagus available for stitching—the thyrohyoid membrane was completely divided. After the introduction of a soft œsophageal tube, the œsophagus was cocainised and stitched up. Feeding was, of course, by œsophageal tube and by rectum. The man had pneumonia on admission, but lived five days, when he succumbed to exhaustion and the lung trouble. He had also scraped off the occipito-frontalis in part, and the frontal bone was deeply grooved by some rough instrument. There was also a punctured wound in the abdominal wall.

For very extensive disease of the tarsus and lower end of the tibia, Syme's amputation was performed on a case of long standing. The patient made a good recovery, assisted by iron, cod-liver oil and maltine.

A leg was amputated in a case of compound fracture of the tibia below the middle of the bone. This injury was associated with a 20-year old ulceration extending from the seat of fracture to the dorsum of the foot. I had to amputate by lateral flaps, as there was not sufficient material for a long anterior flap. The man had been a cripple for years, and has made a good recovery.

There is a tremendous ophthalmological field, but it is difficult to get people, especially from the rural districts, to stay sufficiently long under surveillance; there is grave danger in operating and then losing the run of your eye cases.

We badly want a hospital, or at least a number of beds, for gynæcological cases. If we had something of this kind, with an experienced foreign nurse who could speak the local dialect well, much good work could be done. At present it is pitiable to have to let case after case go unassisted. It is hopeless to attempt any treatment of Chinese women's troubles at their own homes in or around Ningpo.

It is gratifying to report that on the 10th April the Sisters of Charity Hospital of St. Joseph, in the Settlement, opens a new wing, with accommodation for 34 fresh beds and with a room for operations attached.

For the following meteorological table I am indebted to Captain RAE, Harbour Master:—

METEOROLOGICAL TABLE, October 1893 to March 1894.

MONTH.	WIND.					BAROMETER.				THERMOMETER.					WEATHER.		
	No. of Days N. to E.	No. of Days E. to S.	No. of Days S. to W.	No. of Days W. to N.	No. of Days Calm.	Highest by Day.	Lowest by Day.	Highest by Night.	Lowest by Night.	Maximum.	Minimum.	Mean.	Averages. Wet Bulb.	Averages. Dry Bulb.	No. of Days Rain.	Rainfall.	No. of Days Fog.
1893.	*D. h.*	*D. h.*	*D. h.*	*D. h.*	*D. h.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	°	°	°	°	°	*D. h.*	*Inch.*	*D. h.*
October.....	10 0	1 0	0 12	15 0	4 12	30.52	30.04	30.47	30.00	87	42	66.0	80	83	3 13	6.62	1 0
November.....	3 0	5 12	2 12	15 0	4 0	30.55	30.15	30.54	30.10	76	33	33.9	71	74	0 1	0.08	1 18
December.....	6 0	4 0	1 12	14 6	5 6	30.60	30.09	30.60	30.07	69	25	30.0	65	67	0 21	0.38	1 6
1894.																	
January.....	10 12	3 0	1 12	12 12	3 12	30.57	30.00	30.48	30.20	65	26	29.3	58	64	5 0	4.22	1 6
February.....	8 6	5 0	0 12	10 6	4 0	30.63	30.10	30.63	30.13	70	25	33.0	63	68	2 22	1.01	0 12
March	6 12	5 12	2 12	9 6	7 6	30.63	29.94	30.50	29.98	84	30	36.7	70	72	8 11	4.26	2 0

DR. J. H. LOWRY'S REPORT ON THE HEALTH OF WENCHOW

For the Half-year ended 31st March 1894.

THE general health of the foreign community in this port and district, now numbering 29, has been very good during the past six months. The winter was very mild compared with that of last year, the only cold weather experienced being towards the end of December and first part of January. From October to early in February a very serious drought lasted, and caused much misery among the natives. Enteric fever was said to be rife—a statement hardly to be doubted, seeing that the poorer classes were in desperation for water and took it from where they could get it, even when it was little better than cesspool water.

Owing to the prevalence of small-pox in Shanghai, I vaccinated a number of adults and children. Late in January Dr. ALFRED HOGG, of Aberdeen, arrived here to establish a hospital and dispensary in connexion with the United Methodist Free Church Mission; his services will be greatly appreciated by the native community, and there is a large field for surgical work.

I give a list of the more serious cases that came under my treatment:—

Amenorrhœa.	Influenza.
Blood-poisoning.	Remittent fever.
Bronchitis.	Sprain of shoulder, result of heavy fall.
Diarrhœa.	Tonsillitis, acute, with abscess.

Appended is an abstract from the Customs meteorological observations taken at this port (latitude, 28° 1′ 30″ N.; longitude, 120° 38′ 28½″ E.).

METEOROLOGICAL TABLE, October 1893 to March 1894.

MONTH.	Highest Reading of Barometer.	THERMOMETER.		RAINFALL.	
		Highest by Day.	Highest by Night.	No. of Days on which Rain fell.	Quantity.
1893.	*Inches*	° *F.*	° *F.*		*Inches*
October	30.400	75	58	9	4.60
November	30.430	65	48	...	...
December	30.490	66	37	3	0.28
1894.					
January	30.400	57	35	13	3.09
February	30.500	64	38	9	1.20
March	30.500	68	42	17	6.62

DR. ALEXANDER RENNIE'S REPORT ON THE HEALTH OF CANTON

For the Year ended 31st March 1894.

DURING the period under review the health of the community has been fair. The foreign population amounts at present to about 300 persons, most of whom are resident on Shamien. The erection recently on the island of a number of new houses has afforded accommodation for several who formerly resided in Honam and Fati, but a considerable number of missionaries and members of the Customs out-door staff still occupy houses in these suburbs, as also down river near the hospital.

Eight births and seven deaths have to be recorded. The causes of the latter were:—

1. Alcoholism and dysentery.
2. Alcoholism and epilepsy.
3. Phthisis.
4 and 5. Typhoid fever.
6. Gunshot wound of the head (suicidal).
7. Pneumonia.

The two deaths from typhoid fever occurred in the case of a husband and wife, both of whom were about 60 years of age and had resided the greater part of their lives in America. The former had been in feeble health for some months, and readily succumbed to the disease; while the latter, whose case was complicated by Bright's disease, died in the seventh week of illness.

Of late years typhoid fever has not been a frequent disease among residents on Shamien, who no doubt owe this immunity to the excellent sewage arrangements. Nightsoil is disposed of by the pail system, while rain and bath-room water and waste from cook-houses are carried off by the drains. These drains are flushed by the rise and fall of the tide, so that it is only in exceptionally dry weather, when the river is low, that any accumulation of filth is likely to occur. During the past two years the enterprising builder has been at work, with the result that several terraces of new houses have been erected in the east end of the island, which is now somewhat too crowded to permit of the same sanitary conditions as formerly existed. The drainage system of such houses demands careful attention in the dry season, otherwise blocking with refuse from cook-houses, etc., is likely to take place—an evil which can easily be averted by frequent flushing with water from the wells or river.

In addition to the two fatal cases alluded to above, two other cases came under observation.

In one case, resident on Honam, the disease appeared to be malarial, and the temperature reached normal on the 16th day. On the 20th day some indiscretion in diet was followed by a recurrence of fever and the appearance of the characteristic eruption and stools. The patient made a good recovery.

The greatest desideratum in this port is a pure water supply. At present most residents derive water for drinking and cooking purposes from Hongkong, whence it is daily conveyed by the river steamers. This supply is not devoid of disadvantages, for apart from the trouble entailed by such a long transit, the water is liable to contamination *en route*, and besides, when the quantity in the Hongkong reservoir runs low, and the inhabitants there are put on short allowance (a contingency which does occur), the source of water for Canton must be doubtful.

A few missionary residents collect rain water and store it in earthenware jars, for use in the dry season.

The wells sunk in Shamien furnish an abundant supply, but such is simply river water percolating through the sand and mud of which this artificial island is composed, and although fairly clean and suitable for bathing and cleansing, is not regarded as particularly wholesome for cooking purposes. It is, however, more largely employed in this way than householders suppose. Similar wells exist all over the city of Canton, but in dry seasons, such as at present, they become very filthy and unwholesome, so that this water is little, if at all, superior to that obtained from the river. On the White Cloud and other hills near the city there are a few springs of pure water, but such is a luxury reserved for making tea and boiling opium.

Looking at the basin in which the city lies, and judging from the configuration of the surrounding country, we can most reasonably infer that the boring of artesian wells would be attended with success. No doubt, in order to obtain a pure and copious supply, these borings would require to be deep—possibly 300 feet or more,—and some rock might be encountered in the process; but these drawbacks are not to be weighed against the inestimable benefits that would accrue to both foreigners and the many thousand natives who have not known the luxury of pure water. The scheme is no visionary one, but both from a sanitary and financial point of view appears worthy of the attention of a company sufficiently enterprising to undertake its development.

During the early months of 1893 small-pox prevailed among the Chinese in the city, but not to any great extent. Only one foreigner contracted the disease.

In the beginning of summer many cases of fever occurred in the south-east quarter of the city, several of which came under treatment in the mission hospital. Many of these were cases of typhoid; in only one was it found possible to make a postmortem examination, but in this the characteristic appearances in the ileum were observed. It is noteworthy that in the bile ducts of this patient several specimens of Distoma Sinense were found. The health of the city was good from this time onwards until the outbreak of the bubonic plague, towards the end of March 1894. This epidemic prevails at the date of writing, and has extended to the surrounding towns and villages, as also to Hongkong.

I append hereto an abstract of the meteorological tables kindly furnished by Mr. J. H. MAY, Chief Tidesurveyor and Harbour Master.

ABSTRACT of CANTON CUSTOMS METEOROLOGICAL TABLES, April 1893 to March 1894.

MONTH.	WIND.							WEATHER.			BAROMETER.				THERMOMETER.			
											DAY.		NIGHT.		DAY.		NIGHT.	
	No. of Days N. to E.	No. of Days E. to S.	No. of Days S. to W.	No. of Days W. to N.	No. of Days Variable.	No. of Days Calm.	Average Hourly Force.	No. of Days Fog.	No. of Days Rain.	Rainfall.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest	Lowest Reading and Average Lowest.	Highest Reading and Average Highest	Lowest Reading and Average Lowest.	Highest Reading and Average Highest	Lowest Reading and Average Lowest.
1893.							*miles*			*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	°	°	°	°
April.....	3	14	3	...	10	...	5.6	...	15	6.09	30.350	29.810	30.282	29.730	88.00	56.00	80.00	55.00
											30.107	30.025	30.065	30.009	78.40	71.30	73.60	69.10
May.....	3	10	...	1	16	1	6.1	...	20	8.33	30.190	29.820	30.106	29.780	93.00	66.00	84.00	62.00
											30.026	29.964	29.981	29.941	82.00	75.90	77.30	73.30
June.....	1	20	4	...	5	...	5.8	...	18	7.83	30.140	29.780	30.070	29.800	95.50	70.00	85.00	66.00
											30.024	29.971	29.989	29.949	87.20	82.40	81.40	78.50
July.....	...	12	9	...	10	...	5.5	...	17	4.63	30.044	29.726	30.020	29.720	95.00	75.00	86.00	73.00
											29.928	29.881	29.908	29.869	87.70	82.30	82.00	79.20
August.....	1	14	2	...	14	...	4.8	...	20	4.47	30.094	29.755	30.020	29.780	96.00	79.00	89.00	76.00
											29.945	29.886	29.907	29.868	89.40	83.40	82.90	80.20
September	11	5	...	2	12	...	8.1	...	13	4.93	30.100	29.516	30.180	29.430	97.00	74.00	88.00	69.00
											29.955	29.889	29.943	29.867	87.60	81.20	81.00	77.50
October.....	21	...	...	...	10	...	8.5	1	8	5.56	30.410	29.600	30.322	29.646	90.00	71.00	81.00	62.00
											30.167	30.084	30.120	30.062	81.30	75.00	74.00	70.40
November..	14	...	...	1	15	...	6.3	1	...	...	30.420	30.190	30.342	30.200	85.00	56.00	74.00	48.00
											30.355	30.262	30.290	30.261	75.30	66.80	66.10	61.40
December..	16	2	2	...	11	...	6.0	1	2	0.01	30.490	30.126	30.440	30.106	77.00	47.00	68.00	44.00
											30.344	30.254	30.281	30.246	68.60	58.70	60.40	54.70
1894.																		
January....	13	3	...	3	12	...	7.0	5	13	0.80	30.480	29.926	30.420	29.942	75.00	43.00	70.00	42.00
											30.259	30.178	30.219	30.169	62.40	56.60	58.80	55.00
February...	5	4	1	1	17	...	6.1	1	11	0.31	30.520	30.092	30.440	30.074	79.00	42.00	69.00	36.50
											30.323	30.237	30.269	30.234	68.00	60.00	62.00	57.00
March.....	8	10	2	...	11	...	6.5	5	17	1.87	30.444	29.900	30.386	29.900	83.00	47.00	75.00	45.00
											30.203	30.120	30.147	30.114	67.70	61.60	64.40	59.90

DR. A. SHARP DEANE'S REPORT ON THE HEALTH OF PAKHOI

For the Year ended 31st March 1894.

THE year under review compares unfavourably with preceding years, inasmuch as an epidemic of remittent fever with diarrhœa prevailed among children from June to the end of August; and again in January small-pox broke out, followed, in March, by influenza and bubonic plague.

FOREIGN RESIDENTS.

On the 27th February another male child was born, making a total of seven males, against two females, born here since the opening of this port.

The child mentioned in my last Report as born in 1892 died on the 18th June 1893 from inflammatory diarrhœa of the most fatal type.

Remittent fever, with or without diarrhœa, attacked three children, aged respectively 11 months, 2 years and 3½ years.

The child 11 months old contracted remittent fever, with high temperature, which gave place to an intense form of inflammatory diarrhœa that could be checked by no treatment. Nervous symptoms supervened, and death followed in eight days from the commencement of the diarrhœa. A finer specimen of a child and one more likely to resist disease could hardly have been seen.

The child 2 years old suffered somewhat in the same way, but the diarrhœa was of a mild character. This case was complicated with lumbrici, and it was thought at Hongkong, where the child was sent for change of air, that the fever was due to the presence of worms, which apparently was not the case, for on the child's return to Pakhoi the fever came on again, and it was not until some months later that convalescence was complete.

In the remaining case the child suffered from remittent fever, with high temperature and nervous symptoms, but without diarrhœa. This critical state continued for 10 days, after which convalescence was protracted for two months.

A prominent symptom in these cases was intense thirst. Night and day the children hardly ever ceased to call out for drink.

An engineer on board one of the steamers became infected here with variola. He was taken to Hongkong, and there treated as a severe case of the confluent variety of the disease.

Three members of the community suffered from influenza during March, the weather at the time being hot and cold alternately, with a thick, damp atmosphere.

Nervous symptoms were prominent, particularly pain in the head and back, and in two cases reflex vomiting occurred.

Bronchitis, listlessness, debility and anorexia were marked symptoms during convalescence.

Native Population.

Remittent fever with diarrhœa prevailed among children from June to the end of August, and proved rapidly fatal in those under 2 years of age.

Variola was first noticed during the second week in January, and reached its height towards the middle of March. This epidemic was severe, but pitting was much less noticeable than before the system of vaccination.

Vaccination with imported calf lymph is year by year gaining in favour, and at the present time is largely practised. This is owing, in the first place, to the introduction here of the foreign system by Dr. Horder, at the Church Missionary Society Hospital; and, secondly, the observation of the good results following vaccination at Hongkong and in Tonkin has induced the Chinese to adopt the practice here. The lymph is imported from Hongkong, and then arm-to-arm vaccination follows among the poorer people, but those who can afford it prefer the imported lymph.

Influenza was prevalent about the middle of March, but on this occasion was not nearly so severe as during the epidemic in the spring of 1892.

Bubonic plague, known locally as *li-tzŭ-chêng* (癘子症), though falsely rumoured to have been present during the spring of most years since 1884, is now, at the date on which this Report ends, after an absence of 10 years, making its appearance in Pakhoi. Endemic as the disease is to this part of China, the outbreak on the present occasion has its origin in the filthy state of the town, from want of rain, of which we have had, I may say, none since last September. Only a few cases have been reported; some of these were brought to the Church Missionary Society Hospital in a moribund state, hopelessly beyond medical aid. The disease so far cannot be called epidemic, for it is only those living in the most loathsome parts of the town who contract it, and beyond these localities it has not extended. But what proportions this outbreak may assume depend entirely upon the continuance of the drought.

During May 23.94 inches of rain fell, extending over a period of only 14 days, while in Kwangsi and the interior of this province the rainfall was still heavier. The small rivers being inadequate to carry off such a sudden downpour, the country became flooded, and considerable damage to life and property was reported. As direct evidence of this, we were eye-witnesses to the dead bodies both of human beings and cattle, the roofs of houses and *débris* of various kinds passing down the bay for upwards of six days, having been cast out by the river flowing through Lien-chou.

The frost during January 1893 destroying the potato crop, and the floods of the following May sweeping away the rice crop as well as large quantities of paddy, a famine was then averted only by the prompt importation of rice from Hongkong and Tonkin.

Now plague, pestilence and famine threaten from drought, for during the six months from the 1st October to the 31st March only 2.73 inches of rain were registered; consequently, rice and other crops, which should have been sown in the beginning of February, are still unplanted or have died off from want of rain.

Such a continuance of dry weather cannot exist for long without sickness following. Plague has already commenced, and in all probability, when the heavy rains set in, bowel affections—cholera, diarrhœa and dysentery—will be more prevalent than they have been for some years past.

In the appended meteorological table the temperature has been taken according to the rules laid down by the Astronomer at the Hongkong Observatory.

METEOROLOGICAL TABLE, April 1893 to March 1894. (Latitude, 21° 29′ N.; longitude, 109° 6′ E.)

MONTH.	THERMOMETER.			Rainfall.	MONTH.	THERMOMETER.			Rainfall.
	Highest.	Lowest.	Mean.			Highest.	Lowest.	Mean.	
1893.	° *F.*	° *F.*	° *F.*	*Inches*	1893.	° *F.*	° *F.*	° *F.*	*Inches*
April	89	55	74.95	2.01	November	85	54	71.00	...
May	91	65	78.98	23.94	December	77	47	65.00	...
June	97	72	84.90	4.87					
July	94	73	83.00	15.49	1894.				
August	95	73	83.61	16.18	January	78	42	61.50	0.93
September	94	69	81.43	11.89	February	80	42	62.30	...
October	89	62	75.00	0.80	March	84	46	65.00	1.00

DR. E. B. LANDIS'S REPORT ON THE HEALTH OF CHEMULPO (JENCHUAN), COREA,

For the Half-year ended 31st October 1893.

ABSTRACT of CUSTOMS METEOROLOGICAL TABLES, May to October 1893.

MONTH.	WINDS.						RAIN, SNOW AND FOG.				BAROMETER.				CENTIGRADE THERMOMETER.				DRY BULB.	WET BULB.
	No. of Days N. to E.	No. of Days E. to S.	No. of Days S. to W.	No. of Days W. to N.	No. of Days Calm.	Average Hourly Force.	No. of Days Rain.	Total Rainfall.	No. of Days Snow.	No. of Days Fog.	Highest by Day.	Lowest by Day.	Highest by Night.	Lowest by Night.	Highest by Day.	Lowest by Day.	Highest by Night.	Lowest by Night.	Average.	Average.
						Miles	*D. h.*	*mm.*	*D. h.*	*D. h.*	*mm.*	*mm.*	*mm.*	*mm.*	°	°	°	°	°	°
May.....	8	2¼	13	4½	3¼	10.6	4 5	136.6		2 0	775.60	755.38	771.28	757.98	+29.5	+12.1	+14.6	+ 4.0	+14.8	+12.7
June.....	2	1	19½	3½	4	10.5	3 9	166.4	...	5 12	765.16	754.10	764.80	754.62	+27.5	+19.2	+21.0	+11.5	+19.4	+17.6
July	½	3	21½	4½	1½	10.5	3 15	137.1	...	7 12	774.69	752.58	767.07	754.37	+35.6	+23.1	+25.0	+19.5	+25.4	+23.8
August....	4½	2½	15	7	2	10.2	2 1½	221.4	...	1 0	764.55	750.42	763.76	751.28	+35.0	+24.7	+25.5	+18.5	+25.9	+23.9
September	10½	3½	7½	6	2½	13.0	7 2	366.2	...	3 0	769.40	748.57	769.96	740.00	+29.1	+18.3	+23.5	+10.6	+20.7	+19.3
October ...	12	2	4½	11	1½	14.0	2 2	71.3	...	2 12	776.46	758.94	774.58	759.70	+23.6	+11.4	+15.5	+ 1.5	+13.7	+10.8

The general health of the foreign community (which consists of only 25 persons) is good. During the last six months there were no deaths and not a case of sickness.

Among the Japanese, however, there was a large mortality from pulmonary phthisis. This is due to the fact that a great many of them are natives of Nagasaki and the south of Japan, where the climate is much milder than in Corea. Coming to a more severe climate, with a suicidal carelessness in matters of hygiene, and especially in dress, with the chest always exposed, makes them easy prey to the sudden changes in weather for which this port is noted. Phthisis in the Japanese, as in the Coreans, runs a rapid course, and almost always terminates fatally. It is very rare indeed for any treatment to affect the course of the disease to an appreciable extent after it has once taken a firm hold of the patient. I have not yet been able to get the statistics as to the causes of death among Japanese at this port, but I think I am safe in saying that almost 40 per cent. of the deaths is due to this disease alone.

The sick and death rates of the Chinese are low compared with those of the Japanese. There have been four deaths during the last six months out of a Chinese population of about 800. The causes of death were:—

Apoplexy	1	Pneumonia	1
Phthisis	1	Excessive opium smoking .	1

This makes a death rate annually of 10 per thousand. Judging from the imperfect data I can get, the Japanese death rate is more than double, *i.e.*, 22 or 23 per thousand.

Among the Chinese from Southern China I have met with three cases of beriberi during the last six months. I have also treated seven Corean patients. Among the Japanese I have not seen a case, but this may be accounted for by the fact that I treat but a comparatively small proportion of the Japanese patients.

With the Coreans the death rate has not been higher than the average of former years. In the spring and early summer malarial fevers, and in the summer and early autumn diarrhœa and dysenteric affections, claim the larger number of victims. Anal fistulas and hæmorrhoids are very frequent. Not only does the general diet tend to produce constipation, but hot peppery sauce enters into the composition of almost every dish, and hence causes indigestion, which leads to constipation and rectal troubles. What is more serious than either of the above is rectal prolapse, which is not infrequent.

DR. JAMES H. McCARTNEY'S REPORT ON THE HEALTH OF CHUNGKING

For the Half-year ended 30th September 1894.

THE past six months have been very trying to nearly all the foreign residents in Chungking. The temperature was higher than last year, but the atmosphere was not so damp. The summer has been the driest since the establishment of the Customs here. Nearly all the foreign residents left the city during the period of the greatest heat.

With the exception of the old enemy—malaria—and three cases of acute dysentery, there is nothing to report affecting the foreign community. The *han-ping* remittent fever, together with diarrhœa and dysentery, have been severe among the natives. The fruits which we have in abundance during July and August are of a very inferior kind, and in 99 per cent. are the cause of the digestive disturbances.

I have the following cases to report:—

Retention of Urine for 11 Days.—The patient, a Chinese lady, gave birth to a child 11 days previous. When called I found the patient in great pain and feverish. The abdomen was greatly distended. Gave an anæsthetic, on account of the patient's fear of pain. The catheter was introduced, and nearly 1½ gallon of highly-coloured urine was drawn off. There were no bad after effects, and patient made a good recovery.

Imperforate Anus.—Male child, 3 days old; without the least impression where the anus should be. The perinæum was dissected to the depth of about 1 inch, when I came upon the rectum, terminating in a blind pouch. The gut was opened, drawn down and stitched to the opening. When opened, a large quantity of meconium was evacuated. The child made a good recovery.

Closure of the external Genitals by Cicatrisation.—The patient, a girl about 15 years of age, was brought to me with the external genital opening closed, with the exception of a small aperture through which the urine was passed. The labia pudendi were totally destroyed, and the vaginal opening was closed with the cicatrix. A burn was caused by the girl setting her clothing on fire with a charcoal basket which she carried under her clothing. A large portion of the scar tissue was dissected away; what was left of the labia were separated, and kept apart while they healed. The healing was slow, but a good result was obtained.

Radical Operation for Hernia.—The patient, a young man, single, had double inguinal hernia from birth. It was always reducible, and gave him no pain. He was first seen about four years ago, while on a journey, but was lost sight of until he unexpectedly turned up at one of the dispensaries. At this time the scrotum was distended to the size of a 2-gallon bucket. It interfered greatly with his locomotion, and he desired to have it operated upon. He was taken to the hospital; the parts were shaved and disinfected. The right side was first operated upon. The Banks's operation was performed. Two silver wire sutures, in place of silk, were introduced, and the pillars drawn in apposition. No drainage was used. Had slight rise of temperature for a few days, owing to formation of pocket of pus round one of the sutures. Superficial stitches removed in seven days. Result perfect.

Leprosy.—Of over 600 cases of skin disease, I saw but six cases of leprosy; two of these were of the anæsthetic and four of the tubercular variety. Of the four sufferers who came to the hospital, one remained a week, one about two weeks, one about a month, and one is still in hospital. The first two were treated with gurjun oil and tonics; the others, with a 20 per cent. creoline ointment. During the short time the first two remained no improvement took place; the others were greatly benefited, and the one at present in hospital is probably cured.

Cancrum Oris.—Several cases have been seen in children from a few months to 3 years of age. The patients were always brought when it was useless to attempt treatment. The accompanying reproduction from a photograph illustrates the average case seen.

For the appended meteorological table I am indebted to Mr. Tidesurveyor W. STEBBINS.

METEOROLOGICAL TABLE, April to September 1894.

MONTH.	THERMOMETER.				BAROMETER.		RAINFALL.
	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Highest.	Lowest.	
	°	°	°	°	*Inches*	*Inches*	*Inches*
April	95	78	97	50	29.30	28.76	1.96
May	88	86	90	61	29.22	28.85	7.82
June	87	79	97	67	29.07	28.82	3.66
July	98	84	100	72	29.05	28.85	2
August	102	84	104	74	29.16	28.82	3.60
September	90	89	90	61	29.30	29.05	8.05

DR. E. A. ALDRIDGE'S REPORT ON THE HEALTH OF ICHANG

For the Half-year ended 30th September 1894.

THE following abstract is from the meteorological observations taken at the Custom House, Ichang (latitude, 30° 14′ 25″ N.; longitude, 111° 18′ 34″ E.):—

METEOROLOGICAL TABLE, April to September 1894.

MONTH.	THERMOMETER.				BAROMETER.		RAINFALL.	
	Highest.	Lowest.	Average Highest.	Average Lowest.	Highest.	Lowest.	No. of Days.	Quantity.
	° *F.*	° *F.*	° *F.*	° *F.*	*Inches*	*Inches*		*Inches*
April	93.5	47.0	76.0	57.8	30.50	29.49	10	6.51
May	97.0	52.0	81.0	64.0	30.02	29.60	12	4.70
June	101.0	64.0	89.3	68.2	29.80	29.50	12	8.57
July	105.0	74.0	98.3	78.1	29.80	29.30	9	5.13
August	108.5	70.0	98.5	78.0	30.00	29.50	14	7.79
September	95.0	61.5	80.8	64.5	30.50	29.78	18	9.84

The really hot weather began later than usual, as May and most of June were comparatively cool months, owing to a cloudy sky and frequent showers. The heat during the latter end of August was extreme and almost unbearable; the average maximum reading of the thermometer in the shade from the 17th to the 30th of that month was 104°.5, and the nights were, even for Ichang, unusually close and sultry. The heat broke on the 31st August, when the summer may be said to have ended. The up-river breeze that blows during the summer when the weather is fine does much to mitigate the oppressiveness of the heat. This south-east wind blows usually from 10 A.M. to 5 P.M., being strongest about 3 P.M. and dying down before sunset. Often there is a breeze from the north-east from 8 to 10 P.M., while during the night, if there is any wind at all, it blows down river from the north-west. 42.54 inches of rain fell during 461 hours. September was a wet month and, as is so often the case in the Yangtze Valley, was very unhealthy.

The health of Europeans was good up to the end of August, and with the exception of one case of remittent fever, and that only at its commencement, there was no case attended that gave rise to uneasiness as to the result. In September, however, there were several cases of dysentery and diarrhœa, in some of which recovery was retarded longer than yet observed in Ichang. The proportional number of cases of dysentery, typhoid fever and diarrhœa among

foreigners appears to be higher at Ichang than at other ports. As the drinking water is drawn from the river bank, below the Chinese city and a large junk population, the necessity of personally seeing that it is well boiled before filtration cannot be too strongly recommended. In my experience I have found that this slightly irksome daily duty is much neglected, and that the purity of the water depends too much on the fulfilment of verbal orders to servants and the efficiency of a filter; such faith is too often misplaced. The milk supply is fairly good, but the quality poor, and the adulteration of it by water from an impure source has to be guarded against by boiling.

The health of the Native population was unusually good this summer; there was no cholera and less malarial fever, but in September there were many fatal cases of dysentery.

DR. J. H. LOWRY'S REPORT ON THE HEALTH OF WENCHOW

For the Half-year ended 30th September 1894.

FOREIGN POPULATION, WENCHOW AND DISTRICT.

Male adults	15
Female adults	11
Male children	1
Female children	2
TOTAL	29

The summer has been trying, and there was a good deal of sickness among foreigners. As a slight indication of the amount of sickness, I made 110 visits at the houses of the sick during the months of July, August and September. Among the natives there has been the usual diarrhœa, choleraic diarrhœa, dysentery, and a great deal of fever of a malarial type.

From April to September Dr. HOGG treated, at the dispensary of the United Methodist Free Church Mission, 3,424 medical and surgical cases. Of these, 2,117 were new cases. No record was kept of patients treated up country and on non-dispensary days and hours. During the building of the new British Consulate several cases of accident occurred among the workmen, and they were promptly looked after by Dr. HOGG.

The diseases that I have observed and treated during the past six months have been:—

Choleraic diarrhœa.
Congestion of liver and biliary derangement.
Conjunctivitis.
Constipation.
Diarrhœa, simple and tropical.
Entozoa, intestinal.
Gout.
Hæmaturia.
Hæmorrhoids.
Incised wound of thumb, with sprained arm (result of heavy fall on Customs Jetty).
Remittent fever.
Rheumatic gout.
Sprue or psilosis.
Uterine vomiting (pregnancy).

I append an abstract from the Customs meteorological observations taken at this port.

METEOROLOGICAL TABLE, April to September 1894.

MONTH.	Highest Reading of Barometer.	Highest Day Reading of Thermometer.	RAINFALL.		REMARKS.
			No. of Days.	Quantity.	
	Inches	° *F.*		*Inches*	
April	30.100	75	18	7.20	
May	30.200	78	21	9.05	
June	30.000	86	16	11.05	Typhoon on the 29th June; lowest barometer 28.950.
July	29.980	89	4	0.39	
August	29.984	94	8	4.67	Typhoon on the 3rd August; lowest barometer 29.250.
September	30.130	89	10	3.34	

DR. J. F. WALES'S REPORT ON THE HEALTH OF CANTON

For the Half-year ended 30th September 1894.

FOR the last six months the health of the Shamien community has been excellent. There were four births and one death; the latter was that of an esteemed resident, from cerebral hæmorrhage.

The freedom from all zymotic diseases, save malaria, enjoyed by those dwelling on Shamien is remarkable, and is undoubtedly due to the absence of sewers and plumbers' handiwork and adherence to the primitive and efficient, though inelegant, bucket system. I have had an experience here of nearly 12 years, and have not seen a case of scarlatina or diphtheria. The few cases of enteric fever which have occurred have very possibly and probably been contracted away from this Concession. September is generally the most unhealthy month; cases of bronchial and intestinal catarrhs and also of mild malarial fevers are more numerous then than during the rest of the year. There are two causes to account for this: (1st) the exhaustion following exposure to the trying heat of a six months' summer; (2nd) the chills often occasioned by the change of the monsoon.

I cannot write about the health of Canton; reliable information is not available. The great missionary hospital in the city receives almost entirely surgical cases, and the members of its staff know little or nothing of the diseases which may prevail outside.

The terrible outbreak of bubonic plague has been the event of this year. I will not refer to its clinical and pathological characters, as they have been frequently and fully discussed by those who have had special opportunities for observation and study. The first notice of the outbreak appeared in a native newspaper dated 14th March, which stated that the officials had ordered the cleansing of the streets because of the unusual sickness which so extensively prevailed. At the end of March a foreigner living within the city became affected. After the 1st April there were frequent references to the disease in the native newspapers. In May the plague was at its worst. I have it on good authority that during the 3rd, 4th, 5th, and 6th Chinese months 90,000 coffins were sold—probably only 75 per cent. were for plague cases. By the end of July the pestilence had in great part disappeared simultaneously from here and Hongkong, although sporadic cases are likely to crop up for months to come. This coincidence is remarkable, for in Hongkong the most vigorous sanitary precautions were taken and enforced, whereas here no means whatever appear to have been used to check its spread and progress. In a recent issue of the *British Medical Journal* the plague mortality was given as high as 97 per cent.; this is probably an exaggeration. Of nine foreigners attacked (one in Canton and eight in Hongkong), only two died, and one of these deaths is stated not to have been caused by the plague. It is difficult to form an accurate estimate of the virulency of bubonic plague. To do so we might contrast its mortality, if the same could possibly be discovered, with that

of Asiatic cholera or with that of the recent great outbreak of influenza in Europe. We must also consider the habits and surroundings of the majority of its victims and the great over-crowding and privations which the poor in Canton and Hongkong have to endure, and which so impairs their vitality that they frequently succumb to attacks of pyrexia that would not be fatal to foreigners. Apart from this over-crowding and oftentimes starvation, it is a mistake to think that the habits of life of the poor are more insanitary than those of the richer Chinese. Exercise for health's sake is absolutely unknown to them. Small wonder, therefore, is it that the widespread prevalence of so serious a disease as bubonic plague should be attended by a high mortality. These considerations make it doubtful whether its occurrence among the healthy and robust is more to be feared than that of other diseases with which we are better acquainted. A noticeable feature of the plague was the mixture of panic and apathy displayed. The wildest rumours and most absurd stories about gods, devils and foreigners found ready credence, while when a case of plague actually occurred the most stupid neglect and want of humanity was often shown. Not infrequently the whole family would bolt incontinently, without leaving anyone to attend to the patient.

That it is not conveyed like cholera, dysentery or enteric fever is more or less evidenced by the wonderful immunity enjoyed by the boat population. At low water one would think that there was enough filth exposed in the numerous creeks and canals, which traverse this city in every direction, to have favoured the spread of the disease. This immunity was probably due to the tidal ebb and flow, the constant out-door exercise and the well-known cleanly habits of the sampan people.

It is noteworthy that in May, when the plague was at its worst, a number of Shamien residents suffered from lymphatic enlargement and tenderness, and in two cases the parotid glands were so swollen that the patients appeared to have mumps. All these symptoms occasioned no trouble, and passed off within a few days. It has been noticed in epidemics of cholera and diphtheria how frequent are cases of diarrhœa and ordinary sore throat; possibly these cases of gland irritation occupy a similar relationship.

The great mortality among children can easily be accounted for when we see the extreme disregard of cleanliness in their management. The children of rich people wear filthy clothes and often suffer from loathsome skin diseases, while those of the poor can be seen most of their time grubbing in the dirt and drains.

The plague took district by district, street by street, and at any given time appears never to have been evenly distributed. Thus, early in the epidemic a street in the city named Tin Tong was attacked; then it became quite free until near the end of the outbreak, when many cases again broke out. The villages and country districts—apart, of course, from Fatshan, Shiklung, Chantsun and such-like large towns, where, practically, like conditions to Canton obtain—appear, so far as can be learnt, to have been remarkably free from the disease. Reports were spread about the terrible outbreaks in the country, but these were not authenticated, and persons living there stated that very few cases occurred, save among fugitives from Hongkong and Canton. Dr. KUENE, of the German Mission Hospital at Tungkun, states that over 200 plague patients came there from Hongkong. In spite of this importation, there was no outbreak of the plague nor fresh cases in that town.

Mr. Chief Tidesurveyor MAY has supplied the appended abstract of the Canton Customs meteorological tables.

ABSTRACT of CANTON CUSTOMS METEOROLOGICAL TABLES, April to September 1894.

MONTH.	WIND.							WEATHER.			BAROMETER.				THERMOMETER.			
											DAY.		NIGHT.		DAY.		NIGHT.	
	No. of Days N. to E.	No. of Days E. to S.	No. of Days S. to W.	No. of Days W. to N.	No. of Days Variable.	No. of Days Calm.	Average Hourly Force.	No. of Days Fog.	No. of Days Rain.	Rainfall.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.
							miles			*Inches*	*Inches*	*Inches*	*Inches*	*Inches*	°	°	°	°
April	4	17	...	...	9	...	5.4	3	13	6.50	30.180 30.094	29.940 30.027	30.190 30.051	29.864 30.004	89.00 78.20	54.00 72.30	79.50 73.30	53.00 69.50
May	3	12	3	...	13	...	6.9	...	17	7.68	30.170 29.997	29.800 29.934	30.100 29.961	29.786 29.920	94.00 85.00	68.00 79.30	84.00 79.10	66.00 75.80
June	...	18	2	...	10	...	6.3	...	23	15.64	30.060 29.923	29.710 29.876	30.032 29.906	29.700 29.858	97.00 85.40	75.00 81.30	88.00 80.50	73.00 77.80
July	...	19	3	...	9	...	5.9	...	19	6.03	30.050 29.933	29.790 29.891	30.042 29.915	29.760 29.872	95.50 88.50	77.00 83.10	85.00 82.30	74.00 79.10
August	...	22	2	1	6	...	5.5	...	18	14.09	30.108 29.915	29.608 29.873	30.068 29.894	29.608 29.859	99.00 88.30	77.00 82.70	90.00 82.80	74.00 79.90
September	9	8	1	...	12	...	8.6	...	18	5.07	30.100 29.983	29.670 29.908	30.070 29.959	29.750 29.917	96.00 88.10	77.00 82.20	87.00 82.10	75.00 79.20

DR. J. L. MICHOUD'S REPORT ON THE HEALTH OF MENGTSZ

For the Year ended 30th April 1894.

SITUATED in latitude 23° 34′ N., longitude 103° 36′ E., Mengtsz lies in the southern part of the province of Yunnan, in the middle of a huge plain, 20 miles long and 12 miles wide, elevated 4,500 feet above the sea level. On all sides this plain is encircled by mountains reaching in height from 2,000 to 5,000 feet. We thus get a total average height of 6,000 to 9,000 feet for the southern mountain range of Yunnan. About 100 miles to the southward, on the Tonkin frontier, this mountain range begins to diminish in altitude towards the centre of Tonkin. Uninterrupted series of high mountains and highlands run to the west and the north—on the one hand, up to Burma; on the other, to the River Yangtze. Eastward the chain ramifies in the Kweichow, Szechwan and Kwangsi provinces.

From a bird's-eye view the physical aspect of Yunnan presents a vast network of mountains with ridges from 6,000 to 10,000 feet high, whose meshes, more or less wide, more or less deep, are occupied by innumerable plains or valleys, forming highlands, situated at heights varying from 4,000 to 6,000 feet. The general geological structure of the Yunnanese mountains is conglomerate, sandstone and limestone; that of the highlands is mostly clay. Alluvial deposits are met in many places, testifying that, as was the case with the Mengtsz plain, these spaces were once covered by water. Many lakes, large and small, are found in the highlands, sometimes drying off completely and sometimes overflowing the surrounding country, probably the mysterious sources of many of the great rivers which originate in the Yunnanese mountains and afterwards take every direction—north, south, east and west.

Landslips are not infrequent in Yunnan, as the special nature and arrangement of the different strata of the soil do not secure its stability. It may happen, too, that in their subterraneous way across variously constituted layers of ground the drainage waters of lakes find points of least resistance and excavate enormous underground gaps, which later on bring about landslips or the sinking of mountains.

Earthquakes, too, are comparatively frequent, but of very slight intensity. Dr. WELLS WILLIAMS, however, reports in *The Middle Kingdom* that a dreadful upheaval, which occurred in 1834, lasted three days, and overthrew the greater part of the capital, Yunnan-fu.

Yunnan is not over-crowded by population, as many provinces in China are. We shall see further on that if in certain places infertility of the mountain soil may explain this fact, there are also several other causes to account for the scarcity of inhabitants.

The Chinese population of Yunnan inhabit the large plains, where they have founded important cities. Long since expelled from their former seats, the aborigines live in mountains or remote valleys, far from Chinese society. Owing to its constitution, the mountainous soil

is mostly infertile, while that of the plains, clayey but loaded with humus and carefully manured, magnificently rewards the labourer who devotes himself to its cultivation. Unfortunately, great inconvenience is experienced through the want of hands, and many tracts on the plateaux still lie waste. In the Mengtsz plain, for instance, we find hardly two-fifths of this large and fertile tableland under cultivation. To the traveller journeying between Mengtsz and Yunnan-fu the country displays an endless succession of mountains and plains or valleys, some naked and barren, others covered with pleasant gardens or vast rice fields, or desolate and waste in spite of the richness of the soil.

Viewed as a whole, vegetation is very scanty in Yunnan. Systematic deforestation of mountains, which prevails extensively all over China, has long since been practised in Yunnan. After leaving the Tonkinese frontier the traveller finds a striking contrast between the densely-wooded Tonkin hills and the almost barren mountains on the Chinese side. In crowded parts of China every deforested spot of land is soon brought under cultivation. This serves a double purpose: the wood is utilised as fuel or as building material, while the soil is rendered available for agriculture. In Yunnan no such double purpose is sought. Partly because of the infertility of the soil, partly because of the small number of inhabitants, the lands deprived of trees remain uncultivated, no vegetation except a bad scanty grass taking the place of the destroyed forests. We know that by the process of vegetable respiration oxygen is emitted and carbonic acid absorbed. Therefore in some way the composition of the atmosphere must be influenced by the absence of vegetation or by its scarcity on very extensive tracts of land. Hence we can easily conclude that in Yunnan to the normal diminution of oxygen on highlands may be added this other cause, reducing the amount of the gas, viz., deforestation. We shall see by-and-by that important pathological problems are connected with this question.

In a medical report it is not necessary or advisable to dwell upon the productions of a country so far as they do not concern its medical constitution or special pathology. Nor can we be expected to furnish exhaustive information about the peculiar morals, occupations or professions of the inhabitants. We shall state only that the people of Yunnan, like those of the rest of China, are mostly agricultural. Trade is confined to the towns. Some districts, rich in precious minerals, are mainly occupied by miners. The chief agricultural products are rice, maize, sorghum, sweet potatoes, beans, the poppy and, in some places, tea. In the Mengtsz plain two crops are gathered in the year, namely, millet and rice during the summer, and peas, the poppy and wheat during the spring. Many fruit trees belonging to temperate climates are found, such as the apple, pear, peach, plum, chestnut, pomegranate, etc. Among important mercantile products we must first quote Yunnan opium, which, on account of its cheapness and superior quality, finds a ready sale in Tonkin and the southern provinces of China. This opium is obtained, when the plant is ripe, by means of incisions made in the poppy bulb with a special three-bladed knife. On the day following this operation the farmer, by scratching the bulbous receptacle, gathers in an earthen basin the inspissated juice, which later on will be sold, after drying, as raw opium. No adulteration is practised, and the product accordingly maintains a good reputation.

Neither the production nor the consumption of native alcohol is large; it is distilled from rice, sorghum, etc. Notwithstanding its 30 distilleries, Mengtsz manufactures but little alcohol,

owing to the very primitive machinery in use. The Chinese smoke opium, but do not take to alcohol; the aborigines, who avoid opium, drink spirits.

Other valuable products of Yunnan are due to the mineral wealth of the province. Tin, copper, silver and gold abound in many districts, if we may trust Mr. ROCHER'S book; but few mines are worked.

The climate of Yunnan is not uniform all over the province, and differs widely from the north to the south. According to the classification of general climates, it is one of exception, one of the so-called partial climates. Owing to the considerable altitude of the northern plateaux the climate is there quite temperate. The lower altitude of Southern Yunnan and its situation under the tropic of Cancer render its climate hotter. It should, however, be placed not among hot but among mild climates. To this region, and especially to Mengtsz, the following lines will be devoted.

We are indebted to Mr. LYE, of the Mengtsz Customs, for the appended abstract from the meteorological readings for the year 1893:—

METEOROLOGICAL TABLE, January to December 1893.

MONTH.	WINDS.						No. of Days Rain.	THERMOMETER.				
	No. of Days N. to E.	No. of Days E. to S.	No. of Days S. to W.	No. of Days W. to N.	No. of Days Variable.	No. of Days Calm.		Highest.	Average Highest.	Lowest.	Average Lowest.	Average Temperature of the Day-time.
								° F.	° F.	° F.	° F.	° F.
January	1	14	7	1	8	...	3	79	68.58	33	48.19	57.30
February	...	12	13	...	2	1	3	87	76.72	45	52.54	62.60
March	...	14	11	...	4	2	13	88	74.06	45	57.90	64.50
April	1	12	11	...	1	5	14	93	80.56	51	61.66	69.00
May	...	15	12	...	2	1	14	91	79.64	53	64.74	71.20
June	...	15	14	...	...	1	18	84	77.33	67	69.60	73.80
July	...	14	13	...	...	4	22	83	76.74	68	69.60	73.00
August	1	13	9	...	4	4	20	81	77.90	65	69.26	73.70
September	...	13	6	...	6	5	10	87	77.06	60	67.46	72.00
October	...	21	7	1	2	...	4	86	74.89	55	60.07	67.20
November	4	16	8	...	2	...	8	85	73.80	45	52.73	58.50
December	7	15	8	1	...	...	2	73	66.75	37	43.00	55.40

Adding the monthly thermic averages, we get the annual thermic average of 66°.5 for the year 1893. Thereby we come to the conclusion that the climate is not tropical, though geographically speaking Mengtsz is a few minutes within the north tropical circle. The mere reading of the maxima and minima monthly averages points out extensive variations of temperature in the nycthemeron, which is characteristic of climates of altitude in the tropical

zone. In hot months this daily discrepancy does not exceed from 8° to 10° F.; in cold months it reaches 20° or 23° F. Altitude is not the only cause of such considerable daily oscillations.

According to the preceding table the prevailing wind comes all the year from the south. Want of necessary instruments prevents our giving accurate indications about its force. Rising in the morning at 9 or 10 o'clock, it blows during the whole day, ceasing only at midnight. We can say that its violence in winter, aided by its constant direction, is such as to be the most valuable means of propulsion for native junks on their way up the strong, steep current of the Upper Red River. Raising considerably the thermometric indications in the daytime, it is easy to understand that its absence during the greater part of the night makes the normal difference between day and night temperatures more sensible. In summer it blows only intermittently and with much less strength; it varies in direction at this season, and sometimes is interrupted by periods of calm.

Although the great difference of thermometric range between day and night may be thus sufficiently explained, the state of the sky must also be taken into account. During winter the heat absorbed by the soil in the daytime is radiated at night through cloudless pure skies towards the planetary spaces; hence there is intense cooling at night. In summer clouds shroud the sky, and as they diminish the radiation, diminish the cooling.

The difference between the winter and summer thermic means in Southern Yunnan is not, however, that of so-called excessive climates, as Peking or New York, for instance. We may perhaps compare it to the difference indicated in variable climates. The above table points out a difference not exceeding from 15° to 20° F., which figure keeps up only for a third of the year, as the temperature of the other eight months is approximately uniform.

The law of the four seasons dividing the year in temperate climates does not apply exactly to Southern Yunnan. As in tropical countries, the two great seasonal periods—namely, the rainy season, or summer, and the dry season, or winter—are indeed here well marked. Short intermediary periods may, however, be admitted, though they participate in the characters of the great season anterior to each of them. So we shall divide the year into "winter," from the end of October to the end of February; "spring," from the end of February to the end of April; "summer," from the end of April to the end of August; "autumn," from the end of August to the end of October. It must be borne in mind that such a division is an arbitrary one, there being in some years no well-defined demarcation between these seasons.

In the highlands the air, as a rule, is but little charged with moisture. If on some elevated points of the globe deficiency in dampness is due to the absence of broad expanses of water, in many others, where no such reason exists, the scanty evaporation of sheets of water, resulting from the ordinary low temperature, may be called into account, and will thus give a satisfactory explanation of the comparatively pronounced dryness of the atmosphere in highlands; for, as NIELLY says,* the higher the temperature of a place the greater generally will be the fraction of saturation of its atmosphere. In Yunnan other causes of this dryness

* *Hygiène des Européens aux Pays chauds*, p. 63.

may be found in distance from the ocean and the remarkable scarcity of vegetation, already recorded.

Rains are infrequent at Mengtsz during the winter months. Occasionally in spring short rainy periods set in; in 1893 they were of exceptional duration. In fact, heavy rains only begin in July, and cease definitely by the end of September. During October and November the sky remains overcast, letting fall but few showers; the crops are gathered in; the fields, no longer clothed in vegetation, are covered with vegetable *débris;* fermentative and putrefactive processes are in the highest state of activity; the marshes dry off; the waters of the springs, no longer confined for irrigating purposes, are given free exit towards the big lake lying to the north of Mengtsz. It is the time of appearance of malarial fevers. The natives dare not move away from their homes or undertake any journey, especially the journey from Mengtsz to Manhao. The mafoos entrusted with the caravans plying between these points and the couriers in charge of mails going overland from Mengtsz to Laokai and conversely are decimated by the mountain fever—*Man-tu* (蠻毒), "Manhao poison," or *chang-ch'i* (瘴氣), "malarial air," as the Chinese call it,—this much-disputed type of malarial disease. We must add that no cases of plague are recorded at this time of the year in Southern Yunnan.

Owing to the absence of instruments, we made no observations as to the variations of barometric pressure in Mengtsz. From the situation of the city, at an altitude of 4,500 feet, we may infer a diminution of that pressure, and consequently a relative rarity of oxygen in the atmosphere.

As to electricity, from the law due to PALMIERI, that the atmospheric electricity increases as its relative humidity, we may assume that there is but a small amount of electric fluid in the dry atmosphere of Yunnan. As, moreover, atmospheric ozone originates from oxygen mostly condensed under electric influence, it is easy to see that the diminution of normal oxygen on the highlands can only admit of a scanty production of ozone.

At the beginning of this study we mentioned the geographical situation of Mengtsz, describing its position in the midst of a large plain some 4,500 feet above the sea level. All parts of that plain are not, however, uniform. Hilly eminences emerge above the general level of the ground, with countless graves dotted over their tops and slopes, the whole area forming a vast necropolis, picturesque to the eye, though not pleasing to the mind. It may be said that one-fifth of the huge plain of Mengtsz is devoted to sepulture, and that so large a space hardly suffices. The stranger is literally stupefied by the prodigious number of graves. Death travels fast in Mengtsz. Thousands of victims yearly made by plague require to be buried. From a hygienic point of view the choice of burial grounds and the burying processes here adopted, if not objectionable in every respect, show deep ignorance of sanitary requirements. The stratum in which corpses are buried ought to be above the highest level of the ground water fluctuations, because inundations of the subsoil expel the air and suspend the oxidising process. Besides, the bacteriferous layer of the soil should be made use of for burying purposes, for, as the richness in bacteria diminishes from the superficial parts to the lower ones, it is of advantage to bury in the superficial layer, on the surface of the ground, wherein nitrification is the most active.* The second of these rules is strictly observed all over China.

* RICHARD, *Hygiène appliquée*, p. 87.

Coffins are interred at a depth of about 18 inches, or are left on a level with the soil, hidden under a more or less elevated mound of earth. As to the first rule, the situation of graves on hillocks more elevated than the town precludes, in ordinary times, pollution of the ground water by any contact with the organic matter of the surface; but when heavy rains come it must certainly happen that putrefying matter is carried down, owing to the slope of the hills, and sullies the low-lying parts of the country, if not the ground water itself, the level of which is about 10 feet below the surface of the soil.

Many other hygienic faults may be pointed out: in the proximity of the cemetery to the town; in the nature of the soil, consisting of an aluminous clay, through which air and water cannot permeate; in the absence of vegetation on this extensive ground, which a dry, scanty grass hardly covers; and we know that the more rank and the more luxuriant is vegetation the more active are decomposing processes. Finally, we may mention the ignorance of any rule concerning the minimum of space to be assigned to a grave and the rotation of inhumations, which should never be allowed to take place on the same plot of ground more than once every five years,* for, in the contrary case, there would be an accumulation of organic matter never to be consumed afterwards.

The disposition of the dead, so much enlarged upon here, is no doubt in close connexion with the regular annual appearance of plague in Mengtsz.

One-fifth part of the Mengtsz plain being looked upon as cemetery ground, there remain four-fifths to be dealt with, of which one-half may be designated as cultivated or occupied by human communities and the other half as waste or submerged by water. The cultivated part consists of rice or sorghum fields in summer, and of sweet potatoes, peas, wheat fields or kitchen gardens in winter. The waste part is chiefly swampy.

Mengtsz itself extends over an area of about 600 acres. Northwards it is surrounded by large paddy fields; southwards and eastwards it is separated from the country by a long marshy pond. The western outskirts of the town are conterminous with the cemetery. Graves are found among the dwelling-houses. An unbroken defensive wall encircles the city, whose centre is slightly more elevated than its periphery. Hence a natural slope has been formed for every street, by means of which the water in time of rain is easily drained towards the lower parts, exterior to the town. The cleansing of streets is thus facilitated; but up to 1893 the main consequence of that disposition was the formation in these low-lying parts of innumerable pools, noisome reservoirs of organic matter in every stage of putrefaction. In 1894, under the orders of an intelligent official, a large deep moat with sufficient incline was dug all round the city, intended as a collecting drain for carrying away every kind of refuse, filth and rubbish brought down by rain. As in every Chinese town, no well-planned system was ever adopted for the arrangement and grouping of houses. A rudimentary pavement, made of large stones carelessly juxtaposed, favours the cleansing of the streets; but no sewer or interior channel is seen in the thoroughfares. The houses, as a rule, are not storied. Over-crowding prevails in every habitation, there being in each room an enormous disproportion between the air space and the number of occupants.

* Richard, *l. c.*

Almost every house possesses a latrine, consisting of an excavation generally secluded in a corner of the inner court-yard. More or less broad and rather shallow, these cesspools are neither dammed up with masonry nor cemented in order to prevent leakage. No cover, no ventilation, prevents the spreading through the premises of exhaled gases, and consequently the habitation is constantly infected. Human excrement is allowed to accumulate there for fully a year, intermingled from time to time with ashes and sweepings. Once a year, in April or May, these latrines are emptied, and their contents carried into the street in front of the house, waiting until bought by a farmer and utilised for manuring purposes. Domestic refuse and vegetable or animal residual products are collected into another heap in the same court-yard, but carried away from the dwelling-house as early as February or March. Domestic animals, such as pigs, ducks and fowls, are kept on the premises, but during the daytime are left out in the streets, where they look for their daily food.

The Chinaman of Mengtsz, like most of his congeners in China, is indifferent to personal hygiene. The habit of washing the body is not practised by him, although he sometimes washes his face. No cleanliness is observed in his garments; slatternliness prevails as well on his outer as on his inner surface. At home he is always barefooted; it is only cold that induces him to protect his extremities. It is needless to say that these remarks apply only to the common people and not to educated Chinese.

The majority of the people live principally on rice and beancurd, mixed with pork, vegetables, fish and fowl, according to each person's means. This diet appears to be abundant and wholesome. It may be taken for granted that the Yunnanese, generally speaking, are not poverty-stricken.

Water is obtained from wells scattered in many corners all over the town. The minimum depth of the wells is 10 feet, hardly enough, according to sanitary requirements, to prevent the percolation of outside impurities. We must not, however, be oblivious of this fact, that the ground is mainly clayey, that is to say, almost impervious. The water is therefore quite fit for drinking purposes, notwithstanding the absence of a protective perimeter and the contamination of the surrounding soil, deeply impregnated with organic matter. It is soft, aerated, palatable rather than tasteless, and is free from any bad odour. We know that the Chinese drink only water that has been boiled, and for the most part that in which tea has been infused. Although the safe consumption of such boiled water cannot be taken as an argument in favour of its innocuity before boiling, we can quote the fact of foreigners having for five years used it, imperfectly filtered through bad charcoal filters, without experiencing any harm attributable to its ingestion.

Since 1889 the foreign community of Mengtsz has until 1894 resided in the centre of the town, accommodated in yamêns lent by the local authorities. The Customs premises, in the matter of bad arrangement, could vie with the more common Chinese dwelling-houses. "*Nécessité fait loi.*" For five years foreigners have been obliged to face a lamentable state of things in Mengtsz, most fortunately without encountering the evil consequences one would have expected to follow.

In 1893, if the unhealthy conditions of the Assistants' premises could not be remedied, at least every possible improvement was made in the main house. These hygienic measures, well

executed, and aided by frequent disinfection of the floors and court-yards with lime water or a solution of bichloride of mercury, prevented, perhaps, that year the intrusion into our premises of the prevailing disease when it was raging at our doors.

The French Consulate, which since its inauguration in Mengtsz has occupied a yamên near that of the Customs and in a like unsatisfactory state, moved in August 1893 into new buildings situated outside the town, under improved hygienic conditions. New quarters, conterminous with the new French Consulate, are now being erected for the Customs staff, and are expected to be ready for occupation by June 1894.

It is certainly not to the excellence of their food that the exceptional good health enjoyed by foreigners in Mengtsz should be attributed. The want of beef and mutton is much felt by them, cattle and sheep being but seldom slaughtered, in spite of a good many Mahommedans residing in the town. The only animal meat used is pork, alternated with chicken, fish and game. Vegetables are plentiful in the market, although but few enter into the diet of foreigners. Far from being scarce, cattle and sheep are so exceedingly common and cheap in Yunnan that people from Tonkin come up for supplies; but difficulties, such as the absence of a butcher and of a slaughtering-place, have up to the present prevented all attempts at regular slaughtering from succeeding.

No kind of milk is obtainable in Mengtsz.

Riding and shooting are the chief amusements indulged in by foreigners. The practicability of the roads during winter and spring, and the genial climate then prevailing, render riding easy and agreeable, while people fond of more fatiguing exercise find plenty of shooting, game abounding on all sides.

During the five years commencing with the arrival of foreigners at Mengtsz the community numbered, on an average, eight members. No case of serious illness specially due to climatic conditions occurred among them, in spite, as already said, of the most defective sanitation. We must notice, however, a peculiar state of sleeplessness to which most of the foreigners residing in Yunnan, as well as many Chinese who are strangers to the province, are subject. This malaise has been felt by foreigners during their whole sojourn at Mengtsz. Some Cantonese complained to us of the same uneasiness, never experienced by them elsewhere in China. Akin to this physiological disturbance, a difficulty of breathing may be noted, occurring sometimes in new-comers for the first few days after their arrival in the highlands. Undoubtedly this last symptom belongs to "mountain sickness." As said by CORRE,* "On high lands there is a diminution of the oxygen of the atmosphere, while increased digestion and muscular straining, associated with a lowered temperature, go far to hasten the exhalation of carbonic acid; so the lungs have to work with more activity and amplitude in order to make up for their want of respiratory nutriment." Hence a difficulty in breathing, chiefly noticed in new-comers, expressing but a momentary want of adaptation.

Perhaps some connexion may also be found between the diminution of the atmospheric oxygen and the sleeplessness just alluded to. It, too, may be due to a protracted failure of adaptation.

* *Traité des Maladies typhiques*, p. 556.

We shall enlarge later on upon the curious immunity enjoyed by foreigners against the terrible plague so deadly to the natives. During the year ended in April 1894, the first of our stay in Mengtsz, the only affections observed and treated among foreigners consisted of a case of malarial anæmia, accompanied by chronic enlargement of the spleen, and a case of remittent malarial fever.

Masked fits of ague, absence of variety in food, want of a generous diet, and chiefly the fatigues of a long sojourn under the most unsatisfactory conditions of comfort, already mentioned, had brought about, in the first case, a rather alarming state of anæmia, which, however, hydrotherapy and bark improved speedily.

The case of remittent fever lasted for 10 days without any remarkable symptoms other than high fever, with variable remissions, controlled successfully by large doses of quinine.

But few pathological cases have been observed and treated among the Chinese population, and there is confessedly no prospect of the number increasing for years to come, as we have but little hope of winning the confidence of the natives or of conquering the feeling of shyness entertained towards us. Moreover, the lack of any suitable conditions for the practise of foreign medicine may have hitherto deterred patients from seeking foreign advice, while from the same cause we have not been prepared to welcome them. Not only have we no dispensary or consulting-room for receiving and attending our occasional patients, for preparing medicines and making examinations, but medicines and surgical instruments are, for want of room, accumulating in cupboards among jars of comestibles. Another discouraging drawback is the lack of an attendant able to understand us and to aid in performing the minute details of our work. All these different causes account for the very small number of cases related in our notes on the plague.

Among surgical cases we have nothing to mention but some burns and slight wounds.

Affections of the eye are very common in Yunnan, mostly due to granular infection. Unquestionably, in many cases, by applying for medical aid, incurable infirmities could be warded off and the large number of blind people reduced; but, unfortunately, the reliance of this ignorant population on foreign medicine is but fragile. Out of a few cases of granular conjunctivitis which came under treatment, some very severe, at an advanced stage of the affection (almost total opacity of the cornea), only one patient could be induced to undergo the prolonged and painful course of treatment commenced, which at last proved quite beneficial. At the end of a week the confidence of our other patients gave way and they did not return.

Most of the medical cases observed belonged to the class of infectious diseases.

We had, however, two cases of pulmonary tuberculosis, rather an infrequent occurrence in climates of altitude, according to the researches of the last 30 years.

Suicide by opium is rather common at Mengtsz. We heard of at least 10 attempts of that nature throughout the year.

In three instances our aid was sought and, fortunately, proved successful. The treatment employed was that usual in such cases, emetics and general stimulation. In the last case, which was the worst of all, as the patient after swallowing several mace of prepared opium got drunk with samshu (Chinese alcohol), recourse to Faucher's tube was necessary in order to wash out the stomach, which no longer reacted under the repeated administration of emetics. The patient, who was quite unconscious and comatose, received

about 10 pints of cold water, which, in the long run, brought out pieces of opium which had been sticking to the stomach walls. After 24 hours of torpor he was restored to his normal state.

Leprosy is not rare in Yunnan; but we do not think its frequency there is greater than in other parts of China. Although small-pox makes its appearance intermittently in Mengtsz, no case has hitherto fallen under our observation. Vaccination is not practised in Yunnan; its extension, so great nowadays over the rest of China, has not yet reached this remote province. We cannot but feel sorry to have been unable up to the present to inaugurate anything in that line. Vaccine tubes, which we had kindly been provided with by our comrade CALMETTE, Director of the Bacteriological Institute at Saigon, when passing through that city on our way up to Mengtsz, remained unused on account of the indifference with which our disinterested proposals of vaccination were received. We were afforded no facilities for inoculating a young calf or buffalo with the vaccine lymph, which preliminary precaution it was advisable to take in order to renew the virulence of the lymph, somewhat exhausted by our protracted journey. Consequently, no further attempt has been made.

We have been told by natives that cholera is not unknown in Yunnan, but we have not been able to obtain any precise information on the subject.

As to other infectious diseases, all the different types of malarial fever are frequently encountered here, namely, intermittent, remittent, typho-malarial, etc. No doubt this last form of malarial fever and *chang-ch'i* (瘴氣), or *Man-tu* (蠻毒), are identical. In all cases quinine proved effectual, which is the best guarantee of the correctness of our diagnosis.

At last we arrive at the description of the most interesting disease prevailing in Yunnan—the plague, or *yang-tzŭ-ping*, as it is called by natives.

THE PLAGUE.

Every year during the last 35, at variable epochs for different points of the province, but regular for a determined point, an epidemic disease occurs in Yunnan called by the natives *yang-tzŭ-ping* (痒子病), that is to say, "bubo disease," because it is characterised by the almost constant appearance of one bubo or several somewhere on the patient's body.

The history of this disease in Yunnan is extremely obscure, and the information given by Chinese is contradictory. Some people believe it took its rise in Western Yunnan at the time of the Mahommedan Rebellion, conspicuous for so many massacres and attended by so many miseries. Others think it came at that moment from Western countries through Thibet or Burma. Another vague assertion is that of a French missionary, who spoke to us of his having read, in the itineraries of Jesuits sent by the Emperor K'ANG HSI to survey the province in 1617, the description of a disease quite similar in its symptoms to the *yang-tzŭ-ping* observed nowadays. All these statements go far to shroud in mystery the question of the origin of *yang-tzŭ-ping*. It is difficult to believe in the local origin of this disease. Too many proofs of past prosperity abound in Yunnan, incompatible with the conditions of misery necessary to the development of such an infectious germ as that of the *yang-tzŭ-ping*, and therefore

contradictory of any belief in the early existence and permanency of an epidemic the consequences of which are fatal to the welfare and fortune of a country.

The proximity of India, so frequently visited by *máhámari*, which has been long recognised as identical with Plague (GRIESINGER), can perhaps help us towards a solution. At various intervals since 1699 epidemics of *máhámari* have been recorded in the mountainous provinces of Western India. In 1834 and 1836 the disease reached the highlands of the Kumaon district, in the north-west of India. In 1849, 1852 and 1859–60 we again find the disease raging in that district. On these occasions the outbreak of the epidemic was preceded by great mortality among rats, jackals, snakes and other animals.* The Kumaon district is contiguous to Western Thibet, and though the distance which separates Yunnan from Kumaon is not less than 1,500 miles (WELLS WILLIAMS), strong reasons can be adduced in favour of the Kumaon plague having been propagated to Yunnan through Thibet. Notwithstanding their great uncertainty, the fragments of information gathered from natives are found to agree on two points, namely, the approximate date of the appearance of the disease in Yunnan, which they represent as contemporaneous with the beginning of the Mahommedan revolt in 1860, and the fact of its having come from the west of the province. If, then, we compare the date of the first appearance of the plague in Yunnan with that of the outbreak of *máhámari* in Kumaon in 1859, at the same time bearing in mind the considerable trade carried on between Western Yunnan and Anterior Thibet by numerous Thibetan caravans coming over to take part in the great annual fair of Tali-fu, the capital of Western Yunnan, the former hotbed of the Mahommedan Rebellion, we may conclude, without being taxed with precipitation, that very likely the Yunnanese *yang-tzŭ-ping* is nothing else but the Indian *máhámari*, propagated by means of caravans all along the highlands of the southern frontier of Thibet up to the western borders of Chinese Yunnan. Eminent epidemiologists have already compared these diseases, and have observed this noteworthy peculiarity, common to both, namely, the great mortality prevailing among some animals on the eve of each outbreak.†

The march of *yang-tzŭ-ping* in China is most interesting. At various intervals epidemic visitations occurred in Kweichow, Kwangsi and Kwangtung, sometimes reaching Pakhoi, where the disease is locally known as *li-tzŭ-chêng* (癘子症).‡ It is easy to trace the *yang-tzŭ-ping* on all these sides. In 1893, after having committed its usual ravages in Yunnan, the disease extended towards the south-east, and two months after its visit to Mengtsz we heard of its raging at Lungchow and in many towns of the Kwangsi province. The commercial intercourse of Yunnan with Kwangsi is incessant.* Every day thousands of peddlers and numerous caravans of horses and mules are plying on the roads of the two provinces, evidencing the importance of the traffic existing between them—probable agents, too, of the propagation of such a contagious disease as the plague. It is worth noting that the disease does not remain permanently in the low regions of Kwangsi and Kwangtung. The variability of its appearance in these places seems to point to a newly-imported contagium whenever the plague breaks out. One would think, in short, that in the low-lying regions the micro-organism of the plague does not

* Surgeon General GORDON, *Epitome of Chinese Customs Medical Reports*, p. 377.

† Surgeon General FRANCIS, quoted from Surgeon General GORDON'S *Epitome of Chinese Customs Medical Reports*, p. 379.

‡ Customs *Medical Reports*, xxxviii and xxxix, 15.

find the conditions necessary to its vigour. On the Yunnanese highlands, on the contrary, if the disease is not perennial, it shows at least great regularity in its annual revival.

Undoubtedly the filthy habits of the Yunnanese are highly objectionable,—the defective sanitation of Mengtsz has already been described; but those unhealthy conditions prevail extensively all over China, as well in low-lying districts as on highlands. *Yang-tzŭ-ping*, in spite of its frequent visits to Kwangsi and Kwangtung, never succeeded in acclimatising itself there. So in Mexico, typhus, which is endemo-epidemic in the highlands, is comparatively very rare in the low-lying lands.*

We are thus led to assume either a susceptibility to typhous affections peculiar to the inhabitants of highlands, or some special influence due to the altitude of the same regions, hitherto undefined, but obviously favouring the vitality, reproduction and multiplication of any typhous germs, whether those of the highland typhus or those of the Yunnanese *yang-tzŭ-ping*.

The first theory has been defended by JOURDANET and CORRE with regard to the Mexican typhus.

On the highlands, says JOURDANET, the diminution of atmospheric pressure, the greater dilatability of air, its lessened richness in oxygen, its excessive dryness during several months of the year, the ardour of the sun's rays intensely heating the body in the daytime, and the extreme cooling brought about by the nocturnal radiation across a cloudless sky—all these causes involve a reduction of the hæmatosis, a general impairment of every function, when the most powerful reparative assimilation is required to restore an organism exhausted by its incessant losses due to evaporation and radiation. The consequence is that adynamia is somehow the characteristic of the physiological and pathological states observed in the inhabitants of high countries. It is in that climatic influence, which prostrates the strength and effects that blood deterioration particular to typhoid affections, that the cause of typhus is to be looked for.

The same reasoning could be applied to the development of bubonic typhus in Yunnan, considering the remarkable analogy existing between the climate of Yunnan and that of the Mexican highlands.

We feel, however, rather inclined to attach more importance to a special influence due to altitude, irrespective of the individual physiological conditions of the inhabitants of highlands.

When investigating the specific cause of such a disease as Plague, which, as GRIESINGER says, very likely finds in decomposing bodies its elements of development or of protracted existence, we would first point out the momentous significance which ought to be attached to the diminution of oxygen on highlands. We know, indeed, that the destruction of pathogenic germs is carried out by saprophytes, by the action of light or of a drying process, and chiefly also by oxygenation. It is in helping nitrification that the action of oxygen proves effectual; the more oxygen there is in the atmosphere, the more speedily the stage of putrefaction is gone through; its diminution delays the nitrifying process and gives rise to a process of reduction, due to the organisms of putrefaction. So it may be supposed that the specific plague germs find in that diminution the conditions most favourable to their development, especially when, in addition to this circumstance, the first heavy rainfalls of summer deluge the compact clayey soil of these regions, which, being well-nigh impermeable to water, becomes, when once deluged,

* CORRE, *Mal. Inf.*, p. 556.

impenetrable to the air. Hence a slackening in the oxidising processes, and, instead of the beneficial nitrification, an incomplete combustion of the organic matter is effected only by the germs of putrefaction. Thus, probably, a favourable medium is constituted in the decomposing bodies of men and animals dead of plague, or in any organic matter which once contained plague germs. Germs which were dormant and inactive on account of the want of favourable conditions then develope and multiply under the new influence, waiting only for contact with living beings to exhibit their destroying power.

It is already long since the production of epidemics was attributed to want of ozone in the atmosphere. Great epidemics, it has been said, have often been marked by an almost total disappearance of ozone. Although based on merely coincident facts, it seems that this deduction gives support to the preceding theory, since we stated in the beginning of this Report that the quantity of ozone on the Yunnan highlands cannot but be small.

We have already adverted to the vegetation, which is very scarce all over Yunnan and does not exist at all over the immense cemeteries of the country. This condition is extremely hostile to the purification of a soil infected during many years by the interment of millions of corpses of men and carcases of animals dead of plague. Although not a direct factor in the destruction of pathogenic germs, vegetation is most useful in purifying the soil. The roots facilitate the penetration of the soil by air; the filtration of subterranean water is effected by absorption by the roots of plants and evaporation from their leaves. We know, besides, that the more compact and clayey a region is, such as that of Mengtsz, the more vegetation it requires in order to become a real purifying ground. The small roots tend to aerate it, and the soil-fluids being constantly evaporated less resistance is encountered by impure water in sinking into the earth.

From a prophylactic point of view an important practical deduction could be drawn from these last considerations, were it not certain that any attempt at improving the actual state of things is useless. That deduction is the necessity of planting the Yunnan cemeteries, with a view to their purification and disinfection.

The specific germ of the Yunnan plague is undoubtedly to be looked for in the superficial layers of the ground. The singular propagation of the disease among animals furnishes a strong argument in favour of this affirmation. In reference to the latter fact, Mgr. FENOUIL, Bishop of Yunnan, who has lived for more than 40 years in the country, kindly gave us the following information:—

> In the plains visited by *yang-tzŭ-ping* the first victim is invariably the rat, whose snout is always close to the earth; in succession and regular order the pig, cat, dog and ox, and, finally, man, whose mouth is most distant from the soil, are afterwards attacked. In places where epidemic visitations are frequent, as soon as the inhabitants see rats emerging from holes in dwellings in full daylight, jumping up and turning round without showing the least fear of their ordinary foes, everybody prepares to make for higher lands.

Although what we have already written points chiefly to infection through the digestive or respiratory organs, we have grounds for thinking that in many cases infection takes place through the altered integuments. Among some cases observed during the last epidemic we could twice clearly trace the origin of infection to a small scratch on the foot, for as early as the 1st day of the disease a pustule was seen on such a spot. Agonising pain in the calf

and thigh on the affected side speedily followed, attended almost at the same time by a large inguinal bubo. Inguinal bubo is reported by Chinese as being by far the most invariable symptom of plague. May we not attribute this prevalence to the habit of walking barefoot, which involves the frequent occurrence of small scratches on the feet or legs, very slight superficial excoriations never cared for, unheeded fissures ready to be penetrated by morbific germs residing in the soil? The great number of cases would thus be accounted for.

The mode by which infection invades the organism is thus, in our opinion, rather uniform, as we assume direct penetration of the pathogenic germs into the blood. We must also take count of the total want of personal hygiene, and the extremely filthy and objectionable habits of the natives, as well as their dirtily prepared food.

In a case which came under our observation a submaxillary adenitis appeared as early as the 2nd day of the disease. The patient, an Annamite, used constantly to chew some of those strong spices (pimento) which produce an almost caustic action on the mucous membranes. We are inclined to suppose a direct inoculation through the inflamed buccal mucous membrane in this case, which was remarkable for the precocity and intensity of the cerebral phenomena and the presence of a solitary submaxillary bubo. May we not, moreover, look upon the scrupulous cleanliness of foreigners, their well-protected integuments, and their carefully prepared food as so many causes effective in diminishing the chances of inoculation? The curious immunity from *yang-tzŭ-ping* hitherto enjoyed by them might thereby be explained.

As regards the plague, local infection has up to the present been considered exceptional (GRIESINGER). But who knows whether, as has been the case with charbon, the infection of the plague may not some day be traced in every case to an inoculation, a direct penetration of the specific germs through a crack on the skin, a sore or wound, however slight, however hidden it may be, on an internal mucous membrane? The original excoriation which the pathogenic micro-organism uses for its entrance into the body may be somewhere on the mucous membrane of the digestive or respiratory tract. The most obscure cases, wherein no external adenitis appears, might in this way be cleared up.

At Mengtsz every year the first few cases of plague begin regularly about the period of rice planting, that is to say, in May. In March and April, a month or two before the outbreak of the epidemic, the troughs which constitute the ordinary latrines are in every dwelling emptied and cleaned. Their contents are allowed to accumulate for weeks outside the houses, in the street, until they are disposed of to the farmer and carried to the rice fields. May, too, is the first month of oppressive heat and occasional heavy rains. The result of these simultaneously occurring events, as they highly favour fermentative and putrefactive processes, is to give rise to an immoderate development of most malodorous gases. As mentioned above, perhaps a month or two previous to people being attacked by the disease, the rats first and the pigs afterwards begin to perish. The epidemic in Mengtsz starts invariably from the west quarter, contiguous to the cemetery, and notwithstanding the occasional occurrence of cases in remote and far apart corners of the city, it is apparent that the disease spreads from that quarter, visiting successively house after house. The west part is, according to natives, by far the most affected, and there is no doubt that the proximity of the cemetery and the compulsory removal

of the bodies of persons dead from plague through the west gate are among the main causes of the graver ravages of the disease in that quarter. On either side of that gate we remember to have seen in 1893 rows of human bodies leaning against the city wall, some still moving, others already stiffened by death—people dying or dead from the plague. It is a custom of the Yunnanese for parents or relatives to remove patients in a hopeless state from their homes and even from the town and to let them die in the open air, as the superstitious Chinese fear that in case of death occurring in a house the soul of the deceased may refuse to accompany the body and remain to haunt the premises.

As soon as the disease breaks out many well-to-do Chinamen desert their homes and make for distant places situated at a more considerable altitude, remaining absent during the entire period of its prevalence. They are, unfortunately, thus often the means of spreading the epidemic.

We have reason to believe that the water of Mengtsz has nothing to do with the causation of *yang-tzŭ-ping*. The depth of the wells and the good quality of the water have already been spoken of. We mentioned, too, the facts that while the Chinese drink only water that has been boiled, foreigners, on the contrary, consume it in its natural state, imperfectly filtered, yet that none of them in Mengtsz has ever been affected by the disease.

Instances are, however, recorded of foreign missionaries having been attacked by *yang-tzŭ-ping*. This only confirms our views about the causes of the immunity enjoyed by foreigners, as the obligations of the missionary's life are hardly compatible with strict hygiene, and impose on him continual intimate intercourse with the natives.

The Chinese do not admit of any immunity connected with special occupations, as was the case with water-carriers, oil merchants, etc., in the old epidemics of the plague in Europe. It may be sheer want of observation. But the immunity enjoyed in subsequent epidemics by people once affected is a well-established fact.

We said that the epidemic appeared contemporaneously with the first rains and heat, in May. As a rule, it does not last more than three or four months. In May a few cases occur. In June the disease reaches its fastigium: 20 to 30 deaths are daily recorded. In July the epidemic begins to subside, its daily victims numbering only from 10 to 20. In August the decrease continues. In September scattered cases are met with, the latest running a mild course and being easily rescued. From September the disappearance of *yang-tzŭ-ping* is complete; and until May of the next year the disease is not heard of except in extremely rare instances. The greatest intensity is displayed by the epidemic during the hottest month, June (but even then the average temperature does not exceed 74° F.). As the rainfall becomes more abundant the epidemic decreases, and disappears when at last the parched soil is clothed in vegetation and the crops in the cultivated fields are full grown. Its cessation precedes by a month the advent of malarial fevers, proving thereby that vegetable decomposing matter, which at this time accumulates in the fields after the harvests, has no share in the generation of *yang-tzŭ-ping*.

In Northern Yunnan, at Yunnan-fu, the disease prevails chiefly in winter, but has lost nowadays its previous gravity. We are unable to explain this difference in the dates of appearance of *yang-tzŭ-ping* in the north and south. The climate differs essentially in these

two parts of the province. At Mengtsz the disease arises on the spot every year, whence, after penetrating every corner of the city, it overspreads the whole plain, not sparing any village or hamlet, and frequently extending to Kwangsi. It has never yet reached Tonkin, although Mengtsz is but five days' journey from Laokai, the first French town on the Chinese frontier. Manhao, the first port on the Red River, half-way between Laokai and Mengtsz and separated by only 40 miles from each, with which, moreover, it is in daily communication, is only exceptionally visited by *yang-tzŭ-ping;* yet the cases recorded are said to have been imported from Mengtsz. Manhao lies some 3,600 feet lower than Mengtsz; although free from *yang-tzŭ-ping*, it has a very bad name, owing to the prevalence there of the so-called mountain fever. The muleteers from Mengtsz, as a rule, refuse to spend the night in that low-lying place, camp out on the mountains, and come down to the little town only in daytime to load their beasts. Nothing could prove better the influence of altitude on the development of *yang-tzŭ-ping* than the immunity of that small place.

Notwithstanding the considerable trade between Mengtsz and Laokai, there are but few travellers to be found on the way, the Chinese being forbidden to enter Tonkin without a regular passport. All the traffic is carried on from hand to hand. Goods circulating between Mengtsz and Laokai are transferred by muleteers to the crews of mercantile junks, discharged at Laokai, to be afterwards passed on to the crews of other boats.

We have no means of accurately determining the period of incubation of *yang-tzŭ-ping.* We can only guess that the average incubation period must be, as a rule, extremely short, from the fact that travellers coming from non-infected districts have been seized by the disease immediately on arriving at a contaminated place.

Yang-tzŭ-ping is essentially an infectious disease; that is its first character. Secondly, it is contagious, as proved by numerous instances of the disease being spread through the medium of travellers or fugitives, and also by the mode of its propagation, as above described, in Mengtsz, as well as by the heavy mortality befalling some families in consequence of the over-crowded, promiscuous conditions of their existence.

As to the modes of contagion, we believe that contact, direct or indirect, with a patient affected with *yang-tzŭ-ping* is necessary for the transmission of the disease. Air, even confined air, is no vehicle for the infectious germs. Experiment has demonstrated the infectiveness of the pus of the buboes, but it has not been ascertained whether other products or excreta of the patient contain the contagium.

Before beginning the following incomplete description of the symptoms of *yang-tzŭ-ping*, some explanations may be offered, in order to justify us in asking the indulgence of our readers. In the first place, we must confess that very few cases came under our observation, and that therefore our account is largely based on information gathered from native practitioners and from Chinese treatises. In the next place, serious clinical study was impracticable in the absence of a laboratory and of the necessary appliances for the examination of urine and blood. We had, moreover, no interpreter, indispensable to translate technical questions properly. And, finally, postmortem examination, formally opposed by Chinese laws, was impossible.

No prodromal stage, as a rule, marks the invasion of the organism by the infective germ. The first morbid manifestations are extremely sudden. Yesterday in full health and vigour, the subject feels to-day all at once terribly ill. The prostration is immediate and profound; or, in other cases, the patient is suddenly and wildly excited. Without apparent reason, he becomes delirious. He cannot stand on his legs. He is hardly able to complain of the violent pains which rack all his body but chiefly his head and back.

The temperature is very high, 102°, 104° or 106° F.; the heart tumultuous; the pulse rapid, irregular, beating 180 or 200; respiration is hurried, panting. The tongue is whitish, sometimes black. Vomiting is very common. Constipation exists as a rule; exceptionally a momentary diarrhœa occurs, with fetid, black stools. The urine is scanty and loaded.

After 24 or 36 hours these initial symptoms are aggravated. Depression increases or delirium becomes maniacal. The patient seems to suffer excessively. In one case suicidal attempts were obstinately made from the beginning. The features are soon so altered that after 24 hours a patient can hardly be recognised. The sunken eyes stare in the most inexpressive way, with dilated pupils. At other times the features denote deep distress. The conjunctivæ are injected in the corners, the ocular mucous membrane remaining dry. The skin is dry and pungent, sometimes parchment-like. Every system seems to be intensely affected.

The fever goes on unremittingly for the first two or three days. Irregularity of the heart points to profound blood deterioration, which in some cases is manifested at the end of a few days by the appearance of a petechial exanthem.

In the cases which came under our notice auscultation did not reveal any serious disturbance in the respiratory functions, beyond a notable acceleration in breathing. Nevertheless, native practitioners speak of hæmoptysis, occurring sometimes as early as the 3rd or 4th day, which would indicate a severe pulmonary complication.

Hiccough sets in very soon. Vomiting does not persist beyond the first few days, but frequently the stomach shows an unconquerable intolerance for everything introduced into it throughout the disease. Constipation persists or speedily replaces the diarrhœa, which in rare cases is at first present. There is usually slight tumefaction appreciable both in the hepatic and splenic regions, though pressure does not indicate any increased sensibility. The urine is scanty, almost red, often entirely suppressed.

As early as the 1st day, oftener on the 2nd or 3rd, at variable points over the patient's body—behind the ears, under the jaws, in the armpits, but most frequently in the groins,—a tumour appears, including one gland or several. The development of this bubo is extremely rapid. After two or three days its size may be that of a hen's egg. *Rubor, calor, dolor*, these three great classical signs of inflammation, attend the tumour.

In two cases we observed the appearance of the inguinal bubo as early as the 1st and 2nd day of the disease respectively. Both patients presented a small scratch on one foot, attended by lymphangitic tracks along the leg and thigh. After a few days the inflamed glandular swelling became enormous, the deep glands participating in the enlargement, as was proved by palpation.

Adenitis is not always discoverable in *yang-tzŭ-ping*. We regret that no postmortem research was possible, in order to determine whether internal glandular tumours may not exist where external tumours are absent.

We mentioned the fact of the early appearance in some cases of a petechial exanthem. No such cases having come under our observation, we must trust to information derived from natives. The eruption consists of slightly elevated (?) red spots as large as a millet seed, discretely and irregularly disseminated on the back, chest, arms, thighs and legs, and frequently turning black. As some of these characters do not apply to petechiæ, the eruption referred to may occasionally be simply erythematous. Carbuncles are not infrequently observed. We had only one opportunity of meeting with a well-characterised carbuncle developed on a scratch of the foot (Case I). About the 3rd day of the disease there generally occurs an unexpected remission of the fever, a sudden abating of every grave symptom. The patient seems to revive and entertains the most sanguine ideas about his condition. Every depressing nervous symptom vanishes for a while. The circulation and respiration are not so tumultuous; the digestive organs not so intolerant. Even the skin is often bathed in sweat. We recall the case of a servant in the French Consulate at Mengtsz, who, on the day of this remission, left his bed, walked a few paces from his room into the open air, swallowed several bowls of rice, and on the following day was found dead at the door of the Consulate.

Death may occur before the remission just described, due, in some cases, to a kind of sideration (?) of the nervous centres, brought about by the excessive temperature or the direct blood-poisoning; in others, to premature heart failure, resulting from a direct intense action of the poison on that organ. As a rule, however, death is posterior to that remission, which usually lasts hardly more than one day.

The grave situation before described, and so well masked during the remission, is again suddenly betrayed after some 24 hours. Delirium, if not yet existing, commences, or it becomes more and more violent, soon followed by a period of coma ending fatally. At other times hyperpyrexia recurs and speedily exhausts the patient. Protracted cases may also be observed lingering in a septicæmic state, attended by hæmorrhagic transformation of the petechiæ, and due perhaps to the absorption of the bubonic pus. These always end fatally.

Hæmoptysis is considered by the Chinese as a sign of early death, the unavoidable consequence of a probable pulmonary gangrene. If on the 10th day the patient is still alive, he is generally looked upon as safe.

When recovery takes place the buboes are absorbed or suppurate spontaneously, as the Chinese seldom use the lancet. The typhoid state, sordes on the tongue, prostration, stupor or delirium, etc., vanish slowly. The brain clears at the same time as the digestive functions become regular, and the kidneys begin again to work. These cases of recovery are chiefly observed at the end of epidemics, the disease at that time, according to natives, running a much milder course.

It is not necessary to describe benign forms of *yang-tzŭ-ping*, as we had no opportunity of observing any. There cannot be many such cases in a disease which kills, on an average,

nine out of ten people affected by it, unless cases of recovery occurring at the end of epidemics may be looked upon as belonging to that category.

We shall not attempt to enumerate the many and various complications which attend the disease, as the information about them given by natives is strangely mixed with fanciful theories of disease, but prefer to content ourselves with the incomplete description just given, which, even if full of gaps, is at all events accurate.

Death may occur after 24 or 36 hours, which is no rare occurrence at the beginning of an epidemic. Generally the patients succumb on the 4th or 5th day. But it very often happens that death is the consequence of some complication after the first 10 days.

Convalescence sets in usually after the 8th or 10th day, but is indefinitely protracted. Sometimes two or three months elapse before recovery can be said to be complete. A patient of ours, the only one who recovered, remained in a state of mental dulness approaching imbecility for nearly two months after his convalescence.

We cannot say anything about the sequelæ of *yang-tzŭ-ping*, as we have not sufficient personal experience of them.

Relapse is said to be frequent.

Recurrence is extremely rare, which fact is well known by natives, who, once attacked, believe implicitly in their future immunity.

Prognosis is exceedingly grave. At the beginning of an epidemic the mortality is said to be 90 per cent. Towards the end the chances of recovery increase. Children and old people invariably succumb. Only young men with strong constitutions are able to go through such a formidable disease and survive. According to the Chinese, several buboes are a better omen than a solitary one. Premature sweats are of very bad augury; also the appearance of petechiæ from the first.

The natives say that the epidemic of 1893, which lasted for three months (June, July and August), was not particularly severe in Mengtsz. However, out of an estimated population of 10,000 or 12,000, 1,000 people died. Carried outside the dwellings, the victims of plague lay dead or dying unheeded in the streets or set in rows leaning against the city wall. We saw on some roads dogs and pigs feeding undisturbed on corpses which no one cared to bury. These animals fell victims to their voracity and succumbed to the scourge.

In some places whole families disappear. At the beginning of the last epidemic we were called to the young son of the Chên-t'ai (Chinese general) of Mengtsz. The poor boy had just been given over by the native doctors, who, probably from fear of displeasing the father, would not declare the nature of the disease. As we were aware of a case of *yang-tzŭ-ping* having already occurred in the Chên-t'ai's yamên; considering, too, the rapid evolution and extreme gravity of every symptom exhibited by the little patient; disregarding at the same time the hypothesis of a heat-stroke or pernicious intermittent fever—we had no hesitation, in spite of the absence of any external adenitis (and to the great displeasure of the father) in diagnosing *yang-tzŭ-ping*. Although ready to do our best, we insisted on the probable failure of any treatment, and urged the necessity for immediate and energetic disinfection, in order to ward off further diffusion of the disease.

The boy died shortly afterwards. None of the measures advised were taken, because the native quacks denied the accuracy of the diagnosis. Doubtless the failure of our treatment had discounted the value of our advice. However that may be, the Chên-t'ai, an old warrior, who had spent his whole life in Yunnan and had passed unscathed through all the previous epidemics which decimated the country, was, a few days after the death of his son, attacked by *yang-tzŭ-ping*, and speedily perished. Some of his wives, many of his relatives and servants were in succession attacked, all the cases ending fatally. The people that died from *yang-tzŭ-ping* in that yamên before the end of the epidemic numbered at least 25.

The early epidemics were, according to Mgr. FENOUIL, far more virulent and deadly than the later.

At the time when *yang-tzŭ-ping* raged most severely in Yunnan-fu, writes Mgr. FENOUIL, from 1,200 to 1,500 coffins passed daily through the six gates of our city. No one that I am aware of ever tried to determine the number of victims in the whole province. In 1866 people in a position to be well informed assured me that both in Yunnan-fu and the plain which surrounds the town there remained no more than a fifth of the former population. It must, however, be remembered that the Mahommedan war, commenced in 1856, had contributed a good deal towards increasing that immense mortality. . . . . The enormous figure of 1,500 deaths per day occurred seldom; the average amounted to 600 or 800 daily victims.

After this description we do not think that the question of diagnosis admits of much discussion.

The Yunnan *yang-tzŭ-ping* appears unmistakeably to be the bubonic plague, with all its formidable symptoms—the ancient Western scourge which in past centuries ravaged the whole of Europe.

The hypothesis of a malignant form of typhus with rapid evolution cannot be sustained. In *yang-tzŭ-ping* buboes are extremely frequent, if not constant. They are seen but very seldom in any form of typhus. On the other hand, while the appearance of an exanthem, erythematous or petechial, is the rule in typhus, it is the exception in *yang-tzŭ-ping*.

There is a certain resemblance between the invasion period of many cases of *yang-tzŭ-ping* and that of malignant pustule. Thus we note an initial elevated pustule on which a carbuncle soon developes, and the suddenness of general symptoms of extreme gravity. But in malignant pustule there is neither lymphangitis nor adenitis, which are nearly constant in *yang-tzŭ-ping*. Besides, the characters of the pustule are not the same. The well-known ring of vesicles encircling malignant pustule is absent in *yang-tzŭ-ping*. We never heard, moreover, of malignant pustule becoming epidemic to the same degree as *yang-tzŭ-ping*. No other differential diagnosis is worth discussing.

As already explained, no postmortems being obtainable, the morbid anatomy of the disease must necessarily remain a blank.

We shall not enlarge upon the various modes of treatment employed, which all proved of no use, except perhaps in one case.

Refrigeration (cold baths or wrapping up in a wet sheet) was resorted to, to combat hyperpyrexia and diminish cerebral excitement.

Champagne was ordered with profusion in a case where prostration was the dominant symptom.

We tried to meet the obstinate constipation of the beginning by the administration of saline or oily purgatives.

Diaphoretics and diuretics were employed to facilitate the working of the heart and kidneys when these organs seemed to be hampered in their functions.

As local treatment, we once incised a bubo (Case I); but there is seldom any indication for cutting, as the patient generally dies before fluctuation or softening of the tumour is apparent.

The only attempt to go beyond a merely symptomatic medication consisted in the subcutaneous injection of carbolic acid, 8 grains per day, intended to combat the blood-poisoning. We used it in only two cases, of which one recovered; so no definite result was obtained.

Among the most valuable items of information supplied by Mgr. FENOUIL, we have to record the marvellous cures he effected on people ill with plague by the use of potasso-tartrate of antimony in very large doses. He goes so far as to affirm that he never lost any patient treated in that way. The next epidemic will afford plenty of opportunities to put this observation to the test.

We have already alluded to the impossibility of altering the insanitary conditions in this region.

Isolation of patients attacked by contagious diseases; their removal to spacious shelters; cleanliness, disinfection and aeration of these places—these are measures that the Chinese will never approve of, as they do not comprehend them. Their faith in foreign treatment shows itself only in the swallowing of drugs; and even then the nature of these drugs must not be in contradiction with their theories of diseases. For instance, they are unwilling to accept treatment by alcohol or refrigeration. We have already insisted on the inestimable effects which would follow the planting of trees and the cultivation of useful plants, such as *Eucalyptus globulus*, over the extensive cemeteries of Mengtsz, with a view to the purification and disinfection of the ground.

Without dwelling on the hygienic measures adopted in every civilised country, but the execution of which is impossible in China, we wish, before terminating this Report, to propose a mode of prophylaxis which, were it enforced upon all, would certainly prove most effectual in Mengtsz.

Lime is an extremely cheap and abundant product of this country. Its powerful antiseptic properties are taken advantage of everywhere else for disinfecting purposes. Nothing could be more feasible here, provided the local authorities were to intervene, than on the eve of an epidemic, as announced by the death of the rats, to enforce the whitewashing of every house in Mengtsz and the daily irrigation with lime water of every interior court-yard and every floor, these being mostly made of bricks or simply of earth.

As regards foreigners, we have no doubt that the secret of their immunity from the disease resides altogether in their rigorous personal hygiene. Frequent disinfection of foreign-occupied premises, by means of lime water or a solution of bichloride of mercury, was the only supplementary precaution which we advised.

We cannot but express wonder at the indifference hitherto shown by the Tonkin Government towards a disease which has already invaded South China up to Tonkin,

which every year devastates new countries, and which permanently menaces French Indo-China.

A medical commission would here find a large and splendid field for scientific investigation. Its work might prove of immense value, either by suggesting measures to be taken with a view to face the possible contingency of a propagation of the disease to Tonkin, or perhaps by discovering the means of stamping it out.

Case I.—Annamite, aged 25; stout, strong fellow, recently arrived at Mengtsz from Tonkin. Lives in an extremely unhealthy house—damp, unventilated, wherein, moreover, a number of people died from plague in late years.

22nd July.—Intense malaise; vomiting after food; giddiness; strong fever. A very slight scratch on the right foot, hitherto unnoticed by the patient, has swollen, causing distressing itching. Pain in the right groin.

23rd July.—Condition when first seen (2nd day of the disease): severe headache and backache; general muscular pains; face anxious; no delirium; no mental disturbance; tongue loaded; anorexia; bowels constipated; pulse rapid, irregular, vibrating; heart tumultuous; temperature 105°; no cough; slightly hurried breathing; nothing discoverable in the chest; no enlargement or sensibility of the liver or spleen; very little urine, red in colour. A small umbilicated vesicle appears on the back of the right foot, exceedingly painful; all round the tissues are red, œdematous. Lymphangitic traces on the leg and thigh. In the inguinal region a bubo, already quite manifest, projects, palpation of which starts the patient crying. A purgative dose of sulphate of soda was administered, and 1.50 gramme of quinine prescribed for the evening. Belladonna and mercury ointment applied to the whole limb.

24th July.—Same state. Several large stools. Fever persists. Temperature: A.M., 104°.3; P.M., 105°.2. The vesicle on the foot is increasing and the œdematous inflamed zone extending. The bubo continues to enlarge. 1.50 gramme of quinine again. Aperient lemonade prescribed. Until now we had not diagnosed *yang-tzŭ-ping*, regarding the case as one of adenitis with severe general symptoms.

25th July.—Every symptom aggravated. Restlessness; sleeplessness; stupidity. The features begin to alter in an extraordinary manner. Every medicine is vomited. Constipation sets in again, in spite of aperients. Respiration hurried, panting. Pulse rapid, vibrating. Temperature: A.M., 105°; P.M., 105°.5. Slight hyperæsthesia of the hepatic region, the liver seeming to be enlarged as well as the spleen. The patient suffers excessively, though hardly able to complain. No eruption. Urine diminishing in quantity. The vesicle on the foot is now a flat pustule, as large as a 5-cent piece, on the border of which a black slough is forming. Some serum exudes when the surface is pressed. Œdematous inflammation extends all over the foot. Lymphangitis more pronounced. The bubo is enormous, but not fluctuating. Cinchona and alcohol. Wrapping in a wet bed-sheet for an hour and a half. 1 gramme sulphate of quinine; champagne.

26th July.—Remarkable remission in all the grave symptoms. Tongue almost moist. Better aspect. Pulse strong, not so rapid. Temperature: A.M., 100°.4; P.M., 101°.3. Breathing easier. Constipation continues; urine scanty. The pustule has obviously given place to a carbuncle. The outer pellicle sloughing off, shows a black surface. No ring of vesicles round the pustule. Slight fluctuation in the bubo. A large, deep, crucial incision was made into the carbuncle. About 15 grains of bichloride of mercury was introduced into the incision and spread over the slough. Interstitial injections of 10 per cent. tincture of iodine were made in the surrounding areolar tissue. Cinchona and alcohol; champagne. At night the wet sheet was reapplied, the temperature reaching 102°.

27th July.—All the bad symptoms have reappeared. Intermittent delirium; restlessness. The features have altered to such a degree as to make the patient unrecognisable. Intense thirst. Pulse strong. Temperature: A.M., 102°.1; P.M., 104°. Had one stool; urine scanty. Liver and spleen manifestly

enlarged and sensitive. Very distressing hiccough has set in. Foot quite insensible. Wet sheet for one hour. Champagne. Subcutaneous injections of carbolic acid in solution (0.50 gramme a day). Cinchona and alcohol.

28th July.—Patient constantly delirious. Pupils dilated but sensitive. Restlessness. Pulse depressible, small. Heart irregular. Temperature: A.M., 104°.2; P.M., 105°. Struggled with his nurse to get out of bed. Refused medicine. Hiccough persisting. The bubo is aspirated with a Pravaz needle, which draws off some pus mixed with blood. Wet bed-sheet applied three times to-day. Subcutaneous injections of carbolic acid.

29th July.—No fever this morning. Temperature 99°.3. Patient semi-conscious. Pulse soft, depressible. Heart irregular, feeble. Breathes with difficulty. Temperature, P.M., 103°.2. Constipation persists; no urine for two days. Bubo incised; very little pus is set free. The cavity of the bubo is washed out with a solution of bichloride of mercury and dressed with vaseline and iodoform. Wet sheet, preceded by injections of valerianate of cafein (0.20 gramme), on account of the cardiac weakness. Injection of carbolic acid (0.25 gramme). Cinchona and alcohol; champagne.

30th July.—Temperature: A.M., 100°.3; P.M., 101°.2. Great prostration. Pulse small, hardly felt. Sulphate of sparteïn (0.10 gramme) injected alternately with valerianate of cafein (0.40 gramme). In the evening pulse better; heart beating with more strength. The patient passed urine abundantly; no stools. No wrapping. Champagne; cinchona and alcohol. Injection of carbolic acid.

31st July.—Temperature: A.M., 100°.1; P.M., 102°. Great weakness; semi-consciousness. No stools; passed urine. Very little suppuration from the bubo. The carbuncle on the foot is now replaced by a large black slough, the borders of which are quite insensible. Valerianate of cafein injected (0.20 gramme); carbolic acid injected (0.25 gramme). Cinchona and alcohol; champagne.

1st August.—Temperature: A.M., 97°.4; P.M., 99°.3. Consciousness returning. The patient can talk. Tongue moist. Some desire for food. Heart beating regularly. Constipation persists. No more injection of any kind. Cinchona and alcohol. The patient drank some chicken broth.

2nd August.—Temperature: A.M., 97°.4; P.M., 101°. Improvement goes on. The patient ate some chicken and drank some milk. The swelling in the groin includes now several glands and is enormous; very little pus flows from the opening. On the foot a large phlyctæna encircles the slough. No œdema. Absolute insensibility of the region. Calomel (0.50 gramme), the patient having had no stool for five days. Cinchona and alcohol.

3rd August.—Temperature: A.M., 98°.2; P.M., 99°.2. Two copious stools; passed urine normally. The patient's features resume their normal aspect. Great weakness. The slough on the foot has separated, leaving a healthy surface. Light food—milk, rice and chicken.

4th August.—Convalescence may be said to set in decidedly from this day. Considerable suppuration from the first bubo. The inguinal swelling slowly disappeared, while the foot healed speedily. The patient had become extremely thin. Mental weakness approaching imbecility lasted for about two months. Later on, however, all trace of the disease disappeared. The patient has recovered all his strength and vigour, and is as sane as before.

Case II.—Female Annamite, aged 21; living in the same house as Case I. Two months' stay in Mengtsz. In good health till now, but subject to dyspepsia, caused probably by her habit of constantly chewing strongly-spiced substances. Of average strength. Seen at the time of our first visits to Case I. Had been complaining of fever, headache and vomiting for one or two days before our being asked to examine her.

27th July.—Extraordinary irritability of temper; in fact, she is already delirious. Face flushed; looks bewildered. Complains of excruciating headache and backache; moaning all the time. Tongue red, dry. The buccal mucous membrane is inflamed; some superficial excoriations are seen on the internal surface of the cheeks. Quinine taken has been vomited. Constipation; urine scanty. Hurried breathing.

Pulse extremely rapid, uncountable. Temperature: A.M., 105°.3; P.M., 106°.4. The heart's action is so tumultuous that the condition of the organ cannot be ascertained. Menses suppressed. No particular tenderness in the hepatic or splenic region. Ipecacuanha (1.50 gramme) administered. Two hours after, antipyrin (2 grammes) and sulphate of quinine (1 gramme). Medicines vomited almost immediately. Injection of morphia (0.01 gramme), to control vomiting, had no result. No enema can be administered.

28th July.—Every symptom aggravated. Extreme restlessness; violent delirium. Temperature: A.M., 104°.6; P.M., 106°.3. Constant vomiting. The patient is shrieking, foretelling her death. No medicine can be swallowed. No stools; no urine. The wet sheet was applied for an hour and a half, which quieted the patient very much, the temperature having fallen $1\frac{1}{2}$° at the end of the wrapping. A second injection of morphia, to control the vomiting, remains unsuccessful. It is not repeated, on account of the cerebral congestion and the arrest of the renal functions. Compresses to the epigastric region. (No ice is obtainable in Mengtsz.)

29th July.—Situation becomes steadily worse. Suicidal attempts repeatedly made. Vomiting not stopped. No stool; no urine. Heart fluttering as in asystolia. Cerebral symptoms command the scene. Temperature, A.M., 106°.3. A small, very painful swelling appears under the lower jaw on the left side. The temperature rising, a cold bath, at 80° F., is prepared, and the patient placed in it. Champagne administered during the bath and not rejected. At the end of the bath the temperature of the water is 65°. Three hours after the bath the patient's temperature is 98°.5. No delirium; the patient is quiet. Late in the evening the temperature rose again to 106°. Furious delirium. The wet sheet was applied, when suddenly syncope occurred. Ether and cafein restore consciousness. Everything is done to excite the circulation; the heart starts again, but feebly.

30th July.—In the morning the patient became collapsed again and sank.

CASE III.—Chinese boy, 10 or 12 years old. Looks very weak and wasted, but accustomed to hardship, as are many of these wretched Chinese boys, without anybody to care for them. The day before the first symptoms of illness he was seen running behind a foreigner riding for a distance of about 8 miles.

8th August.—To-day sudden illness. Headache; backache; intense depression; tongue loaded; anorexia; no vomiting; constipated; no urine; pulse weak, rapid. Temperature: A.M., 105°.2; P.M., 105°.1. Although the 1st day of the disease, a bubo appears in the left groin and is already quite distinct. A large scratch, dry, not inflamed, is detected on the back of the corresponding foot. 0.50 gramme calomel. Wet sheet for one hour. Alcohol and cinchona.

9th August.—Prostration increasing. No delirium, but the boy is quite unconscious. Had one stool; no urine. Pulse uncountable. Temperature: A.M., 104°.3; P.M., 106°.2. Nothing discoverable in the chest. No sensibility in the hepatic or splenic region. Bubo increasing rapidly. Several glands are included in the swelling. The surrounding tissues do not look inflamed. Sulphate of sparteïn (0.05 gramme) injected alternately with valerianate of cafein (0.20 gramme), in order to facilitate the working of the heart, which is more and more impeded. Wet sheet.

10th August.—Remarkable remission of the fever in the morning. Temperature: A.M., 99°.3; P.M., 105°.3. Pulse slower but hardly felt. In the morning the boy was semi-conscious. Took some cinchona and alcohol. Constipation; passed some urine. No fluctuation yet in the swelling, which grows enormous. In the evening became delirious. Pupils dilated, insensitive. Sudden rise of temperature to 105°.3. Respiration hurried, panting. Pulse running, miserable. Died at night.

CASE IV.—Chên-t'ai's son, 7 years old. Had been ill for two days before being seen. Sudden sickness, marked by intense cerebral symptoms from the beginning. The child complained of headache, backache and general pains all over the body. Restlessness; sleeplessness; no cough; passed urine; constipated; was purged without result.

2nd June.—When first seen the little patient seemed dying. Quite unconscious; profound prostration; pupils dilated, insensitive; lies with mouth open; heart sounds hardly audible; pulse miserable; temperature 105°.1; respiration superficial, irregular; mucous râles at the base of the lungs; no stool, no urine to-day; abdomen retracted; no swelling anywhere; bathed in cold sweat; limbs icy cold. Injections of valerianate of cafein and sulphate of spartein alternately. A small bottle of champagne is swallowed with some difficulty. Rubbing of the limbs with flannel soaked in alcohol.

3rd June.—In the morning better, consciousness having returned. In the afternoon death suddenly occurred.

DR. E. H. BALDOCK'S REPORT ON THE HEALTH OF SEOUL (COREA)

For the Year ended 30th September 1894.

SINCE the last Report from Seoul the number of foreigners—that is, Europeans and Americans—has steadily increased, until now it is estimated at 120, of which children form a very large proportion.

The insanitary condition of the city remains the same, and is as bad as the natives can make it, though, fortunately, the whole town is situated in a well-drained basin. Nearly every house has its particular drain, well flushed by the rain, and it is to this fact that the city owes its generally healthy condition.

There have been no epidemics during the past year, and small-pox, which generally runs rampant during the winter months, has been infrequent.

Among foreigners an intractable form of remittent fever was observed.

It ran its course in from two to three weeks, and in one case relapsed 14 days after the first attack had ended. Quinine appeared to be useless, and in large doses only added materially to the discomfort of the patient. A persevering use of 5 grains of sulphate of quinine with small doses of arsenious acid every four hours, with careful attention to the functions of stomach and liver, seemed the most efficacious plan of treatment.

During September there was a total absence of rain, which gave rise to a pretty general epidemic of diarrhœa, and in two cases dysentery developed.

Epidemic influenza has been observed in several cases. They presented the same appearances as in the epidemic in England of 1891–92, but the disease did not spread to any extent.

Among the Coreans, dyspeptic conditions and malarial affections come foremost of all others.

Venereal diseases are extremely common, but actual syphilis is not so universal as accounts would lead one to suppose. It is a fact that the Hunterian chancre is extremely rare, only nine cases having been observed out of 4,000 out-patients. The form in which syphilis most frequently comes under observation is the tertiary, such as perforations of the palate, sore noses and the various ulcers and skin lesions. The soft sores are common enough, and in regard to these I could never see the utility of the actual cautery or nitric acid when iodoform will heal the whole much more quickly and painlessly.

The idea seems to be prevalent that leprosy is common in Corea. If, however, this is the case, patients suffering therefrom do not come to Seoul, as I have only seen two cases in 18 months—one of lepra nodosa, the other of lepra anæsthetica. They both came from the southern provinces. According to the patients' accounts, none of their family had anything of the kind, neither did they know nor had they heard of any others in their district with the

same affection. Several cases of supposed leprosy have been sent up from the country, but they have turned out to be cases of multiple neuritis, due, in all probability, to alcohol.

Some horrible cases of cancrum oris come under observation, in which the whole cheek has sloughed and exposed all the teeth and the jaws of one side. Treatment is absolutely useless. Even when seen earlier there is very little chance of recovery.

One case of hydrophobia was noticed in a boy three months after having been bitten in the leg by a dog credited with rabies. He had been ill four days. The parents, refusing to leave him in the hospital, took him home to die.

The following illustrates one of the native methods for treating strangulated hernia:—

Patient, a woman of 58 years, admitted on 22nd August. She had a sausage-shaped swelling about 5 inches long by 2½ inches broad extending from the middle of the groin downwards and inwards to the labium of the right side. From her account she had had this trouble for years, getting better and worse at times, but that four days previously she suddenly experienced great pain in the swelling, which increased in size. A Corean doctor then saw her and burnt a hole in the skin and subjacent parts over the middle of the tumour. This is said to have relieved the pain somewhat, but the next day the swelling burst, and on admission there was a round, sloughy hole, from which protruded a black, dry piece of omentum. She was extremely collapsed, vomiting constantly. She had had no solid food for four days, and the bowels had not acted for the same time. 1 grain opium pill given at once, and some tincture of opium and brandy a little later. As soon as possible she was put under chloroform. The opening was enlarged and a quantity of fetid omentum oozed out. At the bottom of the sac was found a knuckle of intestine of a dark reddish-purple colour coated with lymph and adherent to all its surroundings. The whole sac and its contents were well washed with 1 in 20 carbolic, afterwards with 1 in 40. The neck of the sac was freed all round and slightly incised. Bowel was returned and the omentum cut away, three silk ligatures being applied and their ends left long. The sac was dissected out and cut away as close up as possible. Wound was allowed to granulate up from the bottom, no stitches being applied. The bowels acted freely the same evening, and the patient made an uneventful recovery.

A usual accident complicating tracheotomy may be worth noticing.

Patient, a feeble old woman of 63, admitted for œdema of larynx about noon on 29th August. She had had a sore throat for six days, but on the 28th August she said she very nearly choked. There was some reddening of the fauces, and on examination with laryngoscope, the epiglottis was swollen and turned over, while the aryteno-epiglottidian folds were white, glistening and œdematous, almost meeting in the middle line. Respiration was most difficult—44,—with pulse 120; the patient much distressed, with perspiration pouring from her face. Some considerable cyanosis existed. The œdematous portions were very freely scarified and hot compresses, etc., applied. At 5 P.M. she was decidedly worse, and spasms of suffocation supervened. As I had no laryngotomy tube, I performed a high tracheotomy, meeting with no difficulty except that the isthmus of the thyroid was rather enlarged and had to be drawn downwards before the trachea could be opened. The operation was at 5 P.M.; at 6 P.M. I left her conscious, breathing quietly and quite comfortable. At 7 P.M. the sister in charge noticed a little blood trickling from the dressings. This increasing in quantity, I was sent for and arrived at 7.45 P.M. By this time the patient had lost a good deal of blood, and some had run down into the trachea, producing violent fits of coughing; she was very collapsed. All the dressings were at once taken off and all stitches removed, and after a tedious search, much embarrassed by difficulties of light and the rapidity of the oozing, the bleeding was controlled by Spencer Wells' forceps. The blood welled up from the bottom of the wound and came from some vessels behind the isthmus, which had most probably been torn by the retractor. After this proceeding the condition of the patient was critical, and an enema of 1½ pint of brandy and water was administered. This revived her for the moment, but she rapidly fell off again until 8.45 P.M., when she

was nearly in a dying condition, almost pulseless, the breathing gasping, and totally unconscious. After a hypodermic injection of ether, I opened the median basilic vein and introduced 1½ pint of warm normal saline solution. The pulse at once improved and consciousness returned. She then had a few curious trembling fits, during which her teeth chattered and she complained of the cold. Hot towels were applied to the præcordium. The patient passed a good night, and, except that the throat and tracheotomy wound took a good deal of trouble in order to keep them sweet, nothing out of the way happened. She went home on 8th September.

Malignant diseases are not common, myeloid sarcomata of the jaws and epithelioma of tongue and mouth being the more usual. The sufferers generally apply for help when they are totally beyond the reach of surgical interference. Tubercular diseases form an extremely large class and present themselves in all forms. Those cases in which the bones are affected are most troublesome, as after repeated scraping the disease appears again and amputation is the only resource left; even then it is advisable to go well above the disease or a recurrence may be expected in the stump.

An interesting case of compound fracture occurred.

A boy, æt. 17, admitted on 21st April. Three days previously a bullock cart had passed over his leg. On admission the limb had five pieces of bamboo, about 6 inches long, placed at intervals round it; these were kept in position by some bark, and a dirty rag was wound round the whole. The tibia and fibula were broken, the latter in two places, while the lower fragment of the former protruded from an anterior wound. It was all scrubbed, cleaned and packed with iodoform and put on a back splint. There was much inflammation, and a piece of the lower fragment was sawn off to make a freer exit for discharges. Four other openings were made in dependent positions to allow of the escape of pus. All splints had to be put aside and the limb was steadied by sand-bags. Although the pyæmic condition lasted for eight weeks, the boy eventually made a good recovery and has a very fair leg.

A rather unusual complication was met with in a case of ununited fracture of the patella.

A vertical incision was made, the patella exposed, and a slice sawn off either fragment, when it was found that there was a commencement of pulpy disease of the synovial membrane of the joint. The operation was, however, proceeded with, the bone tied with thick China twist silk and the wound closed. All healed, and the patient was discharged in six weeks, very pleased with his leg. The two fragments had united by firm though fibrous tissue.

Some 20 cases of bullet wounds have been treated in the hospital. Eight of these came from the south, whither Corean soldiers had gone to quell the Tonghak rising. These men had been conveyed in various chairs and improvised stretchers for 12 days. Their wounds had never been even washed and were most foul. The most interesting were:—

(1.) Through knee-joint from above the outer condyle, emerging 2 inches below the articular surface of the tibia on its inner side. The leg was amputated in the lower third of the thigh. (2.) Through the arm, fracturing the humerus—about its middle,—of which 2 inches were loose and were removed. The bullet was found under the deltoid two days after admission. (3.) Through the upper jaw into the nasal cavity. (4.) Through the lower jaw; the bullet being removed from the neck. (5.) Through both buttocks, entering a little behind the great trochanter and emerging at a corresponding place the other side. All these cases made a good recovery.

After the taking of the Palace by the Japanese on the 23rd July, another batch of wounded were admitted. The most important cases were:—

(1.) Through the right chest, 3 inches below the right clavicle, emerging through the scapula below the crest. (2.) Through the leg, piercing the tibia 4 inches below the joint. (3.) Bullet lodged in the

tibia, splintering it 5 inches below the joint. (4.) Fracture of femur at its middle by a shot which passed through the thigh. About 2½ inches of femur were carried away and the remainder badly splintered. These two latter cases were at first taken to the Japanese military hospital; two days later the men were, according to their own account, turned out to shift for themselves, and were admitted into the hospital the same night at 10 P.M. The wounds were covered with antiseptic dressings, but notwithstanding, the smell was abominable, and maggots were found crawling between the dressings and the wounds. The last case was eventually amputated in the upper third, and though the wound has all but healed, the poor fellow is so run down that his ultimate recovery is doubtful.

NOTE ON "YEMPYENG."

A febrile disorder lasting from seven to eight days, characterised by extreme anæmia and prostration, and terminating in a crisis.

Etiology.—It appears to prevail in most parts of Corea, and by the Coreans is considered contagious. It is certain that conditions of ill-health and privation predispose to the disease, and some cases have been observed in which the disease appeared to have been acquired from those already suffering from it. Thus, three in-patients—surgical cases—and a servant contracted the complaint while there were cases in the hospital, the three in-patients never having gone outside the compound wall. Again, a man was admitted on the 5th day of the fever, and 10 days afterwards his wife and two children were taken ill and were admitted—the woman and one child on the 5th, the other child on the 4th, day of the illness.

The disease first makes its appearance about the time of the breaking up of the frost, towards the end of March and beginning of April, though an occasional case occurs earlier than this. In 1894 there were admitted 1 case in January, 3 cases in February, 10 in March, 34 in April, 41 in May, 17 in June, and 7 in July. With the commencement of the summer rains and the hottest part of the season the cases come to a sudden end. Thus, in 1893 the last case was seen on 15th July and in 1894 on 14th July. One attack is said by the natives to predispose to others, but this has not been confirmed as yet by experience.

The majority of cases are among the lower classes, and those applying for admission are, as a rule, men who have come to Seoul from the country. The reason for this is obvious, as the innkeepers and Coreans generally turn a man out into the streets as soon as he becomes definitely ill. There is no probability of scarcity of food accounting in any way for the disease, as a starving Corean is almost unknown.

Symptoms and Progress.—The onset of the disease is, for the most part, definite, so that the patient will be able to tell how many days he has been ill, and in the majority of cases his chart shows him correct. It commences with pains in the head, back and limbs; this is followed by some heat and dryness of the skin; the headache, generally frontal, increases, and extreme debility and anorexia supervene, with often a very feeble, slow pulse. The face is strikingly pale and sallow, the eyes sunken, the body is dirty and uncared for, the hair in tangles and the clothes in tatters. On the 5th day the patient is so prostrate as to have a tendency to sink into a heap on the floor. On the 7th or 8th day a more or less profuse perspiration breaks out, and in a few hours the temperature falls to normal or subnormal through sometimes as many as 8°. During the attack the temperature does not range very high, being, as a rule, about 102°–103°. Patients are occasionally admitted with a temperature of 99°; in

the morning a bath and some food in a warm room are given, and the temperature runs up to 103° by the evening. The pulse is always feeble, thin and slow, but becomes quicker as the temperature rises.

The tongue is characteristic, being always coated with a thin moist white fur, the tip and sides remaining pale pink. In severer cases it later on becomes dry, brown and glazed, while in the worst cases it is covered with a thick black crust and presents large bleeding cracks. Sordes often appear on the teeth; the lips become dry and cracked. Great thirst is a prominent symptom.

The mental depression is extreme, while the principal complaint is of headache. There is also tenderness over the liver and spleen. The condition of the bowels varies, being sometimes loose, sometimes constipated. Early on the 6th day or late on the 5th a very considerable proportion of cases suffer from epistaxis, which is sometimes so severe as to require the plugging of the nose. Little or no relief is the result, except that perhaps the headache is a trifle better. Patients are, as a rule, conscious throughout, though stupid and dazed, while most are obstreperous and have a way of wandering round the compound and lying about in the most undesirable fashion. The worst cases become comatose, rapidly sink and die. In 1893 some of the fatal cases presented a curious condition of gasping breathlessness, pain in the throat and difficulty in swallowing some six hours before death. Nothing was discovered to account for these symptoms. Two cases in pregnant women occurred which resulted in miscarriage, one of the women dying of hæmorrhage.

After the crisis the tongue cleans gradually from before backwards; the general condition remains very low for some time, but the patient expresses himself as feeling quite well and asks at once for his native food.

The mortality among Coreans is said to be considerable. The people are much more afraid of the disease than of small-pox, and unless a man has a house of his own, he is put into a temporary straw hut by the city wall until he dies. Of those admitted, the majority recover and the prognosis is good, unless the patient comes under observation too late or there is some intercurrent disease. The fatal result may happen from pneumonia, bronchitis, uræmia or collapse. Convalescence is slow, but not as a rule complicated with sequelæ. Among the latter, jaundice is frequent, and it occurs on the 2nd day after the crisis and is more common in those cases which have had severe epistaxis. Bronchitis and albuminuria have both occurred as sequelæ. Some cases of partial paralysis have ascribed their trouble to this disease.

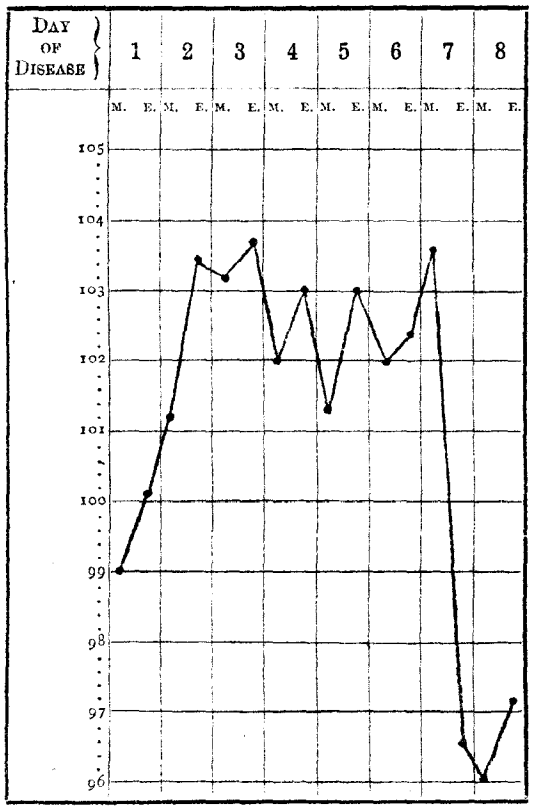
Treatment.—Many and various drugs have been given, but, as usual in specific fevers, all are useless in the matter of cutting the attack short. On the supposition that the disease was of malarial origin, quinine in small and large doses was tried, with no effect, the larger doses doing more harm than good. Opium was given in two cases in which the persistence of the pains tempted its use, and the result in both was nearly fatal, though less than 2 grains were administered. Pilocarpine has been recommended to produce sweating, but it only lowers the vitality of the patient without producing any permanent benefit; besides, on the 7th day the patient will sweat quite enough without medicinal aid in this direction. The only cases in which its use is indicated is in those where uræmic symptoms threaten and in those few cases of difficulty of swallowing and breathing already mentioned. The most satisfactory

results have been obtained by giving a hot bath on admission and putting the patient in a warm room. Beef tea, broth, milk and eggs, also brandy, will probably be required. At bedtime on the 1st night, 2 grains of calomel, and a dose of salts in the morning, providing, of course, that the patient is not too ill for such treatment. This seems to lessen the cases of epistaxis and certainly brings down the numbers of consecutive jaundice. 3 minims of carbolic acid in solution of chlorate of potash keeps the mouth sweet and comfortable,—it also seems to suit the cases remarkably well; while the temperature can usually be controlled by acetanilide, which is given in doses of 5 grains if the thermometer reaches 103°. Special complications will require special treatment, but most cases will do well under the above *régime*. Of 113 cases admitted in 1894, only one died—a man of 50 years of age, who at the crisis developed acute bronchitis, which rapidly proved fatal.

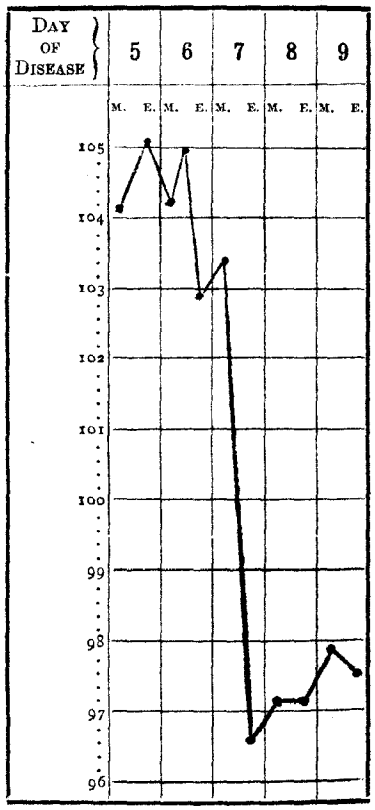
From the preceding description it will appear that in a great many points this fever resembles relapsing fever. It evidently belongs to the class of typhous continued fevers and has a seven days' duration. It also ends by crisis, following which the patient suddenly feels remarkably well, and there is, as a rule, no rash or other eruption. The main points of difference appear to be—absence of jaundice during the fever, the *yempyeng* tongue, the epistaxis on the 5th or 6th day, and the anæmic condition of the patient; added to which are the facts that the characteristic spirilla of relapsing fever has not as yet been discovered and that *yempyeng* does not relapse.

The following are the temperature charts of nine cases of this fever; Case No. 1 is that of the servant and Case No. 3 that of the surgical in-patient before alluded to:—

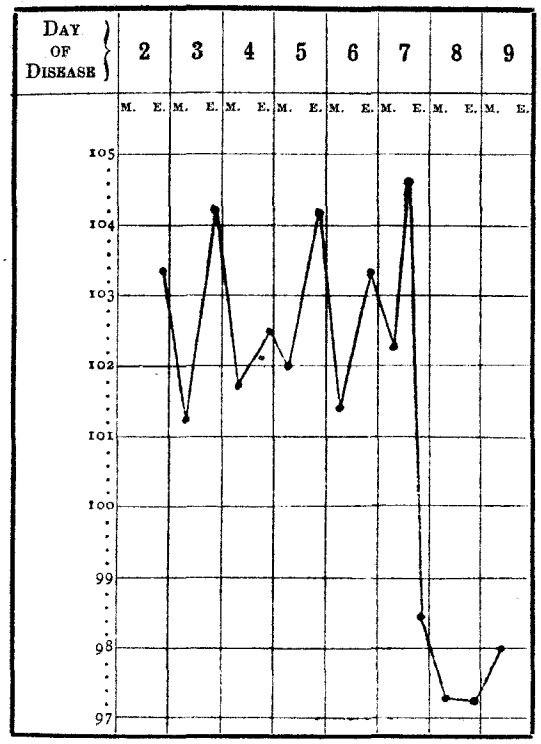
CASE No. 1.



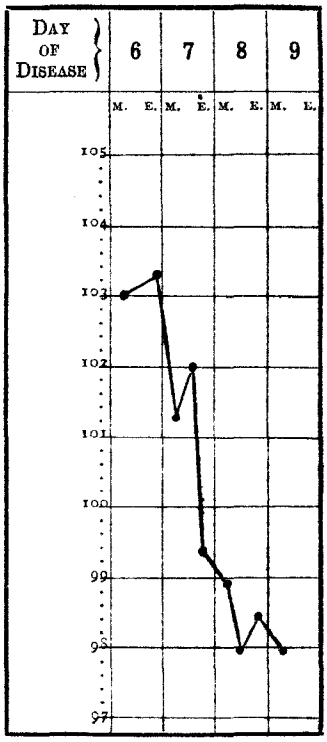
CASE No. 2.



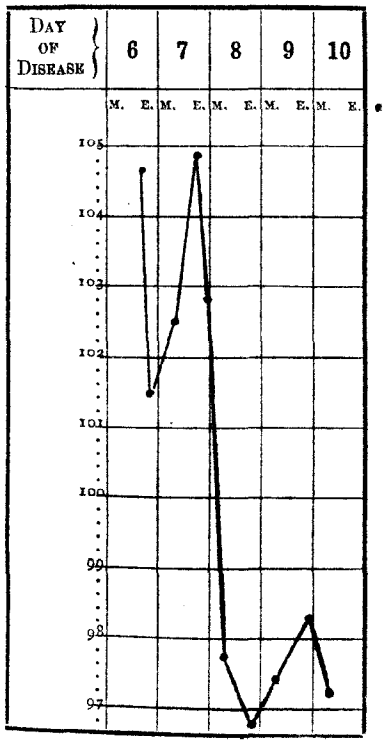
CASE No. 3.



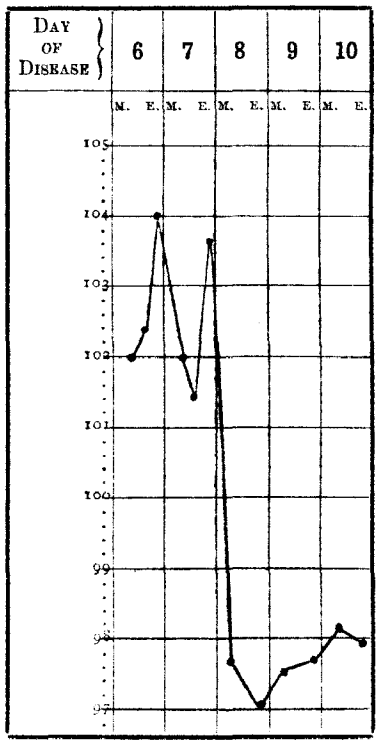
CASE No. 4.



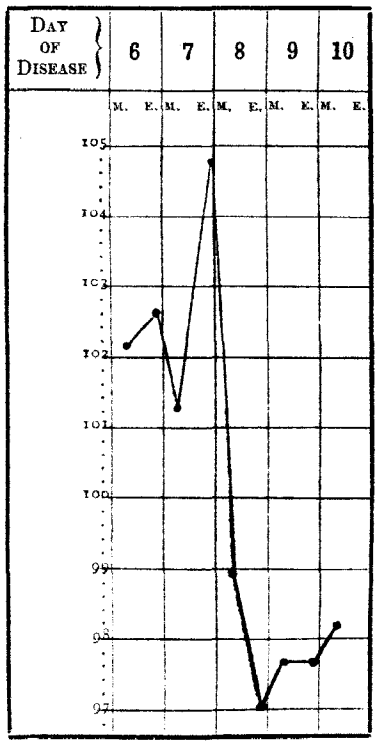
CASE No. 5.



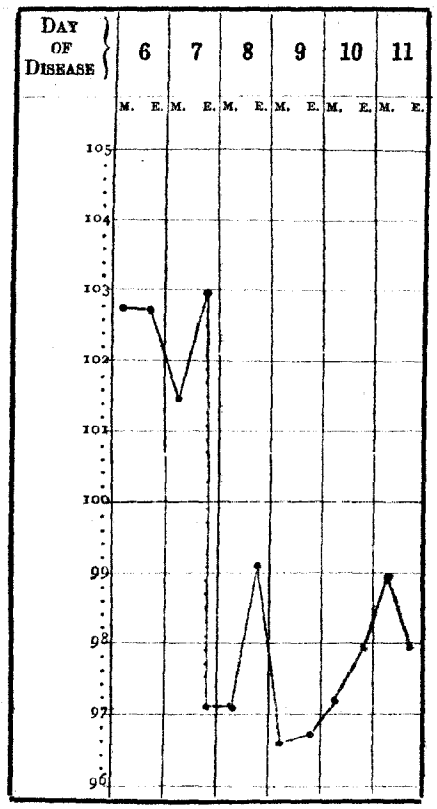
CASE No. 6.



CASE No. 7.



CASE No. 8.



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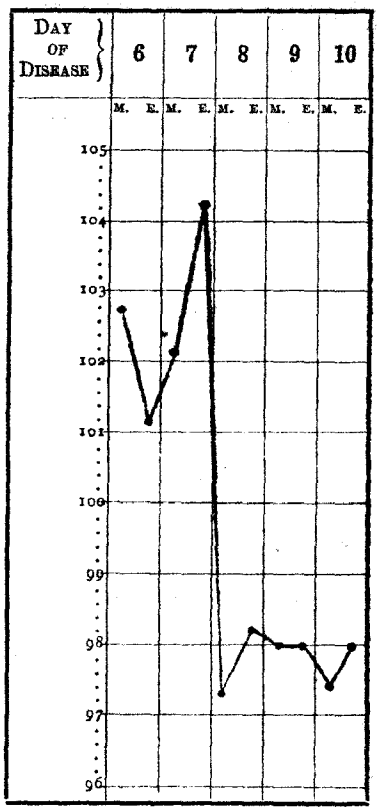

REPORT ON THE PLAGUE PREVAILING IN CANTON DURING THE SPRING AND SUMMER OF 1894.

By ALEXANDER RENNIE, M.A., M.B., C.M.

IN China little or nothing had been heard of the plague since its prevalence at Pakhoi in 1882, so that its appearance at Canton in March 1894 was somewhat unexpected. Europeans, by the ravages of centuries, were rendered painfully familiar with the disease; but to them all interest ceased on its disappearance from Europe in 1841, and in 1844 from Egypt—its home for over 20 centuries. Several years passed, and epidemiologists were beginning to believe the virus was extinct and the plague a thing of the past when attention was directed to an outbreak in Assgr, Western Arabia, 1853; followed by outbreaks in Bengazi, North Africa, 1858; Persian Kurdistan, 1863; the banks of the Euphrates, south and west of Hillah, 1867 and 1873; extending as far north as Bagdad, 1876, and over the country lying between the Tigris and the Syrian Desert. It now appeared in South-eastern Persia and gradually extended northwards to the southern shore of the Caspian Sea; and in 1878 broke out in the province of Astrakhan, Lower Volga, thus reappearing on European soil after an absence of 37 years.* It would thus appear that, though often seemingly quiescent, the plague has never really been extinct; and now, brought face to face with its presence in Southern China and Hongkong, menacing as it does commercial intercourse with the West, we must realise that the outbreak is fraught with danger.

The presence of the plague in the Chinese Empire does not seem to have been brought to notice until the outbreak in 1871, at P'u-êrh, in Yunnan, during the great Mahommedan Rebellion. With its subsequent progress in that province we have been made familiar by the notes of Mr. E. ROCHER and travellers such as BABER and BOURNE, and also by the French missionaries, who have on one or two occasions been attacked by the disease.† From the observations of these men we learn that the plague is endemic in Yunnan, prevailing annually from March to July, the summer heat being evidently adverse to its progress. Its severe epidemic violence in 1871–73 was doubtless accentuated by the misery and privation attendant on the horrors of civil war. According to Mr. ROCHER, opinion in Yunnan is divided as to the origin of the disease, some stating that it reached the province from Burma, while others maintain that it had existed previously in Tali-fu, in the extreme west of the province. In the absence of authentic history as to how long the plague has existed in Yunnan, we may be justified in inferring that the outbreak there is traceable to sources further west. The disease prevails in Northern India—under the name of *máhámari* or *pali*,—and, as we have seen, has prevailed in Persia and the neighbourhood of the Caspian Sea; thence it may have found its way to Yunnan through Thibet or Northern Burma. Of course there

* Vide *Papers relating to the modern History and recent Progress of the Levantine Plague*, presented to Parliament in 1879.

† See also *Customs Decennial Reports*, pp. 670–672.

are writers who regard China as being the original home of the disease, whence it issued forth centuries ago to devastate the world. What their authority may be we cannot say, but probably it is no more reliable than that which has led certain speculators at all times to ascribe to China the honour of being the source alike of those diseases and inventions whose early history is involved in obscurity.

We can find no reliable evidence to show that the plague has been known in Canton previous to the present outbreak, although, of course, from vagueness of nomenclature, the history of any epidemic in China must always be surrounded with a certain amount of doubt. Making, however, all due allowance for this, we are, after diligent inquiry, obliged to accept the statement—received alike from official, medical and lay sources—that although from time to time various epidemics have prevailed in Canton, especially in the spring of the year, the particular disease in question has not hitherto been observed.

At the commencement of the outbreak the native doctors with whom we came in contact expressed themselves as quite ignorant of the nature of the disease. They held no particular theory as to its causation or treatment, but merely spoke of it in such indefinite terms as:—

時疫 *(shih-i)*: "season epidemic"—an indefinite term applicable to any disease prevailing in an epidemic form; and

瘟疫 *(wên-i)*: a term also indefinite, but one, nevertheless, most generally used by the people in connexion with the plague.

Later on many other names were applied to the disease, such as:—

鼠疫 *(shu-i)*: rat plague.

卵子症 *(luan-tzŭ-chêng)*: egg disease, or, rather, bubonic disease.

標蛇 *(piao-shê)*: "shooting snake"—a term said to refer to the rapidly fatal nature of the poison, and also to appearances on the body after pinching.

大頭天行症 *(ta-t'ou-t'ien-hsing-chêng)*:
紅絲疔 *(hung-ssŭ-ting)*:
} terms which are said to be applied on account of certain appearances on the skin resulting from pinching by the fingers or scraping with copper cash, a method of treatment largely resorted to.

瘍子瘡 *(yang-tzŭ-ch'uang)*: this term was not in vogue at the beginning of the outbreak, and was no doubt borrowed from Yunnan, this being the common term in that province; it seems to refer to the boils appearing on the body.

In Pakhoi the disease has been known for quite 30 years, but little attention was drawn to it until the publication of Dr. LOWRY'S report on the severe epidemic prevailing in 1882.*

Excluding as unscientific the theory that, under certain fostering conditions, the virus has originated *de novo*, the question arises, How did the disease reach the seaboard of China? The starting-point was doubtless Yunnan, and thence it most probably found its way to Pakhoi by one of the usual trade routes. The great highway of commerce between Yunnan and Kwangtung is the West River, on which are situated one or two entrepots of trade with Pakhoi and Lien-chou, through which opium and other products of Yunnan are transmitted to those cities. Inquiry in official circles shows, however, that no outbreak of plague has been

* Customs *Medical Reports*, xxiv *et seq.*

known at Nan-ning-fu, Wu-chou-fu or other cities on the West River, which we should expect to find if the disease had spread by this channel. We feel, therefore, justified in excluding this route and limiting ourselves to the more probable supposition that it reached Pakhoi overland through Kwangsi or the borders of Tonkin. Chinese authorities state that it reached Pakhoi from Tonkin, but as it is known sporadically in the borders of Kwangsi, this latter source is more probable.

From official sources we learn that in 1891 the disease broke out in Kao-chao, the prefecture adjoining Lien-chou, in which Pakhoi is situated; it had evidently, according to the Chinese, spread northwards from the latter city. During the present spring the disease prevailed in other places between Kao-chao and Canton; the outbreak at Yang-chiang was especially severe, and no doubt other towns and villages suffered equally from the ravages of the plague in its march northwards. An erratic course is characteristic of its progress, an observation which is fully borne out by a glance at Mr. ROCHER'S map of its spread in Yunnan, where that traveller remarks that, "instead of visiting every village in its course, it would pass some completely by, returning, however, to those neglected spots months afterwards, when the epidemic would appear to have passed far away." * On the outbreak of the disease in Canton many persons, especially the well-to-do, removed into the country, thus forming fresh foci for its dissemination; and in the same way the outbreak in Hongkong no doubt arose from persons having migrated from Canton to Hongkong while actually suffering from the disease or during the short incubation period.

Apart from the risk of future outbreaks in South China, its presence there is fraught with danger to more northern ports. All attempts to keep out the plague by examination of steamers and quarantine regulations, such as have been adopted at some of the coast ports, must in the end prove futile, seeing that no control is exercised over the ingress of the disease by junks and other craft. Besides, there is nothing to hinder its spread overland, just as it reached Canton from Pakhoi. If it came to Canton by sea it is rather remarkable that Hongkong, which is nearer to, and in direct communication with, Pakhoi, should have been visited by an outbreak nearly two months later than Canton. In Hongkong improved house accommodation and hygienic arrangements may in the future prevent the plague attaining the same serious dimensions as in the severe outbreak of 1894; but what of the Chinese cities, where over-crowding, insanitary arrangements and filth provide the conditions so necessary for its propagation? History repeats itself: the disease may remain comparatively quiescent for a few years, but will surely be again called into activity under the same fostering conditions as preceded the present outbreak.

CAUSATION.

History shows that previous epidemics have been preceded or attended by certain conditions and circumstances pointing to a causal connexion.

1.—*Filthy and insanitary Surroundings.*—The sanitary arrangements of Canton are similar to those existing in other large cities of China. Public water-closets are established all over the city, from which both fæces and urine are daily removed and utilised as manure for

* *La Province chinoise du Yunnan.*

the surrounding country. A drainage system can scarcely be said to exist, unless we regard as such the ditches that run under the large paving stones of the streets, and receive rain water and refuse matter washed into them from the houses and shops. The city being flat, there is no fall to empty those drains, and as no municipal control is exercised over the cleansing of them, this duty devolves on individual householders, who, of course, attend only to the sections which more immediately concern them. Consequently the drains are more often than not choked up, and are practically cesspools containing fermenting animal and vegetable refuse. In the smaller streets waste material finds its way into open side ditches, which are usually in the same neglected condition. Several canals enter the city, and as the tide has a rise and fall of about 5 feet twice in the 24 hours, a certain amount of rubbish is carried off in this way. When, however, the river is abnormally low, as during the early part of the year, these canals are like stagnant pools, thick with decomposing matter.

The water supply is equally defective. People living near the river use the river water, which, containing as it does the refuse of the immense boating population, is of course very impure. The majority depend on surface wells, which exist all over the city. These merely contain surface and tidal water which has percolated through a porous soil sodden with the filth of centuries. Bad at the best of times, one can readily imagine the chemically impure state of the water in these wells, almost empty after such a prolonged period of drought.

To persons imbued with Western ideas of sanitation this state of affairs must sound very unwholesome, and no doubt would prove most deadly but for the attention which Chinese in general bestow on the proper cooking of their food and drink. As cities in China go, Canton is comparatively clean and healthy, and, so far as concerns immunity from epidemic diseases in general, may even compare favourably with Eastern cities boasting of more elaborate sanitary arrangements.

2. *Prolonged Drought.*—The rainfall in Canton during the winter months is very small, but during the past winter and spring was exceptionally so. Thus:—

		Inches
1893.	November	...
	December	0.01
1894.	January	0.80
	February	0.31
	March	1.87
		2.99

Intelligent Chinese regarded this absence of rain as the most important factor in the propagation and dissemination of the disease, rendering as it did both wells and drains more filthy than usual.

3. *Epizoötics among the Lower Animals.*—In addition to the mortality among rats, we learn from Mr. ROCHER that in Yunnan cattle, pigs and dogs die in great numbers previous to the outbreak of the plague. Rats, however, suffer more than other animals, and are thus said "to give warning *(p'ao hsin)*, for they tumble about and die in the streets." *

* BOURNE, *Report of a Journey in South-west China.*

The same circumstance was noted in Canton both previous to and during the epidemic. From districts of the city where the disease had lasted for some time rats entirely disappeared, but kept on dying in other parts to which it subsequently extended. They would come out of their holes in broad daylight, run and tumble about in a dazed condition and die. Certain officials took steps to have all dead rats collected, offering about 10 cash per head. Up to 8th May it was stated that the officer in charge of the west gate had in this way collected 22,000, which were duly interred outside the city. So far as we can learn, no other animals were affected. With a view to ascertain the cause of death, we from time to time examined the bodies of these rodents and noted the following postmortem appearances:—

1. Stomach distended and filled with particles of food, sand and indigestible substances; mucous membrane red and inflamed towards the pyloric end.
2. Liver much enlarged and congested, and containing (*a.*) encysted tapeworms (probably tænia saginata)—these were present in every case, in some as many as nine cysts being noted; (*b.*) ova of distomata, usually found in patches near the anterior border—in some the whole liver substance was infiltrated with ova.
3. Congestion at base of lungs present in some—about 40 per cent.
4. Glandular enlargement was present in 30 per cent. of those examined, but in a much less marked degree than in the human subject.

Is the disease in man and animals identical? Should bacteriological examination give an answer in the affirmative, then we must recognise that these rodents are active agents in transmitting the disease from place to place for long distances overland.

We regret that, owing to the strong antipathy of the Cantonese to any foreign interference either in the treatment or postmortem examination of these cases, we have been unable to obtain any evidence bearing on the pathological conditions present in the human subject. Much light will most probably be thrown on the pathology of the disease by the band of scientists who are engaged in investigating the question in Hongkong.

Course and Symptoms.

A few stray cases occurred in the beginning of March, but it was not until the end of the month that attention was awakened, on account of its fatal prevalence in a poor neighbourhood near the south gate of the city, and also in Nan-shêng-li, a quarter occupied by Mahommedans, among whom the mortality was very high. At this time the type of the disease was exceedingly severe—of those attacked, quite 80 per cent. dying. Towards the middle of April the cases we saw were of a milder type; but the disease subsequently became more severe and extended its boundaries to other parts of the city and also to Honam, the maximum mortality being reached about the middle of May. At the "Fang Pien So," an institution inside the north gate, we had opportunity from time to time of examining patients, and were thus enabled to form a more accurate estimate of the progress of the disease than by the slender and unreliable information obtainable from outside sources. Rain fell copiously during the month of May and beginning of June, so that many streets were under water; the temperature remained comparatively low.

But both these factors seemed to favour the propagation of the disease, as by the beginning of June it was rife in the western suburbs as well as in the surrounding towns and villages.

It is impossible to give any correct estimate of the mortality, as no official records of burials are kept. Comparing the estimates obtained from various sources, we believe the mortality from the beginning of the epidemic to the middle of June (the date of writing) to have been about 40,000—a large number, but, in a city with a population of about 1,500,000, by no means excessive when compared with the ravages of this fell disease in other cities. In the great plague of London (1665) it was estimated that 60,000 deaths occurred in a population of 500,000.

Although a goodly number of well-to-do people fell victims to the pestilence, the chief sufferers were the poor—over-crowded and badly housed. The people who escaped the scourge in the most marked degree were those living in upper stories and the boating population. With the exception of those put in boats after falling sick, scarcely a case was noted on the river. Many well-to-do people, observing this immunity, removed from their houses and made their homes on the water. Judging from this circumstance, therefore, and also from the fact that rats living in the ground and drains were the first animals to fall victims, we infer that the specific poison emanated from the soil. What the specific poison may be is not determined, but no doubt the insanitary conditions referred to, exaggerated by a prolonged period of drought, provided a specially suitable nidus for its growth and dissemination.

The immunity enjoyed by residents on the foreign Settlement of Shamien is remarkable, seeing that it is separated only by a creek some 20 yards wide from houses where cases of the plague occurred. Not only did foreigners living on the Settlement enjoy excellent health, but no case of plague occurred among their servants living on the premises; the rats also, up to the date of writing, remain healthy and lively.

The disease is not markedly contagious; it affects chiefly those occupying the same rooms and coming in close contact with the affected. Casual visitors, especially if there is free ventilation, are not liable to contract the disease. In its mode of spread, and in the limited area to which the poison extends beyond the body of the victim, the affection bears a remarkable likeness to typhus, although the course and symptoms show little or no affinity to that disease.

The malady runs no regular course, and has no characteristic eruption or day of crisis. With or without premonitory symptoms, such as malaise or rigor, fever sets in suddenly, rising to 105° or even 107° F., accompanied by headache, thirst, great restlessness, giddiness and subsequently stupor. In from 8 to 24 hours a glandular enlargement occurs in the neck, axilla or groin; in a few hours the swelling may reach the size of an egg, is hard and acutely tender. Coma supervenes, and death occurs in 48 hours from the onset or sooner. Cases lingering on for several days are regarded as hopeful, although relapses are liable to occur. The date of appearance of the bubo is most uncertain, and may occur at any stage of the fever; we have seen it as late as the 5th day, and as early as the onset of the fever. In a few cases vomiting of blood has been observed; in others petechiæ appear, but no characteristic eruption. In milder cases glandular enlargements are absent, the prominent symptoms being fever and diarrhœa with great restlessness and giddiness. Boils may appear during convalescence. Post-mortem lividity is very pronounced, giving rise to the term "black plague."

The chief sufferers are women and children, most probably because, leading a more in-door life, they are more freely exposed to the source of contagion. We have frequently remarked the number of female children suffering from the disease. A medical friend has suggested that as in wet weather Chinese stay in-doors, and so absorb a larger dose of the specific virus, the increase after rainfall may be due to this circumstance.

TREATMENT.

If not edifying, it is at least interesting, to glance at the line of treatment adopted by the native faculty. At first, and in the absence of previous experience of the disease, the usual remedies against fever were employed, but subsequently others, regarded more or less as specifics, were had recourse to. Recipes for nostrums claiming infallibility were freely distributed both by physicians and laymen. Of these the following translation is a fair sample :—

1. Pterocarpus flava, $1\frac{1}{2}$ mace.
2. Betel-nut, 3 candareens.
3. Wild chrysanthemum, 3 mace.
4. Scutellaria viscidula, $1\frac{1}{2}$ mace.
5. Taraxacum officinale (dandelion), $1\frac{1}{2}$ mace.
6. Szechwan rhubarb, $1\frac{1}{2}$ mace.
7. Kan-ts'ao (a kind of grass), 2 mace.

Mix these ingredients, boil, and drink the resulting liquid.

In addition, directions are given to rub the body with the leaves of the wild chrysanthemum chopped into paste.

The following formula was circulated by a gentleman possessed of a smattering of knowledge regarding Western drugs :—

To a teacupful of sea water add 2 candareens of lime made from stone (lime from other sources unsuitable). Shake and filter. To this add $\frac{1}{8}$ tael of calomel. Rub this over the swelling.

In addition, when the patient is dangerously ill, dissolve a dose of iodide of potassium in warm sea water and drink at once.

Many nostrums were vaunted for purposes of gain, while others were distributed by benevolent persons free of charge. Prominent among these are so-called preventive remedies, although from the harmless composition of some we cannot but infer that the element of faith plays an important part. In the streets almost everyone kept smelling some substance which he regarded as endowed with virtues capable of neutralising the poison of the pestilence.

Later on more drastic measures were resorted to, such as burning and incising the swellings, even when no signs of suppuration were present. This line of treatment was certainly severe, but not marked by any success. In fact, taking the treatment all through, and leaving out of the question the pretensions of quacks, native doctors of good repute readily admit that drugs generally are powerless in arresting the progress of the disease.

Passing on from those remedies of a tangible nature, we turn to the devices suggested by superstitious belief, which is particularly rampant in the native character in proportion as ordinary remedies are powerless. With a view to dispel the evil influences, processions paraded the streets by day and night, accompanied by much noise and firing of crackers. Prohibitions

against the slaughter of pigs were equally unsuccessful; so at length the happy idea suggested itself to inaugurate a new year. Proclamations were accordingly issued ordering the 1st day of the 4th moon to be observed as such, and this day was therefore ushered in by the usual noisy demonstrations. The idea underlying this device was that so much suffering having filled the early months of the year, by this resort the misery would be left behind and the remaining months be happy. Dragon boats, which are supposed to possess power to drive away the evil influences, were called into requisition. These boats, after the proper Dragon Festival, are submerged in the beds of the streams until the time of the next annual celebration approaches; but on this occasion they were raised from their resting-places much earlier than usual and paddled along the creeks adjoining the city.

Although we had abundant opportunity of examining the disease in the city, foreign treatment was at a decided discount, and but few cases came under our care.

A. B., foreigner, resident in the city; was first seen on 1st March. Temperature 104°.5; pulse 96. Complained of pain in right groin. On examination found a small bubo, hard and very tender. On inquiry found that a servant resident on the premises had died the previous day, and although the exact nature of the disease could not be ascertained, still, from the fact that the total duration of illness was under 40 hours, accompanied by fever and giddiness, it was suspicious of plague.

Temperature ranged from 103° to 105° for four days, at the end of which period we removed patient to more healthy quarters. The temperature gradually declined, and under painting by iodine liniment and poulticing, the bubo was sufficiently soft to admit of incision on the 9th day, after which convalescence was rapid, although a fistulous opening persisted for some time afterwards.

In the few cases under our care the line of treatment was, briefly, free purgation by calomel at the outset, antipyrin to reduce high fever, quinine and stimulants when necessary. Having regard to the fact that the affection is more or less a form of blood-poisoning, some benefit might possibly be derived from the administration of germicidal remedies, such as carbolic acid, bin-iodide of mercury, etc. Our experience, however, in the matter of treatment has been too limited to warrant us in expressing an opinion on this subject; the rapidly fatal nature of many cases we saw led us to infer that remedies in most instances would prove of little avail, and that success must be chiefly looked for in the domain of preventive medicine.

DR. ALEXANDER JAMIESON'S REPORT ON THE HEALTH OF SHANGHAI

For the Year ended 30th September 1894.

THE weather during the closing three months of 1893 was perfect both from the point of view of health and from that of pleasure. No typhoons reached the neighbourhood of Shanghai, and, with the exception of a heavy blow on the 10th November, the air was free from marked disturbance, light breezes alone varying the prevalent calm. The temperature was slightly below the average calculated from the previous 20 years; but the October maximum (87° on the 1st) was higher than usual. The minimum for October was 40°.5 (26th). Winter began about the 10th November, from which date the air was distinctly cold, although frost did not appear until the 24th, nor did it last beyond the following day. The mercury fell slightly below 32° for a few minutes on the 28th. The maximum temperature for November was 76° (1st), and the minimum, 28° (24th). The mean temperature registered in December was exactly the calculated average. The maximum was 64° (19th); the minimum, 21° (16th). A few flakes of snow, the first for the season, fell on the 27th, and the fall continued lightly on the 28th. Meanwhile the days were for the most part dry and bright. Rain fell heavily on the 3rd and 10th October, but from the 10th to the end of the month there was not a drop. In November the number of rainy days was one-quarter of the average, and the quantity one-eighth. As regards the quantity of watery vapour in suspension, the air was drier in December than in any month previously observed; while the rainfall did not exceed one-fifth of the average. The first shower in the month fell on the 21st, closing a long period of absolute drought.

The temperature continued exceptionally mild during January and February, with which latter month winter may be said to close. The average for January was 40°.5, as against 36°.7, the calculated mean; and that for February 41°.4, as against 39°. January was for the most part dry, with one period of heavy rain lasting from the 23rd to the 27th, corresponding to a marked barometric depression and accompanied by heavy blows over the Shanghai district and along the coast. February was unusually dry. There were but 5 days of rain, the average being 11, and the rainfall amounting to 0.66 inch, as against an annual mean of 2.63 inches. February was remarkable also for a series of slight atmospheric depressions accompanied by moderate wind. On the 19th there was a strong north-easterly gale of short duration.

Spring was as regards temperature an average season, although the mean for April was 1°.8 above that calculated. The range of temperature was narrow. Thus, in March freezing point was touched only once—on the 13th,—while in May the mercury, which generally rises to 88° or 90° and has occasionally reached 96°, did not rise beyond 86°. March opened with

torrents of rain, which continued through the first eight days, after which the weather cleared, and for the remainder of the month there were but two wet days—the 22nd and 23rd. April, on the contrary, was rainy throughout. The number of days on which rain fell was 16 (the average being 13), but the total fall (3.74 inches) hardly exceeded the mean. Rain persisted through May, but was unevenly distributed. The greater part of the total fall was registered during a short but very violent thunderstorm in the afternoon of the 6th, and most of the remainder fell during two periods, from the 11th to the 17th, and from the 28th to the 31st. The thunderstorm of the 6th May was the third which had occurred since the beginning of the year. The first burst over the Shanghai district during the evening of the 11th April, and the second in the afternoon of the 25th. In March the winds were far more violent than in January or February. A heavy gale, densely dust-laden, occurred on the 27th. The winter monsoon did not break up until April, south-easterly wind being very exceptional at Shanghai or along the coast until late in that month. The predominance of wind from the south-east was more marked in May, although its force was less than that recorded in April.

The summer of 1894 will be remembered as one of unusual heat. Comparing the maxima, minima and means for June, July and August respectively with the corresponding figures drawn from the observations of 20 years, it is found that the maximum for June was 1°.7, for July 1°.8, and for August 6°.3 above the average; the minimum for June was 3°.6, for July 5°.9, and for August 4°.8 above the average; and, finally, the mean for June was 1°.4, for July 2°, and for August 2°.2 above the average. On the other hand, the temperature registered in September was rather below the calculated level. In spite, however, of excessive heat the summer months were not notably oppressive. This was due to the dryness which prevailed and the consequent facility of exhalation from the cutaneous and pulmonary surfaces. In June, beside light showers spread over nine days, there was one, and only one, period which could be called rainy, namely, from the 15th to the 19th. During this period the only thunderstorm for the month occurred. The total rainfall (4.49 inches) was but little above half the average. In July and August drought was still more marked. There were only five days of rain in the former month, with a total fall of 3.62 inches, of which 2.13 inches fell on the 1st, while the remainder accompanied two thunderstorms which burst over this region on the 8th and 27th respectively. August opened with a short rainy period lasting to the 6th, which was succeeded by absolute drought up to the 30th, when a heavy thunderstorm, which may almost be said to have broken up the summer, occurred. During this storm 2.07 inches of rain fell, out of a total of 3.89 inches. Thus, instead of the calculated average of 36 rainy days with a fall of 18.08 inches spread over June, July and August, the register for this period in 1894 shows 26 rainy days with a fall of 12 inches. September was dry up to the middle of the month, but between the 14th and the 30th there were 13 days of rain.

The heavy rain noted as having fallen on the 1st July and the rainy period with which August opened corresponded to the only two typhoons which approached the coast between Shanghai and Foochow during the summer. The first passed over Wenchow on the 30th June, and the second over Nankwan harbour (27° 10′ N.) on the 3rd August. While these typhoons were in our neighbourhood strong easterly and north-easterly breezes were experienced here. Otherwise the season was remarkably calm.

DEATHS among FOREIGNERS from 1st October 1893 to 30th September 1894.

CAUSE OF DEATH.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL.	MAY.	JUNE.	JULY.	AUG.	SEPT.	TOTAL.
Small-pox	...	...	...	1 3†	2* 1†	1	1*	...	...	...	...	...	9
Enteric fever	1*	1*	...	...	...	...	...	...	1	1	...	...	4
Remittent fever	...	...	...	...	...	...	1†	...	...	...	...	...	1
Puerperal fever	...	...	...	...	...	...	...	...	...	...	1*	...	1
"Fever"	...	...	...	...	...	...	...	...	...	...	1	...	1
Septicæmia	...	...	...	...	1	...	...	...	...	...	...	...	1
Diphtheria	...	1	1†	1	...	...	...	...	...	...	...	1	4
Syphilis	...	...	...	...	...	...	...	1†	...	...	...	...	1
Tuberculosis	...	...	...	...	...	...	...	...	...	...	...	2*	2
Phthisis	1*	1	2	...	1	...	...	1*	...	3 1*	...	1	11
Cancer	1	...	...	...	...	...	...	...	1	...	1	...	3
Bright's disease	...	...	1	1*	1*	...	2	...	...	...	...	...	5
Alcoholism	...	1	1	...	1	...	...	...	...	1	...	...	4
Anæmia	...	...	...	...	...	...	...	...	1*	...	...	...	1
Marasmus	...	...	...	1†	1†	...	...	...	...	...	...	...	2
Tubercular disease of brain and membranes	...	...	...	...	...	...	1*	...	...	...	2†	...	3
Heat apoplexy	...	...	...	...	...	...	...	...	...	...	1 1*	...	2
Cerebral apoplexy	...	...	...	...	...	1	...	...	...	...	...	1 1*	3
Tetanus	...	...	...	1	...	...	...	...	...	...	...	...	1
Convulsions	...	...	...	...	...	...	...	...	...	...	1†	...	1
Heart disease	...	...	...	...	...	...	...	1	1	...	...	...	2
Laryngitis	...	...	...	...	1†	...	...	...	...	...	...	...	1
Bronchitis	...	...	...	...	...	...	...	...	...	...	1†	...	1
Broncho-pneumonia	...	...	...	...	...	...	...	...	...	...	...	1†	1
Pneumonia	...	...	...	...	1*	1	...	...	...	...	...	...	2
Empyema	...	...	...	...	...	...	...	1†	...	...	...	...	1
Peritonitis	...	...	...	...	...	...	...	1	...	...	...	1	2
Gastro-enteric catarrh	...	1†	1†	...	...	1†	...	1†	...	...	...	...	4
Enteritis	...	...	...	...	...	...	...	...	...	...	1 1†	...	2
Diarrhœa	...	...	1*	...	...	...	...	1	...	2†	...	2†	6
Dysentery	2	1	2*	...	...	...	...	...	...	...	...	1*	6
Infantile cholera	...	...	...	...	...	1†	...	...	...	1†	...	...	2
Strangulated hernia	...	...	...	...	...	...	...	...	...	...	...	1*	1
Cirrhosis of the liver	...	1	1	...	...	...	...	...	...	...	...	...	2
Abscess of the liver	...	1	...	1*	...	...	...	1*	...	...	...	1	4
Accidental poisoning	...	...	...	1	...	...	...	...	...	...	1*	...	2
Accidental wound	1	...	...	...	...	...	...	...	...	1*	1*	...	3
Suicide	...	...	...	1*	...	...	...	...	...	1*	...	...	2
Drowning	...	...	...	1*	...	...	...	2*	...	1	1*	...	5
Old age	...	...	...	...	...	1	...	...	...	...	...	...	1
Uncertified	...	...	1	...	1*	...	1 1†	1*	...	...	...	...	5
TOTAL	6	8	11	12	11	6	7	11	4	12	14	13	115

* Non-residents (36). † Children under 10 (28).

This table does not call for extended comment. No fatal case of cholera occurred during the year, although the disease, or the assemblage of symptoms which we call cholera, was common among the natives, and one unmistakeable case was admitted to the General Hospital in July 1894.

The patient, a French man-of-war's man of festive habits, had been drunk in the grogshops on the 24th and 25th. What had become of him on the 26th nobody seemed to know. On the morning of the 27th, having been arrested and carried on board his ship, he was seized with all the usual symptoms of cholera. When he arrived at the hospital prostration was extreme, the respiration was shallow, rapid and difficult, but the pulse had not disappeared, and the voice was to some extent preserved. His chief complaint was of intense heat. The skin was very cold, and the rectal temperature, which in consequence of

restlessness was taken with great difficulty and was not altogether reliable, was 100° F. A little highly albuminous urine was passed after 30 hours, and next day convalescence was fully established.

The mortality from small-pox was serious, and it will be noticed that four children died of the disease. The first European case for the season occurred on the 12th November 1893, but a Japanese had been admitted to the small-pox hospital on the 8th October. It is much to be desired that the Councils should obtain power to remove foreign cases of small-pox to hospital whenever the Health Officer or the practitioner in attendance reports that isolation is otherwise impossible. As it is, small-pox is frequently treated in private houses, to the serious danger of the inmates and even of the neighbourhood, the patients or their friends objecting to removal, and no power existing to enforce it. Diphtheria, as previously noticed, is increasing in frequency. On the other hand, it is satisfactory to observe that among residents there were but two deaths from enteric fever during the year. Diarrhœa and dysentery together killed four resident adults, a figure far below those annually registered a few years ago, when the water supply was in every way objectionable. Two residents and two visitors died of abscess of the liver. It is curious, but undoubtedly true, that (as is also the case with cholera) the fatality of this affection is far higher among foreigners in China than among foreign residents in India. In the latter empire the mortality after operation is 50 per cent. Here the numbers are so small that a per-centage estimate may easily be deceptive, but it is certainly no exaggeration to set down the death rate at at least 80 per cent.

In October 1893 my private sick list was made up almost exclusively by diarrhœa, inflammatory diarrhœa, dysentery, malarious fever, hepatic congestion, sore throat of various types, and bronchitis. Inflammatory diarrhœa was chiefly prevalent among children, and was doubtless often due to errors of diet for which native servants were responsible. A few cases of true dysentery requiring ipecacuanha were under observation, but most attacks of dysenteric character yielded to gentle laxatives and carefully regulated diet. The constipation of dysentery and of fluxes resembling it is not sufficiently recognised. Hence the mischief done by patent or proprietary anti-cholera and anti-dysenteric specifics, which tend to shut up within the colon scybala which are frequently the sole cause of watery and mucous discharges. It cannot be too widely known that while no harm can possibly be done by beginning the treatment of every case of diarrhœa or dysentery, without exception, by the administration of a gentle saline or oily laxative, the laxative will itself in the majority of cases be the only treatment required. The time for sedatives or astringents comes later, and even in dysentery there is no better preparation for the action of ipecacuanha than the clearing away of putrid matter which has accumulated before the specific symptoms declare themselves. With a few cases of remittent fever of the old "Shanghai" type, in so far as that was differentiated from enteric, and was therefore amenable to quinine and cholagogues, there was what might almost be described as an epidemic of intermittent fever, mostly of the quotidian type. The usual quinine treatment during the intermissions was always effectual. The beneficial action of antipyrin in cutting short the congestive stage of intermittent fever, and hastening the stage of sweating, during which quinine can be administered largely, should be borne in mind. 20 or 30 grains of antipyrin in two doses at an interval of a couple of hours act much more agreeably than the emetic and more rapidly than the purgative which used to precede with advantage the administration

of quinine. There cannot now, I think, be any reasonable doubt of the existence of some sort of relationship between all forms of sore throat accompanied by exudation upon any portion of the buccal or pharyngeal mucous membrane. It is certain that some cases in which spots of deposit form on the tonsils, giving at the first glance the impression of follicular tonsillitis, and which are not infective so far as the individual is concerned, are contagious, contact with them lighting up diphtheria, which may prove fatal. The accuracy of this assertion I am unfortunately in a position to prove, as will be seen farther on. It is therefore imperative to isolate every case of sore throat in which any patches are seen, even when the affection, whatever it may be, is evidently running a benign course. Inflammatory affections of the air passages, seldom of much gravity, are common at the change of season, when hot days are succeeded by cool or cold nights. Thus also is to be explained the frequent occurrence of fugitive hepatic congestion in healthy persons at the same time of year, accompanied or not by vomiting either of reflex character or perhaps due to congestion of the stomach walls.

The remarks just read are applicable to the entire of the last quarter of 1893. During November and December as the average temperature fell malarial affections and intestinal fluxes diminished in frequency. Catarrhal sore throat and bronchitis continued to be observed.

The year 1894 opened with a burst of malarial fever not easy to explain. Cases, mostly of quotidian, presented themselves with great frequency, but none that I saw were of special gravity. All catarrhal affections—conjunctivitis, pharyngitis, bronchitis,—which had diminished during the previous months, again became prevalent. So also with diarrhœa, whether simple or dysenteric. Among children varicella was common, but cannot be said to have been epidemic. Small-pox, though not by any means widespread, gave rise to a sort of panic among the foreign community, which had the effect of creating an urgent demand for revaccination. Judging by my own experience I should think that by the end of February very few foreigners remained who had not been revaccinated.

Saigon lymph, which has always proved of excellent quality, has been largely—almost exclusively—used, and I imagine that the use of humanised lymph has within the past year been almost, if not altogether, abandoned. Vaccination with Saigon lymph is frequently followed by a generalised eruption and marked fever, but this latter seldom assumes important proportions. In three cases in which I used Brussels lymph the symptoms induced were of extreme severity, the entire body being covered with cow-pox vesicles and the temperature ranging between 102° and 105°. There probably was but little, if any, danger to life, and the disease in each case ran a much more rapid course than small-pox would have run. The actual suffering undergone during the worst period of the eruption was, however, in nowise less than would have accompanied an ordinary attack of discrete small-pox. From every point of view Saigon lymph is to be preferred to that imported from Europe or America; it has now proved its safety and efficiency, and there would seem to be no advantage whatsoever in making any experimental attempt to supplant it.

The small-pox scare continued through February as exaggerated reports of the wide spread and fatality of the disease reached the public. As a matter of fact, foreign residents in China are marvellously exempt from small-pox, considering the intimate relations in which they are compelled to live with the natives. The freedom thus enjoyed by foreigners is certainly due

to the care and frequency with which revaccination is performed. Interesting and valuable observations might be accumulated if the course of revaccination was in all cases noted from day to day.

Thus, a young foreign lady recently arrived in Shanghai had been vaccinated in infancy, and in early childhood passed through an attack of small-pox the scars of which were here and there visible. She had been revaccinated in two places a few years later and the marks of this operation were distinct, but it was impossible to say exactly from what time they dated. I vaccinated her with Saigon lymph on the 6th February. On the 10th February there was a minute papule at the site of vaccination, but no sign of vesiculation. She was so terrified by the possibility of catching small-pox that she begged me to vaccinate her again, which I did on the 11th. This second revaccination proceeded at first sluggishly, as the former had done. It was not in the least affected by the previous vaccination, but developed side by side with it. In each case a vesicle formed on the 5th day with a faint surrounding areola. The contents became milky on the 7th day, and frankly purulent on the 10th. Drying and scabbing followed quickly, and at the end of three weeks good marks were left.

A few cases of whooping-cough and of parotitis occurred among foreign children in late winter and early spring. The former was extremely prevalent among natives. Several adults suffered from pneumonia, and I observed an unusually high ratio of simultaneous affection of both lungs. Catarrhal sore throat, rheumatic tonsillitis, and sewer-throat came frequently enough under observation; but I know of no case of diphtheria having occurred before April. At all events, no death from this cause happened before that month. The circumstances attending a group of cases then observed were of the greatest importance as enforcing all that can be said about the insidious character of diphtheria.

A household consisting of husband, wife and two girls, aged respectively 18 and 14, were living on a terrace in Hongkew under ordinary conditions of hygiene and personal comfort. So far as I could make out by careful inquiry, no cases of diphtheria or suspicious sore throat had lately occurred in the immediate neighbourhood. The younger of the girls was at a boarding-school where the scholars are sedulously watched, and isolated on the first appearance of illness. The health conditions as to elevation, ventilation, drainage, cleanliness and dormitory space in this school are unexceptionable. No cases of any kind of sore throat had occurred there for several months. During the last week in March the younger girl complained of sore throat, and was immediately isolated. The mucous membrane was livid, the uvula œdematous, there was no deposit or exudation. Her maximum daily temperature varied between 102° and 104°. There was nothing particularly noticeable about the case except severe pains in almost all the large joints, none of which were hot or swollen, and that the degree of prostration was out of proportion to the fever and the apparent local condition. She rapidly improved under salicylate of soda, and on the 4th day her temperature was normal until night, when it rose to 101°, returning definitely to normal in the morning. Next day two small white spots appeared on the right tonsil and uvula. Two days later the throat was well, and so far as this child was concerned the incident terminated here. She continued in perfect health, and no further case of the disease, whatever it was, occurred in the school.

The girl's mother inquired for her every day, and, unluckily, became deeply discontented when she was informed that although the fever had disappeared and the throat seemed well, isolation and baths were still considered necessary. Without further ado she carried the child away with her, and, as was afterwards ascertained, put her to sleep in the bed occupied by the elder girl.

On the 12th day after the younger sister's return the elder felt generally ill, but went to school on the following morning. I saw her at night (2nd day of the disease). Her temperature was 105°, and she complained of headache, backache and sore throat. For want of light nothing very exact could be made out in her throat. Early next morning (3rd day) speaking and swallowing were difficult; the cervical

glands were tender and swollen on both sides; both tonsils, uvula, soft palate and anterior pillars were œdematous and covered with white exudation. The urine contained $\frac{1}{250}$ albumen (Esbach's test). The usual treatment by internal stimulation and local antisepsis was adopted. On the 5th day swallowing became easier after a temporary fall of temperature to normal during the previous night. At noon on this day I noted:—"The pharynx is invisible, as the œdematous anterior pillars, covered with exudation, meet in the middle line." The following night there was great frequency of micturition, and I was informed next morning that for the previous three days (since the evening of the 3rd day of the disease) a great deal of liquid blood had been flowing painlessly from the bowel. At noon on the 6th day I noted:—"Sudden change for the worse at 10 A.M. Face puffy and waxy, hands purple. For the first time respiration is accompanied by much retraction of the thorax. A sponge-like mass of exudation protrudes into the mouth from the right anterior pillar." I opened the trachea instantly without an anæsthetic, and apparently without causing pain. There was no exudation in the trachea. Respiration became easier. Death occurred two hours later.

There can be little doubt that the elder girl's fatal disease was caught from the younger, or that the disease in the case that recovered was diphtheria. The absorbed poison had, however, undergone a process of development in the first case which enhanced its virulence before its absorption by the second. Or it may have been that from unknown causes the tissues of the elder girl offered a more favourable soil to the invading germ, the germ itself remaining unchanged.

However this may have been, no paralytic symptoms followed recovery in the first case.

The history does not end here, although its special interest does.

Four days after the girl's death the mother complained of sore throat. There was very slight general inflammation, or rather relaxation, of the mucous membrane. Fever of remittent type lasted for four days in spite of full doses of quinine, no alteration being observed in the condition of the throat. The highest temperature reached was 102°.9, on the morning of the 4th day. The temperature on the previous day and through the night had varied round 99°. At 6 A.M. it suddenly rose to 102°.5, and this rise was accompanied by extensive exudation on the hard palate. Next day (5th), without any alteration of the voice, the uvula was engaged. Delirium now set in without excessive fever (maximum 101°). On the 6th day there was dysphagia for the first time, but it passed off rapidly, and did not recur for two days. On the 8th day the evening note was:—"Hands cold, tongue dry, exudation has been poured out thickly over entire throat, face dusky; she is very drowsy and indifferent." She died next morning after a quiet night, during which she once woke up and expressed the belief that she was getting well.

This tragical series of events took origin in the benign affection of the younger daughter, and would certainly not have occurred had not her isolation been interrupted and close contact permitted between her and the members of her family. She remained along with her father in close attendance on the two fatal cases, but having just gone through a modified form of the disease she was presumably protected ("vaccinated") against it, and had no further trouble. The father also escaped, possibly because he smoked incessantly day and night while sedulously nursing the patients.

I have now a sufficient number of very carefully registered cases to lead me to the provisional conclusions, (1) that every sore throat with fever and exudation is diphtheritic, and (2) that when exudation is preceded by a fall of temperature the patient is not in danger, but is no less a source of danger to others.

These conclusions are, as I have said, only provisional. In any case no harm can arise from acting on them.

Later on in the year other cases of diphtheria occurred. During March and April malarial affections and abdominal fluxes were infrequent, but many people suffered from the catarrhal fever without sequelæ which has locally been labelled "influenza." A few cases of varicella were treated among children, and tonsillitis was common.

In May and June I saw three doubtful cases of scarlatina in children, all of severe character, but all terminating in recovery. On account of the abnormality of the symptoms and of their grouping I am disposed to refer these cases to poisoning by various doses or various qualities of sewer gas. In all three the drains of the houses in which the disease occurred were in bad condition. A sketch of one case may serve for all.

Fever came on suddenly, rising to 104° on the 2nd evening. There was no coryza or lachrymation. The tongue was loaded, with here and there a minute patch of enlarged and reddened papillæ, but was in no sense characteristic. The tonsils were slightly enlarged. The throat was stripped in several places and bleeding, causing much difficulty in swallowing. On the 3rd day its surface was covered with a profuse muco-purulent deposit, easily wiped away with a dossil of cotton soaked in an alkaline solution. Simultaneously with this, erythematous patches appeared on the arms and legs, enclosing closely set minute scarlet dots. No patches appeared on the face or trunk. There was no albumen in the urine. On the 5th day the eruption began to fade and the temperature fell to normal, though the throat was still stripped of epithelium in one or two places. On the 6th day subnormal temperature, with branny desquamation of the skin patches; the throat normal. Next day the child was perfectly well, the disease having completed its evolution in exactly a week.

Measles was of frequent occurrence in May; and through the early summer months children, as is always the case at this season, when fresh fruit is plentiful, suffered severely from digestive and nervous symptoms due to lumbricoid worms, and from urticaria due generally to mangoes, lichees and strawberries. There was no great prevalence of either malarious fever or diarrhœa, and (speaking from my own experience only) cases of enteric fever were unusually infrequent. The Settlements must in fact have been remarkably free from this form of fever all through 1894, inasmuch as during the nine months from the 1st April to 31st December I had but four cases in my wards at the General Hospital, none of them of severe character and all terminating in recovery. It will be noticed that among residents only two deaths were attributed to this disease during the year under review. Bronchitis of more or less severity was common until the hot weather set in. With the onset of persistently high temperature the affections due to it, such as sleeplessness, general exhaustion, dyspepsia, anorexia and fugitive anæmia, showed themselves, as they do every summer, in forms generally of little real gravity. Two deaths (one of a resident) occurred in August from heat apoplexy, and many cases of fever, lasting two or three days and presenting none of the characters of malaria, were attributable to the high air temperature, often aggravated in its action by imprudent bodily exertion, the two together inducing the condition known as "fièvre de surmenage." Boils also were common. The diarrhœas of this period of the year usually follow chills caught during the enjoyment of currents of cool air while the body is bathed in perspiration, as, for instance, after lawn tennis. Distressing attacks of vomiting are not infrequently due to the same cause, to which also may be referred the great frequency of inflammation of the external ear. Malarious affections, though infrequent, are of course never altogether absent from the sick lists of the hot months, and when fever does occur it is very liable to assume a pernicious form, comatose in adults, and convulsive in children.

A patient about 40 years of age, leading a very regular life but forced to expose himself to the sun, had been ailing for a few days with fever of remittent type. The highest temperature registered on the 25th August had been 101°, and this only for a couple of hours in the afternoon. During the rest of the day the temperature had varied between 99° and 100°.

Through the night of the 25th–26th August he was sleepless and very restless, walking about, but not delirious. His temperature at 6 A.M. was 100°.2, and at 10.30 A.M. 100°.6. At this latter hour there was nothing strange in his manner, but I noted a curious "hunted look" on his features which I have observed in several cases of malarious fever on the point of assuming a pernicious form. At noon the temperature was 101°; at 2.30 P.M. 103°; at 3.30 P.M. 104°. At 5 P.M. he was quite unconscious, groaning, the face grimacing, the muscles of the arms and legs twitching, the skin of the face waxy, the lips violet, the skin of the trunk and limbs livid. He had rolled himself tightly in a thick blanket. Respiration very rapid and superficial, interrupted every now and then by a deep sigh. The pulse was apparently slow and intermittent, but twitching of the muscles made it almost impossible to judge of its character. An attempt to take the temperature in the axilla, the thermometer remaining only a few seconds in place, gave 106°.5. The skin was dry and scorching; the pupils were pinpoint.

Fifteen grains of bisulphate of quinine was injected subcutaneously in four punctures. The patient, deeply insensible, was placed in a bath covering the whole body to the chin, through which water from the tap was kept continuously running, the plug being removed and the bath overflowing. The supply of ice was extremely limited. I, however, secured enough to keep a block constantly supporting the neck, and a piece continually applied by gentle friction all over the head. There was reflex clutching of the edges of the bath as the water from time to time lifted the body. I had no ordinary thermometer to measure the temperature of the bath water, but I think it averaged about 78°. No observation of the bodily temperature was taken at the moment of immersion.

After 20 minutes immersion the temperature in the rectum was 108°.6.
" 35 " " " " " 106°.5.
" 45 " " " " " 104°.8.

At this moment consciousness returned. He recognised the people round him and said "I've come back; it's a miracle I've come back." He could now swallow, and sips of brandy and water were administered.

After 60 minutes immersion the temperature in the rectum was 102°.2, and he shivered.

He was at once removed from the bath, a light blanket thrown over him, and his body gently rubbed dry. 10 minutes later the rectal temperature was 101°.4. He was quite conscious and inclined to be loquacious, but was extremely deaf. 15 grains of bisulphate of quinine was again injected hypodermically. His skin now felt natural; respiration 20, regular; pulse 105, soft and fairly full. A large ice bag was ordered to be kept constantly applied to the back of the neck.

At 10 P.M. temperature 102°.4. Deafness was passing off. 15 grains of quinine were given in enema.

During the succeeding days the temperature on two or three occasions reached a maximum of 102°.5. Quinine was kept up in 10-grain doses every four hours, but on the 5th day, as it appeared to have lost its effect, it was stopped. All this time he had lain on an ice bag applied to the neck. He now suffered chiefly from sleeplessness, and a mixture of chloral and bromide of potassium was ordered. Meanwhile he was carefully nourished, and the bowels kept in order by frequent doses of a saline aperient. The temperature fell as soon as the quinine was stopped, and never reached 100° after the 7th day. Convalescence now proceeded without interruption.

In the last week of August two cases of diphtheria were under treatment in the General Hospital. In one case, a child's maid employed in a foreign house called to see a friend, and

casually mentioned that her throat was sore. Three minute patches of exudation were found on her tonsils, and she was retained, against her will, as she professed not to feel in any way ill, although she had been seedy for a few days previously.

Her temperature, in fact, was 99° and she had an excellent appetite. Next day the exudation had spread to the posterior border of the soft palate, and deglutition was difficult. There were no general symptoms; and after four days all the patches had disappeared. She was kept in hospital for another week, under the continuous use of local disinfectants. A month after her discharge I heard of her suffering from occasional cough during eating, and regurgitation of liquids through the nose.

The second case was that of a novice living in the Sisters' quarters at the hospital, seeing nobody from outside but members of her family at long intervals. How she acquired the disease is mysterious.

In her case, between the 3rd and 4th day of fever of remittent form, accompanied by slight swelling and tenderness of the cervical glands, a small spot of exudation was found on the left tonsil. This rapidly increased and spread to the right tonsil and thence to the back of the pharynx. The soft palate was very slightly engaged. Dysphagia was the most distressing symptom, and this appeared to be due more to pain in the neck than to any local soreness or mechanical obstruction. There was little interference, if any, with breathing. The fever continued until the exudation completely disappeared. Some weeks later this patient was inconvenienced by occasional regurgitation of liquids through the nose, and her voice retained a nasal twang for months.

A few weeks later, towards the end of September, a case of diphtheria was brought into hospital, which proved rapidly fatal, and whose history is instructive from the point of view which I adopt here and at pages 76 and 78. The unusual suddenness of onset is also deserving of notice.

About the middle of September an apprentice on board a ship lying in harbour suffered from "a bad sore throat with some white spots, and swelling of the neck." Nothing particular was done for him and he got well speedily. The captain had a large family of young children on board, and this boy was allowed to play with them while he was still complaining of his throat.

A week after the boy's recovery, a girl aged 10, without any premonitory symptoms, suddenly complained of difficulty in swallowing and in opening her mouth, and it was noticed that the left side of her neck was swollen. Her skin was burning all day. She swallowed nothing, but constantly hawked up stringy mucus. Her breath was offensive. Next day (2nd of the disease) she was brought into hospital, when the following note was taken :—

Very marked swelling, not tender to gentle pressure and not hot, reaching from the left mastoid process vertically downwards to the clavicle. The lower jaw cannot be depressed beyond half an inch without severe pain referred to the middle point of the swelling. Only a very imperfect view of the fauces can be obtained, but the upper border of a white deposit on the tonsils and anterior pillars can be seen. Breath smelling horribly. Voice preserved. Tongue dry in centre. Can swallow nothing.

In the evening the mouth could be opened a little better and it was found that the soft palate was gangrenous. The voice was now hoarse and nasal, respiration was extremely rapid, but there was no dyspnœa. Next morning (3rd day), dyspnœa and retraction of thorax. Tracheotomy under chloroform, the tissues of the neck exuding much serum on section. Respiration was easy from this out. In the afternoon the child was cheerful and drank some milk. On the 4th morning, after an interval of inability to swallow during the night, she could drink freely, and swallowed a considerable quantity of milk and beef juice. At 6.30 A.M. she became unconscious, with blue lips, etc. The canula was clear, but the trachea was full of mucus and serum. This was pumped out with a syringe adapted to an india-rubber drainage tube

introduced through the canula, artificial respiration being meanwhile maintained. Respiration was re-established after about 45 minutes, and there was no further difficulty on this score. The heart gradually failed; quiet unconsciousness set in, broken by occasional short fits of restlessness, and death occurred in the evening.

This history also has a sequel.

A galley boy in the same ship was brought to hospital about a fortnight after the child's death. Three days previously he had been suddenly seized with shivering followed by heat and sweating. Next day (2nd) he complained of severe lumbar pain, the fever persisting, and on the 3rd day swallowing became extremely difficult and painful. On the 4th day he was sent into hospital. His symptoms then were:—Temperature (at noon) 102°.8; sweating profusely; tongue baked along an oblong surface $\frac{3}{4}$ inch wide, occupying its middle from root to point; pulse soft, full, easily extinguished; breathing 40, extremely superficial; dysphagia. No eruption anywhere on skin; there is a white deposit symmetrically situated on both halves of the soft palate, starting from the base of the uvula. Voice nasal; much irregular swelling of the neck, but no marked or localised tenderness. A very faint trace of albumen in the urine.

The exudation disappeared on the 6th day, but the temperature remained high (maximum, which varied as to the hour, 104°.6) until the 30th day, and defervescence was not final until the 41st. Meanwhile the stools became typhoid in character on the 8th day, and the general symptoms, due possibly to the action of toxines absorbed from the throat, or possibly to extrinsic infection running its course after having first manifested itself by the throat exudation, would, but for the history of the case, have been attributed to a slightly aberrant form of enteric fever. The heart's action became intermittent on the 14th day. The soft palate was partially paralysed on the 19th day, after which there was gradual improvement. The pulse did not become regular until the 34th day. Convalescence was protracted, and the boy was still extremely weak, though otherwise well, when discharged on the 51st day of his disease.

The source of infection in this boy's case is obscure. His work did not carry him near the captain's quarters, which, moreover, had been thoroughly scraped and repainted some weeks before he was attacked, as soon as the nature of the child's illness was known.

In the last week of September two cases occurred at a boarding-school in children aged 11 and 13 respectively, the description of which exactly follows the lines of the first of the series of cases of diphtheria above related (page 78). They were isolated and recovered, the disease not spreading. A few days later a case which proved fatal was admitted to the General Hospital.*

Among the minor affections observed during summer, prickly heat held an important place, notwithstanding its acknowledged benignity, which causes it to be ranked with corns and toothache among annoyances undeserving of serious sympathy. In 1894, however, a large number of cases came under observation in which the intense and persistent tingling induced sleeplessness with consequent general malaise. The treatment which I have always found most useful is a tepid bran bath twice a day, and the avoidance of soap, which should be replaced by raw egg, the whites and yelks of a couple of eggs being mixed thoroughly with the fingers in a

* Out of the large number of cases of diphtheria that I have seen, I have notes of and remember only two (both fatal) in adults, although naturally many adults were engaged in the care of each infantile case. This is merely an additional illustration of the fact already well known, that diphtheria is especially a disease of childhood. But it is interesting to place alongside of this fact the recent observations of WASSERMANN of Berlin, to the effect that the blood of persons who do not contract diphtheria, although constantly exposed to the infection, possesses the property of neutralising 10 times its volume of the diphtheritic toxine.

convenient vessel, and gently rubbed into the skin before entering the bath. Raw egg is as cleansing to the skin as soap, and causes no irritation.

As the summer closed, and cold nights succeeded hot days, inflammatory diarrhœa became extremely prevalent, especially among young children. The disease, however, in most cases yielded readily to treatment, and only three deaths were certified in September as due to intestinal fluxes.

A death from "accidental poisoning" was recorded in August. This was a fatal case of chloroform narcosis and occurred in my practice.

A young German, apparently in perfect health, had arrived in Shanghai direct from Europe a few days previously, with the intention of settling in the interior of China. He had several carious teeth, and these he arranged to have extracted by a local dentist under chloroform. While he was preparing for the operation I asked him whether he had ever taken chloroform before. To this he replied in the negative, adding that he was a very nervous fellow, but that he could not face the pain of tooth extraction without an anæsthetic. After the usual precautions as to loosening his clothes, examining his mouth, etc., he was laid perfectly horizontal in the chair, and the administration of chloroform begun from ESMARCH's open inhaler. He did not struggle, and in about one minute the conjunctivæ were no longer sensitive; I removed the inhaler and three stumps were quickly extracted. The forceps was on the fourth when respiratory movements of the abdomen ceased, the right external carotid artery, which from the position of the head and neck it was particularly easy to observe, continuing to beat forcibly. I caught the tongue and pulled on it rhythmically four or five times, but failing to excite any respiratory movement, I had the patient laid on the floor, and began artificial respiration. The pupils, which were contracted when the operation began, were now widely dilated, and the carotid pulsation had ceased. The face and ears were livid, and death had evidently already occurred. Artificial respiration was, however, kept up without intermission for half an hour, when it was abandoned.

A postmortem examination was made 12 hours after death by Dr. PAULUN. In the lungs there were old cicatrices of small tubercular cavities at both apices; otherwise they were healthy. The heart was healthy. The left ventricle was slightly distended; the right ventricle was empty. Liver, spleen, kidneys healthy. Catarrhal inflammation of stomach and intestines; the stomach walls deeply injected, this condition extending through the duodenum.

The inflamed condition of the stomach and intestine seems to have given rise to no symptoms; at all events the patient had made no complaint of any discomfort.

II.—SPECIAL SERIES.