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Inspector General's Circular No. 19 of 1870.

Inspectorate General of Customs,

Peking, 31*st 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, &c. / 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. I have committed to Dr. Alex. Jamieson, of Shanghai, the charge of arranging the reports for publication, so that they may be made available in a convenient form.

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, &c.,

(signed) ROBERT HART,
I. G.

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

SHANGHAI, *8th January*, 1877.

SIR,

IN accordance with the directions of your despatch No. 6 *A* (Returns Series) of the 24th June, 1871, I now forward to the Statistical Department of the Inspectorate General of Customs, the following documents:—

A.—Further observations on Filaria Sanguinis Hominis, pp. 1-26.

B.—Report on the Health of Amoy, pp. 27-35;

C.—Report on the Health of Shanghai, pp. 36-55; and

D.—Report on the Health of Canton, pp. 56-61; each of these referring to the half-year ended 30th September, 1877.

E.—Report on the Health of Chinkiang for the year ended 30th September, 1877, pp. 62-64

F.—Report on the Health of Ningpo, p. 65;

G.—Report on the Health of Tientsin, pp. 66, 67;

H.—Report on the Health of Swatow, pp. 68-78; each of these referring to the half-year. ended 30th September, 1877.

I.—Report on the Health of Hankow for the year ended 30th September, 1877, pp. 79-81.

K.—Report on the Health of Tamsui and Kelung, p. 82;

L.—Report on the Health of Foochow (Pagoda Anchorage), pp. 83-94; each of these referring to the half-year ended 30th September, 1877.

I have the honour to be,

SIR,

Your obedient Servant,

R. ALEX. JAMIESON.

THE INSPECTOR GENERAL OF CUSTOMS,
Peking.

The Contributors to this Volume are—

P. MANSON, M.D., CH.M.	Amoy.
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R. A. JAMIESON, M.A., M.D., M.R.C.S.	Shanghai.
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A. R. PLATT, M.D.	Chinkiang.
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E. I. SCOTT, L.K.&Q.C.P, L.R.C.S.I.	Swatow.
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A.—Further observations on Filaria Sanguinis Hominis,*

By PATRICK MANSON, M.D.

THE following statistics and observations were made with the view of ascertaining:—

1st.—The degree in which the general population of this district (Amoy) is affected with Filaria sanguinis hominis.

2nd.—The influence of age, sex and occupation, in determining the presence of the parasite.

3rd.—The morbid conditions, if there are any, with which it is associated.

4th.—Its history and development.

Before giving the results of my observations I will premise that, with the exception of cases of elephantiasis and allied diseases, the selection of subjects for examination was made without reference to their physical or social condition. Most were patients at the Chinese Hospital suffering from a variety of miscellaneous diseases, but many were relatives or friends in charge of patients and not themselves diseased; others again were students at the hospital, or their relatives or acquaintances.

The method of examination employed I have already described. In some instances, instead of dividing the drop of blood into six slides, I have latterly been in the habit of placing the entire drop between two slides, using one as covering glass for the other. By so doing I think the chance of the hæmatozoon escaping from under the covering glass is diminished, and there is a considerable saving of time effected.

1st.—*The degree in which the general population of this district is affected with Filaria Sanguinis Hominis.*

NUMBER EXAMINED.	FILARIA FOUND IN	PERCENTAGE.	PROPORTION.
670	62	9.25	1 in 10.8

A certain proportion of these cases came to hospital and were examined because they were affected by what I shall hereafter show was filaria disease—elephantiasis. To arrive therefore at a correct idea of the degree of infection of the general population these must not be included in the calculation. Slighter degrees of filaria disease, viz. varicose lymphatic glands and mild cases of lymph scrotum, do not apply at the hospital on account of these affections, which as a rule, are discovered only when searched for, the patient coming to be treated for some other complaint. I will therefore include all cases of enlarged groin glands and half the cases of lymph scrotum as fairly representative of the general population.

A correction must also be made for temporary absence of embryos in the blood in individuals who at another time might be found to possess them. As most of my cases were examined once only, it might so happen that just at the time the examination was made embryos were absent. To arrive at this correction I collected the results of a considerable number of examinations in persons all known to have filaria embryos in their blood at some time, and found

* See *Customs Medical Reports*, xiii, 32 seqq.

from this the proportion of times in which embryos were absent and present. In an aggregate of 89 such examinations they were found 55 times, not found 34 times. That is to say, if a certain number of persons are examined once for filaria embryos and these are found in 55 instances we may infer that they are temporarily absent in a certain number of others, the proportion of present to temporarily absent being as 55 to 34.

Number examined less all Elephantiasis cases and half the Lymph Scrotum cases.	Number of cases in which embryos were found less all the Elephantiasis and half the Lymph Scrotum cases.	Correction for temporary absence of embryos from the blood.	Total of such cases examined affected with F. Sanguinis Hominis.	PERCENTAGE.
641	51	31.96	82.96	12.81

From these figures we may conclude that in Amoy and the surrounding districts on an average about one person in every eight is affected with Filaria sanguinis hominis, and that in searching for embryos they will be found about once in every thirteen examinations.

2nd.—The influence of Age, Sex, and Occupation in determining the presence of the parasite.

Age.—By classifying the cases according to age and in decennial periods, the progressive liability to filaria as age advances is well demonstrated in the following table:—

DECENNIAL PERIOD.	NUMBER EXAMINED.	FILARIA FOUND IN	PERCENTAGE TO TOTAL CASES OF FILARIA.	PROPORTION AFFECTED.
10 to 20	35	2	3.22	1 in 17.5
20 „ 30	219	17	27.42	1 „ 12.9
30 „ 40	177	16	25.81	1 „ 11.1
40 „ 50	133	12	19.35	1 „ 11.1
50 „ 60	70	8	12.91	1 „ 8.8
60 „ 70	25	4	6.45	1 „ 6.25
Over 70	9	3	4.84	1 „ 3
Not Ascertained	2	...	...	...
Total	670	62	100.00	...

Thus from youth to old age the liability to filaria gradually rises from 1 in 17.5 to 1 in 3. This is to be explained, partly at least, by the fact that the parent worm lives a long time, often a very long time, so that old age not only has its own liability to fresh infection but possibly inherits the worms of youth and middle age.

Sex.—Owing to the social prejudices of the Chinese my opportunities of examining females have been few as compared with males—too few to warrant any conclusions as to special liability of a particular sex.

SEX.	EXAMINED.	FILARIA FOUND IN	PROPORTION AFFECTED.
Male	620	57	1 in 10.88
Female	50	5	1 „ 10
Total	670	62	1 in 10.8

Occupation.—The following table gives the occupation of the different cases examined, and shows the number affected with filaria in each occupation. These are grouped according to social or physical circumstances as fairly as the nature of the case admits, and proportion and percentage of filaria cases in each group given.

Group.	Occupation.	Number Examined.	Total Examined.	Filaria found in	Total Filaria Cases.	Proportion Affected.	Percentage Contributed to Total cases.
Rural Occupations.	Cultivators	363	...	24	..	...	...
	Cowherd	1	365	1	25	1 in 14.6	40.32
	Milkman	1	...	...	...	...	...
Trades.	Bakers	3	...	1	...	...	...
	Cobbler	1	...	1	...	...	...
	Cooper	1	...	1	...	...	...
	Masons	2	...	1	...	...	...
	Builders	2	...	1	...	...	...
	Tailor	1	...	...	...	...	...
	Salt-maker	1	...	...	...	...	...
	Paper-maker	1	...	...	...	...	...
	Coffin-makers	3	...	...	...	...	...
	Silversmiths	3	...	...	...	...	...
	Basket-makers	3	90	...	11	1 in 8.18	17.75
	Pen-maker	1		...			
	Carpenter	1	...	...	...	...	...
	Reader	1	...	...	...	...	...
	Blacksmiths	2	...	...	...	...	...
	Washerman	1	...	...	...	...	...
	Shoemakers	2	...	...	...	...	...
	Sandal-maker	1	...	...	...	...	...
	Tanner	1	...	...	...	...	...
	Pedlars	48	...	3	...	...	...
	Barbers	10	...	2	...	...	...
	Tinker	1	...	1	...	...	...
Literary.	Students	26	...	2	...	...	...
	Schoolmasters	6	...	1	...	...	...
	Doctor	1	...	...	...	...	...
	Scholars	2	49	...	3	1 in 16.3	4.85
	Artist	1		...			
	Gentleman	1	...	...	...	...	...
	Monk	1	...	...	...	...	...
	Preachers	11	...	...	...	...	...
Indoor.	Shopkeepers	29	...	7	...	...	...
	Cooks	6	...	2	...	...	...
	Shroff	1	45	1	10	1 in 4.5	16.12
	Clerks	4		...			
	Gambler	1	...	...	...	...	...
	Domestic Servants	4	...	...	...	...	...
Outdoor.	Actor	1	...	...	...	...	...
	Chair Coolies	7	...	4	...	...	...
	Coolies	20	38	1	8	1 in 4.75	12.90
	Millers	3		2			
	Soldiers	6	...	...	...	...	...
	Policeman	1	...	1	...	...	...
Sea.	Boatmen	11	...	...	...	...	...
	Fishermen	4	22	...	...	...	...
	Sailors	7	...	...	...	...	...
	Occupation unknown	11	11	...	0	...	...
	Women	50	50	5	5	1 in 10	8.06
	Total	670	670	62	62	...	100

I will attempt no explanation of these figures. They are too few to be of much value. They show however that no particular kind of occupation, with perhaps the exception of those of a seafaring character, secures exemption from filaria.

3rd.—The Morbid Conditions, if there are any, with which the parasite is associated.

No.	Names.	Age.	Sex.	Residence.	Occupation.	Disease, if any.	Duration of Disease.
							yrs.
1	Augkhi	58	M	Changchiu	Baker	Elephantiasis scroti	30
2	Sinto	21	M	Tinhai	Student	None	...
3	Liah	45	M	Lamoa	Farmer	Lymph scrotum	3
4	Kim	33	F	...	Married	Enlarged glands and ulcerated cornea	5
5	Lia	22	M	Hooioah	Chair Coolie	Enlarged glands	5
6	Tso	50	M	"	"	Elephantiasis scroti	15
7	Liengoo	34	M	Amoy	Teacher	Fever and anasarca	5
8	Kim	23	F	"	Spinster	None	...
9	Toon	60	M	Lamoa	Chair Coolie	Lymph scrotum	30
10	Nin	26	M	Lamcheng	Shopkeeper	Leprosy	2
11	Beng	22	M	Petsnia	Student	Debility	...
12	Boo Biong	38	M	Chiupo	Farmer	Enlarged glands	2
13	Lin	27	M	Oahai	Shopkeeper	None	...
14	An	28	M	"	Cooper	"	...
15	Leng	30	M	Lamoa	Cobbler	Enlarged glands	...
16	Ho	25	M	Tchoantchiu	Farmer	Ulcers of legs	5
17	Tsooien	50	M	Tchiupo	"	Lymph scrotum	5
18	Thian	43	M	Thienpo	"	Rheumatism, hydrocele and enlarged glands	8
19	Tsosim	36	M	Hooioah	"	Enlarged glands	⅓
20	Tho	19	M	Amoy	"	Ague	...
21	Nng	61	M	Thienpo	"	Stricture of œsophagus	½
22	Khatsiu	32	M	Lamoa	"	None	...
23	Ngai	36	M	Tchangtchiu	"	Ague and enlarged spleen	14
24	La	41	M	"	"	Enlarged glands and lymph scrotum	12
25	Poe	45	M	Tchoantchiu	Shopkeeper	Elephantiasis scroti	3
26	Phien	70	F	Ankhoe	Widow	Heart disease and ulcer	...
27	Simpoo	39	M	Lamtaiboo	Farmer	Lymph scrotum	17
28	Tho	40	M	Tchiupo	"	Chyluria and lymph scrotum	5
29	What	23	M	Tchangtchiu	Barber	Ulcer and enlarged glands	1
30	Ngee	58	M	Pholam	Cotton Carder	Hydrocele, enlarged glands and cataract	3
31	Tui	32	M	Tinhai	Farmer	Elephantiasis of leg	10
32	Tchian	49	M	Lamoa	Tinker	Hæmatemesis and enlarged glands	7
33	Lang	26	M	Soasia	Farmer	Ague, enlarged spleen and inflamed scrotum	15
34	Kan	72	M	Amoy	Pedlar	Lymph scrotum and chyluria	3
35	Pho	64	M	Soakoe	Shopkeeper	Enlarged glands	11
36	Kiong	20	M	Tangoa	Farmer	Enlarged glands and cataract	8
37	Tiokna	39	M	Tchiupo	"	Lymph scrotum	3
38	Liu	27	M	Pholam	Coolie	Ague	...
39	Seng	22	M	"	Shroff	Inflammation of scrotum	1
40	Hoen	27	M	Tchiupo	Farmer	Hydrocele	7
41	Hanliong	14	M	"	Cowherd	Enlarged glands and ulcer of cornea	2
42	Tengiee	40	M	"	Farmer	Hydrocele	...
43	Sietgoan	37	M	Tchianan	"	Enlarged glands and ulcer	4
44	Seng	54	M	Pholam	"	Lymph scrotum	14
45	Toon	32	M	Tchiupo	"	" "	3
46	Hinlo	48	M	Ankhoe	Cook	Hydrocele and fever	...
47	Tanlo	42	M	Tangoa	Mason	Lymph scrotum	19
48	Tanlok	36	M	Hooioah	Barber	" "	13
49	Tantchin	43	M	Lamoa	Cook	Hydrocele and enlarged glands	13
50	Pong	22	M	Tchinkang	Shopkeeper	Leprosy	2
51	Ti	48	F	Tobia	Widow	Enlarged glands and rheumatism	...
52	Tchiamtoo	68	M	Amoy	Shopkeeper	Chronic eczema	½
53	Heng	25	M	Taboe	Farmer	Enlarged glands	...
54	Lin	47	M	Pholam	Pedlar	Internal piles	4
55	Boon Bor	70	M	Amoy	Ricegrinder	Lymph scrotum and elephantiasis	3
56	Lio	51	M	Lamoa	Farmer	None	...
57	Boon Sa	41	M	Amoy	Shopkeeper	"	...
58	Phiet	29	M	Tchoatng	Pedlar	Enlarged glands and spleen	...
59	Ngam	57	F	Paha	Married	None	...
60	Hesai	39	M	Amoy	Builder	"	...
61	Khoan	35	M	"	Policeman	Enlarged glands	...
62	Oon	51	M	"	Chair Coolie	Enlarged glands and ulcer of leg	...

At the end of this paper, and in the last number of the *Medical Reports*, the details of most of the cases in which I have found the embryo of Filaria sanguinis hominis are given. The above table, giving name, age, sex, residence, occupation, disease and its duration, will serve as an index to these, besides showing at a glance the principal features of the cases. The numbers in the table correspond with the numbers attached to the cases, and by referring to the latter full particulars will be found.

A glance at this table shows at once that elephantiasis and allied diseases are much more frequently associated with the parasite than any other morbid condition. To bring this out more clearly I have arranged the cases as follows :—

	Disease.	Number Examined.	Totals.	Number of Filaria cases.	Total Filaria cases.	Corrected for Temporary Absence.	Proportion Affected.	Percentage Contributed.
Elephantoid Disease.	Elephantiasis of Leg	10	63	1	36	58.25	1 in 1.1	58
	Elephantiasis of Scrotum	15		4				
	Lymph Scrotum	13		10				
	Lymph Scrotum and Chyluria	2		2				
	Enlarged and varicose groin glands	23		19				
	Inflamed Scrotum and Fever	2	412	2	16	25.81	1 in 16	25.8
	Hydrocele	410		3				
	Other Diseases			11				
	Healthy	195	195	10	10	16.18	1 in 12	16.2
		670	670	62	62	...	...	100

In addition to the statement of the number of cases in which embryos were actually found, I have appended the correction for temporary absence. The propriety of this is questionable, as many cases of elephantoid disease were examined several times before hæmatozoa were found, and as the correction applies only to cases examined once the addition for correction is too large. I would also add that every patient examined for filaria was not always examined for lymph scrotum or enlarged glands, and as these often exist in a slight degree without the patient being aware of it, several such cases have undoubtedly been overlooked and do not appear under the head of elephantoid disease. The scrotum and glands were carefully examined in every case in which filaria were found. Making every allowance for these imperfections in the table, it still proves unquestionably the connection between Elephantoid disease and Filaria sanguinis hominis.

I have elsewhere shown that varicose groin glands, lymph scrotum, elephantiasis and chyluria are pathologically the same disease, and if additional evidence were required to prove this it may be found in abundance in the cases now published and in those given in the last *Reports*. In the same paper I ventured to attribute these diseases to the parent of the embryos that Dr. Lewis had discovered in the blood and urine of chyluria cases; and I think I have now brought sufficient evidence together to prove my conjecture, although the tests of experiment and post-mortem examination are still wanting. Mere coincidence will not account for the frequent, and in some forms of the disease almost invariable, association of the parasite and the

disease; they can only stand to each other in the relation of cause and consequence. The way in which the cause operates is made sufficiently apparent by the anatomy of the diseased structures, and arguing from what has been observed of the habits of other penetrating filariæ, I have concluded that the essential feature of elephantoid disease—obstruction of the lymphatic circulation—is produced by the mechanical interference of the parent parasite with that circulation, higher up the lymphatic system than the seat of the elephantoid disease.

It may be asked, "If the filaria sanguinis hominis is the cause of elephantoid disease, "why are embryos not invariably found in the blood; and why when embryos are found in the "blood are they not invariably associated with elephantoid disease?"

The second question is easily answered. Disease in the host is not a necessary consequence of the existence of filaria in or near the lymphatics. The filaria immitis seldom inconveniences the dog in whose heart it lives and breeds—so the filaria sanguinis hominis may live and breed in or near a man's lymphatics without inducing disease. The disease, so to speak, is only an accident, though a very frequent one, in the history of the parasite.

But the accident or disease having happened we argue that the cause of it is or has been present; how can we account then for the absence of the other evidence of the parasite's presence, its embryos in the blood? Why were they found in one only out of ten cases of elephantiasis of the leg, in four only out of fifteen cases of elephantiasis scroti, and be so frequently absent in lymph scrotum and varicose groin glands? I do not know enough about the habits of the parent worm to give an exhaustive and quite satisfactory answer to this question, but I can account, in part at least, for this apparent anomaly. As I have already mentioned, embryos are often temporarily absent. This very often happens in cases where, from the small number of embryos found even at the time they are most abundant, we may infer that parent parasites are but few in number. The following record of examinations of three cases shows how the numbers found fluctuate, and how frequently in some cases they are altogether absent:—

Case 46.			Case 16.			Case 28.		
Date of Examination.	Number of Slides Examined.	Number of Embryos found.	Date of Examination.	Number of Slides Examined.	Number of Embryos found.	Date of Examination.	Number of Slides Examined.	Number of Embryos found.
June 4	6	1	June 12	6	1	July 12	6	0
" 6	6	Many	" 13	6	1	" 13	6	0
" 13	6	12	" 14	6	3	" 14	6	0
" 19	6	23	" 15	6	0	" 15	6	0
" 26	6	30	" 16	6	1	" 16	6	2
July 5	6	14	" 17	6	3	" 17	12	0
" 10	6	18	" 18	5	2	" 18	6	1
" 16	6	14	" 19	6	0	" 19	6	2
" 24	6	36	" 20	6	4	" 20	6	0
" 31	7	27	" 21	6	2	" 21	6	0
August 7	9	13	" 22	6	5			

It is evident from this that as most of the cases of elephantiasis, especially of elephantiasis of the leg, were examined once only, embryos may have been temporarily absent at the time of examination and present at other times. Case 28 was examined four times before embryos were discovered in the blood. Had this case been an ordinary one of elephantiasis of the leg, and not one of great interest, with chyluria and lymph scrotum, the search for embryos would probably have been abandoned after the third or fourth failure, or more probably the patient would never again have returned to the hospital. This accounts for the absence of embryos in a certain number of cases; but there are undoubtedly others in which embryos are permanently absent. I proved this by examining frequently, often daily, the blood of patients recovering from the operation for elephantiasis scroti during the whole of their residence in hospital, perhaps many weeks. In such cases the absence of embryos may be accounted for in some of the following ways:—

1.—The parent worm or worms, after permanently damaging the channels by which the lymph passes to the circulation, may have died. Filaria tumours and cicatrices are often found in the œsophagus and aorta of the dog, the worm or worms which caused them having died or escaped. The same may happen in man.

2.—If still alive, they may be encysted in some situation where there is no opportunity of discharging embryos into the blood or lymph, and yet near enough the lymphatic vessels to occlude them. The accidents to which the filaria is constantly exposed are so numerous, that very few ever attain maturity. Very few embryos get further than the first step in development; probably very few of those that make a second advance, in the way I shall hereafter describe, reach the third step in man; and probably many of those that do enter man, and start fairly on their final journey, lose themselves among the tissues and fail to find their proper home and breeding place. Such wanderers may do infinite damage to man, though they never succeed in fulfilling their functions as regards their own species. Instances of wandering filariæ that have lost their way I have met in the dog, and such I am sure do much more mischief than those who reach and breed in their proper habitat. Filaria sanguinolenta, whose home is undoubtedly the œsophagus, sometimes penetrates the pleura, sometimes the walls of the aorta, becomes encysted and pregnant in these situations and discharges eggs uselessly into aorta or pleural cavity. A similar miscarriage may happen to Filaria sanguinis hominis. The eye worm of the horse is also a wanderer that has lost its way.

3.—The filaria may be present in the usual situation but only one sex may be represented; or if both sexes are present they may not have come together. I have found unimpregnated female filaria immitis in the heart of the dog, no male being present, and vice versa. In such cases there could be no discharge of embryos.

In one or all of these ways the absence of embryos may be accounted for in elephantoid disease, and as they are most frequently absent in elephantiasis of the leg, the form of the disease that is usually longest in existence before coming under observation, it is probable that the most frequent cause of the absence of embryos is the death of the parent filariæ.

Hydrocele is another disease frequently associated with hæmatozoa. It is not difficult to understand why this should be, and how a very slight obstruction in the lymphatic vessels connected with the tunica vaginalis would derange the delicate balance of secretion and

absorption in that sac. The prevalence of hydrocele in warm countries may be thus accounted for.

In my last paper I referred to a form of disease sometimes met with here and characterised by recurring attacks of fever, anasarca, and great debility. This I once found associated with filaria sanguinis hominis. This case, No. 7 of the series, is since dead, and I had an opportunity of making a post-mortem examination which was done under circumstances of extreme difficulty. The privilege had to be paid for, and was hampered with the condition that the widow should be present to see that no part of the body was removed. Besides it had to be made secretly with closed doors, quickly, and in the room the man died in, a place hardly big enough to turn in. The light was very bad and the heat overpowering, so from this unfortunate combination of circumstances the examination was far from thorough or satisfactory, and did not result, as I had hoped, in the discovery of the parent worm. I will give my notes of the case in continuation of those in my last paper.

Case 7 continued:—May 25th. Filariæ in large number in the blood.

August 10th. LIENGOO has been better and worse since the above date. Latterly he has been quite bedridden and often very foolish in his conversation. I saw him about a week ago; he was bedridden; incapable of moving himself; universally œdematous though not to a great degree. I noted that the transverse præcordial dulness extended from nipple line to well over on the right side of sternum: a distinct soft systolic bruit, audible all over the heart, but loudest at sternal end of left third rib: second sound indistinct everywhere: throbbing of vessels of neck: a full strong regular pulse. This morning he died comatose.

Post-mortem Examination.—Skin slightly jaundiced; generally œdematous, but not much so. No enlarged glands in groin or eleswhere, nor any particular marks on skin. A live filaria embryo, seen by the microscope, in blood from a small vein in integuments of thorax.

Deep epigastric veins much dilated. Liver coarsely cirrhosed and contracted to half its proper size. Spleen much enlarged, measuring perhaps 9in × 7in × 4in, soft with abundant tar-like pulp. Considerable amount of serum in cavity of peritoneum; Glisson's capsule thick and matted; and the lesser omentum at its attachment thick, matted, a confused mass of what seemed to be dilated veins, enlarged glands, and areolar tissue. Bladder full and normal. Kidneys large, healthy. Ureters large. Pancreas, hard and matted with the omentum. Heart, much dilated in all its cavities, but there was no valvular lesion; blood fluid in right side, which was in diastole; left side empty. Lungs much pigmented; left pleura contained a considerable quantity of serum. Aorta and vena cava inferior normal. No parent worm found in any vessel opened. Thoracic duct and receptaculum chyli searched for but not found. Head not opened. Examination made under very disadvantageous circumstances. Relatives crying, wife in room obstructive. Temperature over 100°, no air, bad light, much fatigue. Not allowed to remove any part of body.

I am particular in mentioning the disadvantages under which the examination was made, to avoid giving grounds for the conclusion that because no parent worm was found none existed. I believe, that had I been allowed to remove and carefully examine the mass of glands, vessels and areolar tissue that lay in front of the vertebræ in the abdomen, the animal would have been discovered.

In concluding this notice of the morbid conditions associated with the parasite I may mention, that ulceration of the cornea has been met with several times in hæmatozoa cases, and is the only mischief which I have any grounds for attributing to the *embryo* in the blood.

4.—*The development of Filaria Sanguinis Hominis.*

Development cannot progress far in the host containing the Parent.—Fortunately, it is an almost universal law in the history of the more dangerous kinds of entozoa, that the egg or embryo must escape from the host inhabited by the parent before much progress can be made in development. Were it possible for animals so prolific as the Filaria immitis of the dog, or Filaria sanguinis of man, to be born and matured, and to reproduce their kind again in an individual host, the latter would certainly be overwhelmed by the first swarm of embryos escaping into the blood, as soon as they had made any progress in growth. If, for example, the brood of embryo filariæ at any one time free in the blood of a dog moderately well charged with them were to begin growing, before they had each attained a hundredth part of the size of the mature filaria their aggregate volume would occupy a bulk many times greater than the dog itself. I have calculated that in the blood of certain dogs and men there exist at any given moment more than two millions of embryos. Now the individuals of such a swarm could never attain anything approaching the size of the mature worm without certainly involving the death of the host. The death of the host would imply the death of the parasite before a second generation of filariæ could be born, and this of course entails the extermination of the species; for in such an arrangement reproduction would be equivalent to death of both parent and offspring, an anomaly impossible in nature.

The Embryo must escape from the Original Host.—It follows therefore that the embryo in order to continue its development and keep its species from extermination must escape from its first host in some way. After accomplishing this it either lives an independent existence for a time, during which it is provided with organs for growth not possessed by it hitherto; or it is swallowed by another animal, which treats it as a nursling for such time as is necessary to furnish it with an alimentary system. The former arrangement obtains in the filariæ inhabiting the intestinal canal, the lumbricus and thread worm; the latter is followed by the several species of tape worm, and also by other kinds of entozoa.

I find that in cases where embryo filariæ are not in great abundance in the blood, that is where we may infer that there are only one or two parent worms—they often disappear completely for a time, to reappear after the lapse of a few days or weeks. From this circumstance I infer, first, that reproduction is of an intermitting and not of a continuous character; and, second, that the embryos after a certain time either are disintegrated in the blood or are voided in the excretions. The latter does occur, I know from personal investigation, in the urine; and we have Dr. LEWIS's testimony that he has found the animals in the tears. In this way then they may have an opportunity of continuing development either free, as in the case of the lumbricus, in the media into which the excretions are voided; or in the body of another animal, which has intentionally or accidentally fed on these, as in the case of the tapeworms. Man, in his turn, may then swallow this hypothetic animal or other thing containing the embryo suitably perfected, and so complete the circle. This is the history of many entozoa; but I have evidence to adduce that, if it be one way in which Filaria sanguinis hominis is nursed, it is not the only way, and therefore probably not the way at all.

The Mosquito found to be the Nurse.—It occurred to me that as the first step in the history of the hæmatozoon was in the blood, the next might happen in an animal who fed on

that fluid. To test this idea I procured mosquitoes that had fed on the patient Hinlo's (case No. 46) blood, and examining the expressed contents of their abdomens from day to day with the microscope, I found that my idea was correct, and that the hæmatozoon which entered the mosquito a simple structureless animal, left it, after passing through a series of highly interesting metamorphoses, much increased in size, possessing an alimentary canal, and being otherwise suited for an independent existence.

History of the Mosquito after feeding on Human Blood.—I may mention that my observations have been made exclusively on the females of one species of mosquito. I have never in many hundreds of specimens met with a male insect charged with blood.* There are two species found during the summer here; one quite a large insect about half an inch long with a black thorax and black and white banded abdomen; the other about half that size and of a dingy brown colour. The former is rare comparatively, the latter is very common and is the insect my remarks apply to.

After a mosquito has filled itself with blood (which it can do, if not disturbed, in about two minutes), it is evidently much embarrassed by the weight of its distended abdomen, so that it no longer can wheel about in the air. It accordingly attaches itself to some surface, if possible near stagnant water, where it remains in a comparatively torpid condition, digesting the blood, excreting yellow gamboge looking fæces, and maturing its ova. In the course of from three to five days these processes are completed, and the insect now betakes itself to the water, where the eggs are deposited, and on the surface of which they float in a dark brown mass looking like a flake of soot. The eggs do not take long to hatch (they are beautifully shaped objects, like an Etruscan vase) and the embryo emerges by forcing open a sort of lid placed at the broad end of the shell. The larvæ now escape into the water where they swim about and feed, and become the "jumpers" we are familiar with, found in every stagnant pool.

If the contents of the abdomen are examined before the mosquito has fed or after the food has been absorbed, the following parts can easily be distinguished; two ovisacs containing from sixty to a hundred ova; two large glandular masses; intestine and œsophagus; and a very delicate transparent fibrous bag, the stomach. If the blood contained in the dilated stomach is examined soon after ingestion, the blood corpuscles are seen quite distinct in outline and behaving very much as when drawn in the ordinary way; but changes rapidly occur. First the corpuscles lose their distinctness of outline, then crystals of hæmatin appear; corpuscles and crystals give place to large oil globules, and the mass is deprived of its fluidity, and before the eggs are deposited, all colouring matter disappears; the white material is absorbed or expelled, and by the time the eggs are deposited the stomach is quite empty but for the embryo filariæ it may contain.

How to procure Mosquitos containing Embryo Filariæ.—It may be useful to those who wish to repeat and test my observations to know the plan I found most successful in procuring filaria-bearing mosquitos, and how their bodies were afterwards treated for microscopic observation. Such details may appear frivolous and unimportant, but by following them the observer will be spared disappointment and will economise his time and patience.

* This is explained by the arrangement of the appendages and proboscis of the male mosquito, which prevents it from penetrating the skin. As the male is provided with a complete alimentary apparatus it is presumed that he feeds on the juices and exudations of plants and fruits.

I persuaded a Chinaman, in whose blood I had already ascertained that filariæ abounded, to sleep in what is known as a mosquito house in a room where mosquitos were plentiful. After he had gone to bed, a light was placed beside him and the door of the mosquito house was kept open for half an hour. In this way many mosquitos entered the house, the light was then put out and the door closed. Next morning the walls were covered with an abundant supply of insects with abdomens thoroughly distended. They were then caught below a wine-glass, paralysed by means of a whiff of tobacco smoke, and transferred to small phials into some of which a little water had been poured. A cover providing for ventilation was then placed over the mouth of each phial. The effect of the tobacco smoke, if it has not been applied too long, is very evanescent, and seems to have no prejudicial influence on the future of the mosquito. From the phials they may be removed from time to time as required, by again paralysing with tobacco, and seizing them by the thorax with a fine forceps. The abdomen is then torn off, placed on a glass slide, and a small cylinder such as a thin penholder rolled over it from the anus towards the severed thoracic attachment. In this way the contents are safely and efficiently expressed, and observation is not interfered with by the almost opaque integument. If the contents are white and dry a little water should be added and mixed carefully with the mass so as to allow of the easy separation of the two large ovisacs. These can be removed in this way by the needle and transferred to another slide for separate examination. A thin covering glass should be placed over the residue, which will be found to contain the filariæ either within the walls of the stomach, or, if these have been ruptured by too rough manipulation, floating in the surrounding water.

Large proportion of Filariæ ingested by the Mosquito.—The blood in the stomach of a mosquito that has fed on a filaria-infested man, usually contains a much larger proportion of filariæ, than does an equal quantity of blood obtained from the same man in the usual way by pricking the finger. Thus six small slides, equivalent to about one drop of blood, from the man on whom most of my observations were made, would contain from ten to thirty hæmatozoa; whereas the blood drawn by a single mosquito, about as much as would fill one slide only, contained from twenty to thirty as a rule and sometimes many more. One slide in which I had the curiosity to count them had upwards of a hundred and twenty specimens. From this it would appear that the mosquito has the faculty of selecting the embryo filariæ; and in this strange circumstance we have an additional reason for concluding that this insect is the natural nurse of the parasite.

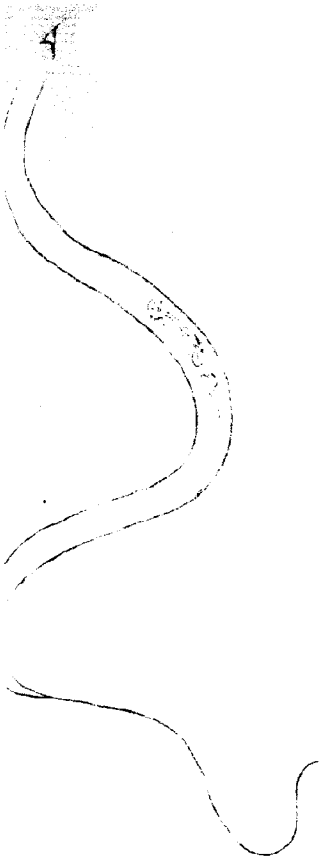
All Embryos do not attain Maturity: by far the greater number die and are disintegrated, or are expelled in the fæces undeveloped. At the end of the third, fourth or fifth day, when the stomach is quite empty as far as food is concerned, and an embryo could not easily be overlooked, only from two to six are found in the same or slightly different stages of the metamorphosis I will now attempt to describe.

The Metamorphosis of the Embryo.—The embryo for a short time after entering the stomach of the mosquito retains all the appearances and habits which characterised it when in the human body (Fig. 1); that is, it is a long snake-like animal, having a perfectly transparent structureless body enclosed in a delicate and for the most part closely applied tube, within which it shortens and extends itself, giving rise, from the collapse of the tube when the body is retracted

at either end, to the appearance of a lash at the head or tail. In a very few hours changes commence. The tube first separates from the body by an appreciable interval, giving the appearance of a distinct double outline; and the body itself becomes covered with a delicate, but distinct and closely set, transverse striation (Fig. II). Oral movements are now very distinct, not that they did not exist before, but because the slight increase of shading from the striation renders them more apparent. The appearance of a viscus seen in some specimens vanishes at this stage. Presently the tube or sheath is either digested by the gastric juices of the mosquito or is cast off, as a snake does its skin, and the animal swims about naked and without any appearance of a head or tail lash. (Fig. III.) The striation becomes very marked; but gradually as the blood thickens, and the movements of the embryo become in consequence less vigorous, these markings completely disappear, giving place to a peculiar spotted appearance such as I have endeavoured to represent in Fig. IV. Each spot is dark or luminous according to the focussing of the microscope, and probably depends on some oily material now collecting in the body of the animal.

This concludes the first stage of the metamorphosis, and takes about thirty-six hours to complete. During all this time the original proportions of the animal have been preserved and vigorous movement maintained. Now, however, it enters on a sort of chrysalis condition, during which nearly all movement is suspended, and the outline and dimensions are very much altered. Hitherto the body was long and of graceful contour; now it becomes shorter and broader, the extreme tail alone not participating in the change. The large spots in the body disappear gradually, giving place to what seems to be a fluid holding numerous minute particles in suspension. (Figs. V, VI, VII.) I have once or twice detected to and fro movements in these. The tail continues to be flexed and extended vigorously, but only at long intervals, while all oral movements cease. By the end of the third day the animal has become much broader and shorter; the small terminal portion of the tail still retaining its original dimensions, and appearing to spring abruptly from the end of the sausage-shaped body. (Figs. VIII, IX, X, XI.) Large cells occupy the previously homogeneous looking body, and sometimes something like a double outline can be traced. Indications of a mouth present themselves; and, if a little pressure is applied to the covering glass, granular matter and cell-like bodies escape from an orifice placed a little in advance of the tail. (Figs. IX, XI.) The animal now begins to increase in length, and, in some specimens, diminish in breadth, the growth seeming to be principally at the oral end of the body. The structure of the mouth is sometimes very evident; it is four-lipped, the lips being either open, as in Fig. IX, or pursed up, as in Fig. X. From the mouth, a delicate line can be distinctly traced, passing through the whole length of the body to the opening already referred to as existing near the caudal extremity. Feeble movement may still sometimes be detected in the caudal appendix, but when the now growing body has attained a certain length the tail gradually disappears. (Figs. XII, XIII.)

After this point specimens of the filaria in its third and last stage are difficult to procure. Most mosquitos die about the fourth or fifth day after feeding; and if their bodies which fall into the water are examined, they are soft and sodden and without filariæ, these having either decomposed or escaped. Sometimes, however, ovulation does not proceed rapidly. and the mosquito survives to the fifth or sixth day; or perhaps death may not occur; as it usually does, soon after the eggs have been laid, and the insect may survive this operation for two or three days. In



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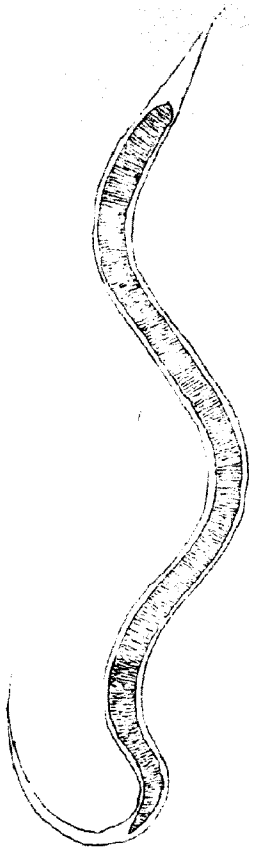

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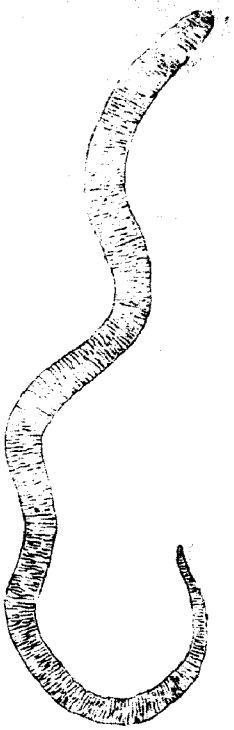

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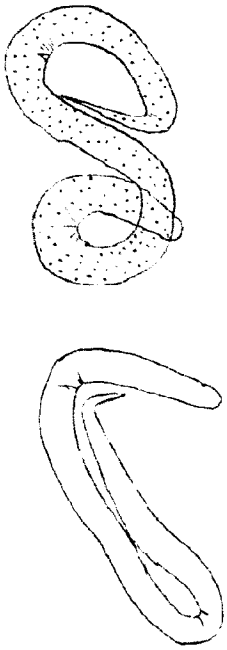

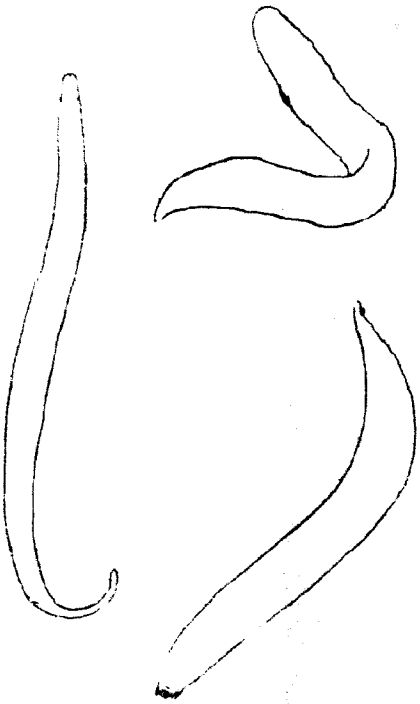

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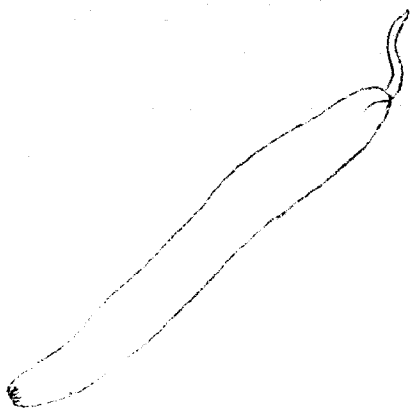

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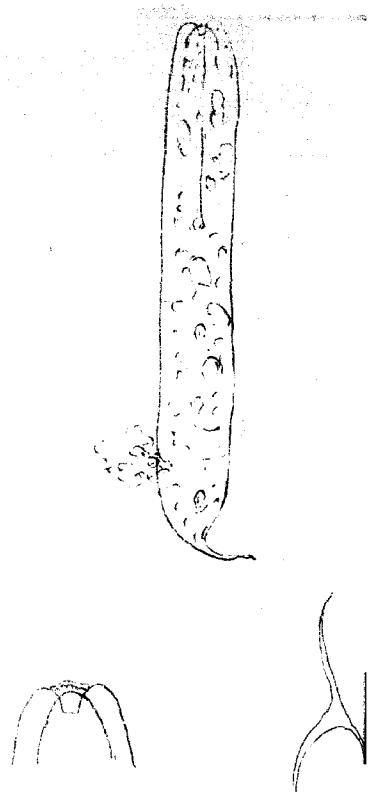

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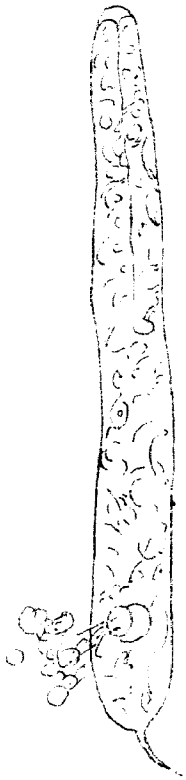

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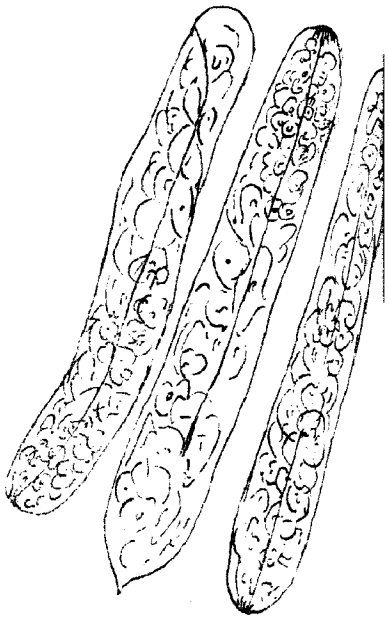

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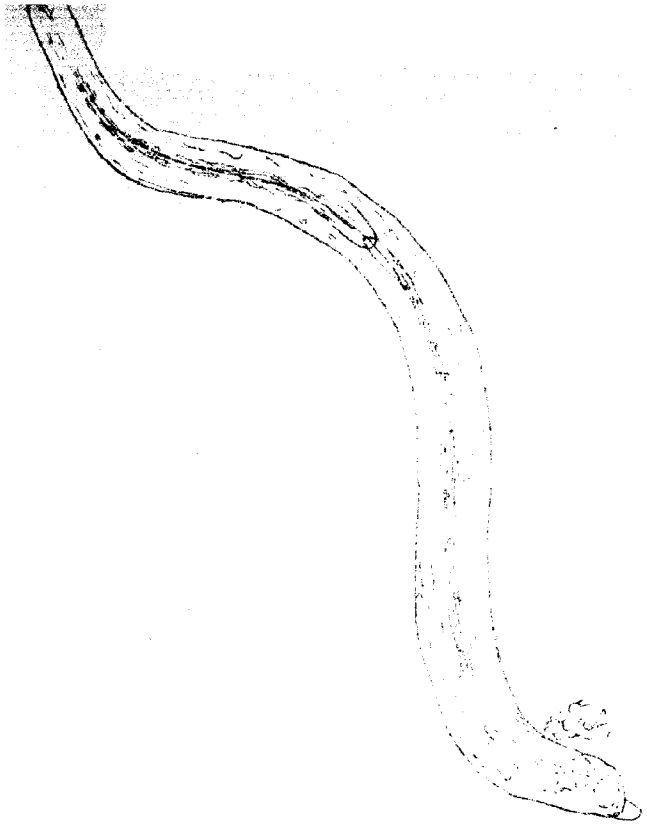

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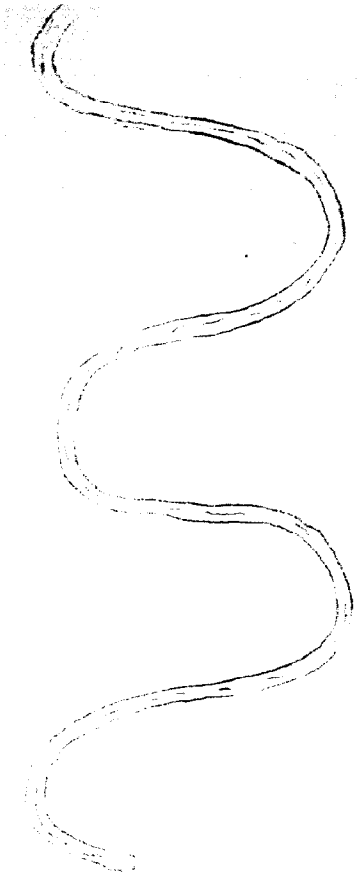

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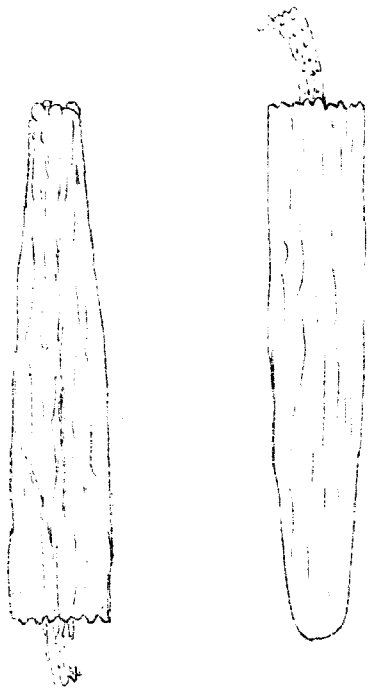

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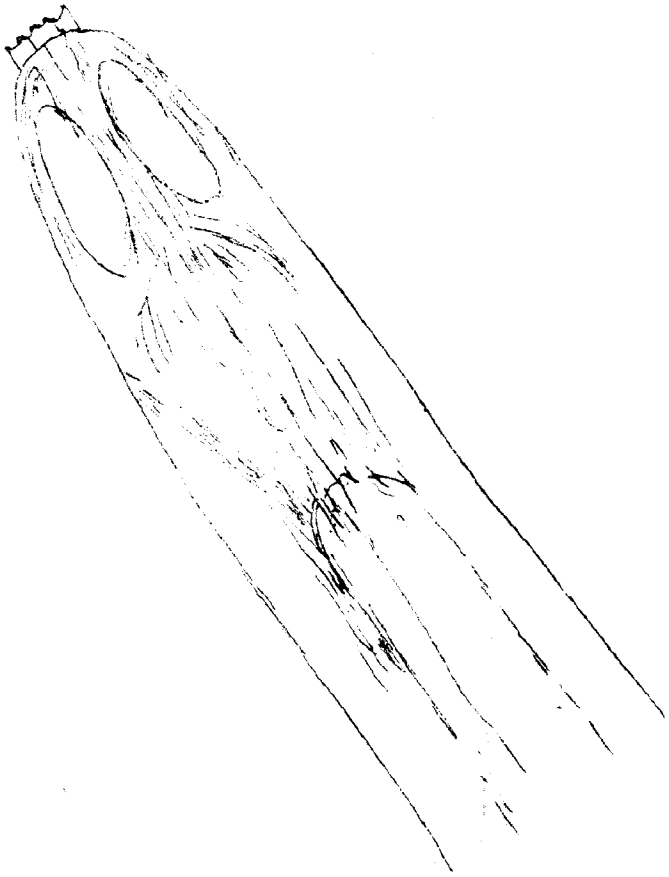


XVI

such the last stage of the metamorphosis can be studied: four to six days seem to be necessary for its completion. In hundreds of mosquitos watched I have been successful in finding filariæ in this last stage in four instances only. In one of these there was quite a number of embryos in regular gradation from the passive chrysalis, as represented in Fig. XI, up to the mature and very active embryo Fig. XIV; so that there can be no doubt of the relationship of the latter to the former, though their appearances differ so much. Owing to the small number of specimens I have examined I am not quite certain about the details of this stage of the metamorphosis. As far as I can make out, the body gradually elongates from the hundredth, as at Fig. X, to the fortieth or thirtieth of an inch, and when mature, as in Fig. XIV, (drawn to a much smaller scale than the others,) it measures fully a fifteenth of an inch in length by the five-hundreth of an inch in breadth. When at the stage represented in Figs. IX to XII large cells occupy the interior; but as development advances these become reduced in size, and accumulate round the dark line I have already mentioned as running from the mouth to the caudal extremity. In this way an alimentary tube is fashioned; and the peculiar and characteristic valve-like termination of œsophagus in intestine, seen in the filariæ, is developed. (Fig. XIII.) The mouth may now be seen open and funnel-shaped, and the tail is reduced to a mere stump. Movements, first of a swaying to and fro character, but afterwards brisker, begin. The body gradually elongates, becomes perhaps slightly thinner, all cellular appearance vanishes, and owing to the increasing transparency of the tissues, the details can no longer be made out. A vessel of some sort is seen in the centre running nearly the whole length of the body and opening close to one extremity; this extremity is slightly tapered down and is crowned with three or perhaps four papillæ; but whether this is the head or tail, and whether the vessel opening near it is alimentary canal or vagina, I cannot say. The other extremity is also slightly tapered but has no papillæ. There can be no doubt which is mouth and which tail in Fig. XIII, but the intermediate steps to Fig. XIV I have failed to trace satisfactorily. There is a stage between these two in which the mouth is closed and the œsophagus can be seen running from it, and if the body is compressed that tube can be forced through the skin and distinctly seen; but about that time the tissues become so transparent that their exact relations cannot be made out. Probably these papillæ are the boring apparatus to be used in penetrating the tissues of man and escaping from the mosquito. At this, presumably the final, stage of the filaria's existence in the mosquito, it becomes endowed with marvellous power and activity. It rushes about the field forcing obstacles aside, moving indifferently after either end, and appears quite at home and in no way inconvenienced by the water it has just been immersed in. This formidable looking animal is undoubtedly the Filaria sanguinis hominis equipped for independent life and ready to quit its nurse the mosquito.*

* I cannot say whether the group of papillæ round one extremity of the developed embryo, is the perfected boring apparatus of the worm, or the boring apparatus at all. But, comparing it with what is found in other species of the same genus, I think it is very probable that it either is, or will become, the piercing apparatus. Fig XVI represents the head of the eye worm of the horse. Some time ago I operated on an Australian horse for this worm and had the satisfaction of finding the parasite not very much injured after removal; it was an unimpregnated female possessing all the typical structures of the filaria. Its head was armed with a five or six-toothed saw, the teeth arranged (like those in some kinds of old-fashioned trephines) in a circle round the month. I removed a worm from the same eye of the same horse about three or four weeks previously; the cornea had healed and the cloudiness cleared up before the second worm appeared. I infer from this, and from the very perfect boring apparatus, and from the female being unimpregnated, that the eye is not the resting or breeding place of the filariæ found in it; but that it is sometimes accidentally entered by the worm on its travels in search of the suitable spot. From the fact that one worm succeeded the other, I infer that the sexes are brought together in this way as in the case of Filaria sanguinolenta of the dog. When a wandering worm comes across the track of another it follows it up; thus several may be found together at the end of the burrow.

Future history of the Filaria.—There can be little doubt as to the subsequent history of the filaria; or that escaping into the water in which the mosquito died, it is through the medium of this fluid brought into contact with the tissues of man, and then either piercing the integuments, or, what is more probable, being swallowed, it works its way through the alimentary canal to its final resting place. Arrived there its development is perfected, fecundation is effected, and finally the embryo filariæ we meet with in the blood are discharged in successive swarms and in countless numbers. In this way the genetic cycle is completed.

The bearing of these observations on the explanation and prevention of Elephantoid disease.—The statistics I have given above are amply sufficient to prove the association of Filaria sanguinis hominis and Elephantoid disease as cause and effect; and now that I have shown that the mosquito is a necessary element for the perfection of the parasite, the limitation of the distribution of elephantoid diseases to certain districts and zones of the earth's surface receives an explanation. Such disease is endemic only where the mosquito flourishes, *i.e.* in tropical and subtropical climates. Elephantiasis is more common in certain districts than in others; and I venture to predict that in those districts where it prevails the mosquito will be found to abound, and that in those localities where the disease is absent or uncommon, the mosquito will be found to be rare, or to be represented by a species incapable of nursing the infant filariæ. The habits of the people, with regard to the use of water and mosquito nets, will also undoubtedly have an influence in determining the amount and spread of filaria disease. This is a point deserving investigation, for from the fact of the disease depending on so tangible a link as the mosquito, it is quite possible to prevent its spread, if not to secure its extermination.

It is a sign that a great advance in our knowledge of a disease has been made, when it becomes possible to assign it its proper place in the nosological table, classifying it according to its *cause*. To be able to say such and such a disease is miasmatic, enthetic, parasitic and so on, implies that not only is the cause known, but also that much of the manner in which the cause operates can be at once described; and more important still, the means of prevention and cure are certainly indicated, and we are spared the labour of a blind and often hopeless search for specifics. It is important therefore to aim at the *cause* as the main basis for a scientific classification of disease. This can be found only in two ways:—1st, by studying the phenomena of a disease, and by a combination of theory and observation, arriving at its etiology; in this way miasmatic diseases have been attributed to a ferment as yet unseen, syphilis and other enthetic diseases to a cell or plasm not yet separated; and doubtless correctly: 2nd, by direct observation of the cause itself; in this way scabies, the ringworms, and other parasitic diseases, and now elephantiasis, have had their proper place assigned them. But there are still many diseases, sometimes classified under one head sometimes under another, which, owing to the incompleteness of our knowledge of their phenomena, or the difficulty of demonstrating their principal causes, will neither by reason nor observation yield their secret and allow of a scientific classification. Leprosy is one of these diseases. But, since I have become familiar with the Filaria sanguinis hominis and the diseases it produces, I fancy I see a very close parallel in their associated phenomena to those of leprosy, and I would seek by an application of the first method of arriving at a scientific classification to relegate leprosy to its proper corner in the nosological table.

In the first place, I would divide the order of Parasitic diseases into two sub-orders according as they are *directly* or *indirectly* contagious or infectious. The directly contagious parasitic diseases are represented by scabies, the ringworms, and such like; the indirectly contagious parasitic diseases by the tapeworms, hydatid, elephantoid diseases etc., the characteristics of this latter sub-order depending on the necessity for a medium to convey the infection from the donor to the receiver. In this latter sub-order I would seek to place leprosy.

The necessity for the intervention of the medium impresses certain peculiarities, not so much on the pathological appearances of a disease as on the distribution, manner of infection or extermination, and behaviour as endemic or epidemic. Roughly speaking, no two diseases are more unlike than chyluria and tapeworms, elephantiasis and hydatids, and yet they are in reality closely allied and have many phenomena in common. What are these phenomena that indirectly infectious diseases have in common?

1.—Such diseases are endemic in certain localities.

2.—They may be imported into hitherto unaffected districts.

3.—They disappear by hindering or interfering with the operation of the medium.

4.—They are not hereditary but are found in families, because the members of such are all as a rule under similar circumstances as regards the operation of the medium.

5.—They are not infectious in the ordinary sense of the word, nor can they be inoculated.

The rationale of these points is apparent and needs no explanation. Many diseases conform to 2, 3 or 4 of the points; but no disease conforms to all of them unless it is an indirectly infectious one. Leprosy conforms; am I not justified in placing it in the sub-order indirectly infectious, and inferring that its poison is distributed by means of a medium?

The only point on which doubt can exist as to the conformity of leprosy, is that included under the fourth head, the question of hereditary transmission. If leprosy fails to conform in this point, then it cannot be an indirectly contagious disease; for though a parent can transmit to offspring certain mental and physical peculiarities, he cannot transmit to them more than to any other person his parasites.

On what ground is leprosy assumed to be a hereditary disease? Only this, that the children and descendants of lepers are often leprous also. If this is sufficient proof then many other diseases behaving in the same way should be classified as hereditary. Scabies for example, Elephantiasis Arabum and so on.

Dr. Edward John WARING in his valuable statistics of elephantiasis in Travancore (*Indian Annals of Medical Science*, No. IX, 1858) says, that in 930 cases of elephantiasis, relatives were affected in 376, or 40.49 per cent. Relatives were unaffected in 554 or 59.51 per cent. Of the 376 cases 138 had one parent alone affected, 22 had both parents, 27 had one grandparent, 38 had one or more brothers or sisters, 42 had uncles or aunts, and 8 had sons or daughters affected. He gives a case of elephantiasis whose grandfather, grandmother, stepmother, and six half-brothers, besides himself, were affected; another, whose hands and legs were much enlarged, had 10 members of his family similarly affected, viz. 6 maternal aunts, 2 uncles and 2 brothers; another, with both legs and left hand affected, had a father with elephantiasis, and for three

generations in this family father and son had been affected; and yet another whose father, mother, 2 sisters, and 2 brothers had elephantiasis. Dr. Francis DAY (*Madras Journal of Medical Science*, Vol. 1, 1860) collected the particulars of 100 cases of elephantiasis. He says "whether the children of persons who have the disease are more subject to its attack than others is an important enquiry; I have found the figures to stand as follows:—

"Father and mother, one or both affected, 56.8 per cent. Neither father nor mother affected, 43.2 per cent.; although many of these last had relatives suffering from it."

If the frequent appearance of a disease in a family is a proof that the disease is hereditary, what stronger proof that elephantiasis is hereditary could we have, than these facts and figures supply? But to say that elephantiasis is hereditary, is also to affirm that the parent of the embryo filariæ we see in the blood in this disease enters the fœtus before birth, and in the case of the disease being inherited from the male parent, enters the uterus with the spermatic fluid. This position is too absurd and impossible to maintain. The true explanation of the appearance of heredity depends on the fact that most of the members of affected families live under similar circumstances as regards the operation of the medium of infection. Will not the same explanation apply to the hereditary reputation of leprosy? In the Amoy district only about 26 per cent. of the lepers have leprous relatives, a smaller claim than has the Elephantiasis Arabum of either Travancore or Cochin to be classified as a hereditary disease.

As regards the other characteristics of indirectly infectious disease, there can be no dispute about their applying to leprosy. Leprosy is well known to be endemic in certain localities, and it may be imported into hitherto unaffected districts; the history of the disease in the Sandwich Islands attests this. There is one well authenticated instance of the importation of Elephantiasis Arabum into a country in which it did not previously exist. (I have mentioned this circumstance in a former paper.) I refer to Barbadoes. With the light now thrown on the etiology of the disease, we can understand why elephantiasis did not exist there before, and why, though not a directly infectious disease, it spread and became endemic. Mosquitos and men were there, but no filaria-infested man had visited the island. Such an individual arriving, the mosquitos soon disseminated the filariæ, and now elephantoid disease is endemic there. This is a curious and suggestive analogy to what has happened in the case of leprosy in the Sandwich Islands. Not an infectious, or markedly infectious disease, yet once imported it has spread. What can better explain this than the hypothesis of indirect infection by a medium?

Again, we know for a fact that leprosy dies out in proportion to the spread of civilisation and its attendant cleanliness and wholesome food. Leprosy is a mysterious disease in many respects, but, though mysterious, no one can deny that it depends on a physical cause of some kind. This physical cause, whatever it may be, is either not produced or is not applied where a people has become civilised. Supposing that civilisation was adopted by the countries in which elephantoid disease is now endemic, and that such accessories of civilisation as the mosquito curtain and the water filter were in universal use; in the first place no filaria would be ingested by the mosquito; and in the second place, if by accident this should happen, the parasite would be arrested by the filter before it could gain access to man. In some such simple manner elephantoid disease may yet be stamped out, and in some such manner the extinction of leprosy has been brought about in countries where it was formerly endemic.

At one time and in certain countries leprosy was believed to be infectious, and in such countries lepers were segregated and kept apart from the general population, and even in our times the belief in its infectiousness is not entirely abandoned. Cases every now and then crop up giving some support to the idea of infection; but they are met in turn by such cases as that of husband and wife living for years together, one being leprous and the other keeping quite free from the taint. Would not the necessity for the intervention of an extraneous agent, such a go-between as the mosquito is in elephantoid disease, reconcile things apparently contradictory? and under such an assumption, does not the universal belief in the utility of segregation and separation in a non-infectious disease, receive support and explanation?

In conclusion I would repeat, that a certain order of enthetic diseases should be divided, and the diseases classified as directly infectious, and indirectly infectious. Syphilis, glanders, rabies, scabies, and the epiphytic diseases, etc., belong to the former; hydatids, tapeworms, elephantiasis and some other diseases, including leprosy perhaps, to the latter. And as a practical deduction from this classification I would suggest, that as directly infectious enthetic diseases can be avoided by the prevention of contact, so the indirectly infectious diseases could be avoided by interfering with the operation of the medium.

Case 16. *Hæmatozoa and Ulcer of the Leg.*—Ho, male, æt. 25; came to hospital on account of ulcers on the leg; lives in Tchoan-tchiu; farmer.

When 17 years of age had a fever for 4 or 5 days; with this exception and the ulceration on his leg, (which is of 5 years standing and originated in a wound from a thorn) has for many years enjoyed good health. When quite a boy had an attack of dysentery, but has never had hæmaturia, chyluria, or any signs of elephantoid disease. His glands are quite normal with the exception of slight induration on the left side, probably the effect of the chronic ulcers in front of the leg.

This man's mother has elephantiasis of the leg, and suffers much from monthly attacks of fever, and a friend living in the same house has also elephantiasis of the leg.

In six small slides eight hæmatozoa were found.

Case 17. *Hæmatozoa and Lymph Scrotum.*—Tsooien, male, æt. 50; Tchiupo; a field labourer; came to hospital to be treated for discharge of yellow fluid from the scrotum of 12 or 13 years' standing.

He declares that very small vesicles appeared on his scrotum years before he became subject to fever, and the scrotum would at times become red and swollen without his general health being affected. For the last five years however he has had aguish attacks many times in a year, their frequency appearing to depend on the amount of work he is doing; at slack times he may not have an attack for several months on end. Before the rigors occur the glands swell suddenly to the size of a fowl's egg, and in about 15 minutes from the time this happens severe rigors set in and continue to shake him for an hour or two; these are followed by high fever of about equal duration, but there is no sweating stage. The scrotum swells rapidly, and next day a vesicle ruptures; from this a discharge will drain for ten days or longer, to the extent of two or three large bowlfulls daily, soiling his clothes and making him very uncomfortable. The discharge at first is straw-coloured and transparent, but after running some time it becomes white and opaque like milk.

He has never had chyluria, hæmaturia or dysentery.

The appearance of the scrotum is most characteristic; many vesicles are scattered over its lower and anterior surfaces, and some of them expanded into large semi-sessile blebs projecting from the skin. Part of the scrotum near the raphe is thickened and elephantiased, and the under part of the prepuce and skin of the penis are much thickened, causing the penis to be bent. The inguinal and femoral glands on both sides are very much enlarged, varicose in some places, and solidified in others. Altogether, the

appearance of the parts gives the impression that the lymph scrotum is passing into elephantiasis, and that ere long the tumour, when the lymphous discharges cease, will grow very rapidly.

Being interrogated on the point, he says he had an abscess in his scrotum some years before it became lymphous.

In three examinations filariæ were found twice, but only one each time.

Soon after admission an attack of fever with inflammation of the scrotum caused us to delay the operation we contemplated, and he returned home unrelieved.

Case 18. *Hæmatozoa and Rheumatism.*—THIAN, male, æt. 43; Lakpangtchee, Thienpo; farmer; came to hospital on account of severe rheumatism of seven years' standing. When young he was liable during a period of ten years to attacks of quartan ague, but since his rheumatism began these attacks have not recurred; the last occurred about eight years ago, and was immediately succeeded by acute rheumatism which confined him to bed for about six months. Before this he was a stout strong man, but since, he has gradually wasted, and is now thin and withered looking. He has had several attacks of acute rheumatism since the first, but until the third month of last year was pretty free from them for a few years.

His right foot is œdematous; calf of right leg swollen, apparently from some effusion amongst the muscles (this he says followed the kick of a buffalo last year); the right ankle is also swollen and he walks on his toes on this side as in Talipes equinus. Left knee rheumatic. Notwithstanding his wasted appearance his appetite is voracious.

Femoral glands on both sides distinctly enlarged, elevating the skin perceptibly. Has a small hydrocele on the left side; this he states has come and gone since childhood.

Has never had chyluria or hæmaturia.

He comes from a district where elephantiasis is very common.

Blood contains hæmatozoa in the proportion of about one in six slides.

Case 19. *Hæmatozoa, Enlarged Glands and Thickened Scrotum.*—TSOSIM, male, æt. 36; Hooioah; farmer; came to Amoy seeking employment as a chair coolie.

Had ague when 13 or 14 years old, never since. Four months ago had an attack of fever, it lasted but one day and he speedily recovered. The fever was accompanied by swollen and inflamed glands, with stiffness of the legs interfering with his walking. The swelling of the glands did not subside.

On inspection the left inguinal glands are found to be much enlarged, and have the soft doughy feel characteristic of dilated lymphatics; on the right side the glands are not perceptibly affected. The skin of the scrotum is thick, dense and corrugated. This condition of glands and scrotum has come on only since the feverish attack four months ago.

Never had chyluria or hæmaturia. Four years ago had an abscess on his left arm, previous to which had a wound on his foot.

In six slides three filariæ were found.

Case 20. *Hæmatozoa; no disease.*—THO, male, æt. 19; Amoy; a field labourer. Last year had several attacks of tertian ague, and a severe attack of scabies which appears to have induced an abscess in his thigh. He is now quite well; has no sign of elephantiasis, enlarged glands, chyluria, or hæmaturia.

In two slides six filariæ were found.

Case 21. *Hæmatozoa and Stricture of the Œsophagus.*—NNG, male, æt. 61; Tangsoa, Thienpo; farmer.

A nephew is leprous, and another nephew has a large scrotum.

He is a very stupid old man and his history is in consequence difficult to make out. He had ague once or twice, but does not remember how long ago; there is also a doubtful history of chyluria many years ago. Had an abscess on his thigh the scar of which is still visible.

No elephantiasis or enlargement of the glands.

He came to hospital on account of symptoms of obstruction of the œsophagus of six months' standing. He cannot swallow rice, and lives on rice-water and liquid food. Sometimes the stricture appears to relax

a little, when he can swallow small quantities of soft boiled rice. Refers the obstruction to the lower part of the sternum. Though very much wasted, no tumour or any cause for the obstruction can be discovered.

Seven slides contained two filariæ.

Case 22. *Hæmatozoa; no disease.*—KHATZIU, male, æt. 32; Lamoa, Itsai; farmer.

When young was anæmic, but since has been in good health. Has never had ague, fever of any kind, chyluria, hæmaturia, hydrocele, or abscess. Parents, relatives and neighbours free from leprosy and elephantiasis. History is quite negative; glands and scrotum are normal.

In six slides one hæmatozoon was found.

Case 23. *Hæmatozoa, Ague, Enlarged Spleen.*—NGAI, male, æt. 36; Tchangtchiu, Anpangsia; farmer.

No leprosy, or elephantiasis among relatives or neighbours.

At 22 he contracted a quartan ague, which stuck to him continuously for four years, and more or less ever since. His spleen has gradually enlarged. Last year the fever was unusually heavy, and was followed by dysentery and dropsy. He once spat blood.

Never had chyluria or hæmaturia. No elephantiasis of legs or scrotum. Glands of groin quite normal. Spleen but slightly enlarged, hardly extending beyond the ribs. His blood is very defective in corpuscles; in three slides three filariæ were found.

Case 24. *Hæmatozoa, Elephantoid fever, Enlarged Glands and Scrotum.*—LA, male, æt. 41; Tchangtchiu, Anpangsia; farm servant; came to Hospital for the removal of a bullet lying amongst the muscles of the back. The bullet has been in its present situation since the Taiping rebellion.

Until his 28th year he enjoyed excellent health. During a raid of the Taiping rebels on his village he was shot in the shoulder, and since then has suffered from feverish attacks eight or ten times a year. They occur principally during bad weather, last for one day only, and are accompanied by pain in his old wound. At such times, the glands of the groin are apt to enlarge, and once he had swelling of the scrotum and left testicle. Many years ago a swollen gland near the left saphenous opening burst and discharged a watery bloody fluid, not pus. The attacks of fever are characterised by severe rigors, fever, and profuse sweating, each stage continuing for about two hours; the glands do not always enlarge with the occurrence of fever, but when they are affected their enlargement precedes the fever by a day or two.

The scrotum is soft, uneven, and vesicated, and when a prominence is pricked a small quantity of clear lymph exudes; the skin over the lower part is very decidedly thickened.

Left inguinal and femoral glands decidedly enlarged; the femoral are hard and firm, the inguinal are softer. Glands on the right side affected but in a much smaller degree.

Never had chyluria or hæmaturia; last year had dysentery, passing frequent stools of mucus and blood for fifteen days.

In eight slides seven filariæ were found.

Case 25. *Hæmatozoa, Lymph Scrotum and Elephantiasis Scroti.*—POE, male, æt. 45; Tchoantchiu, Tchin kang; a shopkeeper. No leprosy or elephantiasis in his family, but a neighbour has elephantiasis of a leg.

Had tertian ague at 17 for two months. At 42 had his first attack of the fever, which, for the last three years, has never left him for more than a few days at a time. Describes the fever as commencing with a feeling as if produced by retraction of the spermatic cords, and giving rise to so much pain that he has immediately to leave off work; this is immediately followed by rigors, fever and sweating, the whole attack lasting for about six hours. Says that his disease commenced by an attack of chills coming on in the middle of a very long and wet journey; when he got home he had fever, and next day he discovered that his glands were enlarged, and his scrotum œdematous; in a month's time vesicles had formed on the surface of the scrotum. With successive attacks of fever the scrotum inflamed, became permanently enlarged, at times discharging a white lymph in great abundance, 4 or 5 ounces. His fever never comes on during the night.

A mass of elephantiasis, weighing about two and a half pounds, involving both penis and scrotum, was removed, and penis and testes were left bare to cicatrise. This process took about four months to accomplish, and during the whole of this time he never had a recurrence of the fever, which formerly attacked him every few days.

The glands in the left groin appear quite healthy; not so those on the right side, where a large tumour is formed by the enlargement of a bunch of them over the saphenous opening, and another cluster above Poupart's ligament; to the touch they are firm and not varicose.

This man has never suffered from chyluria, hæmaturia or dysentery.

His blood was examined altogether seven times and on one occassion only were filariæ found. Three days afterwards they had again disappeared.

Case 26. *Hæmatozoa, Aortic valve disease, dilatation of Arteria innominata and right Carotid.*—PHIEN, female, æt. 70; widow; native of Ankhoe; been resident in Amoy for 30 years.

She is in very destitute circumstances, being able to earn only about 40 *cash* a day; on this pittance she supports herself and two grandchildren.

Her parents lived to be very old; there is no leprosy or elephantiasis in her family. Ten years ago had a tertian ague, altogether about ten paroxysms.

Twenty-five years ago had an attack of inflammation about the left knee, not in the joint, followed by abscess of the groin, and fever. Never had dysentery, chyluria or hæmaturia; and, with the two exceptions mentioned, had, notwithstanding great privation and misery, enjoyed excellent health all her life.

Came to hospital on account of a malignant looking ulcer on her left heel, which, she says, has been open for three years. There is marked disease of ascending aorta, innominate artery and right carotid, much bulging and strong expansion at right front and root of neck on systole; systolic bruit and very distinct reduplication of second sound.

Filariæ abound in this woman's blood.

Case 27. *Hæmatozoa and Lymph Scrotum.*—SIM-POO, male, æt. 39; farmer, Lamtai boo, Soa-kha. No leprosy in his family; a distant relative has elephantiasis in both legs, and in his neighbourhood are several cases of that disease.

Never had ague or other disease till his scrotum began to be diseased 17 or 18 years ago. This commenced with pain in his thighs and knees; red streaks appeared on the parts, and he had rigors, fever and sweating. Similar attacks have since occurred from 2 to 6 times in a year, and, on some of these occasions, the scrotum and groin glands inflame, if the legs are not affected. On the inner surface of the left thigh are the scars of two abscesses which formed at different times after these attacks. Under the skin of the left popliteal space is a bunch of dilated vessels, which look like, and may be, lymphatics; he says there is sometimes elephantoid swelling of this leg.

Last attack of fever occurred seven months ago.

The scrotum is a well marked example of lymph scrotum; and the glands of the groin are very much enlarged, especially on the left side, and are equally characteristic.

Has never had chyluria, hæmaturia or dysentery; and, but for the attacks of fever and inflammation, enjoys good health.

In eight small slides of blood eighty-four filariæ were counted.

Case 28. *Hæmatozoa, Chyluria and Lymph Scrotum.*—THO, male, æt. 40; Tchiupo, Phoolam Rio; farmer. Relatives and neighbours have no leprosy nor elephantiasis.

Till 35 or 36 years old was a strong healthy man; had what appears to have been prolapsus ani about that time. When 18 years of age had an abscess in his scrotum. Elephantoid fever began when he was 35 or 36; attacks consisted of rigors, fever and sweating, the whole paroxysm lasting about six hours. Glands and scrotum have been affected since this fever began; their swelling and occasional inflammation appearing, from his description, to be secondary to the fever. Attacks occur very irregularly from once to

several times a month; last attack occurred four days prior to his admission. He knows of no cause for his complaint.

His is a fine specimen of lymph scrotum; it has never discharged spontaneously, but, on pricking one of the many vessels on its surface two to three ounces of rapidly coagulating straw-coloured lymph exudes. There is no hardening, and but slight enlargement of the scrotum, which is soft, silky, and pendulous. The inguinal and femoral glands of the left side are very much enlarged and varicose; those of the right side are also enlarged to a less extent, and are harder to the touch.

Three months ago he first noticed blood and clots in his urine; at the time he had a slight attack of the usual fever. Since that time his urine has never been quite free from blood and clots, the proportion of these diminishing or increasing according to the amount of work he does. Since the establishment of the chyluria, fever attacks are more frequent, and he has become very anæmic and debilitated; so much so that he cannot keep on his legs for any length of time, but is compelled to lie or sit down.

Never had dysentery or other serious disease.

July 11th.—Came to hospital.

July 14th.—Blood and urine have been frequently examined, but no filariæ have been found in either. Blood is very defective in corpuscles.

Prescribed Quinine grs. ij. and Gallic acid grs. xx three times a day.

July 15th.—To-day I examined two specimens of urine. One of them, passed last night, had been standing in a conical glass vessel for about 12 hours, and had separated into three well marked zones; the uppermost, and most bulky, was of a pale salmon colour; the middle was of a considerably redder tinge than the former, and had small red specks in it; and the lowest was of a dark red like blood, and formed a mere sediment at the bottom of the vessel. I examined many slides of this sediment, and after a prolonged search found one dead hæmatozoon in it. The other specimen of urine, passed only two hours before examination, was of a dirty blood red colour throughout, with several very firm clots floating in it, specific gravity 1012. No filariæ were found in it. Blood, lymph, and oil corpuscles abounded in both specimens of urine.

July 16th.—An assistant found two filariæ in blood to-day.

July 19th.—He found one hæmatozoon in blood last night, and this morning I confirmed his observation by finding two more.

July 22nd.—Returned home, having derived no benefit from the very large doses of Gallic acid he had been taking.

Case 29. *Hæmatozoa, Enlarged groin glands, and Ulcerated leg.*—WHAT, male, æt. 23; Tchangtchiu; barber; came to hospital on account of an ulcerated leg.

Relatives free from leprosy and elephantiasis. A near neighbour is a leper, and another has elephantiasis.

When about 10 years of age suffered much from lumbrici. Last year had two attacks of fever within a few days of each other; and this year about three months ago, had a single paroxysm. Has had ordinary indolent ulcers on his legs for seven years. Never had chyluria, hæmaturia or dysentery.

The inguinal glands on both sides are indurated and slightly enlarged, the femoral glands more so, distinctly projecting; perhaps the ulcers may account in part for the state of his glands.

Filariæ in considerable numbers in his blood.

Case 30. *Hæmatozoa, Hydrocele, Enlarged femoral glands and Cataract.*—NGEE, male, æt. 58; Gopo, Pholam; cotton carder; came to hospital to be operated on for cataract.

No leprosy or elephantiasis in his family. Two neighbours are lepers, but there is no case of elephantiasis near his residence.

Five or six years ago had quartan ague for a month or two, and now is liable to attacks of headache and pain in the limbs, but not to fever. For two or three years has had enlarged groin glands; at times they increase in size, but the swelling is not accompanied by any distinct febrile movement.

The femoral glands are distinctly enlarged and indurated, not varicose. Inguinal glands normal. A small hydrocele in right testicle; skin at the bottom of scrotum thick, wrinkled, and coarse.

Left cataract mature; right forming. The mature cataract was operated on with a good result.

Filariæ found in his blood on several occasions.

Case 31. *Hæmatozoa and Incipient Elephantiasis of the Leg.*—TUI, male, æt. 32; Tinhai; farmer. Parents alive and well; no relatives leprous. His father has elephantiasis of the leg. The man SIMPOO (Case 27) is his cousin, and lives in the same village. Another village about three *li* from his house contains many cases of elephantiasis.

During ten years has been liable to attacks of elephantoid fever, along with inflammation of the right leg, and swollen femoral glands. The attacks recur irregularly twice or thrice a year, the fever lasting four days, and convalescence about ten days more. Says that when about 10 years old had a quartan ague, and that many years ago had inflammation of the scrotum. The scrotum and inguinal glands are now quite normal in appearance.

Never had abscess, chyluria, hæmaturia or dysentery.

Below the knee the right leg is slightly but distinctly swollen and larger in circumference than the left leg by about $\frac{3}{4}$ of an inch. The skin, however, has not yet taken on the thickening and coarseness characteristic of elephantiasis. Corresponding femoral glands slightly enlarged and indurated.

His blood contains hæmatozoa.

Case 32. *Hæmatozoa, Hæmatemesis and Enlarged Glands.*—TCHIAN, male, æt. 49; Lamoa; tinker. Has been short winded for seven or eight years, and two years ago, in Annam, where he has resided for five years, vomited and defæcated a large quantity of blood. Since this occurrence his breathing has become very much worse, and two months ago he returned to China. Last year had attacks of fever for about ten consecutive nights; no enlargement of the glands at that time.

Heart sounds very feeble; no bruit, or abnormality of præcordial space. Breath sounds feeble as in emphysema.

Left femoral glands project much, and are enlarged; right less so, but still large; the skin of the scrotum is very coarse, not however distinctly elephantiased.

Patient is thin, feeble and covered with itch.

Filariæ found in his blood.

Case 33. *Hæmatozoa, Quartan Ague, Enlarged Spleen, and Abscess.*—LANG, male, æt. 26; Soasia; farmer. No elephantiasis in his family or neighbourhood. Several cases of leprosy in his village. When young had many attacks of quartan ague, and has now an enlarged spleen extending to the umbilicus. Every year, about the eighth month, has three or four attacks of quartan ague. A good many years ago, during one of these attacks, his scrotum inflamed; inflammation subsided without the formation of abscess, in ten days.

Never had chyluria, hæmaturia or dysentery. Two years ago, during one of his ague attacks, a large abscess formed in his left groin and discharged a cupful of pus; the resulting scar is very apparent, but glands and scrotum are healthy.

Lens of right eye opaque, globe softened, probably traumatic.

Filariæ in considerable numbers.

Case 34. *Hæmatozoa, Lymph Scrotum and Chyluria.*—KAN, male, æt. 72; Amoy; pedlar.

Parents and five brothers dead; one sister alive and well; no leprosy or elephantiasis in his family.

Has twice visited foreign places, once Tientsin and once Formosa, about 30 years ago.

With the exception of an aguish attack of very short duration between 30 and 40, has always enjoyed good health. When over 30 had an abscess in his scrotum, but it was not till a few years ago that he became liable to swollen groin glands every 3 or 4 months. His scrotum has been swollen for 2 or 3 years; occasionally he has a rigor and fever, and then the scrotum itches excessively, inflames, and becomes

covered with minute white vesicles; these burst and discharge a large quantity of fluid. When this happens, he passes urine white like milk for a few days; when the discharge from the scrotum ceases the urine returns to its normal appearance. This chyluria has occurred many times during the last two or three years. Is much troubled with rheumatism. Had dysentery between 30 and 40.

The scrotum is large, pendulous, and vesiculated; and the glands on both sides are swollen and varicose.

Filariæ in abundance in the blood.

Case 35. *Hæmatozoa, Enlarged Glands.*—PHO, male, æt. 64; Soakoe; shopkeeper. He came to hospital to nurse his nephew who attended for the amputation of a very large elephantiasis scroti; they do not live in the same house, but in places about a *li* apart.

Parents dead, both very old people; six brothers and two sisters alive, none of them have elephantiasis; a grand uncle had a very large elephantiasis scroti, and a near neighbour has a big leg.

When young had tertian ague for about a month, but since has never had any very serious disease. Has been liable to enlargement of the groin glands, especially after exercise, three or four times a year for the last thirty years. He has no pain in them, unless they become very large and hot and he has slight fever. His scrotum swelled once when he was 53 years old; he had rigor, fever, and swollen glands at the time, and he feared his scrotum would become like his nephew's; but the swelling subsided, and the scrotum is now quite normal in appearance. Not so the glands, especially those over the left saphenous opening, which are large as hazel nuts, and grouped together so as to form a prominent swelling 2 inches × 2 inches.

Has never had chyluria, hæmaturia or dysentery.

Filariæ abundant in the blood.

Case 36. *Hæmatozoa, Soft Cataract, and Enlarged Femoral Glands.*—KIONG, male, æt. 20; Tangoa; farm servant. Came to hospital to be treated for double soft cataract and fever.

No elephantiasis or leprosy among his relatives or neighbours.

When 12 or 13 had a tertian ague for about a month; been blind for four years; had a slight recurrence of his ague two or three years ago; has had enlarged femoral glands for many years; favus since childhood; no chyluria, nor dysentery, and no other disease. Femoral glands indurated and distinctly enlarged; scrotum normal.

Six slides contained ten filariæ.

Case 37. *Hæmatozoa and Lymph Scrotum.*—TIOKNA, male, æt. 39; Tchiu-po; farmer.

No leprosy or elephantiasis in his family, but in his town (Boe lim), one of about 10,000 inhabitants, are a great many cases of elephantiasis both of scrotum and leg. Until three years ago he enjoyed good health, when he was attacked with a painful feeling of tightness about the scrotum, swelling of the groin glands, shivering and fever. At first the scrotum did not swell. Such attacks occurred irregularly two or three times a month, and confined him to his bed three days at a time. The scrotum has been affected for one year only; it inflames and swells now with each attack of fever, and is very itchy in the interval, often discharging a yellow fluid.

Never had chyluria, hæmaturia or dysentery; glands and scrotum are most characteristic. Scrotum tends to elephantiasis, being considerably enlarged and thickened.

Abundance of filariæ in the blood.

Case 38. *Hæmatozoa and a history of Ague.*—LIU, male, æt. 27; Pholam; water coolie at the hospital.

No elephantiasis or leprosy among his relatives, but several cases of both diseases among his neighbours at Pholam.

At 17 had a quotidian ague for ten days, and about this time he remarked some slight swelling of his groin glands. Again at 25 had ague, quotidian and tertian for a week or two. Never had chyluria, hæmaturia, dysentery or other serious disease, and his scrotum and glands are at present quite healthy.

Filariæ abound in his blood.

Case 39. *Hæmatozoa and recurring inflammation of the Scrotum.*—SENG, male; æt. 22; Pholam; shroff; came to hospital to have an adenoid tumour removed from posterior auricular region.

None of his relatives have elephantiasis or leprosy, but both diseases are common in his neighbourhood.

Until last year enjoyed excellent health. Last year, however, had an attack of fever; the scrotum became red, and, after five days, swollen; in a month an abscess opened, discharging ten ounces of pus, and healing kindly. After an interval of a month the fever and inflammation of the scrotum returned, but no abscess formed; and again, about six months ago, had a similar attack. During these attacks the groin glands were painful and swollen, but at present both glands and scrotum appear quite healthy. Never had chyluria, hæmaturia or dysentery.

His tumour was removed, and the wound healed without difficulty.

Blood contains hæmatozoa in enormous numbers; 21 specimens were counted on 6 small slides.

Case 40. *Hæmatozoa and Hydrocele.*—HOEN, male, æt. 27; Tchiu-po; farmer; came to hospital to be treated for hydrocele.

HANLIONG (Case 41) is his relative, and lives within a few yards of his house. In his village are several cases of elephantiasis and leprosy.

Suffered from ague, sometimes tertian, sometimes quartan, from 12 to 17, and became very cachectic. He recovered perfectly. Since this ague left him, has occasionally had feverish attacks lasting 2 or 3 days, and at these times his scrotum (hydrocele?) enlarges and becomes slightly heated; but there is no swelling of the glands. His hydrocele has been in existence for seven years, and is now a very large one, extending into the inguinal canal; it is on the right side. Glands on both sides are large and hard, but do not project much. Never had chyluria or hæmaturia.

Blood contains abundance of filariæ.

Case 41. *Hæmatozoa; Ulceration of the Cornea, and Enlarged Glands.*—HANLIONG, male, æt. 14; Tchiupo; cowherd; neighbour and relative of case 40.

No elephantiasis in his family, and he has never had fever or any serious disease. His left eye has been liable to attacks of inflammation for the last 2 or 3 years.

The lower half of the left cornea is inflamed and has two small healing ulcers on it; there is considerable lachrymation and photophobia.

His scrotum is small and healthy; but the groin glands, especially those on the right side, are varicose, much enlarged, and stand out prominently. On both sides the swelling is divided into two parts, an upper and a lower, by Poupart's ligament. After he has been lying down for some time the swelling diminishes, and can be completely dispersed by pressure; pressure removed, swelling speedily returns. Says he never has had pain, only discomfort sometimes, from these glands; and he is in good general heath. Under suitable treatment the corneal ulcers readily healed, and the photophobia and lachrymation disappeared.

His blood contains filariæ in greater abundance than in any case hitherto examined; in one drop placed between two glass slides 122 hæmatozoa were counted.

Case 42. *Hæmatozoa and Hydrocele.*—TENGIEE, male, æt. 40; Kangtan, Tchiupo; farmer. No leprosy or elephantiasis in his family. Elephantiasis among his neighbours to some extent.

He came to hospital in charge of another patient. He suffers from anæmia, and had ague when young. Nearly every year has attacks of evanescent fever, and at those times his legs swell slightly. He is very thin and anæmic, but has never had inflammation of scrotum or glands, chyluria or hæmaturia. Many years ago had dysentery.

Glands are normal; small hydrocele in right testicle.

Hæmatozoa were found in the blood, but they were not numerous.

Case 43. *Hæmatozoa, Ulcer on the Arm, and Enlarged Glands.*—SIETGOAN, male, æt. 37; Tchianan, Soaan; farmer.

Relatives free from leprosy and elephantiasis; several cases of the latter disease among his neighbours.

Came to hospital to be treated for a malignant-looking ulcer on the back part of one forearm close to the elbow. This began from the breaking down of a small tumour about three months ago; the tumour had gradually enlarged during the last four years to the size of a big walnut. The surface of the ulcer is ragged, elevated; granulations uneven; discharge fetid; edges irregular and undermined in places, indurated in others; the sore is nearly circular, and is about 2½ inches in diameter.

During the last four years has had several slight feverish attacks, 8 or 10 a year, lasting for a few hours only, and not accompanied by any kind of inflammation.

Has bleeding piles; never had chyluria, hæmaturia or dysentery.

The left femoral glands are enlarged, projecting considerably; they feel soft to the touch and form an irregular swelling about two inches in breadth. The scrotum is normal.

Filariæ were found in the blood.

Case 44. *Hæmatozoa, Lymph Scrotum.*—SENG, male, æt. 54; Pholam; farmer. Parents died of ague; no elephantiasis or leprosy among relatives or neighbours.

Up till 40 years of age had good health. His present disease commenced then by an attack of fever and inflammation of the scrotum, induced, he says, by washing in cold water while heated with work. The fever lasted 4 or 5 days, but he was confined to bed for a month feeling weak and ill, the pain and swelling of the scrotum continuing. After he began to get about he was still extremely weak and suffered much from pain in his scrotum, and if he walked or worked much this increased and ended in an attack of inflammation. Simply standing up for a short time caused the scrotum to become distended with lymph; this is speedily relieved by assuming the recumbent position. Every year has fever 3 or 4 times accompanied by inflammation of the glands and scrotum. Lymph discharges have taken place altogether eight times, the first three years ago. The discharge is white like milk, coagulates rapidly, and amounts to 50 or 60 ounces every time.

Never had chyluria, hæmaturia or dysentery.

Is intensely anæmic and debilitated; cannot keep his feet for more than a few minutes at a time. After coming to hospital his scrotum discharged, and in the course of three days one hundred ounces of lymph escaped and was for the most part collected. He fainted frequently from the consequent debility, and had an attack of fever. Every afternoon since has feverish feelings.

Scrotum is most characteristic; groin glands much swollen and varicose; the latter can be quite emptied by a little pressure.

Blood was examined 10 times before filariæ were discovered (discharge also). Next examination an assistant found one, and the following morning I found, in a single full slide, three.

Case 45. *Hæmatozoa, Lymph Scrotum.*—TOON, male, æt. 32; Tchiupo, Soanpi; farmer. No leprosy or elephantiasis among his relatives. A neighbour residing at a village a *li* from patient's house, has a large scrotum.

When 18 had a quotidian ague, passing into a tertian, for about a month. At 20 a large abscess formed in his scrotum, and discharged after a time about a bowlful of pus; there was no fever or enlargement of the glands at that time. Has had lymph scrotum for three years only; it set in with fever and swelling of the glands and scrotum; these were troublesome for a day only, but have recurred once every year since, and the scrotum has gradually enlarged. Never had any discharge.

Glands are large and soft; scrotum big and much vesiculated; both are characteristic. Has a 5 or 6 ounce hydrocele in right testicle.

Never had chyluria or hæmaturia; had a slight attack of dysentery ten years ago.

Filariæ found at the second examination, four in one large slide.

Case 46. *Hæmatozoa, Hydrocele, Fever.*—HINLO, male, æt. 48; native of Ankhoe; lived in Amoy for many years working as a cook in foreigners' employ.

I saw him lately for an attack of ague of the tertian type; it recurred four times, but was easily checked by quinine. All the stages of the fever were well marked; there was no inflammation of the glands or scrotum.

He says that every year or two he has similar attacks, induced apparently by exposure to cold; he gradually recovers in a day or two. Never had chyluria.

Has a hydrocele in left testicle; glands are marked but apparently healthy. Scrotum normal.

Hæmatozoa in very great abundance (See page 6).

Case 47. *Hæmatozoa, Lymph Scrotum.*—TANLO, male, æt. 42; Tangoa, Piatchin; mason.

Parents and brothers are dead; no elephantiasis in his neighbourhood.

Between 17 and 18 had two attacks of fever, and again when a little over 20 had five attacks. When 28 had chancre and bubo, and about the same time a discharge from his scrotum. After 30 his fever returned seven or eight times a year, but until he was 41 there was no recurrence of discharge from his scrotum. Then he noticed for the first time vesicles on the scrotum; these, when ruptured, discharged about ten ounces of lymph, at first clear like water, but after running for a day becoming white like milk, the scrotum the while contracting. These discharges happen frequently. When the flow has almost ceased the glands again enlarge, and he has smart fever, the scrotum swelling up again and becoming painful. The fever abating somewhat the scrotum diminishes slightly; it is then his practice to prick it and allow the accumulating lymph to escape, otherwise, experience has taught him that the scrotum will become very painful.

This is a very marked case of lymph scrotum and enlarged glands, and the blood contains hæmatozoa.

Case 48. *Hæmatozoa and Lymph Scrotum.*—TANLOK, male, æt. 36; Hooioah, Soapi; barber.

Parents and brothers alive; no elephantiasis among relatives or neighbours.

At 14 had fever for a month; at 18 fever recurred, the right side of his scrotum inflamed, suppurated and discharged about ten ounces of pus. The abscess healed readily and he kept well till his 35th year, when fever returned and his groin glands and scrotum enlarged. He pricked the distended scrotum with a needle and it discharged during several days a clear fluid. After about a year he noticed vesicles on the scrotum, they itched excessively, but if he scratched and broke them he had fever. The disease is gradually becoming more troublesome. At times the dartos appears to contract violently, giving rise to acute suffering; to prevent this he rubs the scrotum between the palms of his hands, and this has the effect of releasing the spasm and making the scrotum soft and flaccid.

This is a good case of lymph scrotum; the glands, however, are at present but slightly enlarged. Hæmatozoa in the blood.

Case 49. *Hæmatozoa, Hydrocele and Enlarged Groin Glands.*—TANTCHIN, male, æt. 43; Lamoa, Tngtan; cook and farmer.

Parents dead, brothers healthy; a neighbour has elephantiasis of the leg, another of the scrotum.

Till 30 enjoyed excellent health; at that age a gland in his left groin swelled to the size of a fowl's egg (there was no pain) and that side of the scrotum enlarged (hydrocele). He had no fever. Glands and hydrocele diminish and increase at the same time.

Glands on the left side very large. The hydrocele was tapped and injected and did well.

Hæmatozoa found in the blood.

Case 50. *Hæmatozoa and Leprosy.*—PONG, male, æt. 22; Tchinkang, Oahai; shopkeeper. No leprosy in the family, or elephantiasis in his neighbourhood.

With the exception of an anæsthetic patch, the size of the palm of the hand, on the back of the right shoulder, this lad is quite healthy. His scrotum and glands are normal, and he never has had fever. He had slight swelling of the groin glands when the anæsthetic spot first appeared two years ago.

Hæmatozoa in the blood.

B.—Dr. David MANSON's Report on the Health of Amoy for the Half-year ended 30th September, 1877.

TEMPERATURE and Rainfall during the 6 months:—

—	APRIL.	MAY.	JUNE.	JULY.	AUGUST.	SEPTEMBER.
Highest	80°	82°	88°	90°	93°	90°
Lowest	59°	68°	76°	79°	81°	76°
Rainfall—inches	6.40	9.81	12.86	7.20	2.77	2.53

Deaths during the 6 months:—

ON SHORE.

Asiatic Cholera	3 cases.
Infantile Diarrhœa	1 „
Pelvic Cellulitis	1 „

AFLOAT.

Asiatic Cholera	2 cases.
Dysentery	1 „
Compound Fracture of Thigh	1 „
Heart Disease	1 „
Drowning	1 „

Total, 11 cases.

Of the 11 deaths, 5 were cases of Asiatic cholera—2 on board ship and 3 on shore. Of those on shore, 1 was a Japanese, 1 was a Malay and 1 was a European. On board ship both were Europeans. Of the remaining deaths all were Europeans with the exception of the case of compound fracture of the thigh. The subject of this was a Malay.

These figures shew an unusually high rate of mortality, accounted for by the occurrence of an epidemic of Asiatic cholera. Such an epidemic, besides directly affecting foreigners resident in China, is of interest inasmuch as, so far as I am aware, no history of any previous epidemic has been recorded, either as regards its character, or, what is of more importance practically at the present time, its direction of travel. In the course of a few weeks the disease spread from Amoy to Japan, and it is to be regarded as by no means improbable, judging from what we know of the habits of cholera, that we may hear of an outbreak of the disease in America. This would be a new route for cholera to take, but one, in these days of rapid steamers and Chinese emigration, to be considered as not unlikely. For these reasons I purpose to record the history of the present epidemic as observed at Amoy, to make some brief observations on the manner in which an epidemic of cholera immediately affects foreign residents here, and to give, so far as it has been possible to ascertain it in a short time, an account of previous epidemics.

The first intimation of cholera was a request by the Spanish Consul General to examine the body of a Manilaman who had died suddenly with a history of vomiting, purging, cramps and collapse on the 20th June. His sudden death was the cause of the request for a *post-*

mortem examination. On enquiry among the Chinese I learned that since the first week in June, many deaths had occurred from a similar affection, which was said at that time to be confined to a very filthy and low-lying part of the town known as Tek-tchui-kha. On Monday, 25th June, I saw in a dirty boarding-house a Japanese sailor collapsed from cholera. His history was that on the previous night he had been eating fruit and drinking gin and dirty water, that during the following forenoon he had been attacked with profuse vomiting, purging and cramp, and had suddenly sunk into the collapsed state in which I found him. He died on the following morning. Next day a patient recovering from a cataract operation in the Chinese Hospital was similarly seized, and died in a few hours. In the same ward, two days later, a girl about 16 years old, also a cataract patient, who belonged to the same party as the previous case and who had been operated on on the same day, was likewise seized but had recovered by the time I saw her next forenoon. Her father however, an old man of 70 years, who had been taking care of both of these and had been most sedulous in his attentions to them, was suddenly seized about 6.30 A.M. on the following day, and when seen at 10 A.M., was cold, pulseless and collapsed. There was no reaction and he died at 6 P.M. These three cases were of the same party, lived in the same ward and messed together. The old man was the only one of them who had been in town, the others having their eyes bandaged could not move about. All had partaken freely of peaches some days before. On the same day, a man under treatment for ulcer of the leg died. Another patient, under treatment for enlarged spleen, was attacked about the same time but managed to pull through. During these few days at the latter end of June, and throughout July, Chinamen were frequently to be seen in the streets of the foreign concession in different stages of the disease, attended probably by native "pinchers" and their assistants, and, not unfrequently, by a philanthropic foreigner who placed his confidence in brandy and chlorodyne. Dead bodies were lying in the streets covered with a mat, and it seemed to be nobody's business to have them removed. On the 1st July a case was reported on Kulangsu. I saw the man; he had come from the country to ship for the Straits. In the morning he had been seized with vomiting and purging which were still going on when first seen, though by no means violently or in proportion to the state of collapse he was in. With the assistance of two friends he walked a few hundred yards to the Seaman's Hospital. Vomiting and purging ceased, but by midday he was pulseless. His friends removed him at 6 P.M., and it is probable that he died shortly afterwards. This was the first case that came under observation on Kulangsu. At this time—the first week in July—the Chinese reported the mortality at from 10 to 100 daily; but there were no reliable sources from which to obtain an accurate return. The coffinmakers declined to give any information. The disease was no longer confined to one part of the town, it had spread over the whole native city and several cases were reported on Kulangsu daily. For some time past diarrhœa had been alarmingly prevalent among Europeans, both ashore and afloat. The Foreign Consuls were induced to adopt certain sanitary regulations in regard to the shipping, and the Municipal Council to take measures for the cleansing of the foreign concession at Amoy. On Kulangsu, the Chinese authorities, at the request of the Consuls, prohibited the Chinese from manuring the fields. Hitherto no case of cholera had occurred among foreigners. On Monday, 2nd July, one of the marines on board H. M. S. *Hornet* was attacked early in the morning. At 10 A.M. he was sent on shore to hospital, and died at

3 P.M. On Tuesday, 3rd July, a sailor from the *Hornet* was admitted to hospital in a state of collapse; he recovered. During the next few days, several cases of cholera occurred on board the *Hornet*, but none of them so acute as the first two—all recovering, one very slowly and forming a good example of "cholera typhoid." On Thursday, 5th July, a foreign resident on Kulangsu was attacked, but recovered. On Friday, 6th July, the mate of a foreign vessel in harbour was attacked in the early morning and died the same evening. The engineer of a steamer was attacked, but recovered. On Monday, 9th July, a foreigner, living in Kulangsu, was attacked, but recovered. There was suppression of urine for 29 hours. A Chinese boy, living on the opposite side of the street from this patient, was seized at the same time and died within 24 hours. On Monday, 16th July, a foreign child 1½ years old died from acute serous diarrhœa of 48 hours' duration, attended with fever and vomiting. On Thursday, 26th July, a foreigner living in Kulangsu was attacked at 4 a.m. and died the same day at 5 P.M. On 29th July, a foreigner living in Amoy was attacked, but recovered. He did not become collapsed. This was the last case, so far as foreigners were concerned, which I can certainly pronounce to have been cholera.

Among the Chinese, the disease is reported to have spread to the large cities in the neighbourhood of Amoy, and the mortality was very great. In one city, Chinchew, lying to the north of Amoy about 60 miles and on the high road to Foochow, I know, on the most trustworthy authority, that in one day 21 coffins passed through one of the gates. Chinchew has seven gates. From this date the number of cases rapidly diminished in Amoy, and by the end of August the disease had practically ceased.

In the absence of any authentic returns of the mortality it is exceedingly difficult to estimate it with any degree of accuracy. The probable mortality at the height of the epidemic was 75 per diem—possibly 100. The total mortality among the Chinese was about 1,600, in a population of 80,000. At the request of the Commissioner of Customs the Chinese authorities furnished a weekly return of the number of deaths. These official returns are quite untrustworthy, the death-rate for some reason or other being greatly understated. But, as it is an official return—the first of its kind that I have seen—and as it shews accurately enough the rise and fall of the epidemic, I annex it to this report. (*See* page 34.)

The symptoms and treatment will be most accurately described by stating a few cases in detail.

Case 1. A foreigner, aged 45, living on Kulangsu. A note was received from him shortly before 7 o'clock on the morning of 26th July, written by himself. In it he stated that he had some diarrhœa during the night, and that he thought it was right that I should know. He was visited at once and found in bed with choleraic voice, cold extremities and weak pulse. He stated that he had been in excellent health for some time, especially with regard to his bowels, but that some months previously, he had a tendency to diarrhœa, that he had returned from the country in the beginning of the week feeling quite well, and had not visited the Chinese town; and that he had not been guilty of any imprudence either in eating or drinking. He passed through the village on the previous night at 9 o'clock. He stated that he had a loose motion at 4 A.M., and that at 5 he got up as usual but did not feel quite well, that he then had two cups of tea, and immediately after a profuse rice-water stool which he recognised as choleraic and which was attended with cramps in the legs; that he then took chlorodyne and brandy twice and sent for me. A quarter of a grain of morphia was injected, hot water bottles were applied to the body and extremities,

and shampooing was started and kept up to within half an hour of death. By 8 A.M. he was pulseless, the extremities cold and skin wrinkled, the eyes sunken and features pinched, breath cold, voice hollow and almost gone. He was sensible but apathetic and restless. He was cramped at times, vomited 3 or 4 times the brandy and champagne he drank, and had one more cholera stool. He sank steadily and died at 5 P.M. There had been no pulse for nine hours.

Case 2. A foreigner, engineer of a steamer which had arrived in port on 25th June. At 12 o'clock on 6th July, I was called to see him. He stated that he had been suffering from diarrhœa for more than a week, two or three loose motions daily, that he had been on shore, and that he had paid no particular attention to his diet, and that early on this forenoon he had been seized with profuse diarrhœa, vomiting and cramps. I found the man in considerable mental distress and suffering from intense thirst, vomiting a watery fluid and every quarter of an hour or oftener passing a very copious and characteristic rice-water stool of several pints. There were cramps in the extremities but no collapse. The pulse was good. A large mustard cataplasm was applied to the epigastrium, a full dose of laudanum was given and he was removed to hospital. While in hospital he had two or three more loose stools but did not vomit again. The laudanum was repeated. By 4 o'clock the diarrhœa ceased. To relieve the thirst he was allowed to drink from the time he was first seen an unlimited amount of sodawater and ice. The thirst persisted for two days. On the third day he had perfectly recovered.

Case 3. A foreigner, age about 20. On 2nd July, at 8 A.M., I was requested to see a marine on board the *Hornet* who had been attacked in the early morning with diarrhœa and vomiting. On seeing him, at 8.30, he was in a semi-collapsed state and occasionally cramped, pulse very feeble, extremities cold, eyes sunken. It was stated that he had been in good health previously, and that he was of temperate habits, that he had several stools in the early morning, but that he had not considered them of sufficient importance to summon the surgeon in charge of the vessel. He was sent on shore to hospital, where he passed one or two rice-water stools of small quantity, vomited occasionally and complained of cramps. Within an hour of his admission he was completely collapsed, cold and pulseless. Shampooing, stimulants and hot water applications were employed, but there was no reaction and he died at 3 P.M.

Case 4. A foreigner, seaman on board H. M. S. *Hornet*, was received into hospital on 4th July. His history was that he had been seized with vomiting, purging and partial collapse from which he had imperfectly recovered. On admission he was in a semi-collapsed state, pulse small, extremities cold, no vomiting, but an occasional watery stool. From this condition he gradually passed into a state of indifference and stupor out of which it was impossible to rouse him. The stools, from being watery, became fœtid and more frequent—as many as 9 or 10 in 24 hours. The urine was normal. The pulse, from being 90 on the second evening after admission, had fallen on the sixth evening to 64, and his temperature, from being 99° had fallen to 97°, at the same observations. He complained of pain on pressure over the abdomen and suffered greatly from thirst. After the 8th day of his illness he commenced to improve, and in a fortnight was able to leave the hospital. He was treated with opium, bismuth and chalk mixture, and his food consisted for the most part of milk and sodawater. The case was regarded as one of "cholera typhoid."

Many cases were seen among the Chinese. At the height of the epidemic it was not possible to move about much out of doors without encountering several cases, either on the roadside, in the streets or in sampans, but I saw no case from commencement to termination. The cases differed in no respect from those narrated above. The Chinese reported several as having proved fatal within six hours. It was found that, as a rule, where vomiting and purging were copious the prognosis was most favourable, and, on the contrary, that in those cases where the patient had perhaps only one motion followed suddenly by collapse, death was certain. This is illustrated by cases 1 and 2.

As we are ignorant of the nature of the cholera poison, our treatment after a person has been attacked must be a treatment of symptoms. If there is premonitory diarrhœa it must be

checked by the most powerful astringents—this the Chinese attempt to do by the exhibition of opium, astringents and carminatives—and when the disease has fairly manifested itself, by astringents and, attempting to forestall the collapse, stimulants. The popular remedy of brandy and chlorodyne fulfils these indications. As a rule, when the disease is fairly established, it is impossible on account of vomiting to retain medicines, and then our only resort is hypodermic injection, which I think was of use in many cases during the epidemic. In the collapsed stage, stimulants, shampooing and the application of heat in any or all of the different forms recommended were employed.

In addition to these the Chinese employ persons to pinch various parts of the body with *cash*. In Amoy a skilled "pincher" commanded a high rate of wages. It happened to a foreigner here that one of his servants discovered that he possessed an innate talent for pinching, and that instead of earning four dollars a month as a coolie, he could as a "pincher" earn at least thirty. Owing to the liberality of one or two foreigners and a Chinese merchant we were enabled to distribute many thousands of astringent pills. The pills became very popular and must have been useful in the diarrhœa which was prevalent during the epidemic, a diarrhœa which in some cases we are justified in supposing would, but for the pills, have ended in collapse and death.

Though we are comparatively helpless in the medicinal treatment of a bad case of cholera, much can be done in the way of preventive treatment. During the earlier weeks of the epidemic we were anxious to have the fact of the presence of cholera recognised in order that some concerted action might be taken by the authorities, foreign and native, with the object of limiting its spread as much as possible. Our efforts in this direction were much embarrassed by the scepticism of some amateurs, who were very positive in proclaiming their opinion that the disease we were hourly encountering was not Asiatic cholera. The popular idea of cholera is that it bursts on a place suddenly, and that in a single day half the population is attacked and dies. Unless the disease in question satisfied this conception it did not come up to their idea of what cholera should be. It was useless to urge that no disease but cholera spread as an epidemic and killed in a few hours with vomiting, purging, cramps, and collapse, and that a mortality of one in two attacked, and one in forty or fifty of the general population, in a period of two months, was sufficient to prove the disease cholera and satisfy any craving for a sensational death-rate. Why did the disease first appear in one corner of the comparatively small town of Amoy and thence spread over the whole town and then to the large cities in the neighbourhood, and afterwards make its appearance successively at different ports on the coast, reaching at present as far as Japan? The answer is easy enough. Amoy town itself, though a very small place in comparison with the cities in its immediate neighbourhood, is their port and the centre of a great Chinese passenger traffic. The disease, as is always the case out of India, was imported, either from Saigon, where it was prevailing, or from Singapore. The fact of its first appearing at a small port like Amoy and thence spreading as an epidemic over the country and appearing successively at the different centres of communication along the coast ought in itself to be convincing that the disease was not "summer diarrhœa." A person may get diarrhœa from drinking dirty water and eating unripe fruit, but he does not get a disease manifesting itself as I have seen it during the last three months by vomiting, purging, cramps,

collapse and death within twelve hours, and spreading from point to point killing thousands. There is only one disease with such a history and such characters, and that is Asiatic cholera.

The Foreign Consuls were induced to circulate a written notice among the shipping giving some simple sanitary directions for the guidance of shipmasters and sailors, and the Municipal Council took measures for cleansing the streets of the foreign concession. There is one question in the way of sanitary treatment, which concerns immediately the foreign community living on Kulangsu, and that is the rapidly increasing number of Chinese houses on the island. It is a significant fact in the history of the late epidemic that the only foreigners attacked were living in the immediate neighbourhood of the filthy collection of Chinese houses called "the village." Here very many Chinese died, and it is almost certain that it was while passing through the village late on the evening preceding his death that one of the members of our community contracted the disease. Some systematic effort ought to be made at once by the community through the Foreign Consuls in conjunction with the Chinese authorities either to prevent the increase of Chinese houses, or, what perhaps is more practicable, to bring them under some sort of sanitary regulations. If matters go on as they are now going, what is at the present time a small village will, in the course of 10 years, have become a large town, and most of the European houses will have been surrounded by centres of infection. Then, certainly, the deaths in the event of the visitation of another epidemic will be numbered not by twos or threes but by tens. It is possible now to prevent this, though five or ten years hence it will be too late.

Another question of importance is that of quarantine. I believe that to prevent cholera from being imported from one port to another in China, as for instance from Hongkong to Amoy, or *vice versâ*, is impossible without putting a stop to trade entirely; and it would be quite impracticable to bring the junk trade under any regulations. Apart from this, there is the overland traffic; and it was decided at the international sanitary conference in 1874 that land quarantines were "impracticable and useless" even in European countries. At the outbreak of the present epidemic, quarantine laws regulating the passenger traffic between Amoy and Manila were instituted of such stringency as at once to put a stop to all direct communication between the ports. The rules were adhered to throughout, trade was entirely stopped, and it is likely that an epidemic of cholera in Manila was averted by the energetic action of the Spanish authorities. A strange fact in the history of the epidemic is that of its having passed over Swatow and Hongkong. These "freaks" of cholera are characteristic, and, in the present state of our knowledge of the disease, unaccountable. It is not unlikely that we may hear of its having appeared at both these places within twelve months.

The sources of information whence a history of previous epidemics could be drawn are very limited. Since the establishment of foreign consulates here deaths have been registered, but not the causes of death. For the little information which follows I am indebted to the memory of one who has been resident here for 30 years, and to the kindness of the Commissioner of Customs for what has been gathered from Chinese sources.

In the summer of 1858, an epidemic of Asiatic cholera—recognised as such—prevailed in Amoy and neighbourhood, and carried off many Chinese and several Europeans both on shore and afloat. In the summer of 1864 Asiatic cholera again broke out, and very many of the Chinese and several of the foreign community died. From the same source I learn that

diarrhœa, chronic diarrhœa and fevers were prevalent among foreigners living at Amoy in those times, though now-a-days such diseases are almost unknown. Then the majority of the foreign population lived in the Chinese town, and those who lived on Kulangsu, though they enjoyed purer air in one sense, were exposed to the well known risks of living in the neighbourhood of marshy uncultivated ground or of ground which had formerly been cultivated but then allowed to run to waste. This neglect of the fields resulted from the flight of the cultivators on the occupation of the island by British soldiers. Now, almost every patch of ground is cultivated, foreigners live in airy and well ventilated houses, some attention is paid to the water supply, and food of a greater variety and better quality is to be obtained, whence the disappearance of chronic diarrhœas and fevers. But as I have before remarked, the Chinese population of the island is rapidly increasing and a new danger is staring us in the face from this source.

The new edition of the *Fukien Tungchih* (Annals of Fukien), records many instances of epidemics, without, however, describing them in sufficient detail to enable us to say whether they were cholera or not. The general Chinese name for epidemics of all kinds is applied to plagues of a febrile as well as of a choleraic type. Those mentioned in this work as having occurred during the mediæval dynasties were usually accompanied by drought or famine. An epidemic occurring from drought, when all the wells at Foochow were dried up, spread over the province during the Tang dynasty in 791. Other epidemics are recorded as having occurred in various parts of the province, but few only that spread over the entire of it. In 1275 a disease made its appearance by which nearly one half of the population was swept away. Epidemics are recorded at various places—1356, in Funing, when a great famine occurred and cannibalism was resorted to; 1370, in Funing; 1450, in Shaowu; 1682, in Formosa. There is no evidence to shew that in any instance were these epidemics of cholera. The first instance which, from the description given, may be clearly pronounced to have been Asiatic cholera, is mentioned as having occurred in August and September, 1821.

During the 7th and 8th Moon of the 1st year of Taokwang, the annals say

An epidemic spread over the whole province of Fukien, vomiting and purging came on very suddenly and countless numbers died, being men in the morning and spirits at night.

An epidemic similarly described is recorded as having prevailed in Putien-hien, a district surrounding the city of Hinghwa-fu near Amoy, in July and August, 1822; the disease reappeared there in the following year. This "*men in the morning and spirits at night*" disease, attended with vomiting and purging, and spreading over the province, must have been Asiatic cholera. Besides, this entry in the native provincial annals tallies very well with what we know of the history of cholera as obtained from foreign sources. HUC describes the outbreak of the epidemic in Shantung in the same year as the Fukien annals state, viz. in the first year of Taokwang, which he erroneously calls 1820.

Outbreak of Cholera on board H.I.C.M.S. "Fei Hoo."—For the particulars of this outbreak I am indebted to Captain COCKER. They illustrate how the disease may be imported from one place to another, and suggest a method of treatment which may prove useful to some one unfortunate enough to be placed under similar circumstances. Captain COCKER states—

We arrived at Amoy on 23rd July, and finding that cholera was prevalent, anchored on the south side of Kulangsu, outside the harbour, threw overboard all fruit, discharged all water obtained from shore, stopped shore leave and placed carbolic acid in different places of the ship.

During the time the ship remained at Amoy I visited her every morning and treated one or two cases of diarrhœa. There was daily communication with the shore by means of one of the ship's boats with the Captain or one of the officers on ship's duty.

On 1st August left Amoy for the Pescadores islands. 3rd August, at Fisher island, Pescadores, TI-CHIM, aged 27, an Amoy man, was seized at 4 P.M. with pains in the stomach, purging and vomiting. I gave 30 drops of chlorodyne in a glass of brandy—this was immediately vomited. The dose was repeated and he recovered in a few hours. 4th August, CHEN-AH-HUI, Cantonese, boatswain, 40 years old, was seized at 2.30 A.M. with purging and vomiting, but said nothing about it until 5 A.M., when 30 drops of chlorodyne in a wineglassful of brandy were administered. The purging and vomiting continued, and two similar doses were given. Between 5 A.M. and 10 A.M. he complained of violent pains all over, heat in the stomach and cramps in the extremities. At noon he was collapsed and no pulse observable. Gave brandy occasionally. At this stage he was visited by a Chinese practitioner who sent medicine to be rubbed all over the body. He died at 4.45 P.M. 5th August, 2 P.M., AH-KEI, an Amoy man, aged 26, was seized with slight purging and vomiting. Gave 10 drops of chlorodyne in half a wineglassful of water; dose repeated three times at intervals; 4 P.M., cramps in legs and arms; 6 P.M., collapsed, face sunk in and fingers shrunk; 7 P.M., no pain, body cold, no pulse to be felt and evidently sinking. I had the man removed to the engine room and placed between the boilers, stopped up both ends of the passage between the boilers with blankets, administered a claretglassful of brandy and commenced shampooing; 7.30 P.M., complained of great thirst, for which he was allowed to drink lemonade *ad libitum;* 8 P.M., pulse could be felt. Legs and arms commenced to get warm, perspiration set in and he was removed to the forecastle. He recovered. (The heat between the boilers was about 120° F.) 7th and 8th August, two more men were similarly seized and treated with chlorodyne and brandy; one recovered in a few hours and the other after some days.

NUMBER of DEATHS from CHOLERA reported to the HAIFANG-TING by the 18 TIPAO of AMOY, during the months of July, August and September, 1877.

Dates.	Males.	Females.	Sex not stated.	Total.	Dates.	Males.	Females.	Sex not stated.	Total.
Reports of irregular dates previous to 5th July.....	80	29	...	109	August 1st	7	4	...	11
From 6th to 10th (5 days) ...	...	...	70	70	2nd	6	4	...	10
11th	12	9	...	21	3rd.....	6	5	...	11
12th	15	4	...	19	4th.....	6	4	...	10
13th	13	10	...	23	5th.....	5	1	...	6
14th	18	7	...	25	6th.....	4	2	...	6
15th	11	3	...	14	7th.....	5	4	...	9
16th	10	2	...	12	8th.....	4	5	...	9
17th	18	11	...	29	9th.....	1	...	...	1
18th	18	14	...	32	10th.....	2	1	...	3
19th	18	14	...	32	11th.....	3	2	...	5
20th	11	11	...	22	12th.....	2	...	...	2
21st	7	3	...	10	13th.....	1	1	...	2
22nd	10	4	...	14	14th.....	...	...	3	3
23rd	9	7	...	16	15th.....	...	...	5	5
24th	9	5	...	14	16th..	...	...	4	4
25th	4	5	...	9	17th.....	...	...	6	6
26th	9	4	...	13	18th.....	...	...	3	3
27th	9	4	...	13	19th.....	2	1	...	3
28th	10	3	...	13	20th.....	3	2	...	5
29th	8	5	...	13	21st	4	2	..	6
30th	8	2	...	10	22nd	1	2	...	3
31st	6	4	...	10	23rd.....	2	3	...	5
					24th.....	1	2	...	3

Dates.	Males.	Females.	Sex not stated.	Total.
August 25th	3	1	...	4
26th	1	...	...	1
27th	...	1	...	1
28th	1	1	...	2
29th	...	2	...	2
30th	1	...	...	1
31st	...	3	...	3
Sept. 1st	1	1	...	2
2nd	...	2	...	2
3rd	1	...	...	1
4th	...	...	...	...
5th	...	...	...	...
6th	2	..	...	2
7th	1	...	...	1
8th	1	...	...	1
9th	1	1	...	2
10th	1	...	...	1
11th	...	1	...	1
12th	1	...	...	1
13th	1	1	...	2
14th	1	...	...	1
15th	...	1	...	1

Dates.	Males.	Females.	Sex not stated.	Total.
Sept. 16th	...	1	...	1
17th	1	...	...	1
18th	1	1	...	2
19th	1	1	...	2
20th	...	1	...	1
21st	1	1	...	2
22nd	...	1	...	1
23rd	...	...	...	...
24th	...	...	..	...
25th	...	...	...	...
26th	...	...	...	...
27th	...	...	...	...
28th	...	...	...	...
29th	...	...	...	...
30th	...	...	...	...
SUMMARY.				
Total to 31st July, 1877	313	160	70	543
1st „ 31st Aug. „	71	53	21	145
1st „ 30th Sept. „	15	13	..	28
From 1st Return to date	399	226	91	716

C.—Dr. Alexander JAMIESON's Report on the Health of Shanghai for the Half-year ended 30th September, 1877.

ABSTRACT of Meteorological Observations taken at the Observatory of the Jesuit Mission at Sicawei, for the six months ended 30th September, 1877. Latitude, 31° 12′ 30″ N. Longitude E. of Greenwich, $8^h\ 5^m\ 44.63^s$.

DATE.		Barometer at 0° C.	THERMOMETER. Temperature in Shade, observed at intervals of three hours.	THERMOMETER. Extreme Temperature in Shade.	Elastic Force of Vapour.	Humidity.	Ozone.	Evaporation during 24 hours.	Rainfall in 24 hours.	Velocity of Wind.	Prevailing Wind.	REMARKS.
1877.		mm	°C.	°C.	mm of Mercury.	0-100.	0-21.	mm	mm	M. per sec.		
April....	Max...	770·30	26·6	29·2	17·8	100	21	7·6	13·7	12·22	S. 26°·8 E.	Storms on the 9th, 11th and 30th. Swallows appeared on the 2nd. Magnetic storms occurred on the 15th and 23rd.
	Mean	761·59	15·2	18·9	10·6	80	12·3	87·4*	55·5*	4·32		
	Min....	752·38	6·1	5·6	3·1	20	5	0·2	0·1	0·00		
	Range	17·92	20·5	23·6	14·7	80	16	7·4				
May.....	Max...	765·76	30·2	31·2	19·3	99	21	4·9	18·4	10·98	S. 57°·8 E.	Storm on the 4th. Magnetic storms on the 11th and 30th.
	Mean	758·74	19·4	20·3	13·4	80	11	91·6*	31·5*	4·48		
	Min....	750·86	10·3	9·0	8·0	36	5	1·4	0·1	0·00		
	Range	14·90	19·9	22·2	11·3	63	16	3·5				
June....	Max...	760·67	30·8	34·5	23·4	100	15	7·3	63·0	10·78	S. 69°·2 E.	Storms on the 6th and 14th. Cicadas first heard on the 23rd.
	Mean	755·79	23·2	23·9	17·2	83	10	87·2*	171·8*	3·87		
	Min....	750·97	17·5	15·9	10·0	31	4	0·1	0·1	0·00		
	Range	9·70	13·3	18·6	13·4	69	11	7·2				
July.....	Max...	759·47	33·4	33·9	27·5	100	15	4·5	30·8	22·22	S. 49°·4 E.	Violent typhoon on the 3rd. Many storms occurred during the month; the most severe was that of the 22nd. Flights of locusts on the 16th and 17th.
	Mean	754·30	26·0	26·7	21·9	88	7	68·3*	127·1*	4·34		
	Min....	744·03	19·1	18·7	14·4	57	0	1·0	0·1	0·00		
	Range	15·44	14·3	15·2	13·1	43	15	3·5				
August..	Max...	763·91	33·0	33·1	24·9	100	15	4·1	54·1	9·03	S. 82°·4 E.	Storms on the 11th, 12th, 16th, 18th, 19th and 21st. Magnetic storm on the 17th.
	Mean	756·01	25·2	25·7	20·1	85	7	82·5*	147·3*	3·14		
	Min....	748·02	16·9	17·0	12·4	44	0	0·0	0·2	0·00		
	Range	15·89	16·1	16·1	12·5	56	19	4·1				
Sept. ...	Max...	766·89	30·1	31·1	22·8	100	13	4·9	13·6	8·14	N. 66°·6 E.	Magnetic storms on the 15th and 19th.
	Mean	760·96	21·7	22·6	15·9	83	8	74·3*	34·5*	2·19		
	Min....	755·00	12·9	11·1	8·6	31	4	0·6	0·7	0·00		
	Range	11·89	17·2	20·0	14·2	69	9	4·3				

* Total for month.

N.B.—The maxima and minima under each month are those noted at the actual hour of observation, except in the cases of *Rainfall* and *Evaporation*, where the maxima and minima mark the greatest and least amounts for one period of 24 hours. The means are those of the month, but it will be noticed that under the same two headings the *total* for the month is given instead of the *mean*.

For these observations I am as on previous occasions indebted to the courtesy of the Rev. Father DECHEVRENS, S.J., Superintendent of the Observatory at Sicawei. The instruments employed, and the conditions under which the observations are taken were briefly described in a previous report.* Those who are unfamiliar with the scales adopted will find the following rules convenient for reduction. They are sufficiently correct for all practical purposes:—

RULES.

To reduce millimètres to inches, multiply by 3,937 and move the decimal point five places to the left.
To reduce degrees C. to degrees F., multiply by 9, divide by 5 and add 32.
To reduce mètres per second to miles per hour, multiply by 9 and divide by 4.

No satisfactory connection can be traced between the meteorological record and the disease record. It may be observed that the amount of ozone in the atmosphere was small during June, July and August, and that the smallest monthly maximum was noted in September when cholera was most prevalent.† The advance of cholera which was threatened in June may possibly have been delayed by the violent storms which prevailed during July and the first three weeks of August. Among these that of the 3rd July will long be remembered. Pontoons were smashed and swept away; cargo-boats were crushed; sampans and other small craft were upset or blown up on the foreshore; vessels dragged their anchors; roofs, walls and fences were carried away bodily, and many trees on the bund and along the outside roads were torn up or smashed across a foot or two from the ground. On the 5th July the hot season set in, the temperature continuing high for a few days. The extreme temperature registered was however only 94° F. in the shade, and after the 10th July the mercury barely touched 90° F. once or twice. It is a common subject for remark among the older residents that Shanghai summers are yearly becoming milder, and a comparison of the thermometer registers for the past fifteen years appears in some degree to authorise the opinion. But the difference is not so great as seems to be supposed. No doubt a far longer residence than was common in former times has accustomed many of us to the pains and penalties of hot weather, while advancing years have actually dulled our sensitiveness to extremes of heat.‡ From observations during summer, however, I am satisfied that men newly arrived suffer as much from the season to which old residents have become accustomed, as those old residents did when they were younger. But whether trying or not as regards heat, the past summer with its sudden alternations of heat and cold and its frequent rains, was essentially a treacherous season, and accordingly the amount of disease encountered was very large and the rate of mortality unusually high.

The appended return of burials is compiled from the sexton's books and the cemetery register:—

* *Customs Medical Reports*, x. 53.

† The register however was not so low as at the corresponding period of last year, when there was no cholera or other epidemic.

‡ Ita est mi Lucili jam ætas mea contenta est suo frigore ; vix media regelatur æstate.—SENECA ad Lucil. Ep. 67.

Præterea minimus gelido jam in corpore sanguis
Febre calet sola.—JUVENAL, *Sat.* x. 217.

Cum bruma mensem sit tibi per Augustum
Regelare nec te pestilentia possit. MARTIAL in Vetustillam.

BURIAL RETURN OF FOREIGNERS FOR THE HALF-YEAR ENDED 30TH SEPTEMBER 1877.

CAUSE OF DEATH.	APRIL.	MAY.	JUNE.	JULY.	AUGUST.	SEPTEMBER.	TOTAL.
Aneurism (Heart)	1	—	—	—	—	—	1
Aneurism (Aorta)	—	—	1	—	—	—	1
Endocarditis	—	1*	—	—	—	—	1
Phthisis	1	2	—	—	—	—	3
Pulmonary Hæmorrhage	—	—	—	1*	—	—	1
Enteric Fever	—	1*	—	—	1	1*	3
Enteritis	—	—	—	—	1†	—	1
Gastric Fever	—	—	—	—	—	1	1
Chronic Gastro-Enteritis	—	—	—	—	—	*f* 1‡	1
Remittent Fever	—	—	—	—	*f* 1	—	1
Variola	—	—	—	1§	—	—	1
Paraplegia (Caries)	—	—	1	—	—	—	1
Arachnitis	—	—	—	1‖	1*	—	2
Non-inflammatory Softening of Cord	—	—	—	—	—	1*	1
Softening of Brain	—	—	—	—	—	1¶	1
Hydrophobia	—	—	—	—	—	1	1
Chronic Alcoholism	—	—	1	—	1	—	2
Cholera	—	—	1**	—	2	4†† 5*	12
Chronic Diarrhœa	—	—	—	—	1†	1‡‡	2
Suppurative Hepatitis	—	—	—	—	—	1	1
Infantile Marasmus	—	—	—	—	—	1§§	1
Tertiary Syphilis	—	—	—	1	—	—	1
Rupture of Spleen	—	—	—	1*	—	—	1
Urinary Fistula	—	1*	—	—	—	—	1
Accident	—	—	*f* 1‖‖	—	—	—	1
Drowned	—	—	—	—	1*	—	1
Uncertified	1*	—	*f* 1	1*	1	*f* 1¶¶	5
TOTAL	3	5	6	6	10	19	49

* Not resident (16). † 6 weeks old. ‡ 2 years old. § Unvaccinated. ‖ Retrocedent gout. ¶ Man of advanced age. ** 25th June. †† One of these was a child ten years old. ‡‡ 20 months old. §§ one year old. ‖‖ 6 months old; died of exhaustion from extensive sloughing following a fall. ¶¶ 10 years old.

Subtracting non-residents (16) and infants under three years old (6), we get 27 deaths among adult and adolescent (2 deaths at 10 years) foreign residents during the summer half-year. Of these 24 were males and 3 were females, as against 16 males and 3 females during the same period of 1876. They may be thus arranged:—

TABLE OF CAUSES OF DEATH AMONG RESIDENT FOREIGNERS, APRIL-SEPTEMBER 1877.

Cholera	7	Small-Pox	1	Hydrophobia	1
Phthisis	3	Remittent Fever	1	Syphilis	1
Internal Aneurism	2	Abscess of Liver	1	Retrocedent Gout	1
Enteric and Gastric Fever	2	Paralysis	1	Uncertified	3
Chronic Alcoholism	2	Softening of Brain	1		

Cholera, it will be observed, accounts for seven deaths among residents, and for five among non-residents, the latter having been drawn from the ships in harbour. The first case occurred in June and was fatal. The alarm was given on the 2nd July by a telegram to the Commissioner of Customs reporting the presence of cholera in a very fatal form at Amoy, but July passed I believe without a case, at all events without a fatal case. In August there were two deaths, and

so far as I know, only these two cases. The first admission to the General Hospital was on the 3rd September. During that month 12 cases were received, four of which were specially noted as "mild" (perhaps severe choleraic diarrhœa). Of the remaining eight, six died and two recovered. Early in September cholera reached Nagasaki, and spread thence to Kobé and Yokohama. The last case in Shanghai for the season was admitted on the 30th October. There were four admissions during October, and all died. Of marked cholera cases there were therefore 12 admissions and 10 deaths. This sufficiently indicates the severity of the type which prevailed. In any cholera epidemic fortune may be deemed favourable if 50 per cent. of the cases escape, but this ratio of recoveries has never been observed among Europeans in Shanghai. It may be noted that in at least the great majority of instances the persons seized either had been living under defective hygienic conditions, or had for some time previous to seizure led an irregular life. I happened to see nearly all the cases admitted to the General Hospital, and in most of those that I did see the patients confessed to having been drinking heavily for a few days, or to having slept in the open air on the night previous to the attack. I had but one case in private practice, and it may be accepted as fairly representative of the form and course of the disease as observed this year:—

A. B., aged 34, several years in China, dyspeptic and prone to frequently recurring attacks of vomiting with more or less severe fever. On the 20th September after being constipated for several days he began to vomit food and a deep olive green fluid. On the 21st, as he had had no stool since the 18th, he took 10 grains of calomel which relieved the bowels. Next day (22nd) as the vomiting continued he took at an interval of three hours two doses each of 4 minims of dilute hydrocyanic acid. The vomiting then ceased, and during the night of the 22nd-23rd he drank and retained a pint of milk. On the morning of the 23rd he looked and professed himself to be quite well, and was anxious to get up, but as it happened to be Sunday, I persuaded him to stay in bed. At noon he "suddenly began to vomit violently a colourless fluid and to purge a whitish fluid," but as this was considered to be merely a return of his previous trouble I was not summoned until 4 P.M. He was then pulseless and voiceless, the extremities were cold and the thumbs and legs violently cramped; the skin of the trunk was cool, and bathed in perspiration. The skin of the hands was white and puckered, the lips were livid and eyes excavated. The tongue was dry, white, and with red edges, tremulous, and protruded with difficulty. The breathing was irregular and much oppressed. He complained of intense thirst, was very anxious, and enquired with much agitation whether he could recover. He was surrounded with hot bottles, and relays of men were obtained to keep up rubbing of his limbs. A sinapism was applied over the heart, ¼ grain of morphia was injected under the skin, and iced water was allowed freely, but was vomited as soon as swallowed. The breathing became easier soon after the injection, which was therefore repeated at 7 P.M., up to which time there had been no further purging, and no vomiting except of the iced water. Otherwise there was no change in the symptoms. The sinapism although on for three hours had not reddened the skin. At 7.30 he ceased to complain of cramps, and slept quietly till 8.30 when he roused suddenly with intense difficulty of breathing. At the same time his nails became black, and his skin pungently hot. At 9 P.M. he died, and half an hour afterwards the whole body was (to the hand) burning.

It is unfortunate that there are no compact records of the Shanghai epidemics of 1862-1864 wherewith to compare this year's epidemic as regards history, course and fatality. In order to supply this need as far as can now be done, I have collected below all the remarks bearing upon those epidemics that I can find scattered through the official reports of the Naval and Military medical officers serving here during the period. Deputy Inspector-General HOME states in his

Sanitary Report on Shanghai for 1863 that previous to 1838 cholera was almost unknown in China. This is of course very questionable. The writer proceeds to say that in that year a large body of native troops was brought from India, and simultaneously there was a very marked increase in the number of cholera cases entered against China, more than half of which were fatal. He further remarks that at all times Indian troops serving in China have shewn far less liability to the disease than have Europeans, and when attacked recover in a ratio far larger than that exhibited by the European lists.* For purposes of comparison with the facts to be immediately cited in regard to the earlier epidemics, it should be borne in mind that in the October and November visitation of 1875 there were recorded 18 cases among foreigners in Shanghai, of which 11 were fatal, or 61.11 per cent,† while in the visitation of this year, lasting on and off from the end of June to the end of October, there were, as far as I can ascertain, 22 cases, ‡ of which 16 (or 72.72 per cent) died. As usual, there was contemporaneously with the cholera, much diarrhœa of an acute character often accompanied by vomiting and cramps. No trustworthy accounts can be got as to the extent and fatality of the disease among the Chinese, but it is certain that cholera was prevalent and fatal in the city and native quarters of the settlements during August and September.

1862.—One hundred and forty-one cases of cholera were under treatment in the [British] squadron [in China] throughout the year [1862], and of these 89 had a fatal termination. This disease it would appear had been prevailing to a large extent for some time amongst the Chinese rebels: it had spread to the various towns they were investing, and from thence in a northerly direction as far as the Peiho. At Ningpo and Shanghai it committed great ravages among the native Chinese; and the resident Europeans as well as the crews of the men-of-war, and merchant vessels employed in the rivers on which those cities stand, also suffered severely. From the coast of China it seems to have been conveyed to Japan, where at Hakodadi and Nagasaki it occasioned great mortality. . . . The first case [on board the *Coromandel*] occurred at Shanghai on the 20th of July in the person of a quartermaster who in the discharge of his duties had been much exposed to the sun. Death took place in about 20 hours. The second person attacked was an officer, the second master, who had been much exposed in piloting the vessel from Ningpo to Shanghai. He was taken ill on the forenoon of the 29th of July and died early on the morning of the 31st, at which time also a quartermaster was taken ill while sleeping on deck, and never rallying died in about eight hours. These were the only cases that occurred at this time. Subsequently, in October, two men died of this disease at Shanghai after their return from the expedition to Kahding. . . . In the *Euryalus*, which suffered very severely from this disease, there were 21 deaths in 39 cases. They are all referrible to the exposure to which the men were subjected in the Kahding expedition. . . The narrative of the outbreak of this disease appears in the following remarks of the surgeon of the ship. Observing that the men, having scoured the country all day without finding any signs of the enemy, returned to Kahding the same evening, he goes on to say:—

* BRYDEN (quoted in ZIEMSSEN'S *Cyclopædia*, i. 390) draws the conclusion from a series of observations that of 63,409 Europeans, and 93,648 natives in the garrisons and prisons of India, 53.68 per thousand Europeans, and 4.11 per thousand natives died. The natives of the Himalayas and of Goorka have much the same predisposition as Europeans. It was the Sepoy regiments, inhabitants of the plains of the Ganges and Central India, that enjoyed a comparative immunity. In the American epidemic of 1873 negroes suffered more than whites.

† *Customs Medical Reports*, xi. 50.

‡ I have excluded one case, reported to me on the 4th October by the Captain of the *Saracen* as cholera, wherein the man died while or immediately after furling a sail. Dr. BURGE, however, who saw the body soon after death, and questioned the crew, informs me that the man had been drunk for a week and had taken no food for five days. On resuming work he suddenly complained of severe chest pain and oppression, and thereupon died without other symptoms, and presumably from cardiac syncope. A case of true cholera was next day admitted to hospital from the *Saracen*.

Hitherto the men had been in the enjoyment of good health and spirits, and with the exception of the wounded (13 in number) there had been no cases of illness reported on the sick list. On that night [25th October] however, cholera of a most malignant type suddenly broke out. It was observable that a considerable change had taken place in the weather that night. Hitherto it had been remarkably fine, except perhaps that the heat of the sun was considerable, and the dews at night were heavy; the sky became cloudy and overcast, and there was a considerable fall of temperature, followed by a drizzling rain. . . . The first case appeared about 10 P.M. . . Other cases followed in quick succession. . . The little force which consisted entirely of the crew of this ship arrived on board after a tedious and weary passage down the river on the night of the 27th. . . On the 28th there were admitted two cases of cholera, one of whom, the captain of marines, died that night, and ten cases of choleraic diarrhœa. On the 29th there was only one case of cholera admitted, and nine cases of choleraic diarrhœa. On the 30th there were no less than four cases of cholera (one of whom died on the following morning at 3 A.M.) and eight cases of choleraic diarrhœa. . . . Four cases occurred among the men who had been ordered to return to their respective ships; two of the four cases were wounded men; they were seized during the passage down the river about the same time as the men who had been in pursuit of the rebels; they all terminated fatally. . . It is nevertheless a remarkable fact that the troops who marched back to Shanghai overland, and consequently were not exposed to miasmatic emanations from the river were not only comparatively healthy, but were said to have improved materially in health after their trip. . . The mortality among the unfortunate Chinese who had sought refuge in the settlement surpasses belief . . . I have been informed upon good authority that they died at one time at the rate of 3,000 a day. . . During the time this ship was at Shanghai there were thousands of dead bodies, more or less hidden from the sight of the passer-by by some loose covering, that were in a state of decomposition, and tainting the surrounding atmosphere with their deadly effluvia. . . . This ship arrived at Shanghai in a very satisfactory sanitary condition. On the morning of the 22nd of October the expeditionary forces started for Kahding . . They proceeded in flat-bottomed boats along a shallow river which was muddy and unwholesome. They lived in those boats, which came to an anchor at night, and drank freely of the river water. . . Fifteen cases arrived at Shanghai in the stage of collapse. Ten never rallied, but died from exhaustion. In four cases there was partial reaction established as far as the pulse and animal heat were concerned, but neither bile nor urine was secreted, and they died in a state of coma. In two of these cases there were symptoms which I had never seen before in this disease, viz. rigid contraction of the sterno-mastoid muscles. . . Out of 40 cases of cholera, therefore, there were 21 deaths, and 19 recoveries.

There were 35 cases of cholera in the *Impérieuse*, 15 of which terminated fatally. . . . The following remarks are made by the surgeon of the *Impérieuse*. . .

. . . When cholera occurred the *Impérieuse* was lying in the narrow and muddy Wongpoo . . close to the settlement of Shanghai, a place which possesses all the elements of epidemic disease in a concentrated form—a narrow river in which putrescent bodies both of men and animals were constantly floating about; a crowded anchorage; a densely populated and undrained settlement; an alluvial plain outside with the usual amount of paddy fields, in addition to a high temperature. . . . The three men who died in the first stage [out of a group of 17] had been on shore together, and had all slept for two nights in the same house, in the native or bamboo town, a most filthy locality. Of two other men who were with them, one got violent spasms of the bowels, and the other had a protracted attack of low fever.*

. . [Cholera] alone cut off one twentieth of the whole [British white] force [in the north of China] during the six months [of 1862] in which it prevailed.† . . . So fiercely did this frightful epidemic rage among the unfortunate Chinese that it is estimated on good authority that between Shanghai and Sungkiang (distant about 40 miles) about one eighth of the population had died from cholera alone.‡

1863.—The first case [in the *Centaur*, in 1863] occurred in the person of the wardroom steward who went on shore at Shanghai, and was almost immediately attacked with cramps in the arms, legs and abdomen. The case was one of great virulence and terminated fatally in 3¼ hours. . . . [The *Cormorant*] reached Shanghai on the 19th of July when cholera was raging to an alarming extent, the mortality of the Chinese population alone varying from 1,000 to 2,000 daily. All leave for the men was

* *Report of the Health of the* [*British*] *Navy*, 1862.

† Out of a total average force of 2,423 British soldiers (1,362 white and 1,061 black) in Shanghai during 1862, 181 (7.47 per cent.) were attacked by cholera (141 white, or 10.35 per cent. of strength, and 40 black or 3.77 per cent. of strength). Of those attacked 94 (51.93 per cent.) died (79 whites or 56.03 per cent., and 15 blacks or 37.50 per cent.).

‡ [*British*] *Army Medical Report*, 1862.

suspended, the use of fruits, etc., forbidden, and solar exposure as far as possible avoided. The heat was very great and very depressing there at the time, and rumours of many deaths from coup de soleil reached us. On the morning of the 24th July three cases of cholera appeared, two of which were very severe: they were sent in a convalescent state to the *Acorn* hospital ship on the 31st July. . . On the 1st August and while at sea another case appeared in the person of an old quartermaster, the serious symptoms of which, however, soon subsided. We returned to Shanghai by the 5th August, and remained there until the 13th, during which time although cholera continued to rage with great violence and fatality on shore we had no case. On the 13th August we put to sea for Yokohama, and on the 16th another case appeared; on the 17th another, and on the 19th another, all of which were severe. . . . There were three cases of cholera in the *Osprey*, all of which terminated favourably. They were contracted at Shanghai at the time the disease was prevailing epidemically on shore. In the *Racehorse* in the Michaelmas quarter of the year, while stationed at Shanghai 8 cases of cholera occurred, 6 of which terminated fatally. The mortality was confined to two messes, four stokers from one mess being carried off by the disease, and two seamen from the adjoining mess. In the latter instance one of the seamen had been an attendant on the other during his illness, and was in fact attacked with the disease while engaged in that duty. The first case that occurred was about two days after giving privileged leave to the ship's company. Most of the cases were of that class "in which after from one to six hours of characteristic vomiting and purging, often not to a great "amount, the skin becomes cold and clammy, the countenance sunken, the voice almost gone, the restless-"ness great, the pulse almost imperceptible, and the respiration begins to be hurried and anxious." . . . With reference to six cases of cholera that were under treatment on board the *Acorn* hospital ship at Shanghai, and of which one proved fatal, the medical officer remarks:—

> These cases . . with the exception of the fatal one, did not present the aspect of rapid exhaustion and collapse which characterised the formidable epidemic of the previous year: indeed some of them might have been designated as cases of severe purging with vomiting, but without the coldness of extremities and shrunken features so peculiar and so unfavourable in the prognosis. . . . The last stages of several cases of severe and fatal diarrhœa which came under my notice this past year, presented in a marked degree the symptoms peculiar to cholera, such as exhaustion, pallid and shrunken features, and cold extremities; both these diseases appearing to be similar in kind but varying in degree only of severity.*

Spasmodic cholera though less prevalent and fatal than in 1862, was [in 1863] the cause of a high rate of mortality [among British troops in North China]. It broke out among the troops at Shanghai in the end of June, and continued to prevail throughout July and August. It also proved very fatal to the civil population both European and Native. . . . Of the officers and civilians of the better class it is important to remark scarcely one suffered from the complaint, shewing of what consequence, even during the prevalence of a powerful and virulent epidemic influence, are the sanitary advantages of spacious and airy dwellings, good and nutritious diet, regular exercise, and the enjoyment of comfortable circumstances. . . The 67th Regiment, 457 strong, was wholly quartered within the native city of Shanghai. The head-quarters, 271 in strength, occupied the Confucian temple, a spacious building composed of large and lofty ground floor apartments, but closely encompassed by wet ditches filled with the most foul, unwholesome water kept in a constant state of agitation by the rising and falling tide. The margin of these creeks and much of the open space around was covered with luxuriant vegetation, and gardens producing vegetables, watered daily with decomposed urine and liquid manure of the most offensive description. The coffins which had a year before in such numbers occupied this vacant space, had been in a great measure removed elsewhere, though enough still were left at distances more remote, with the wind in certain directions, to taint the air with the sickening odours at once recognised as proceeding from the decomposing dead. The four minor barracks in which as many (four) companies of the regiment were quartered, consisted of smaller temples, likewise within the city walls, and all in consequence exposed to the same evils of stagnant water and impure and muddy ditches as the head-quarters were with the additional disadvantage of being closely

* *Report of the Health of the Navy*, 1863.

surrounded by native houses.* . . In the beginning of July the first instance of cholera made its appearance among the troops. . . The limits of its duration had been in 1862 from May to November, while this year they embraced but July and August. In 1862 the greatest mortality was in June, this year in July, but on both occasions within a month of its commencement, the main strength of the epidemic had evidently exhausted itself.†

1864.—In the *Leopard* at Shanghai [in 1864] four cases of cholera occurred during the midsummer quarter, one of which terminated fatally . . in twelve hours. . . There was a case of cholera in the *Osprey* . . which made a good recovery after being nine days under treatment, [and] an officer . . was suddenly attacked with cholera which carried him off in five hours. There were two cases of cholera in the *Perseus* . . both of which proved fatal. They were of an exceedingly virulent type, occurring in one case in the person of a seaman who, contrary to orders, had exposed himself much to the sun, and in the other in a habitual drunkard. . . Three fatal cases occurred in the gunboats [*Cockchafer* and *Hardy*. The surgeon of the *Leopard*] says :

In Shanghai for the last three years, the absence of ozone has been remarked, and during these years cholera has prevailed to a fearful extent, a remission of the attacks being marked after the heavy rains with thunder and lightning. ‡

[In 1864] cholera can hardly be said to have prevailed as an epidemic [among the British troops]: 7 deaths occurred at Shanghai.§

1865.—[In 1865, one fatal case occurred on board the *Perseus*] at Shanghai. . . Towards the end of the month of August cholera began to appear among the Europeans and Chinese on shore. . . [A marine] while sentry at the Naval Yard, was seized with cholera in the night of the 1st of September, but owing to the corporal in charge of the guard not considering him very ill, the man was not sent on board until early next morning, when he arrived in a state of complete collapse. Every effort was made to procure reaction, but in vain. This man was a poor weakly subject, very tall, thin and ill-made; he had formerly suffered from severe diarrhœa. Most of the cases of cholera which occurred on shore were among children or debilitated adults, and were mostly fatal. A great variety of treatment was adopted by the medical men on shore, but large doses of chlorodyne, with champagne and brandy were principally trusted to. The Chinese were said to cure many cases by acupuncture.‖

During the past few years there have been hardly any additions of importance to the literature of cholera. The official account ¶ of the epidemic which in 1873 ravaged the valley of the Mississippi is somewhat disappointing. No less than 7,356 cases are placed on record, and many of these are reported with instructive minuteness. Nothing new however appears to have been discovered with respect to the etiology or prevention of the disease, and the morbid anatomy was very partially worked out. MACNAMARA'S observations in the dead-house (published in 1870), which added nothing to what had been known long before, are reproduced and confirmed, but along with other omissions no notice is taken of the subpericardial and subpleural ecchymoses which illustrate so forcibly the tremendous strain thrown upon the circulatory and respiratory

* 20 men of the 67th died of cholera in 1863. In that year out of a total British strength at Shanghai of 1,604 (718 white and 886 black) 113 (7.04 per cent.) were attacked by cholera (58 white, or 8.08 per cent. of strength, and 55 black, or 6.21 per cent. of strength). Of those attacked 44 (30.10 per cent.) died (35 whites or 60.34 per cent., and 9 blacks or 16.36 per cent.). It would thus appear that though shorter in duration, the epidemic of 1863 was, so far as Europeans were concerned, more virulent than that of 1862. Compare note p. 41.

† *Army Medical Report*, 1863.

‡ *Report of the Health of the Navy*, 1864.

§ *Army Medical Report*, 1864.

‖ *Report of the Health of the Navy*, 1865.

¶ *The Cholera Epidemic of 1873 in the United States.* Washington: Government Printing Office. 1875.

systems, a strain which is during life made evident enough by the agonising oppression which in severe cases patients almost invariably exhibit. The pathology is left untouched. As to treatment,

The cases which have been collected shew that in the treatment by calomel, in large and small doses, there was a mortality of 23 per cent; calomel and opium there was a mortality of 31 per cent; calomel, opium and acetate of lead, the mortality was 40 per cent; calomel, opium and stimulants, the mortality was 50 per cent. In cases where stimulants alone were employed the mortality was increased to 59 per cent. Where the preparations of iron were used, the mortality was 33 per cent, while from the [sulphuric] acid treatment but 8 per cent is recorded*; of the latter the cases reported are scarcely numerous enough to afford reliable data (64 cases with 5 deaths).

The total mortality in the American epidemic was 52 per cent.

The ecchymoses mentioned above were, I believe, found under the pericardium in all the cases examined this year in the General Hospital. Amongst the post-mortem signs enumerated by NIEMEYER are the following:—

The pericardium contains no serum; its inner surface feels sticky, and is often the seat of ecchymoses; the muscular substance of the heart is contracted, firm and of a dirty red colour. Like the pericardium and the other serous membranes, the pleuræ are covered with a sticky layer, and many minute ecchymoses are frequently to be seen on them also.†

LEBERT ‡ says, when describing the anatomical appearances,

The epicardium (visceral layer of pericardium) is almost constantly the seat of numerous ecchymoses, which are most numerous towards the base and posteriorly; it is rare to find them on the parietal layer. They are of the size of a lentil, and may lie singly or in groups.

With regard to treatment, LEBERT merely suggests arrest of the prodromic diarrhœa with nitrate of silver and opium, but where the disease has actually manifested itself

The best treatment . . is a carefully regulated hygienic and a correctly interpreted symptomatic treatment, with avoidance of all perturbatory methods in the least degree inutile if not even injurious.‖

Returning to a consideration of the burial returns for the half year, the cases of *phthisis* were all chronic; one of the *aneurisms* occurred in the person of an old Shanghai resident, the other in a patient who had resided for a considerable time here and on the Yangtsze. I have bracketted together the deaths from *enteric, gastric* and *remittent* fevers, *enteritis* and *chronic gastro-enteritis,* as it is probable that all might fairly come under enteric fever. Of this disease there were several cases of more or less severity, especially in July and August, but only three deaths among adult residents are ascribed to the group during the half-year.

In the fatal case attributed to *arachnitis* in July there was no post-mortem. The patient had suffered for many years from gout, and since the spring of 1876 the attacks had shewn a marked tendency to

* The wording of this paragraph suggests that the compiler of the report grimly attributes the deaths to the treatment, but this is not, I presume, really his meaning.

† Der Herzbeutel enthält keine Spur von Serum, seine innere Oberfläche fühlt sich klebrig an und ist oft mit Ekchymosen bedeckt, die Muskelsubstanz des Herzens ist contrahirt, derb, von schmutzig-rother Farbe. Die Pleurablätter sind wie der Herzbeutel und die übrigen serösen Häute mit einer klebrigen Schichte überzogen. Oft zeigen sich auch in ihnen zahlreiche kleine Ekchymosen.—*Pathologie und Therapie,* 2 Bd. p. 727 (8te Auflage).

‡ *Ziemssen's Cyclopædia,* i. 433.

‖ ibid, 462.

retrocession upon important organs. On the last occasion an attack of moderate severity was gradually dying away when on the 29th June severe gastric symptoms developed themselves while at the same moment the joint inflammation (chiefly in left knee and right tarsus) nearly though not altogether disappeared. The gastric disturbance yielded by the 1st July, and on the morning of the 2nd, all vomiting and purging having ceased, the patient wished to get about. Suddenly at noon, he looked "queer," at 12.30 P.M. he was violently delirious, and at 12.50 P.M. when I saw him, insensibility was complete, the right side of the face and the left side of the body were paralysed, the face was pale, teeth clenched, head thrown back; temperature 106° F. in axilla. Ice was applied to the head. At 1.30 P.M. the temperature was 108°, and at 2 P.M. death occurred without convulsion, the bladder and lower bowel being however emptied at or immediately before death.

In the case of hydrophobia the sufferer was bitten by a stray dog on the 25th May. Symptoms of rabies appeared on the 30th August, and death occurred on the 1st September.*

The following cases in private and hospital practice are worthy of notice :—

Wound of temporal artery.—An unusual case of arterial wound was admitted to the Gutzlaff Hospital at 2 A.M. on the 26th July. At 9 P.M. on the previous day a coolie was struck in a direction from above downwards and from behind forwards with a knife on the left temporal region which raised a flap, laying bare the bone, and chipping a piece about ¾ inch long out of the temporal artery. The bleeding was severe, but a Chinese doctor stuffed the wound with a powder which checked it for a time. Four hours later it burst out furiously, and the patient was brought to the hospital. The flap was 2¼ inches long, and 1¾ inches wide at its highest point where it reached the hairy scalp. At its lowest part, immediately above the malar bone, it was 1 inch wide. Some little difficulty was experienced in securing the cardiac end of the vessel which had deeply retracted into the lower and posterior angle of the wound where the soft parts were covered with a mud formed of blood mingled with the powder which had been crammed into every corner. The excised portion of the artery was easily recognised on the under surface of the flap, and was dissected off before the latter was replaced. The knife was produced next day. It was about 6 inches long, extremely sharp, and by frequent grinding reduced to the thinness of a stout card. It curved on the slightest pressure, which accounted for the neatness with which it had raised at one stroke a flap from a region not easily so treated.

Request for Mutilation.—On the 29th July a respectable native, aged about 35, who had for some years been employed as writer in a yamên, and had made a little money, applied to me at the Gutzlaff Hospital for the purpose of having his two ring fingers amputated. He explained that he was anxious to join the priesthood at Pootoo, but that the authorities there would not receive him without such a proof of devotion as the voluntary loss of two fingers would afford. He was much put out by my refusal to help him into the clerical calling, and went away expressing his determination to have the job done elsewhere. He doubtless thought that his request would be granted as a matter of course, and he probably counted upon being chloroformed, of which he would have said nothing when displaying the proof of his heroism to the Pootoo hierarchy.

Chinese Operative Midwifery.—An urgent request for assistance was sent to the Gutzlaff Hospital on the afternoon of the 15th July, on behalf of a woman who had been in labour since the morning of the 11th. I found the room where she was lying full of men and women, and a multitude of candles and incense sticks burning. Overpowering the perfume of the incense, however, a smell of gangrene pervaded the room and indeed the whole house. On turning out the spectators I found the woman with an uncountable and hardly perceptible pulse, but the abdomen painless on pressure. The vagina and rectum formed one indescribable cloaca with black, ragged, swollen borders; the perinæum had altogether disappeared, but the extent to which the recto-vaginal septum in its natural condition had been destroyed could hardly be ascertained, the subsequent tumefaction was so great. The child's head was arrested where the perinæum

* *North-China Daily News*, 3rd September 1877.

would have been had it not been torn away, and a loop of cord, of course pulseless, was perceptible in the middle of the gangrenous mass. The friends explained to me that on the night of the 13th, a midwife who had been in attendance since the beginning, seeing that the child was arrested, tore the parts with her hands in order to facilitate its exit, but finding no progress made by the following morning, deserted the case. I should think, however, that some cutting or tearing instrument was used. Having with great difficulty found the meatus, I drew off a large basinfull (at least 3 pints) of urine, and then easily delivered with the forceps. A gush of fetid fluid followed the child's body; the womb contracted firmly, expelling the placenta. Having applied a light bandage to the abdomen, and cloths wrung out of hot water to the external parts, I gave 30 drops of BATTLEY'S sedative in an ounce of brandy, and ordered soup and brandy and water to be administered frequently. The woman as might have been expected died before night, and on enquiry I found that immediately on my departure a Chinese doctor was summoned who countermanded the fomentations and forbad the soup and brandy. There was no hæmorrhage subsequent to the delivery.

The firmness with which the uterus contracts, and the persistency with which it remains contracted while a woman is sinking from nervous exhaustion, or nervous exhaustion combined, as in this case, with blood poisoning, are very remarkable. A case occurred many years ago in my practice where a lady after long continued mental and bodily fatigue miscarried about the 6th month, and sank steadily from the moment of delivery, to die 30 hours afterwards. No pains were spared to recall her failing energies, transfusion was employed, but her nervous system refused to react to any stimulus. . At the same time the uterus remained perfectly contracted, so that neither before nor after death was there any escape of blood. Five years since when writing on the subject of obstetric medicine among the Chinese,* I published some statistics to prove that in a Chinese woman the physiological processes of utero-gestation and parturition are so closely surrounded by the dangers arising from no-management and mismanagement that pregnancy becomes a pathological condition but one half less formidable than typhus fever in England. Such a case as that just detailed goes far to support this or any similar conclusion. There can be no reasonable doubt that the timely application of the forceps would have saved both mother and child.

Suicidal wound of Liver—Death.—On the 1st June, a carpenter aged 55, was brought to the Gutzlaff Hospital. After some domestic trouble he had applied a chisel one inch broad to the surface of his abdomen slightly to the right of the middle line and immediately below the ensiform cartilage, and with a sharp blow with a hammer had driven it backwards, outwards and slightly upwards into the substance of the liver. His main symptom was uncontrollable vomiting, but except for an inch round the wound there was not at any time either pain or tenderness on pressure. On the following day and subsequently there was a constant discharge to the amount of several ounces daily of a yellowish brown, faintly smelling liquid. He slept only while deeply under the influence of morphia. On the 4th day he became maniacal, and continued so until three or four hours before he died. Death occurred quietly on the morning of the 7th. He was fed with frozen milk, but rejected everything he swallowed a few minutes after it reached his stomach. He had no hæmatemesis.

Wound of Wrist Joint.—On the 5th June, a man was admitted to the Gutzlaff Hospital, who an hour before had forced his right hand through a window. On the front and inner side of the joint there were two parallel transverse incisions, the higher on a level with the middle of the styloid process of the ulna, and the lower $\frac{7}{8}$ inch farther down. The inner extremity of the latter was internal to the inner extremity of the former. The tendon of the flexor carpi ulnaris was divided, and the joint was opened immediately above the pisiform bone, a sharp corner of the glass having probably penetrated between the internal lateral

* *Customs Medical Reports*, iii. 82.

ligament, and the ulno-carpal fasciculus of the anterior ligament. Synovia was escaping somewhat freely, so that the examination of the wound was limited to ascertaining that there was no glass left behind. The bleeding was venous only, but the ulnar artery which could be felt beating in the wound had had a narrow escape. The tendon was united with a silver suture, a back splint carefully padded and moulded so as to keep the joint immovably flexed, was applied, and the wounds carefully closed by suture. No special antiseptic precautions were taken. Everything went well, and in a fortnight the patient was discharged well, but with slight stiffness of the joint. A month later this had completely disappeared. The suture through the tendon was not seen again.

Multiple Urinary Fistulæ. Jordan's operation. Cure.—A sailmaker, aged 36, unmarried, entered the Gutzlaff Hospital, 10th June, complaining of a multitude of sinuses through which urine discharged itself whenever he attempted to pass water. He stated that in 1873 after a gonorrhœa, his penis swelled, the stream rapidly diminished, and soon became a constant dribble. After a few months an abscess formed immediately external to and on a level with the anterior superior spine of the ilium, and burst by three openings whence urine began to flow. Later on, three openings appeared over the pubes about 2 inches above the root of the penis, then several at the root on its dorsal surface, in the peni-scrotal fold, and between the glans and the prepuce. Those at the root of the penis on its dorsal surface had since healed, but in healing they had dragged the penis on to the pubes where it lay a nodulated, shapeless lump. The orifice of the prepuce was closed and puckered, but there was one fine opening through which urine dripped, admitting a slender whalebone bougie which went down to the peni-scrotal fold, but apparently not through the urethra. The penis never became erect nor had the patient emissions. The testicles were apparently healthy. The perinæum was quite normal. The patient stated (falsely) that he was not an opium smoker. On the 11th June, having felt for the tip of the prostate which was reached only at the full length of the index finger, I made an incision in the middle line of the bowel with a slightly curved bistoury, but did not reach the urethra. Slightly withdrawing my finger and the knife, I found that I had pushed the mucous membrane on the anterior aspect of the bowel upwards, so that in consequence of this and of the arc described by the point of the knife while depressing the handle to make the cut, the further end of the bowel incision was, when the finger was withdrawn, at least ¾ inch below the tip of the prostate. I therefore divided the sphincter, and passing the back of the index over the posterior wall of the bowel, hooked it forwards so as rather to draw down the mucous membrane on the anterior wall. Then keeping the finger fairly on the prostate gland, not actually in front of it, the urethra was opened immediately, the slightly convex back of the knife touching the tip of the gland. A French olivary catheter was then tied into the bladder, and was replaced next day by a silver female catheter. Two days later (14th) violent diarrhœa set in, upon which the patient confessed to being an opium smoker. The tube had to be removed, and the diarrhœa was not completely under control until the 16th. On the 17th I endeavoured to replace the tube, but though the incision in the bowel was patent enough I could not get the instrument into the urethra. The patient was tied up, and I was in the act of introducing the knife when he involuntarily passed a fair stream through the penis, not a drop escaping by any of the sinuses. From this time out no urine escaped except by the penis. After a few days the prepuce could be slightly retracted, when the meatus was brought into view. A No. 5 catheter (French scale) could now be passed into the bladder, but larger sizes failed, evidently in consequence of their being unable to follow the sharp curve round the pubes due to the displacement of the penis. The stream was fully equal to No. 10. The skin gradually healed round the orifices of the old sinuses, and the patient was discharged well on the 10th July, after refusing to submit to a plastic operation designed to replace his penis in its natural position.

No better proof could be desired than this case affords of the curative effects of physiological rest. From first to last no operative treatment was addressed to the anterior portion of the urethra.

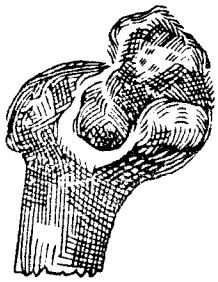
Imperforate Rectum. Death.—A male child (foreign) born at term, in every respect healthy in appearance, failed to pass meconium for 24 hours after birth. This drew attention to the condition of the

lower bowel, when it was found that the anus was well formed, but led into a cul-de-sac about 1¼ inch from the orifice. The infant made no straining efforts, and even when it cried, no bulging could be perceived. It seemed therefore unavoidable to wait so as if possible to obtain some indication of the position of the bowel. At the expiration of 48 hours, the belly was much swollen and tympanitic, the superficial veins distinctly mapped out, and vomiting was present, though not urgent. There was still no perceptible impulse. Pressure on the abdomen did not appear to give pain. An exploratory operation was now proposed and accepted, Dr. HENDERSON, who saw the case with me, agreeing that in case we failed to find the rectum, we should perform LITTRE's operation and search for the descending colon in the left groin. This, however, as it turned out, was not necessary. Chloroform having been administered by Dr. HENDERSON, and the infant held in the lithotomy position, I divided the skin and sphincter back to the tip of the coccyx, and then, starting from the cul-de-sac, dissected upwards and backwards in the middle line following the curve of the bone. As nearly as could be ascertained the knife had gone to the depth of ¾ inch when meconium was seen flowing along the blade. The opening thus made was enlarged with a pair of dressing forceps, and meconium continued for about a minute to flow abundantly. The infant was then wrapped up, surrounded with hot bottles, and fed at short intervals with a teaspoonful of beef juice to which five drops of brandy was added. The loss of blood was trifling, not above a couple of drachms. The effect of the chloroform passed off rapidly, and three hours after the operation the pulse was fairly good, and there had been a further discharge of meconium. From this out, however, the strength flagged, and death occurred quietly three hours later. No post-mortem was obtained.

The most remarkable case of imperforate rectum on record to my knowledge is one that occurred in the practice of the Liverpool Royal Infirmary,* where after 33 days an operation identical with that described above was performed, and the child recovered rapidly. As may be imagined, the symptoms were very urgent.

By a curious coincidence, at the next birth that I happened to attend there was a membranous obstruction in the urethra ¼ inch from the meatus. It was not complete, for during the first 24 hours the urine escaped by drops, but it was sufficiently firm to require forcible pressure with a director in order to rupture it. A few drops of blood were lost, and for two days there was a drop on the napkin each time that it was changed, but the infant did not suffer, and the urethra has since continued patent.

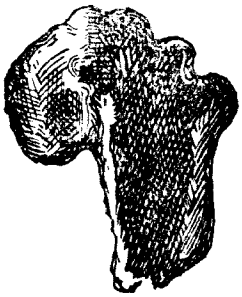
Exostosis of Humerus.—Early last summer a young girl (foreign), aged 15, unusually well developed, and who had always enjoyed perfect health, noticed that the act of raising the left arm was becoming painful. After a short time a slight swelling was noticed at the upper and outer part of the humerus, which I found to be an exostosis of the shaft of the bone. Felt through the muscles it seemed to be about the size of a Brazil nut, immovably attached to the shaft immediately external to the insertion of the pectoralis major, and one inch above the insertion of the deltoid, which it tended to raise from the humerus, at the same time that it interfered with and rendered painful the voluntary contractions of the muscle. There was a history of a trivial accidental blow many months before, but this appeared insufficient to account for the growth. As it was probable that its increase would be slow if it increased at all, I postponed interfering until the beginning of autumn. Meanwhile, the cold-water cure was, I understand, tried, but without any perceptible effect in diminishing the tumour. At the end of three months motion was seriously impaired, the increasing pressure was producing irregular contractions of the deltoid, and these involuntary contractions were very painful. Having applied ESMARCH's bandage, I cut vertically through the deltoid over the middle of the growth, and having exposed it, separated it from the shaft of the humerus with cutting forceps. There was no bleeding to signify; the upper end of the wound was secured with two deep and two superficial sutures, and united by first intention;



Anterior (external) aspect of growth.

* *Lancet*, 1876, i. 312.

the lower end was drained with a piece of oiled lint passed down to the denuded bone. The lint was changed four times at intervals of 24 hours, after which, a sufficient channel for discharge having been established, it was not replaced. Healing proceeded rapidly, and recovery was complete at the end of a month. The tumour is represented of its actual size in the margin. I am indebted for the drawings to the Rev. Canon McClatchie. It was subperiosteal, and continuous with the shaft of the humerus. The enlarged extremity was directed upwards, and the imperfect pedicle passed obliquely into the hard tissue of the shaft. The section was $1\frac{3}{4}$ inches in extreme length, and one inch in extreme breadth, here corresponding to the enlarged upper extremity. The tumour consisted of an outer layer of compact tissue, $\frac{1}{25}$ of an inch thick, covering ordinary cancellated tissue which was continuous as far as could be ascertained by the finger with the cancellated tissue of the humerus. As a practical point in the operation though not of much importance, I observed that the application of the bandage by forcing the muscular masses upwards greatly increased the thickness which had to be cut through, and the depth at which the forceps had to be used. The bandage though very convenient was here perhaps hardly necessary, as sponging would have been sufficient to keep the wound tolerably clear, and the act of cutting away the bone would have been rendered much easier.



Posterior (interior) aspect of growth.

Orchitis simulating Remittent Fever.—A young and powerfully built foreigner, mate of a steamer, came under my care in August with symptoms of remittent fever. He had suffered from malarious fever on two or three occasions previously, and now presented himself with a history of a rigor on the day but one previous, followed by vomiting, scanty and high coloured urine, constipation, muscular pains and headache, and great thirst. The tongue was white and loaded, pulse 120, temperature in mouth (4 p.m.) 104° F. Ordered into hospital. Next morning the temperature was 101°, but it rose again towards evening to 105°. Three days passed, during which the patient was subjected to the orthodox medication without any change in his symptoms, when by chance looking over some old temperature charts I was struck by the resemblance of his curve to that of a case of acute orchitis with high fever in which I had had the curiosity to take the temperature three times daily. On enquiry I discovered that the patient was actually concealing an orchitis. His medicine was therefore stopped, ice was applied to the testicle, and the fever immediately disappeared.

The remittent character of purely symptomatic fever often strikes one in surgical practice, and is deserving of more careful investigation than has I believe been yet devoted to it.

Stone in the bladder is proverbially uncommon among foreigners and natives resident in this part of China.* I have never met a case among Chinese, and with two only among foreigners. In the first of these, after several severe attacks of nephralgia calculosa, the symptoms of stone manifested themselves, but the mass was so friable that in sounding to ascertain its size, it fell to pieces under the instrument, and was passed piecemeal by the urethra. The fragments were chiefly urate of soda, and consisted of sediment and minute concretions which had been loosely held together by mucus. The other case I proceed to describe:—

Oxalate of Lime Calculus, with Uric Acid "Diffused" Deposit.—A foreigner, aged about 37, presented himself in January last with all the subjective symptoms of stone, severe pain at neck of bladder after

* Up to the present there have been but three lithotomies performed in Shanghai. Of these the first was performed by Dr. Henderson last year (1876) on a Chinese lad aged about 20. The calculus in this case proved to be a friable aggregation of urinary salts round a melon seed (*Ed. Med. J.*, Feb. 1877, p. 689). The second case was a Cantonese child operated on by Dr. Johnston, also last year; but in this case residence in Shanghai was accidental. The third case (first among Europeans) was that narrated in the text.

micturition, which was very frequent, occasional passage of blood and muco-purulent fluid, prolapse of the rectum (he also suffered from internal and external piles), pain in the groins and down the thighs, sudden stoppage of urine while flowing, etc. A tight stricture, admitting with difficulty a No. 10 French silver olive, situated 4½ inches from the meatus made it next to impossible to explore the bladder. He stated that his father and mother were alive and healthy, but that an elder brother died many years ago of "the gravel." His appearance was that of a man suffering from malignant disease. Pain and tenesmus of the lower bowel kept him wakeful, and anorexia was complete. He smoked much, but drank nothing. About the middle of 1874, having up to that time been in good health, he noticed that more or less severe pain in the hypogastrium followed any unusual exertion. His bladder always gave him the sensation of being full, but when he tried to pass water the stream scalded him, and generally matter, blood or both preceded the urine. Incontinence of urine now occurred, keeping him always wet. So things went on until the middle of 1875 when all the symptoms became greatly aggravated. He could seldom micturate except when in a hot bath, and even then often with severe straining. About then he first observed the occasional sudden interruption of the stream when by chance it was flowing fairly well. The stoppage was always accompanied by agonising pain of a cutting and burning character which he referred to the neck of the bladder. All this time his urine was "thick and stringy, very red and with a sandy sediment." At Christmas 1875 he passed some fragments of stone. A little later a kidney-shaped fragment measuring about ½ in. × ¼ in. × $\frac{1}{10}$ in. and with sharp points and edges, stuck in the urethra about 5 inches from the orifice, and remained there for 12 weeks, when the patient himself improvised a pair of brass forceps and with great difficulty and indescribable pain succeeded in dragging it out. Much relief followed this operation, but within a few weeks all the symptoms reappeared, and for nearly eight months the patient had been going from bad to worse.

When he consulted me he brought with him the fragment which had stuck in the urethra. I cut it in two and examined one half myself, submitting the other to Mr. THIRLBY, Member of the Pharmaceutical Society, who was good enough to analyse it in the Medical Hall laboratory. We found it to consist of oxalate of lime coated with a very thin film of uric acid.

January 23rd.—I divided the stricture and introduced a No. 14 English silver catheter into the bladder, drawing off all the urine, and injecting 6 oz. of tepid water. Six hours later he passed urine without pain. The same instrument was passed every third day until the 10th February, when the patient left the hospital to attend to some private affairs previous to having any serious operation performed on his bladder.

February 12th.—Examination with the sound disclosed a hard, immovable concretion of some kind on the right side of the bladder, and a fragment whose habitat was on the left side immediately above the neck, whence it from time to time descended to obstruct the urethra. It could be felt only when a short beaked sound was passed at the moment when the stream was suddenly arrested, or occasionally when the urine was drawn off through a hollow short beaked sound and the fragment happened to come into collision with the instrument But whether the stream was arrested or not, the act of micturition was always followed by severe pain. The lower border of the concretion could just be felt high behind the prostate when two fingers were forced deeply into the rectum. All attempts to isolate or move it failed, and it was diagnosed as an encysted calculus upon which probably fresh matter had been deposited. The patient's condition was now very serious. He slept only when heavily drugged, and he was clamorous for operation. On the 16th February I performed lateral lithotomy, extracting only the loose fragment, which escaped with the first rush of urine. The more thorough examination rendered possible by the opening of the bladder shewed that the mass on the right side consisted of a thick layer of calculous matter coating the mucous membrane over an irregularly shaped area about 3 inches by 2. Daily up to the 1st March large quantities of minute fragments, scales of calcareous matter, and sand passed with the urine by the wound. After this, the urine became clear and the incision rapidly closed. The patient was discharged well on the 8th March, the sound failing to produce grating in any part of the bladder.

T. Mc Clatchie del. E. Grelier Lithographic Printer, Foochow r^d Shanghai E. Grelier lith.

He returned on the 27th May with a history of good health till the beginning of the month when he had severe symptoms of nephralgia calculosa. Ten days later he noticed that the stream stopped suddenly as before. He complained much of severe rheumatic pains in all his joints, anorexia and sleeplessness.

28th May.—I crushed a stone measuring $\frac{3}{8}$ inch in the seized diameter, and felt a concretion in the prostate which I could not dislodge. On the 30th he passed a quantity of detritus, and a uric acid stone rather waterworn, less than $\frac{1}{4}$ inch thick and with the impression of the male blade of the lithotrite on one of its faces. On the 6th June, the symptoms, though much less urgent, continuing, I crushed another stone, the remainder, I think, of the former one. No manipulation with the short-beaked sound was sufficient to detach the prostatic mass. Two days later he was, he said, sensible of the grating of two fragments at the neck of the bladder. He now rapidly regained strength and appetite, the urine was clear, free from albumen, and passed painlessly about once in three hours. A fragment—he thought two—now descended into the urethra, but he would not consent to an attempt to remove it. It gradually advanced to the front of the perinæum and lodged there, setting up a good deal of irritation. Attempts with urethral forceps having failed, on the 21st June I cut down on it, and removed a piece $1\frac{1}{4}$ inch long moulded to the urethra. On the 29th June he left the hospital perfectly well, the sound detecting nothing in the bladder or at the prostate. (He continues well at the beginning of December.)

The lithographs on the opposite page represent respectively the condition before operation, and the appearance two months after convalescence, in the case published by me nearly three years ago (*Customs Medical Reports*, ix. 18). The patient has been frequently seen since, and continues in perfect health.

Mr. STENT of the Customs service recently read an interesting paper on Chinese eunuchs, before the local Asiatic Society. To that paper I am (with the author's permission) indebted for the facts relating to the operation of castration and to the status of eunuchs in China, which will be found in the following paragraphs:—

SURGICAL[1] operations among the Chinese are for the most part comprised under the headings of acupuncture, the application of the moxa, and the opening of abscesses. The first two are practiced for all manner of diseases, the sole necessary indication being the presence of local pain or swelling. The last is adopted only when the fluid contents of a tumour are visibly approaching the surface, and no doubt superficial aneurisms occasionally happen to be so treated. But, as a rule, Chinese practitioners are both timid and tardy in their use of the knife, and for this reason foreign surgeons find that a large part of their work among the natives consists in the opening of huge collections of pus which have burrowed between the muscular planes, and the treatment of sinuses whose orifices have, often for years, been carefully closed with resinous plasters. The powerlessness of Chinese practitioners when confronted by obstetric difficulties or by such accidents as extravasation of urine, has been sufficiently illustrated a few pages back. The one exception to the general rule is found in the boldness with which the Chinese castrate men and animals. By some extraordinary chance they have even discovered the dependence of conception upon the presence of the ovaries, and acting upon this knowledge, they not only castrate boars and cocks, but spay sows with remarkable skill and success.

The operation of castration is mentioned in native histories as early as 1100 B.C., when it was by edict constituted one of the recognised modes of punishment for certain grave offences. Its object, when performed in pursuance of a sentence, appears always to have been purely punitive, not preventive on any theory such as has more than once been broached in England, and which has to my mind much to recommend it, that criminals of the worse sort should be prevented from founding or increasing criminal families. According to Mr. STENT, the last recorded occasion on which its performance was inflicted as a penalty was in 1856 when a number of rebels were captured in the metropolitan province, having with them several boys under

[1] A portion of the following pages appeared in the *Lancet* of 28th July 1877.

15 years old. The adults were all beheaded, and the children all castrated. But an edict which appeared in the *Peking Gazette* of the 28th November 1877, proves that in special cases the same punishment is even still inflicted. The following is a translation of the edict referred to:—

YU LUH, governor of Anhwei, memorialises, reporting that when, in 1872, certain disturbances had broken out on the borders of that province and of Honan, after the apprehension of the leader of the rising, LI LIU by name, which took place in Honan, the government forces in Anhwei further effected the capture of this malefactor's son, LI MAO-TZ'E, at that time six years of age. The child was handed over by the governor then in office to the district magistrate of Hwaining to be kept imprisoned until he should reach the proper age to be dealt with according to law; and the magistrate of the said district has now reported that the prisoner has reached the age of eleven, and acknowledges that he is the son of the insurgent leader LI LIU, but that owing to his tender years at the time he knew nothing of his father's treasonable designs. The law runs as follows:—

The children and grandchildren of rebels, if not themselves privy to the treasonable designs of their parents, shall be delivered into the hands of the Imperial Household to be castrated, and shall be forwarded to Turkestan and given over as slaves to the soldiery. If beneath the age of ten, they shall be confined in prison until they shall have reached the age of eleven, whereupon the sentence of the law shall be carried into effect.

As the prisoner in question has now reached the prescribed age, execution of the sentence of the law must be proceeded with; and submission to this effect having been made by the Provincial Judge, on application made by the Prefect of Hwaik'ing-fu, the governor has approved the same, and has communicated with the Board in due form. He requests that instructions be issued accordingly.

Rescript:—Let the Board of Punishments take note.[2]

In China, however, as elsewhere, eunuchs are in general made in order to qualify them to act as palace servants, and occasionally as palace executioners. They may be kept only by certain members of the imperial family and in the palaces of the eight hereditary princes whose ancestors assisted in establishing the present dynasty. The emperor has 3,000 in his service, exclusive of 18 castrated Lamas who act as domestic chaplains; each prince of the blood and imperial princess is obliged to maintain 30, and so on through the different grades, the number diminishing as the distance from the head of the reigning house increases. Every fifth year each prince supplies eight young eunuchs for the palace, but as this contribution does not by any means meet the demand, the general public is called on to send in adults or adolescents as candidates for the painfully acquired honour of palace employment. As a matter of fact there is no dearth of persons willing to submit to castration. Boys are compelled by their parents to offer themselves; while, as to adults, men who are at once poor and lazy are tempted by the certainty of an assured income with little or nothing to do for it, and men with a peculiar form of ambition are seduced by the mystery and importance of the duties supposed to be confided to eunuchs. Thus it happens that at the present moment some of the eunuchs in Peking have wives and families. But when a eunuch dies he is buried not with his family, whether he has one of his own or not, but in a place specially set apart, whither every spring and autumn a body of eunuchs repairs to offer those sacrifices which in the ordinary course of life are offered by children to the manes of their fathers.

The operation is performed at an establishment maintained for the purpose immediately outside one of the palace gates. The operators are known as knifers, and they contrive to keep the trade in their own families. For each castration, and the subsequent care of the case they receive the equivalent of £1.16.0 sterling.

When about to be operated on, the patient is placed in a semi-supine position on a broad bench. One man squatting behind him grasps his waist, and one man is told off to each of his legs. Bandages are fastened tightly round the hypogastric and inguinal regions, the penis and scrotum are three times bathed in a hot decoction of pepper pods, and the patient, if an adult, is solemnly asked whether he repents or will ever repent his decision. If he appears doubtful he is unbound and dismissed, but if his courage has held out, as it usually does, all the parts are swiftly swept away by one stroke of a sickle-shaped knife; a pewter

[2] *North-China Daily News* of 17th December 1877.

plug is inserted into the urethra, and the wound is covered with paper soaked in cold water and is firmly bandaged. The patient, supported by two men, is then walked about the room for two or three hours, after which he is permitted to lie down. For three days he gets nothing to drink nor is the plug removed from the urethra. At the end of this period the dressings are changed, and the accumulated urine is allowed to escape. The parts generally heal in about one hundred days, when the patient is inspected by an old experienced eunuch in order to make sure that the mutilation is complete. About two per cent. of all cases prove fatal, some by hæmorrhage, some by extravasation, and some doubtless by irritative fever. Mr. STENT says nothing about obliteration or contraction of the canal of the urethra, although one would expect that the process of cicatrisation would frequently produce this accident. For a long time after operation there is incontinence of urine. Hence a common Chinese saying—"He stinks like a eunuch."

The organs removed are embalmed and sealed up in pint vessels. Whenever a eunuch is nominated for appointment to any post he must produce his vessel, and have its contents inspected by the proper authority. Should the parts be lost he has to borrow or hire the vessel belonging to another. When he dies his organs are buried with him.

It would seem that even after the very radical operation just described, a growth is occasionally reproduced round the urethra sufficient to excite the suspicion of a jealous tyrant, and perhaps the interest and curiosity of the members of his harem. At all events, history records that in the middle of last century, a report having been made to the Emperor that some of the palace eunuchs had become dangerous, the entire staff were "swept clean" a second time.

When young, according to Mr. STENT, eunuchs are rather like handsome girls, but are easily distinguished by the total absence of hair or down on their cheeks, and by their falsetto voice (vox fracta).[3] They age rapidly. They have little or no muscular strength, but a lavish deposit of subcutaneous fat makes them stout. As this fat is absorbed soon after middle age is reached, an elderly eunuch is repulsive in appearance, resembling a wrinkled, withered hag. In walking, eunuchs lean forward, keeping the legs close together with the toes pointed outwards. When riding they do not grip the saddle, but trust to the stirrups alone. By these marks the Chinese recognise the approach of a eunuch while he is still at a great distance. Eunuchs are hysterical, easily moved to violent wrath, and as easily appeased, readily amused or depressed, but with no tendency to melancholy or suicide. They are generally timid and harmless, affectionate to women and children, and passionately attached to pets, especially to dogs. They are honest and charitable, and are noted as not being hagglers. They are all gamblers. They are moved to revenge chiefly by allusions to their deficiency.

It will not be without interest to draw, as far as may be, a historical parallel between the Chinese practice of castration, and the same practice as found among other nations. It is of great antiquity. The earliest notice of eunuchs occurs in the Bible, and relates to Egypt:—*Igitur Joseph ductus est in Ægyptum, emitque eum Putiphar eunuchus.*[4] It seems strange that Potiphar should have had a wife, but he may have been mutilated after marriage, as sometimes happens in China, or he may have been incompletely mutilated, which would appear to have sometimes been the case in Rome,[5] or he may have taken a wife merely for show and to complete his establishment. This also was done at Rome.[6] The Jews kept up the practice, and adopted all three of the operations which will be noticed further on.[7] I do not remember any allusion to the practice in HOMER. HESIOD[8] tells the story of the mutilation of Uranos by his son

[3] JUVENAL, *Sat.* ii. 111.

[4] εὐνοῦχος (LXX) Gen. xxxix. 1. The Egyptians kept up the practice of castration as an introduction to high office (HORAT. *Epod.* ix. 11 seqq).

[5] JUVENAL (vi. 512) describes the archpriest of Cybele as *ingens semivir;* OVID (*Fast.*, iv. 183) calls the priests *semimares;* MARTIAL (*Epigramm.*, iii. 91 2) also talks of *semiviro Cybeles,* though immediately afterwards he qualifies him and his companions as *steriles;* and (vi. 2) he writes :—*At prius (o mores!) et spado moechus erat.*

[6] JUVENAL, when describing the prodigious doings of his time, says (i. 22) *Quum tener uxorem ducat spado.*

[7] *Non intrabit eunuchus attritis* (θλαδίας LXX.) *vel amputatis testiculis et abscisso veretro ecclesiam Domini* (Deut. xxiii. 1). For much interesting information upon this part of the subject, see SMITH'S *Dictionary of the Bible,* vol. i. *s.v.* EUNUCH.

[8] *Theog.*, 160.

KRONOS, whence it is clear that the operation was at least known in his day to the Greeks. HERODOTUS[9] tells how one HERMOTIMOS who was purchased as a child by a Chian named PANIONIOS was castrated by him, and was subsequently sold to XERXES. Having come to power, he got PANIONIOS and his four sons into his hands, and revenged himself by compelling PANIONIOS to castrate all four of his sons, and when he had finished the sons were forced to castrate their father. HERODOTUS[10] states also in his account of the second Persian conquest of Ionia (about 540 B.C.) that as soon as the Persian generals had mastered the cities, they chose the handsomest young men and turned them into eunuchs. ATHENÆUS[11] preserves accounts of the practice among the Medes and Lydians, and says that the latter nation had discovered the secret of ovariotomy. At what time the operation was introduced into Rome it would be hard to say. The worship of Cybele, whose priests were eunuchs,[12] was imported from Pessinus in Phrygia, during the second Punic war[13] (205 B.C.). The priests recruited their ranks by castrating candidates obtained either by fair means or foul, and considered it their duty to mutilate every youth upon whom by force or fraud they could lay their hands. Thus MARTIAL,[14] in his waggish way, relates a story of the discomfiture of a band of priests who met an old man travelling with a young and handsome slave. Anxious to castrate the latter, they asked where he would lie after retiring to rest, but he suspecting a plot indicated the place that was to be occupied by his master. In the dark, accordingly, they mutilated the wrong man. This anxiety to set a seal on people recalls the enthusiasm of the sect of Valesians who in the fourth century A.D. devoted themselves to the making of eunuchs, until in 325 the Council of Nice reproved the practice. I believe, however, that the right of every person who has undertaken vows of chastity to render the infraction of those vows impossible in his own case is still by many Catholic theologians held to be a matter for decision by the conscience of each individual. The Valesians are in modern days represented by the Russian *Skoptsy*, who perform emasculation, either complete or partial, upon themselves and seek to get as many adult males as possible into their clutches. They likewise mutilate the women of their order by amputating the breasts or disfiguring them by slashes made more or less at random. The *Skoptsy* intermarry, and it is said that these unions are not invariably unfruitful, and are frequently happy. The personal character of the members of the sect stands very high, the probity of a *Skopet* being almost proverbial.[15]

In Rome there were three classes of mutilated persons :—*Castrati*, treated in much the same way as that adopted by the Chinese and also by the Turks;[16] *spadones*, who were "castrated" in our modern sense; and *thlibiæ*, who were rendered impotent by attrition or crushing (θλίβω). It is probable, for reasons before assigned, that there was also a subdivision of the second class including those who were only partially emasculated. From JUVENAL'S account[17] of the careful supervision exercised by Roman ladies over the castrations of mature victims made for their enjoyment, it is clear that at the time and under the circumstances of which he speaks, the testicles only, or perhaps with the whole or part of the scrotum,[18] were removed. The sufferers became burly as they advanced in life,[19] but not handsome it would seem.[20] Curiously supporting the notion held by the Chinese, the Romans supposed that after castration the penis grew to a great size, so as to challenge comparison with the appendage credited to Priapus[21]. Castration when required to remedy or remove disease was performed exactly in the modern way[22] by accredited surgeons, but even in their hands

[9] *Hist.*, viii. 105, 106.

[10] *Ibid.*, vi. 32.

[11] *Deipnosoph.*, xii. 9, 11.

[12] The priests of Cybele were castrated in order to typify the treatment that ought to be inflicted on those who outraged the divinity of the great mother of gods (LUCRETIUS, *De Rerum Naturâ*, ii. 614; OVID. *Fasti*, iv. 221). They were notoriously addicted to abominable vices (JUV. viii. 176).

[13] LIVY, *Hist.*, xxix. 10, 11, and OVID. *Fasti*, iv. 255.

[14] *Epigramm.*, iii. 91.

[15] The best and most accessible accounts of the *Skoptsy* will be found in the *Revue des Deux Mondes*, 1 Juin 1875, p. 600, and in the *Progrès Médical* 1876, Nos. 51–53, and 1877, Nos. 16, 17.

[16] *Abscissa est quare Samia tibi mentula testa?* (MARTIAL, iii. 81, 3.)

[17] *Sat.* vi. 366 seqq.

[18] *Supervacuam carnem* (JUV. ii. 116).

[19] (JUV. vi. 512 and PERSIUS, *Sat.* v. 186.)

[20] *Hic est vetus, vietus, veternosus senex*
Colore mustellino.—TERENT. *Eunuchus* iv. 4
This is a drousy, wither'd, weazel-fac'd
Old fellow.—COLMAN'S *Translation.*

[21] JUV. vi. 375.

[22] CELSUS, *Medicin.* vii. 22.

was esteemed highly dangerous.[23] The mortality must therefore have been excessive when the operation was clumsily performed by unskilled persons, and with any instrument that came handy, such as a piece of broken pottery,[24] a common knife,[25] or a sharpened stone.[26] To so alarming an extent had the practice spread in DOMITIAN's days that an imperial decree was published forbidding it within the city of Rome.[27]

The Franks inflicted the penalty of castration on a slave or freedman who violated a free woman. The operation was either radical, or the testicles alone were removed. It is to be observed that castration appears frequently among the penalties of the ancient Germanic codes,[28] but we are told that the executioners were so skilful that death seldom followed their performances.

As these sheets are being printed, I have received the report of the proceedings of the sixth session of the *Association Française pour l'avancement des sciences* held at Havre last August.[29] Experiments, still being conducted by M. PONCET in professor CHAUVEAU's laboratory, seem to have astonished the investigator, but so far as they have gone do not appear destined to upset any of the notions commonly held with regard to the effects of castration on animals. The following is the official resumé of M. PONCET's researches :—

Les os des animaux (lapins) qui ont subi la castration sont plus forts, mais surtout plus longs que ceux des animaux étalons. Cette différence est surtout marquée pour certaines parties (fémurs, tibias, sacrum, os iliaques). L'augmentation de volume des os longs tient surtout à l'agrandissement du canal médullaire. Les os des lapins ayant subi la castration sont plus droits, et ne présentent pas les inflexions normales.

Upon which, according to the same report, M. VERNEUIL remarked that contradictions were met with; for example Hungarian geldings often exhibit a less highly developed skeleton than do stallions. But it appears reasonable enough that animals so prolific as rabbits should gain more than they lose by being spared the necessity of propagating the species, while animals less prolific, such as horses, should lose more than they can gain by being deprived of parts which are intimately and mysteriously connected with the growth and development of the entire organism.

[23] *Sæpenumero e multis vix pauci evadunt incolumes* (JUSTINIAN, *Nov. Const.*, cxlii, quoted by MILLIGAN *in loc.*)

[24] JUV. vi. 514 and MARTIAL iii. 81.

[25] JUV. ii. 116 and MARTIAL iii. 24, 5.

[26] OVID., *Fasti*, iv. 237.

[27] MARTIAL ix. 7.

[28] DUFOUR; *Histoire de la Prostitution*, iii. 273, where authorities are quoted.

[29] *Archives Générales de Médecine;* Octobre 1877, p. 495.

D.—Dr. WONG's Report on the Health of Canton for the Half-year ended 30th September 1877.

I AM indebted to Mr. PARKHILL, Harbour Master, for the following Abstract of Meteorological Observations taken at his office:—

Month.	Winds.							Weather.			Barometer.				Thermometer.				Tides.	
											Day.		Night.		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 force of Wind.	No. of days Foggy.	No. of days Rainy.	Rainfall in inches.	The highest reading and the Average highest.	The lowest reading and the Average lowest.	The highest reading and the Average highest.	The lowest reading and the Average lowest.	The highest reading and the Average highest.	The lowest reading and the Average lowest.	The highest reading and the Average highest.	The lowest reading and the Average lowest.	The highest Tide and the Average highest.	The highest Tide and the Average highest.
							miles				*Inches.*	*Inches.*	*Inches.*	*Inches.*	F.	F.	F.	F.	*Ft. in.*	*Ft. in.*
April	4	13	11	1	1	...	5.7	...	18	9.6	30.24 30.05	29.75 29.98	30.20 30.03	29.76 29.99	82° 76°	59° 70°	78° 72°	58° 68°	10 3 4 9	9 9 4 0
May	4	17	5	...	5	...	6	...	22	19.2	30.01 29.92	29.74 29.84	30.01 29.91	28.78 29.89	89° 81°	72° 76°	85° 77°	68° 75°	12 2 2 9	11 6 2 4
June	3	8	17	1	1	...	5.1	...	10	6.3	30.05 29.90	29.71 29.83	30.01 29.89	29.71 29.86	92° 88°	78° 82°	87° 83°	76° 80°	11 9 3 0	10 3 2 9
July	2	12	9	1	7	...	4.4	...	19	16	29.99 29.84	29.65 29.79	29.99 29.83	29.69 29.80	91° 87°	79° 82°	87° 83°	78° 80°	9 8 4 6	8 9 3 5
August ...	3	11	4	4	9	...	5	...	11	8	30.00 29.82	29.56 29.77	30.00 29.81	29.54 29.78	97° 89°	77° 83°	92° 85°	77° 82°	10 0 4 0	9 0 3 9
September	5	8	14	1	2	...	5	...	8	11	30.15 30.02	29.83 29.96	30.10 30.00	29.84 29.97	92° 87°	73° 81°	87° 82°	72° 79°	10 0 3 11	9 6 3 9

	Average Max.	Average Min.	Difference.	Mean.
April	76°	68°	8°	71.5°
May	81°	75°	6°	77.2°
June	88°	80°	8°	83.0°
July	87°	80°	7°	83.0°
August	89°	82°	7°	85.0°
September	87°	79°	8°	82.5°

The hottest month was August.

The highest temperature, 97°, occurred on the 7th of that month.

Rain fell on

	18	days in	April,	inches	9.6	against	1876,	15	days,	inches	13.2
	22	„ „	May,	„	19.2	„	„	10	„	„	8.6
	10	„ „	June,	„	6.3	„	„	16	„	„	6.4
	19	„ „	July,	„	16.0	„	„	21	„	„	3.5
	11	„ „	August,	„	8.0	„	„	24	„	„	5.7
	8	„ „	September,	„	11.0	„	„	6	„	„	...
Total,	88	„			70.1 inches.			92	„		37.4 inches.

The amount of rain for the 12 months ending 30th September, 1877, was 77.2 inches, and the number of rainy days 136. Nearly all the rain occurred during the last six months.

The greatest rainfall for a single day (5 inches) occurred on 8th May.

It will be seen from the above tables that the range between the day and night temperature in the summer months was very limited. The summer of this place is characterised by its great length and continuous heat, which is not ameliorated by sea breezes, and also by its long period of rain, which often begins in April, and continues, as in this year, to the end of August. Notwithstanding the high temperature, if the sky is clear with a good south or southwesterly breeze, the heat is bearable; but if the days are cloudy and the atmosphere heavy, evaporation is checked, and the heat becomes most oppressive. As the dryness of a day depends much upon the difference between the maximum of the day and the minimum of the night before, and as the diurnal range here is very limited, the fact that the air is often saturated with moisture is only what might be expected. The prevailing wind in summer is from southeast to southwest, though the hot westerly wind comes in occasionally.

Rain has this summer been excessive not only in Canton, but throughout this province generally, causing extensive inundations in the districts along the North river. In Canton we have not been visited by a typhoon, though storms of that description have occurred in localities not far from here, as for instance in the district of Sanning. Throughout the whole month of August the weather was unusually squally.

The general health of the foreign community was fairly good. The serious cases that occurred were 1 fatal case of affection of the bowels in a child, 2 cases of chronic diarrhœa, 1 case of typhoid fever, and 1 case of serious hæmorrhage with fever. Cases of intermittent fever have been comparatively few, but diarrhœa has been rather common. A few cases of subacute inflammation of the liver have been treated. Some of the foreign residents, both adults and children,

suffered severely from boils. The case of typhoid fever terminated well. One of the patients with chronic diarrhœa died, and the other was obliged to leave for Europe.

There have been during the last six months three births among foreigners, all boys; and also three deaths. Of the deaths one was due to chronic diarrhœa in a gentleman who had resided nearly 23 years in China, the second resulted from some bowel disease in a child 5 months old, and the third was due to phthisis in a lady, who was long a resident in Canton, but who died at Hongkong.

Among the Chinese small-pox, which was severe in the city last winter, was still prevalent up to the middle of April. Measles appeared even in May. In May catarrh and bronchial affections were very general, and in the latter part of the month diarrhœa began to be prevalent, and continued throughout the summer. Rheumatism was unusually common owing to the effects of the inundation. In the middle of June dysentery began, and this with bronchitis and diarrhœa became the prevailing complaints of May, June and July. It was partly caused by exposure to wet and drinking bad water during the inundation of the city. In August and September, while there was still much diarrhœa and dysentery, intermittent fever became common, though fevers of the severer types were less observable this year. Children appear to have suffered a good deal from summer diarrhœa. In June, July and August, when cholera was reported in Amoy and afterwards in Newchwang, Foochow, and some other ports, I took some pains to ascertain the state of health in the native city, and found that no cholera made its appearance, or if sporadic cases did occur, they were not of such a character as to attract attention.

The following case of miscarriage, attended with severe flooding and followed by brain fever, occurred last summer. The patient was in her fourth month of pregnancy, and though she had some premonitions of what was going to happen, was taken ill rather unexpectedly. Before my arrival the ovum had escaped with immense loss of blood, and the nurse had applied cold repeatedly. I found the patient in a state of extreme prostration with a thready pulse, vomiting even the small quantity of brandy and water given her. This irritability of the stomach continued all night and next day. I made myself quite sure that no membranes had been left to keep up the hæmorrhage, and yet the oozing went on more or less, while at the same time the patient was unable to take any nourishment. It was a stormy night and no ice was procurable. I administered ergot by mouth and subcutaneously without effect, and life was in great danger. Having washed out the uterus with cold water, I injected a solution of muriate of iron which at once arrested the hæmorrhage, so that for 18 hours afterwards no more than a few teaspoonfuls of blood came away. The vomiting with the help of ice gradually ceased and the patient rallied. On the third day came fever, and the discharge reappeared, though in much diminished quantity. I cannot attribute the fever to the injection, as there was no sign of local inflammation, and though some pain was felt in the hypogastric region, it was easily removed by the application of a mustard poultice. It appeared to have been due to the loss of blood, and to excitement and exposure during the stormy night the patient was taken ill. The head was severely affected almost from the first, giving rise to great pain, twitchings of the facial muscles, acuteness of hearing, and spectral illusions. By the application of cold water, ice, blisters and cold douche, the fever disappeared in two weeks, and with it most of the pains and inflammatory symptoms. During this period of two weeks, ice had to be freely used to enable the patient to retain what

fluid nourishment she was able to take. She was, however, so much weakened by the hæmorrhage that it was four weeks before she regained sufficient strength to walk.

Typhoid Fever.—Since my last report was written in 1873 there have been many cases here of fever of a typhoid character, so that this port has of late acquired the reputation of being unhealthy. From 1874 to the present time, 10 cases have occurred among foreigners, 3 of whom, all residents on Shamien, died. As I did not see these fatal cases I can give no particulars respecting them. I have been told however that two died with head symptoms, and one from the violence of the diarrhœa. Of the 10 cases, 6 occurred among residents in Canton, 2 among guard-boat people who had remained a long time in the water during a typhoon in Macao, 1 got the fever in Fatshan, and 1 in Hongkong, so that 6 cases only can be attributed to residence in Canton. In most of the cases the duration of the fever was between 30 and 40 days, and in one it extended to 60 days, a relapse having come on after the patient had partially recovered from the first attack. In some of the cases there was but little diarrhœa, or it came on late in the disease, and gave little trouble. In others the ordinary symptoms were present, rose spots, diarrhœa, tenderness and gurgling over the cæcal region, rise of temperature and delirium. The treatment was by milk diet, and astringents when required. This doubtless is the most dangerous disease of this place. The Chinese do not seem to suffer from it so often or so much as one would expect from the water they drink and the air they breathe.

Salicine.—In June I had an opportunity of testing the efficacy of salicine in acute rheumatism. The patient was suffering pain in both knees, especially in the right, which was swollen and acutely painful; the feet were swollen also, and there was high fever with a pulse of 130. 20 grains of salicine were given every two or three hours, so that 2 drs. were given each day. After 160 grains had been taken the pain and fever began to abate, and the pains showed a tendency to shift to the shoulders. On the 4th day after the salicine was given, being the 6th day of the disease, most of the pains had disappeared, and two days afterwards the patient could walk though with a little limping. It is reasonable to attribute the rapid disappearance of the pain and fever to the salicine.

In January there was a great prevalence among the Chinese of *Cynanche Tonsillaris* in which the swollen tonsils showed a tendency to rapid formation of abscess, bad cases of which often prove fatal. The Chinese call this *Ngo-how* or Goose throat, and among the various remedies here used for this affection there is one of a singular character, called *How-tsao* 猴 棗, a soft stone not unlike biliary calculus in appearance. It is expensive, being worth 20 times its weight in silver, and is said to come from Siam. 20 or 30 grs. of this in powder taken in water is said to be very efficacious. I have seen a case where this was given, and where it certainly appeared effective after gargles and astringents had been applied in vain. It seems to be useful in inflamed throats where soothing applications and whatever excites the salivary secretion are more useful than astringents. The specimens I have seen of the stone appear like animal concretions, and are of various sizes, some being smaller than pigeons' eggs, while others are as large as hens' eggs, in shape and size somewhat like urinary calculi. The story goes that in Siam when a monkey is wounded, the animal from its natural instinct picks out the proper medicinal herbs, masticates and applies them to the wound, so that successive layers are in this way laid on so as to form a mass. In time the wound heals, and the lump of dried herbs falls off.

It is then picked up by the Siamese, found by them to possess peculiar virtues, and sent in small quantities to China as a drug.

The most remarkable event of this summer was the inundation of the different parts of the city and of the adjoining low-lying country districts. On the 13th of May (the 1st of the 4th moon) the streets in Honam by the river side and the low-lying localities in the city, those especially in the western suburb and by the river-side, were all flooded during high tide. The river rose higher and higher every day, till it reached its highest point on the 18th, when it was nearly on a level with Shamien. The water in the streets and houses was from 2 to 4 feet deep, and even more in some places. In the western suburb the greatest inconvenience was felt, as locomotion for respectable people was quite impossible. During this time the current of the swollen river was very strong, and it was dangerous to cross it. For some time it was reported nearly every day that some boats had capsized, and that some lives had been lost, the boats being dashed against junks or caught in their cables. Many of the country districts in Honam were also flooded. In a fortnight the water subsided, but on the 12th of June it rose again though not to the same extent as before, and the river current became exceedingly rapid. It is supposed that during the month of May the number of lives lost in the Canton river must have exceeded 100.

The inundation was owing to about 900 feet of the bank of the North river which flows through Ts'ingyüen, a district about 60 or 70 miles from here, having given away. In consequence of the heavy rains in that part of the country the North river became excessively swollen, and on the 26th of April the part of the embankment above referred to, called Shik-kwok-wai, yielded to the pressure, and the water rushing across the open plain to a branch of the river on the borders of the P'anyü district called Pak-nai, poured itself into the Canton river. If the bank had not given away, in all probability all the districts in Show-tak and Sham-sui would have been inundated. The districts that suffered most were Ts'ingyüen, Hwa-yüen and Ts'ung-hwa. The damage must have been most serious on account of the many lives lost, houses and crops destroyed and vast tracts of cultivated land flooded. The people climbed up the hills, lived in caves and on roots and leaves of trees and whatever they could lay hold of. Many of the old and young could not save themselves, and it was reported that tubs containing children floated down this river. News of this terrible disaster reached Canton, and about the middle of May boats laden with rice were dispatched by the Viceroy and the native benevolent society for the relief of the sufferers. On their return fresh supplies of rice and biscuits were again sent. Appeals were then urgently and repeatedly made by the authorities for contributions to repair the bank. For unless the bank were repaired the people of the inundated districts could not raise a second crop for the latter half of the year, and famine would be the inevitable result. It would seem that the Government does not generally undertake alone the repair of river banks, but considers it the business of the districts which suffer from the disaster. It is said that it is now 39 years since a similar breach took place in the same embankment, followed by disasters of equal extent. Four years before that a breach of a less serious character had occurred. In June it was reported that the breach had extended 300 feet farther, making altogether 1200 feet. The work of repair began in June, and after that month no further inundation took place. On the 12th of June the river in Lienchow, a city higher up the North river, rose in 36 hours to a height of 30 feet

above its ordinary level, converting the city into a sea, and destroying silk goods and salt to the value of upwards of $1,000,000. The water is supposed to have come down from the mountains which separate this from the adjacent province of Hunan. About 10,000 lives are said to have been lost by that disaster.

E.—Dr. A. R. Platt's Report on the Health of Chinkiang for the Year ended 30th September, 1877.

For the following report I am indebted to Mr. R. J. Goldspink, Harbour Master.

Table of Meteorological Changes, with the prevailing Winds.

Months.	Barometer.		Thermometer.		Predominating Winds.
	Maximum.	Minimum.	Max.	Min.	
	Inches.	*Inches.*	F.	F.	
October	30.92	30.38	78°	53°	Easterly, ranging Northward.
November	30.96	30.46	66	37	North, with occasional South-westerly spells.
December	31.25	30.65	54	31	East.
January	31.35	30.25	50	23	North and East.
February	30.91	30.06	66	20	North, ranging from N.E. to N.W.
March	30.80	29.75	68	32	West, South and North, nearly equal.
April	30.45	29.63	81	49	East, South-east.
May	30.30	29.54	82	57	do.
June	30.00	29.58	90	68	Easterly.
July	30.00	29.40	93	70	South-east.
August	30.27	29.63	86	70	do.
September	30.42	29.93	79	65	South-east and East.

The health of the foreign community during the period under report has not been good, and among the natives more than the usual amount of sickness has been noted. This is to be attributed to various causes, all more or less clearly defined; as anxiety, a prolonged rainy season, bad drainage, poor water, and improper food. Financial disaster and the serious decrease in such trade as furnished employment to foreigners, have I feel sure been active agents, by depressing the mental forces, in promoting such forms of disease as are dependent in any degree on the mental condition. The spring rains were unusually severe, and lasted many days, saturating the house and compound walls, which were soon covered with a low form of vegetation, quickly followed by an outbreak of malarial fevers and kindred disorders. This was further increased by our system of drainage, which is of the worst order. The house drains are badly constructed of thin, porous brick, laid with small regard to solid foundation or proper incline, so that, after a frost or heavy rain, they sink in their beds, and are converted into reservoirs with no outlet, for the reception of slops, garbage and excrement, the exhalations from which alone, form a standard cause of disease. There is also one main sewer running the entire depth of the concession, and continued up the West Gate Street for the convenience of the French Mission, the frontage of whose property forms the boundary line of the concession. The opposite side of this thoroughfare is densely populated, and a leading branch of industry in the quarter is cloth dyeing, so that from the gutters is poured into the drain a vast quantity of decomposed dye-stuff, refuse from tea-shops, and the drainage of several public urinals, to be at length discharged upon the river bank fronting the Bund, and producing at times a most intolerable stench.

The relation of drainage to disease was very clearly exemplified at the Customs establishment during the summer months by a somewhat startling list of typhoid affections among the native staff. An out-building, used as a cook-house, servants' offices, and quarters, had its rear wall resting against an embankment, and the house appeared to be a hotbed of disease. Finally the bank was cut away, a drain constructed, and the walls dried, since when no case of zymotic disease has been reported from the building. The major portion of the water supply for the foreign and native communities is procured at a point but a few yards removed from the mouth of the drain before mentioned, and which from its easy accessibility from the bund is a favourite rendezvous for native boats. Combined, these causes serve to render the water there procured a source of disease hardly to be appreciated after long years of immunity, but nevertheless dangerous. Three foreigners died during the year. The first death occurred in October, in the person of a member of the out-door staff, from uræmia, secondary to BRIGHT'S disease. The second came under notice pregnant, with symptoms of albuminuria. The face and upper and lower extremities were œdematous, the urine was loaded with albumen, with a s.g. of 1035, and a peculiar dusky appearance. Benzoic, salicylic, and tartaric acids were freely administered with seeming good results, but nine days after she was first seen premature labour set in, she was delivered of a still-born child, and died four days later from uræmia. The third death was a case of chronic alcoholism, and the *post-mortem* examination showed fatty degeneration of both kidneys and liver, all enormously enlarged, the latter weighing over ten pounds.

The diseases prevalent during the year were typhoid, remittent and intermittent fevers, dysentery, diarrhœa, pneumonia, bronchitis, and affections of the liver. Entozoa of several varieties are very prevalent, lumbrici being the most common.

A case of presumed hydrocephaloid disease as described by Marshall HALL is of interest from its having so closely resembled tubercular meningitis as to leave much doubt as to which disease it really was. The patient, a female child of two years old, presenting every characteristic of the scrofulous diathesis, with a history of hereditary taint, who had been under my care for a year previous, during which time her immense head, impaired functions, restlessness, extreme irritability, and precocity, gave warning of trouble to come, was reported as being more than usually ill. June 30th.—On my visit I found that she had been failing for several days; her appetite was gone, she was losing flesh, was feverish and had a cough. She would grind her teeth in sleep, which was light and troubled, and she would awake screaming and frightened. Her tongue was foul, her breath offensive, and there was some nausea and vomiting, though not excessive, and the bowels were irregular, with a tendency to constipation. All these symptoms increased in severity during the next seven days, when the child sank into a comatose state from which she could be aroused only with great difficulty. The pulse was very irregular, falling in a few hours from 135 to 70. There were no convulsions, but slight hemiplegia was detected. On the eleventh day a sudden change for the better occurred, which I regarded as illusory, but improvement steadily continued; a large crop of boils appeared on the face and scalp, with solitary ones here and there on the extremities, and the child regained her usual condition of health. For treatment she had bromide and iodide of potassium, icebags to the head, blisters to the neck; and enemata of beef tea, port wine and quinine. This seems to be a fair history of tubercular disease, but without convulsions, marked paralysis, or the usually fatal third stage. If it was

spurious hydrocephalus, why were the symptoms opposed to those we generally find, or how did she recover on the line of treatment, so calculated to depress? If on the other land, it was true tubercular meningitis, I am tempted to question why she recovered at all.

Small-pox, as usual, prevailed to a great extent during the winter, not amounting to an epidemic, however, But two cases occurred among foreigners. The first case was that of a seaman on board H. M. S. *Frolic* in whom the disease manifested itself a day or so after the vessel arrived in port from Shanghai. The second case, a resident of many years in Chinkiang, was taken ill in Shanghai, January 10th, twelve days after he had made a visit to the *Frolic*, and while case No. 1 was still on board, in the stage of invasion. I do not assume that there is any connection between the two cases, further than to note a possible source of contagion. Case No. 2 returned to his home the third day after the disease had declared itself, and arrived in a state of delirium. The form was confluent, and all the symptoms were so grave, that taken into consideration with the patient's previous history, the results of the exposure on his trip, etc., a most unfavourable prognosis was given. I have for some time abandoned the administration of internal remedies in the treatment of small-pox, a list of some twenty cases which received nothing more potent than a night draught, or an occasional laxative, having given me confidence in the efficacy of disinfectants and fresh air. In this case, as with the others, the patient was placed in a large apartment with an open fire, the windows were opened and the venetians closed to exclude light. The face, neck and arms were frequently and freely anointed with a solution of carbolic acid in glycerine as strong as could be endured, while the entire body was sponged twice daily with a like strong solution. He may have been said to have lived in carbolised vapour, for the room was saturated with it. On the sixth day pustulation was fully accomplished, and the delirium and fever had left him. The pulse never again rose beyond 85, or the temperature above 99°. I have almost ceased to look for secondary fever in small-pox, regarding it as the result of the absorption into the circulation of pus in a state of decomposition, or some product arising therefrom, as held by MARSON and other writers, which may be destroyed as formed, or even its formation prevented by an antagonistic agent, like carbolic acid. As stated in a former report, I find it allays local irritation, prevents the full development of the pustules, and the subsequent pitting is greatly reduced in extent.

Erysipelas was epidemic during the summer months and still continues, but presents no feature for special note.

F.—Dr. J. H. Mackenzie's Report on the Health of Ningpo for the Half-year ended 30th September, 1877.

The health of both foreigners and Chinese at this port was remarkably good during the past season. This was I believe attributable in great measure to the coolness of the summer months. June, July and August contributed most to the sick list with the usual summer complaint—diarrhœa.

During the early part of May when the morning sun was often very hot several cases of heat malaise came under my notice, caused in most instances by a want of due care in wearing proper head coverings.

I have had only two cases of dysentery, and these of a comparatively mild type. In both I administered the liquid extract of ipecacuanha in large doses with good results. I find that patients as a rule are more willing to take the drug in the liquid form than as a powder, and the extract combined with some aromatic tincture is quite palatable. I have had to prescribe for only three cases of intermittent fever among foreigners.

Up to the end of September cholera had not visited this port, although many cases occurred both north and south of Ningpo. At one time the Customs authorities thought of establishing a quarantine for vessels coming from infected places, but unless the Chinese placed their shipping in quarantine also it would be useless to do so with foreign ships, as many junks came here from Amoy during the epidemic there and anchored just opposite the foreign settlement.

Mr. Wheatley, the Harbour Master, has kindly allowed me to look over his meteorological report, from which I have made the subjoined table:—

Months.	Thermometer.		Number of Days Rainfall.
	Highest.	Lowest.	
	F.	*F.*	
April	79°	44°	18
May	86	59	5
June	92	54	9
July	91	74	9
August	90	72	8
September	85	63	17

The temperature was noted every four hours.

One death occurred, that of a child in convulsions shortly after it commenced teething. It had always been delicate, and it was only by the great care bestowed on it that it lived so long as it did.

G.—Dr. Frazer's Report on the Health of Tientsin for the Half-year ended 30th September, 1877.

During the past six months, notwithstanding a very mild and dry hot season, the health of the community was not at all good. Cases of remittent fever, dysentery and bowel derangements were very frequent. Six deaths took place—three children and three adults. Two of the children died with marked choleraic symptoms, and one from chronic diarrhœa and mesenteric disease. Of the adults, one died from aortic aneurism, one from malignant typhus, and one from anæmia.

List of Diseases Treated during the Six Months.

1.—*Diseases of Digestive Organs :—*	
Gallstones	1 case.
Dyspepsia	8 ,,
Diarrhœa	50 ,,
Dysentery	15 ,,
Colic	10 ,,
Constipation	12 ,,
Lumbrici	12 ,,
Tænia Solium	3 ,,
Hæmorrhoids	6 ,,
2.—*Diathetic Diseases :—*	
Rheumatism	15 ,,
Neuralgia	20 ,,
Gout	2 ,,
Anæmia	1 ,,
Cancer	1 ,,
3.—*Diseases of Generative Organs :—*	
Stricture of Urethra	4 ,,
Congenital Phimosis	2 ,,
Hydrocele	3 ,,
4.—*Diseases of the Circulatory System :—*	
Aneurism	2 ,,
Varicose Veins	2 ,,
5.—*Miasmatic Diseases :—*	
Febricula	12 cases.
Intermittent Fever	30 ,,
Remittent	25 ,,
Typhus	1 ,,
Typhoid	1 ,,
6.—*Skin Diseases :—*	
Eczema	2 ,,
Herpes	4 ,,
Scabies	2 ,,
Erythema	2 ,,
Roseola	1 ,,
Urticaria	6 ,,
Sycosis	1 ,,
7.—*Enthetic Diseases :—*	
Gonorrhœa	10 ,,
Syphilis, Primary	2 ,,
,, Secondary	20 ,,
8.—*Accidents :—*	
Fractures	3 ,,
Dislocations	2 ,,
Sprains	10 ,,
Concussion	1 ,,
Sun-stroke	2 ,,
Wounds	10 ,,
Opium Poisoning	2 ,,

During the spring and early part of the summer, typhus, typhoid, and relapsing fever raged amongst the native population, and later on during the months of August and September cholera was present and was of a very fatal type. The disease first made its appearance at Taku and gradually spread by the villages along the river banks until it reached Tientsin. For some few days the epidemic made alarming strides, but a sudden fall of the temperature checked its progress, and it quickly died out.

A case of cholera in a Chinese belonging to the Methodist Mission presented some points of interest. The patient was attacked at 1 A.M. September 8th with violent purging, vomiting, and cramps in the extremities. I saw him at 10 A.M., as the usual native remedies had failed and his friends believed him to be dying. I found him almost completely collapsed, unable or unwilling to swallow; the extremities were cold and the pulse at the wrist absent; he believed himself to be dying and refused to submit to further treatment. After vainly attempting to administer stimulants I determined to try the effect of a subcutaneous injection of sulphuric ether. I injected 25 drops at first into the areolar tissue beneath the skin of the abdomen, and 20 minutes afterwards repeated the injection. After each injection marked and immediate improvement in the patient's condition took place, so that reaction quickly set in. Convalescence however was very slow owing to an attack of secondary fever, followed by purpura, and a large abscess in the cervical region.

TABLE OF EXTREME TEMPERATURES AND PREVAILING WINDS.

MONTHS.	MAX.	MIN.	PREVAILING WINDS.
	F.	F.	
April	80°	52°	W.
May	84°	53°	W., S.W.
June	87°	65°	W., S.E.
July	90°	78°	N.E., S.W.
August	95°	74°	W., S.W.
September	90°	48°	W., S.W.

H.—Dr. E. I. Scott's Report on the Health of Swatow for the Half-year ended 30th September, 1877.

Table of Diseases among Foreigners.

A.—Zymotic Diseases.

1. *Miasmatic Diseases:—*

	Cases.	
Ulcerated Tonsils	5	
Fever, Remittent	2	
„ Intermittent	18	27*
„ Typhoid	1	4*
Influenza	5	
Diarrhœa	12	7*
Dysentery	1	
Cholera Biliosa	4	6*
Cholera	1	2*

2. *Enthetic Diseases:—*

Chancres	1	5*
Phimosis		3*
Bubo		1*
Syphilis		6*
Gonorrhœa	1	10*
Orchitis	1	1*

3. *Dietic Diseases:—*

Intemperance	1	1*

4. *Parasitic Diseases:—*

Round Worm	1	
Itch	1	

B.—Constitutional Diseases.

1. *Diathetic Diseases:—*

Rheumatism, (Lumbago)	4	
„ (General)		1*

C.—Local Diseases.

1. *Diseases of the Nervous System:—*

Neuralgia of Leg	1	
„ „ Head	1	
„ „ Face		2*
Paralysis		2*

2. *Diseases of Circulatory System:—*

		Cases.
Mitral Valve Disease		2*
Varicose Veins		1*

3. *Diseases of Respiratory System:—*

Pneumonia	1	

4. *Diseases of Digestive System:—*

Dyspepsia	2	
Piles		2*
Fistula in Ano		1*
Colic		1*
Jaundice		1*
Gallstones	1	
Hepatitis		1*

5. *Diseases of Urinary System:—*

Cystitis	1	2*

6. *Diseases of Generative System:—*

Tumour of Testicle (Lipoma testis)		1*

7. *Diseases of Locomotive System:—*

Synovitis of Knee	1	

8. *Diseases of Integumentary System:—*

Ulcer of Leg		1*
Ringworm	2	2*

9. *Diseases of Ear:—*

Abscess	3	1*
Otorrhœa (purulent)	1	

D.—Lesions from Violence tending to Sudden Death.

1. *Accidents:—*

Sprain of Ankle	2	
Compound Fracture of Finger		2*
Penetrating Wound of Chest		1*
Heat Apoplexy	1	
Scald of Chest		1*
„ „ Foot		1*
Dislocation of Ankle		2*

* Visitors.

This table shows a total number of 177 cases of various classes of disease, 76 of which occurred among residents. The majority (95) were referrible to the miasmatic class. On the whole the table compares favourably with the returns for the same months last year, though the cases of miasmatic disease are almost the same, being 95 this year against 96 last year. No very severe cases occurred with the exception of one case of cholera which terminated fatally in a few hours. Diarrhœa was not more prevalent this year than usual, though there were some cases accompanied with vomiting and cramps in the belly (cholera biliosa) which made the sufferers uneasy, owing to the prevalence of cholera at the neighbouring ports. Perhaps owing to the epidemic of cholera at Amoy every one here was led to be particularly careful about food and drink, and more especially about the latter, great care being taken to avoid the too liberal use of water, and to have it boiled and filtered before using it. The cholera wave which this year swept over so many ports in China and caused so great a loss of life, passed us by. I met only three cases, two of which died and one recovered, and as far as I can learn cholera was not more prevalent than usual among the Chinese in this district, where it is endemic. I have not one case of boils to record, although generally in summer I meet many instances of this troublesome and painful affection. Perhaps the limited use of water may in some measure account for their absence this year. Several cases of continued fever occurred among the shipping, which I give at length as they are interesting.

Case 1. A. B., aged 17, sailor, admitted to hospital June 6th. The ship left Bangkok for Swatow 23 days previously. Eight days after leaving Bangkok he became ill with great headache, vomiting, diarrhœa and thirst. He tried to work for a few days but was hardly able to move about. He was lying down for ten days when I first saw him. The water taken on board at Bangkok was very filthy, and no doubt this was the cause of this man's disease, as well as that of the other men belonging to the same ship. A chart of his temperature, respiration and pulse from June 6th to 17th, when he died, will be found on page 75.

June 6th.—Fifteenth day of his illness. Saw him on board; looked very ill. Cold sweat all over his body. Tongue white with bright red tip; lips and teeth covered with sordes. Eyes heavy and only half open; deaf; intense tenderness of belly, particularly over the ileo-cæcal valve. No spots on belly or body; pulse compressible and distinctly dicrotous. Removed to hospital, where he arrived in an exhausted condition. He vomited a few times during the day, passed urine three times and passed two loose stools. Ordered 5 grs. quinine every four hours, linseed poultices over the belly, and milk ad libitum, with 12 oz. of port wine in twenty-four hours.

7th.—Quite conscious; answers questions readily; hears badly; passed a good night; tongue moist, white, with red tip; heart's impulse very weak; pulse dicrotous; gurgling and intense tenderness in the iliac fossa; passed only one stool; passed water freely.

8th.—Passed a good night; tongue moist and cleaner; heart very weak, first sound being scarcely audible; one small stool; has a few sibilant râles in the left lung.

9th.—Slept well; had one large stool in the night and two stools during the day; tongue cleaning; belly less tender; sweating profusely.

10th.—Slept badly; one stool during the night; tongue white; belly less tender; two rose-coloured spots visible near the umbilicus; pulse firmer. Vomited once in the evening; seems very weak and lethargic; sweating profusely.

11th.—Slept badly; two stools during the night and one during the day; tongue moist and cleaning; belly very tender; a few new spots on chest and belly.

12th.—Slept badly; tongue moist and brown; three small stools in the night and two in the day; vomited; belly less tender in the morning. Complained of great pain in the belly in the evening; tongue dry in the evening; chloral at bed-time.

13th.—Slept better, though he vomited the chloral draught; vomited once in the morning; tongue brown and dry; belly less tender. Evening.—Had three small stools during the day; tongue moist and cleaner; belly less tender.

14th.—Slept badly; had three stools in the night; tongue moist and brown; belly less tender. Evening.—Ordered acid drinks and beef-tea; had several small stools; tongue moist; complains of great pain in the belly; opiate enema, and one ounce port wine every hour.

15th.—No stool since the enema; belly very tympanitic but less tender; slept well; tongue cleaner; ordered chamomile enema without opium. Evening.—Four small windy stools during the day; very weak and evidently sinking.

16th.—No stool in the night; tongue dry and brown; sweating much; hiccough continually; complains of great pain and tightness of abdomen; belly very tympanitic and distended; fetid enema and turpentine fomentations; to leave off quinine (which he had continued to take from the commencement) and to get one ounce milk and brandy every hour. Evening.—Condition unchanged; subcutaneous injection of morphia.

17th.—Slept well for a few hours after the morphia; says he feels better. Dyspnœa. Ordered beef tea and wine every half-hour. At noon was suffering so much from dyspnœa consequent on the distension of the abdomen, that I introduced the fine needle of an aspirator into the abdomen and drew off a large quantity of fetid gas from the bowels, which operation gave him great temporary relief. I performed aspiration again at 5 P.M. and again relieved him very much. He was however sinking fast, his heart being almost inaudible, and the pulse imperceptible at the wrist; at 7 P.M. he again asked me to introduce the aspirator needle and seemed very cheerful, but as he was dying I did not do so, and he sank quietly and died at 8 P.M.

This case was hopeless from the first, though a hard fight was made for life. The condition was doubtless aggravated at the outset by want of medical attendance and proper food. The body heat did not at any time reach 104°. I have no doubt the continued use of quinine which he took almost to the last may account for the comparatively low range of temperature. Of the use of the aspirator I can say little save that it alleviated for the time the very distressing distension of the abdomen and the difficulty of breathing.

Case 2. C. D., aged 18, a sailor belonging to the same ship as Case 1, first felt ill on June 6th, with shivering, vomiting and headache; tried to work on the 7th and 8th. I saw him on the 9th, and ordered 5 grains of quinine every four hours. Next day he was worse, and on the 11th he was admitted to hospital. The chart of his temperature etc., from June 11th to 30th, when he was discharged cured, will be found on page 76.

June 11th.—Sixth day (evening), complains much of his head; eyes congested, face flushed, tongue very dirty, face and hands twitching; several loose stools during day, vomited once; no tenderness of belly; no spots; complains of great pain in the back; pulse strong and hard; heart vigorous.

12th.—Tongue moist and white with red tip; one stool.

13th.—Very restless during the night; talking much in his sleep; tongue very dry; has to be shaken before he answers questions.

14th.—Very noisy all night, and continually trying to get out of bed; no stool; tongue moist and cleaner; answers questions better; ordered chicken soup.

15th.—Slept well; no stool; quieter, requires a good deal of rousing before he will speak; slight tenderness and gurgling in the right iliac fossa.

16th.—Slept well; no stool; tongue dry and red; very lethargic; pupils natural; a few spots have come out.

17th.—Slept well; one stool in the night; more lively, though his head continues bad; tongue clean, breath very fetid; no tenderness of belly; a few new spots on belly; ordered beef tea.

18th.—No stool; tongue dry and brown; very heavy.

19th.—No stool; head quite well; tongue dry and brown; says he feels better; breath very fetid; more cheerful; had one large stool in the evening.

22nd.—Tongue clean; complains of feeling cold, and shivering; one stool (last on 19th); ordered 6 oz. port wine, and to stop the quinine.

24th.—No stool; feels well; tongue clean; ordered an enema of tepid soap and water. Wandering a little during the day.

26th.—Able to walk a little.

27th.—Had a natural stool; has been walking about all the afternoon, which probably accounts for the rise in pulse and temperature.

29th.—Bowels open, tongue clean, head well; complains of pain in his feet when he walks.

30th.—Discharged.

This case was more like typhus than typhoid, though the rose-coloured spots made their appearance during the course of the fever. The head symptoms were throughout the most severe, even to the very last. I continued to exhibit quinine almost till the day he left the hospital.

Case 3. E. F., a sailor from the same ship as the two former cases, age 34, complaining to my knowledge for six days before his admission to hospital. I saw him from day to day generally lying in his berth, sometimes complaining of shivering and then of being hot, of vomiting and purging, with pains all over his body. Meanwhile his tongue was clean and the pulse very quiet. I never could get his stools kept for examination. On the sixth day the temperature was 103°, when he was conveyed to hospital. His chart, from June 18th to the 26th, when he was discharged, is given on page 77.

June 18th.—Sixth day (?) of illness. Ordered 2 grains quinine three times daily.

19th.—No stool; vomited twice; tongue moist and not very dirty; no spots; pain and gurgling in right iliac fossa. Evening.—Headache; vomited three times.

20th.—No stool; vomited frequently; slept well; tongue clean. Evening.—One stool; headache.

21st.—Slept well; complains of his head; tongue clean; four small stools; says he has great pain in his belly.

26th.—Allowed to get up.

It seems probable that this patient had passed through an attack of typhoid, but had lain down only at the last moment.

Case 4. G. H., aged 24, mate of a steamer, arrived apparently well from Newchwang and Chefoo.

June 4th.—Three days after his arrival, while working in the hold he became giddy, and vomited. He took a purgative, and on the 6th was purging freely; temperature 105°; severe headache; eyes congested. Ordered quinine.

7th.—Rose-coloured eruption appeared in profusion.

9th.—Tenderness over right iliac fossa; delirious, purging; tongue white, red-tipped; temperature 106°. Captain refused to send him ashore.

The chart of his temperature, etc., from the evening of the 9th June will be found on page 78.

10th.—Admitted to hospital. Lips parched, tongue white with bright red tip; head very bad; purging freely. Ordered to continue with 5 grains quinine every four hours; to have iced milk *ad libitum;* head shaved.

11th.—Slept pretty well; no stool in the night; tongue a little cleaner; no belly tenderness; vomited once; had one large clay-coloured stool; head better; tongue very dirty.

12th.—Talked much during the night; lips parched and covered with sordes; no stool; vomited once; says he has no headache; heart's impulse weak. Evening.—Deaf; very heavy; one stool.

13th.—Passed a very restless night; roaring as if on board ship; constantly trying to get out of bed; had one large stool; tongue very dirty, lips parched. Subsultus; will answer questions if roused; heart very weak; first sound hardly audible. Evening.—Tongue very dirty; answers questions; very delirious all day; trying to get out of bed under the delusion that his captain is calling him.

14th.—No stool; spots fading; answers questions badly; eyes clearer. Evening.—One stool. Ordered chicken soup.

15th.—Slept well; only tried to get out of bed once; one stool; tongue dry and cracked; eyes clear; hears better and answers questions readily; picking bed-clothes; slight tenderness in right iliac fossa, with some gurgling. Ordered 12 oz. good claret.

16th.—Slept well, talked much during the night; no stool; spots nearly all gone; slight pain and gurgling. Evening.—Answers questions readily, but easily wanders; tongue moist; heart stronger.

23rd.—Sitting up and convalescent.

In all these cases, with due attention to diet, quinine was the only medicine administered.

There has been much deep-water diving near Swatow recently, and I am informed that the depth at which operations are carried on (144 feet) is greater than any that divers had previously considered practicable. The pressure of the water is 62.5 lbs. to the square inch, and the pressure of the air pumped down is about 75 lbs. to the square inch. The men subjected to these conditions have suffered from a curious paralytic affection, many cases of which I have had opportunities of observing. By the divers themselves it is called "the pressure," and it is no doubt caused either by the direct pressure of the water on the lower half of the body, or by the greater pressure of the air on the respiratory organs, or by poisoning by hyperoxidation, as M. Paul BERT has suggested, or lastly, and I believe most likely, by "*decompression*," to use BERT'S word. I would here refer anyone interested in this subject to a very valuable article in the *Popular Science Monthly* for July 1877, translated from the French of M. Paul BERT, entitled *Atmospheric Pressure and Life*. It is there stated that,

> Among divers and workmen in these tubes symptoms have been noted often so serious as to terminate fatally. First there is an intolerable itching, called by the workmen 'the fleas' (puces); then violent pains in the muscles and joints which have done most work; paralytic symptoms, particularly in the lower limbs, which are often persistent and fatal; finally, sudden death. Of 160 men employed on the foundations of the St. Louis (Missouri) Bridge, thirty were seriously attacked, and twelve died.

Of the four divers engaged here in deep diving three were seriously affected, and did not recover for a long time, and one was attacked twice. All the cases occurred after the men came out of the water, and two men were seized two hours after emerging. For a time they felt quite well and walked about as usual, when suddenly they were attacked in the following manner. While sitting their legs became uneasy with an inclination to "jump about" as they expressed it to me. On trying to stand they felt very shaky, they walked a few steps and then fell down. From that time they found not only that they were unable to walk or stand, but that their legs were constantly "jumping about," due to clonic spasms of the muscles of the thighs and legs, which recurred every five or six seconds. While they were in a sitting position with the feet firmly pressed on the floor, and as long as they watched their feet, the spasms were very much, though not entirely, controlled. There was loss of sensation in the feet and legs, and they could not feel the ground under their feet. When in the lying posture the spasms of the legs were so violent as nearly to "kick" the sufferer out of bed. There was also great pain in the lower part of the spine, and a feeling of constriction round the waist as if a string were tied tightly round the body. There was very little sensibility from the umbilicus downwards, and a complete loss of power over bladder and rectum. The bladder filled without there being any desire to micturate, so that the urine had to be drawn off every six hours. The fæces passed sometimes unconsciously

or only after the use of enemata and active purgatives. Even croton oil sometimes failed to secure a passage from the bowels. It was generally some three or four days after this state of things had set in that I first saw these men, as they took some days to get to Swatow. When I saw them they presented the following symptoms in addition to the above:—Tenderness over the lumbar vertebræ and sacrum; pain on pressure; pulse 120; tongue very foul; temperature 100°; great thirst, and loss of sleep on account of the jerking of the legs. I ordered the spine to be blistered over the lumbar vertebræ and sacrum, and gave a mixture containing 20 minims each of the tinctures of belladonna and henbane in an ounce of camphor water every four hours. On the following day the pulse generally had fallen 20 beats, though the legs jerked more violently than ever. There was complete loss of power over the legs; pain in the spine less. On the next day the patients could generally move the legs a little, and so on, till in about fourteen days they were able to stand alone and to walk a little, holding on to a chair or table. The bowels gradually assumed their natural habit, inclining to constipation as the other symptoms improved. The bladder always remained longer affected than the other organs, the inability to pass water continuing for some months. I must say these men as a rule did not give themselves a fair chance of recovering thoroughly, for as soon as they were able to get about again easily they at once recommenced diving. Individual delicacy of constitution or inaptitude for ordinary diving has nothing to do with the supervention of this condition. The first case that came under my notice was a very powerful Cornishman, aged about 29, and standing 6 feet 2 inches in his stockings. He had been engaged all his life in diving and wrecking ventures, but had never suffered in any way from his occupation.

The following case of biliary colic and calculi presents some features of interest:—

F. K., aged about 35, married, and nursing her baby, was attacked with colic on July 15th. She had been subject to attacks of colic for years past, and latterly for some months just before the appearance of the catamenia she had had severe attacks of colic and pain in the back and chest, which I treated as neuralgia and relieved by the exhibition of chloral and bromide of ammonium. These attacks occurred at intervals of a month—almost a month to the day—and immediately after the cessation of the pain the menses appeared. On this account I was led to believe that the attacks were connected with the periods. Since her confinement she had menstruated, but irregularly. Irregularity, however, was her habit even when not nursing. For a year or more she had suffered from obstinate constipation.

July 15th.—After tiffin she was seized with colic in the stomach and bowels, the pain not being localized anywhere. She was not suffering sufficiently to send for me, and supposed that on the appearance of the menses she would be well as usual. She took a chloral and bromide of ammonium draught, but experienced but little relief from it.

16th.—I found her as on former occasions, though rather worse than usual, complaining much of pain in the chest, back and bowels, not referred to any particular place. There was no fever, and the tongue was clean. Being very flatulent and constipated, I ordered her two aperient pills, and an enema with turpentine after four hours if the pills had not acted.

19th.—The pain continued to increase in severity till to-day, when it became so violent and she suffered so much that I ordered her 15 grains of choral hydrate every three hours till the pain decreased, watching its effects meanwhile. She was now vomiting constantly, and writhing with pain, flinging herself into twenty different positions a minute, sometimes lying, sometimes walking or trying to walk, and always calling out loudly. The pain was now more referred to the back and right hypochondrium, and she said she felt as if she had a "ball of fire" in her stomach.

22nd.—She became steadily worse till to-day, vomiting constantly, eating nothing, and existing principally on brandy and water and a little chicken soup which were vomited almost at once. The vomited matter was watery and very acid, the tongue furred and dry, the eyes congested, and the face and neck a deep purple colour. Her suffering was most intense, the pain being now referred almost entirely to the right hypochondrium. Careful examination showed no enlargement of the liver, but on account of great obesity examination was very difficult. She complained of tenderness on pressure just under the false ribs on the right side. She was in such a bad case that death seemed imminent unless relief could be given. Pulse 120 and very feeble; sweating profusely. The symptoms pointed to the passage of gall stones. She was ordered one grain of opium and ½ grain of calomel in pill every two hours, and took six such pills without experiencing any relief. At 9 P.M. she was suffering so intensely that I injected a grain of morphia over her liver. In less than five minutes her cries ceased, and for two hours she remained so quiet that I fancied she was asleep. At 11 she said she had not slept but was free from pain. As there was no contraction of the pupils I injected half a grain of morphia into her arm and left her for the night.

23rd.—Quite free from pain; during the day, however, she had a slight return under the right ribs, and at night I again injected one grain of morphia into her side.

24th.—Feels very well. Ordered two blue pills and a black draught which produced one motion. This was received on a sieve and washed and about a tea-spoonful of gritty grey coloured gravel was found.

25th.—Had another motion this morning which was treated in the same manner as yesterday and one grey stone about the size of a large pea was found; this stone was very friable and crumbled easily under the finger. Had another motion in the evening and again passed about a tablespoonful of gravel. All this time she continued free from pain.

28th.—All the former symptoms recurred this evening. I injected one grain of morphia which at once relieved her.

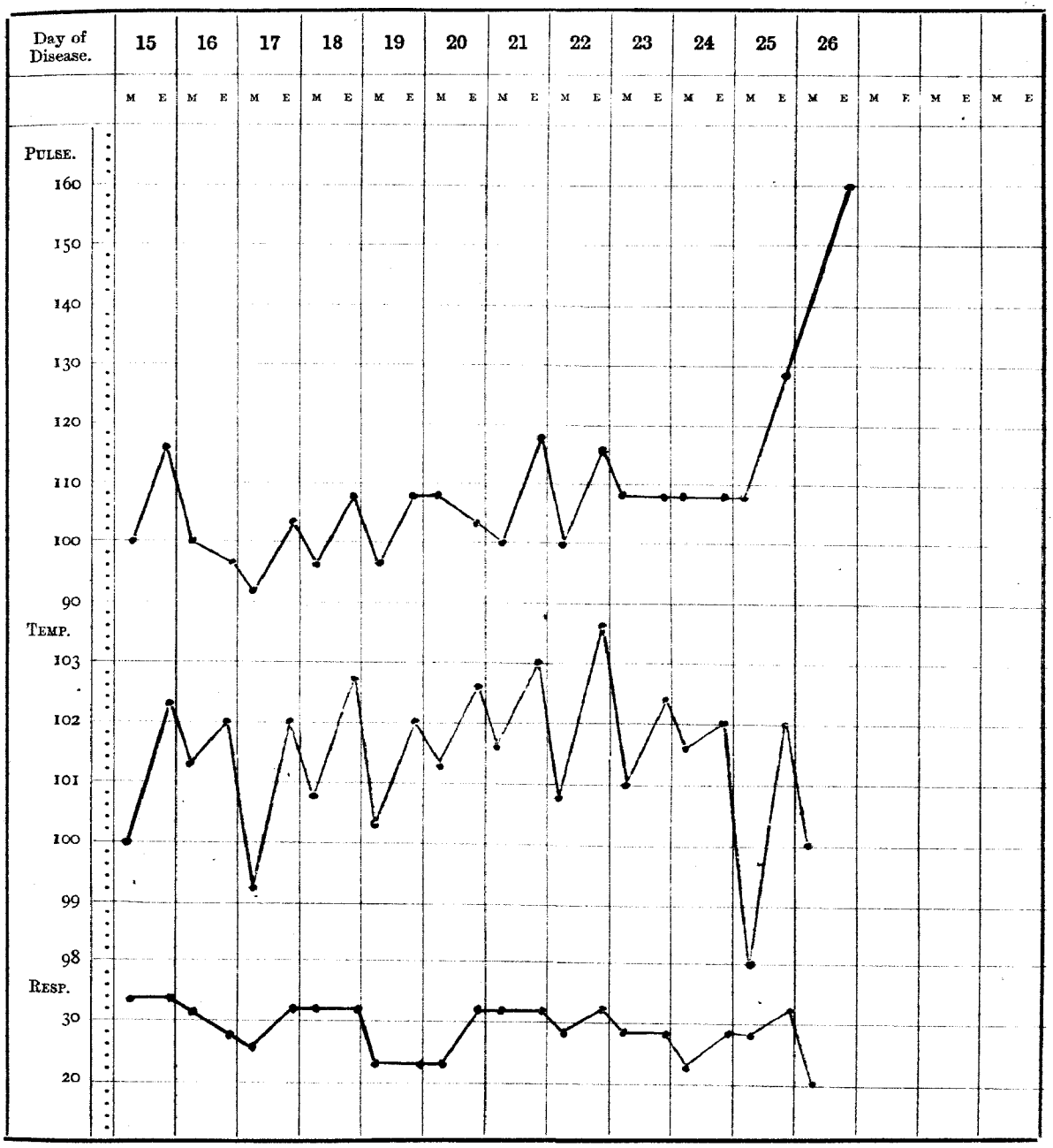
29th.—Free from pain, but in the evening I again injected ½ grain of morphia at her request.

30th.—No return of pain. Ordered blue pills and black draught as before and requested that the motions might be examined, which unfortunately was not done. Since this time she has continued very well, inclined to constipation, which I have corrected by aloes, iron and nux vomica.

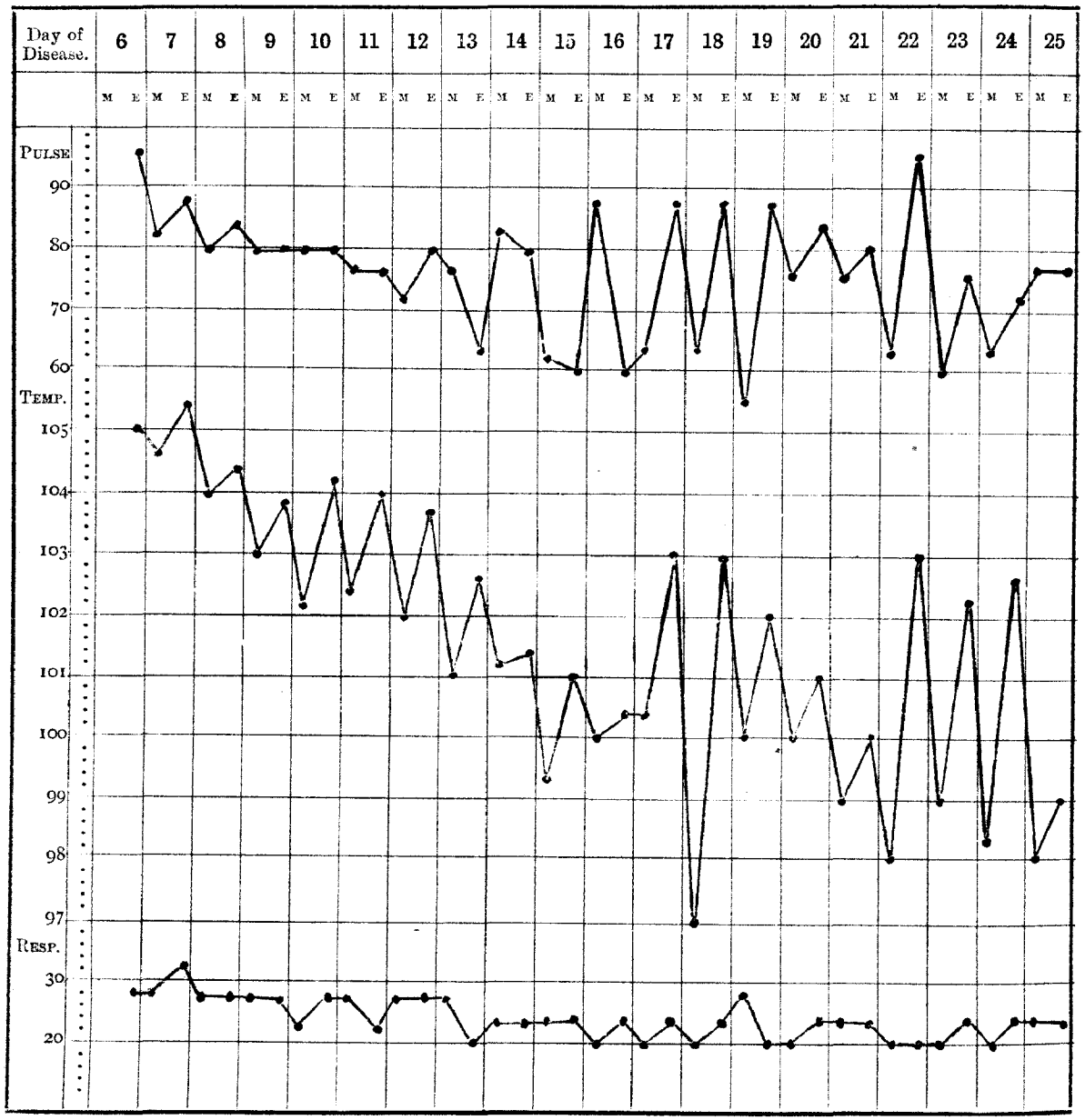
This case is interesting as showing the value of a full dose of morphia in arresting the spasm of the choledic duct and completely and immediately freeing from all pain. GOODEVE in REYNOLDS'S *System of Medicine* recommends the continued hypodermic injection of ⅙th grain of morphia every two or three hours during the continuance of the attacks. TROUSSEAU recommends the inhalation of chloroform during the paroxysms. The indication being to relieve the pain, it matters little how that end is attained. Most authorities place their faith either in chloroform or morphia.

There were 6 births during the half year, 3 boys, and 3 girls. All the labours were natural and uncomplicated. There were 6 deaths during the same period. A child, resident, one year old, died from spasm of the glottis; a sailor died from typhoid fever, a resident from apoplexy, a sailor and a resident from cholera, and a sailor from the effects of alcoholism.

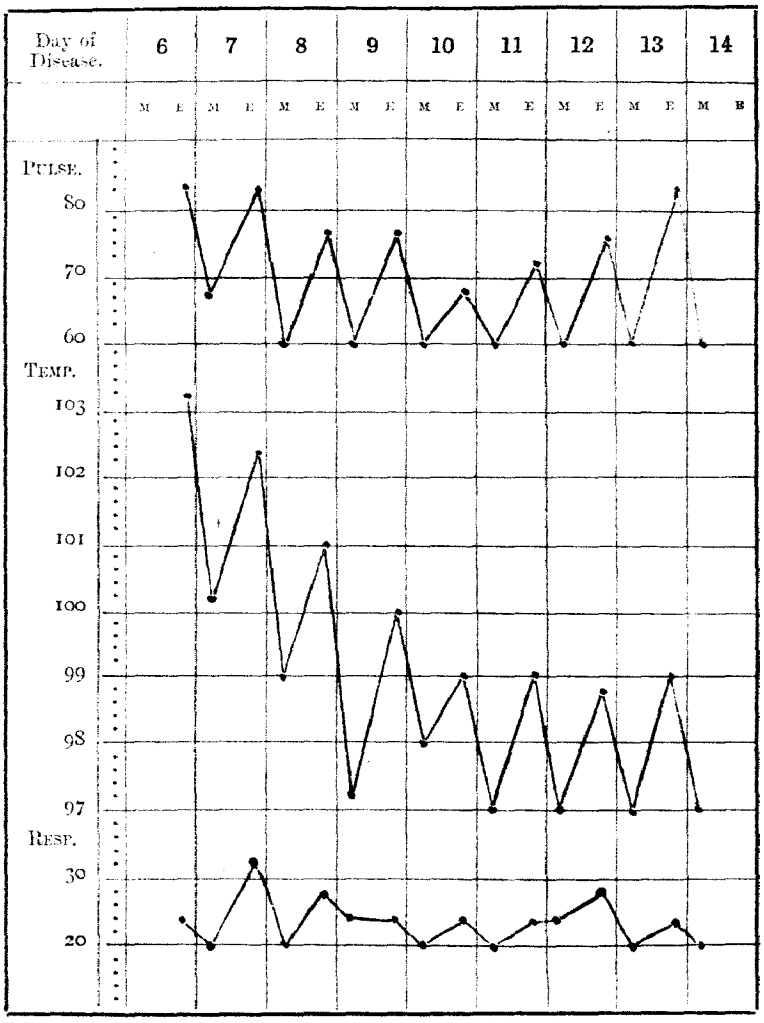
CASE I (page 69).



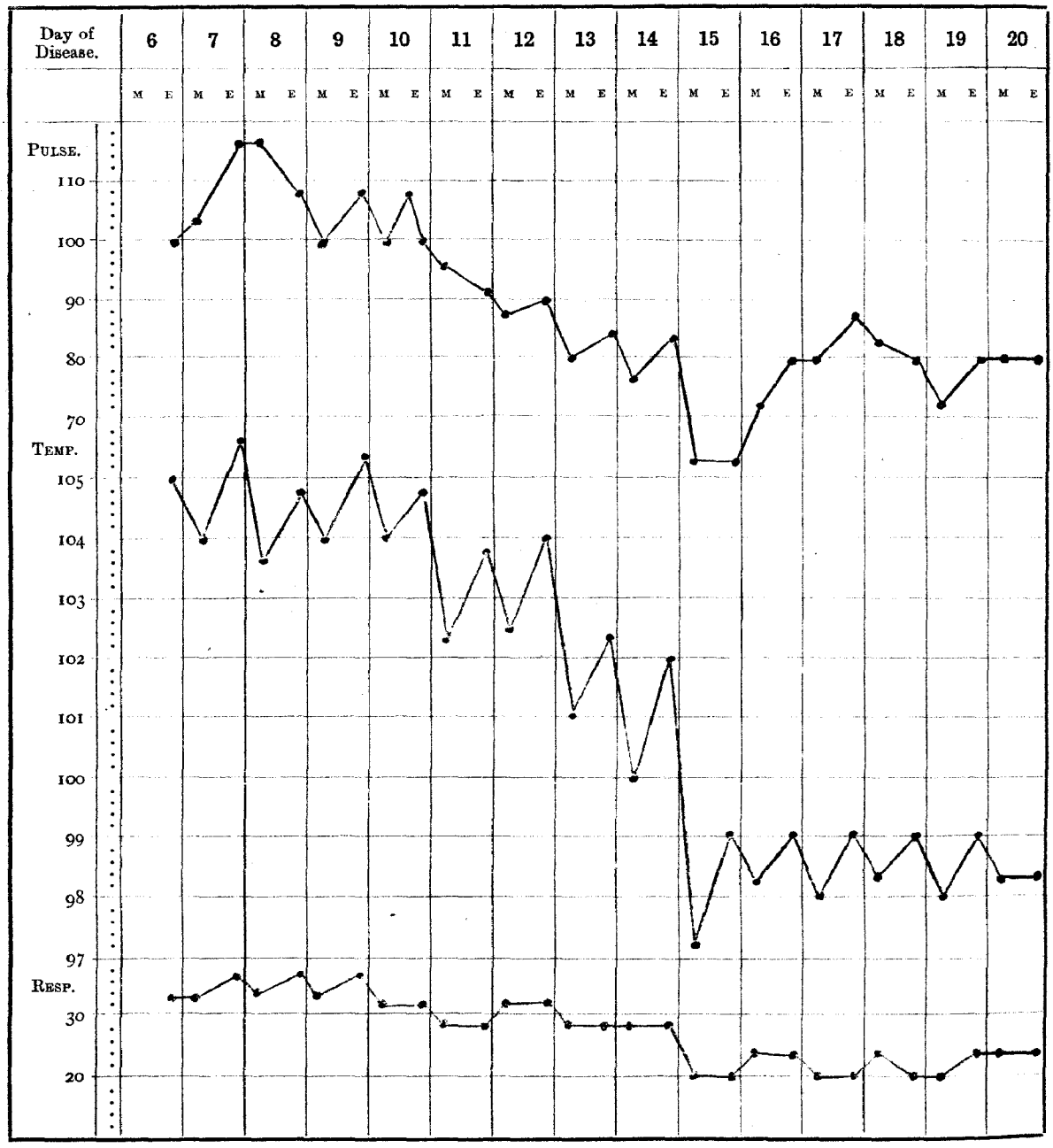
CASE II (page 70).



CASE III (page 71).



CASE IV (page 72).



I.—Dr. A. G. Reid's Report on the Health of Hankow for the Year ended 30th September, 1877.

During the past year no examples of severe malarial fever were met with among the foreign residents at this port. This may have been partly due to the dryness of the summer, the low state of the river and the filling up of several of the low-lying lots. With the disappearance of marshy ground there is a good prospect of the diminution or disappearance of malarial fever within the limits of the settlement during years free from a general inundation. Epidemic contagious disease was represented by one case of semi-confluent small-pox which attacked a foreigner residing within the limits of the native city. This disorder was reported as being moderately prevalent in the neighbouring cities during the winter and spring months, but it was said not to be of a fatal type, nor did it at any time exhibit an epidemic prevalence, like to that which has of late troubled many cities in Europe. Two deaths took place. One was a case of cerebral hæmorrhage which terminated fatally in three hours. The other was due to acute hepatitis and right pneumonia accompanied with early delirium, and death followed four days after the patient's arrival at this port. In each case the constitution was, physiologically speaking, a wreck, and the general system had no power to combat acute disease. In the latter patient, there was the possibility of the existence of hepatic abscess, as he had suffered from liver symptoms for a month, slight jaundice and obscure pain in right hypochondrium. It was not however searched for, as the case seemed hopeless from the other complications. The obscurity often attending the early diagnosis of hepatic abscess and the difficulty experienced at times in separating it from functional liver disorder is admirably described by Sir Joseph Fayrer in the July number of the *Practitioner*. His remarks on the question of the absorption of the contents, or of the abscess becoming encysted or caseous, are highly interesting. In one part, after alluding to the general symptoms, he writes,

> But it must be borne in mind that all these symptoms may have occurred and yet indicate nothing more than acute congestion which has resolved, or that an abscess *may* have formed and have been removed by absorption, or may have passed away so gradually as to be unobserved by the patient, who has regarded it as a phase of diarrhœa from which he may already have been suffering.

In another paragraph he continues,

> It is not generally understood that a man may have an abscess in his liver which is not thus got rid of, and yet recover after its removal by absorption, or by its remaining in a state of quiescence, like chronic abscesses elsewhere, for the remainder of life; such cases are probably uncommon, but I believe they occur, and may be met with from time to time in the examination of the livers of those who have died from other causes.

The words of this eminent authority who has enjoyed such extensive opportunities of seeing hepatic disease, ought to set at rest the question of the possibility of the absorption of pus in some cases of hepatic abscess. I have already * mentioned a case where most of the symptoms of hepatic abscess occurred and where recovery took place without discharge of pus.

I forward a continuation of the meteorological table published at pp. 46, 47 of the 8th number of this series of Reports (April—September 1874).

* *Customs Medical Reports*, vi. 35.

METEOROLOGICAL

Date.	Barometer.		Thermometer.								Minimum on Grass.	
			Dry Bulb.				Wet Bulb.					
			Maximum.		Minimum.		Maximum.		Minimum.			
	8 A.M.	4 P.M.	8 A.M.	4 P.M.	8 A.M.	4 P.M.	8 A.M.	4 P.M.	8 A.M.	4 P.M.	8 A.M.	4 P.M.
1874.	*Inches.*	*Inches.*	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.
October	30.1	30	62.7	64.5	59.3	60.7	60.5	61	57	57.7	55.7	64.6
November	30.3	30.2	52	56.6	46.8	49.7	50.2	51.9	46.6	46.3	38.3	48.4
December	30.2	30	45.67	47.8	41.54	43.5	44.7	47.3	40.4	42.19	33.8	44.5
1875.												
January	30.2	30.2	36.1	42.8	34.28	37.25	37.45	38.8	32.9	35.41	28.8	40.4
February	30.1	30.1	41.32	43.37	35.57	37.71	39.35	41.14	34.8	36.39	31.75	41.64
March	30	29.9	55.6	60.2	50	52.3	53.1	57.4	46	50.5	45	60.5
April	29.9	29.8	66.5	68.5	57	64.1	61.5	63	55	57	48.5	71.5
May	29.8	29.8	72	77	67	69.2	69	70	65	66.3	64.1	80.9
June	29.6	29.6	75	79	72	73.4	73.3	75.1	70	71.3	70.4	80.2
July	29.5	29.5	88	90.9	82.6	86	82	82.4	78	77	79.1	96.3
August	29.7	29.6	87.4	90.8	81.3	85.4	80	79.2	76	76.3	78	94
September	29.7	29.7	75	79.3	71.2	74	71.3	73	68	69	70.4	81.4
October	30	29.9	64	67.1	60	63	61.1	63.3	57	59	61.3	66.3
November	30.1	30.1	53.6	58	48.3	51.2	51	53.2	46	48.3	45.3	52.4
December	30.2	30.2	42	47.2	35	39.4	39.4	43	33.4	32.3	30.3	39
1876.												
January	30.2	30.2	35	37.4	31.3	33.2	34.1	35.2	31.2	31.4	29.4	35.3
February	30.1	29.9	42.5	46.4	39.3	41.2	42.1	45.1	39.7	40.3	37.8	45.3
March	29.9	29.9	52	57.3	47.8	51	50.4	54	48.3	49	45.4	56.1
April	29.8	29.8	62	66	56.8	59.7	61	62.4	56.1	58.1	53.5	68
May	29.8	29.7	72	76	67.5	71	68.4	70.1	65.2	67.1	64.3	84
June	29.6	29.5	77.4	81	71.7	76.4	75	75.4	71.5	72.4	73.7	89
July	29.5	29.5	86.1	89	81.3	84.4	83	81	77.6	78	78.5	97.6
August	29.6	29.5	82.8	85	78.5	81.4	79.4	79.8	76	77	76.7	93
September	29.8	29.8	75.8	78.8	69.8	71.9	72	72.5	68	69	68.4	80
October	30	29.9	67	70.8	62	67	63.3	65	59.9	62	57	68
November	30	30	52	56	46.9	50	48	51	45	46.8	41.5	50.8
December	30.1	30.1	49	51.7	40.7	43	43	44.6	39	41.6	35.3	45.3

OBSERVATIONS.

Thermometer sunk 3 feet under soil.		Thermometer at level of soil.		Solar in Vacuo.	Highest of Solar in Vacuo.	Temperature of River taken at the Jetty.	Rain.	Snow.	Ozone (Negretti and Zambra's Scale).	Total of dried mud in 4 galls. Water taken daily from mid stream.	Date.
8 A.M.	4 P.M.	8 A.M.	4 P.M.				Inches.	Inches.			
° F.	° F.	° F.	° F.	° F.	° F.	° F.					1874.
68.5	—	—	—	122	136	65.38	7.25	—	121	2535	October.
57.7	—	—	—	108	117	55.3	1.10	7	67	1356	November.
51.29	—	—	—	103	110	48.87	4.23	1½	90	2298	December.
											1875.
43.82	—	—	—	96	104	42.6	1	10¼	81	1869	January.
42.82	—	—	—	100.9	110	42.32	3.45	9¼	74	1381	February.
51	—	—	—	122	136	51.1	3.62	—	161	1815	March.
58.9	59	61.2	71.4	129	138	64	3.83	—	133	1998	April.
67.7	68	70	79	138	148	73	10.42	—	117	1942	May.
73.6	73.7	75.1	80.2	123*	134	79	13.90	—	108	2103	June.
80	80.1	84	98.2	144	150	87	3.63	—	95	1549	July.
83.2	83.2	83.5	98.1	145	153	86.3	0.83	—	126	4274	August.
77.2	77.3	73.8	80.4	128	146	78.4	2.53	—	144	2590	September.
67.3	67.4	60.3	68.4	118	130	67.3	2.59	—	106	2164	October.
58	58	50.1	57.6	104	108	58.3	9.95	—	75	1760	November.
45	45.4	36.4	45.3	92	99	47.2	0.42	—	54	2552	December.
											1876.
40.5	40.9	33.3	38.1	78	80	41.3	2.22	11.5	73	1321	January.
42.3	42.4	42.4	48	90	114	45	2.69	5	82	1476	February.
51.6	51.8	51.8	59	112.7	126	54.4	3	—	103	1168	March.
59.1	59.4	59.8	68	118	132	65	5.70	—	127	1212	April.
66.9	67	71	79	133	146	71	2.86	—	87	1357	May.
75.6	75.8	77.9	84	137	151	80	7.68	—	100	2194	June.
80.5	80.5	83	92.9	145	157	86	1.42	—	82	1272	July.
79.9	80	81	87	139	159	84.2	9.22	—	81	2170	August.
75.3	75.7	73.8	79.9	131	150	80	3	—	101	1110	September.
66.9	67	64	69.8	124	129	70	1.16	—	72	968	October.
58	58	52	62.7	114	128	58	1.52	—	60	1881	November.
50.8	50.2	43	57.2	100	110	50	1.54	—	47	1831	December.

* The glass vacuum cover got broken, and from this date the black bulb was placed in a matrass and fixed with sealing wax.

K.—Dr. B. S. RINGER's Report on the Health of Tamsui and Kelung for the Half-year ended 30th September, 1877.

THE health of the foreign community of north Formosa during the past 6 months compares somewhat unfavourably with that of the winter months. The heat was not excessive, and the rainfall from April to September inclusive was 43.93 inches, there having been 52 wet days in all.

A considerable number of cases of malarious fever occurred, principally of the remittent and intermittent type. Several severe cases of remittent attended with slight delirium were observed here and at Coal Harbour.

At the latter place almost all the mining experts were attacked to a greater or less extent by malarious fever. This may perhaps be accounted for to a certain extent by the facts that the mining locality is surrounded by a number of almost entirely uncultivated hills covered with a sparse jungle, and that the men have been subjected to hard work and considerable exposure to the atmospheric influences of an eastern climate for two summers, during the first of which they were able to ward off the evil influences of the malarial poison, having at that time lately arrived from home in vigorous health and condition. Gradually, no doubt, they became more susceptible as the change of living and climate began to take effect upon their constitutions.

A case of dysentery of a mild type occurred, which yielded readily to one or two scruple doses of ipecacuanha. The exhibition of ipecacuanha wine and spirit of chloroform in small and continued doses with a farinaceous diet, till all abdominal tenderness and looseness of the bowels ceased, completed the cure.

One severe case of chronic diarrhœa of six months' standing is still under treatment, and has so far proved most obstinate.

One death has to be recorded. The case occurred at Coal Harbour and terminated fatally before medical assistance was obtained. It appears to have resulted from remittent fever, ending in delirium and fatal coma. 1,500 Chinese troops were landed in Kelung about the middle of February and stationed in a newly built mud fort. At the end of September, according to Chinese statements, 300 had succumbed to various diseases, chiefly it would seem to a low form of fever, but as I had no opportunity of following out any of the cases, particulars are wanting, and the Chinese statistics are not very reliable.

Cholera, which appears to have been severe this summer at some of the Chinese ports, did not attack the inhabitants of northern Formosa, which indeed is probably not so favourable to the spread of this disease as many other places in China. The towns are situated widely apart and are neither very large nor excessively overcrowded, while the people are for the most part in comparatively comfortable circumstances. Abject poverty, so frequently noticeable in many of the large cities on the mainland, is scarcely ever to be observed.

L.—Dr. J. R. Somerville's Report on the Health of Foochow (Pagoda Anchorage) for the Half-year ended 30th September, 1877.

I.—Meteorology.

I regret much that I am unable, for the want of reliable materials, to continue the meteorological table and analysis of the season published by me for some years in these Reports. It is with extreme reluctance that I find myself obliged to abandon this part of the work. I think, however, it better to do so than to give an analysis that would not come up to the standard of scientific accuracy.

Speaking generally, the past summer was one of the coolest ever known here. April was warm for that month and there was very little rain.

May fine; rain towards the end, but rainfall much less than usual for this time of year; winds mostly N.E.

June:—Much rain; floods on river from the 13th to the 20th. I take the following from my private diary:—"18th June, raining hard all night; tremendous freshet on river. Steamers *Viking* and *Fleurs Castle* each lost an anchor. All the tea steamers have steam up. Hear that the water in Foochow is higher even than last year, and that much tea is submerged." Towards the end of the month there were some hot days.

July:—Remarkably cool month on the whole. Many showers and thunderstorms towards end of month. Many days very muggy, and some of the nights hot. The first half of the month exceedingly trying.

August:—Low temperature for this month. Strong gales from N.E. Some hot days towards the end. Nights remarkably cool, but weather altogether very variable.

September:—First half unusually hot, with south-westerly winds. Have had little of the latter winds this summer. Fine weather towards end of month; wind N.E.

The season then was marked by these characteristics,—a general low temperature throughout, cool nights, much humidity during the hottest part, and great and sudden variations in the meteorological conditions.

Notwithstanding the low temperature the summer was in the experience of the older residents one of the most trying ever endured here, but this will come better under the next head.

II.—Diseases.

Nosological Return for the Half-year ended 30th September, 1877.

Diseases.	April.	May.	June.	July.	August.	September.	Total.	Died.	Remarks.
I.—General Diseases.									
Section A :—									
Enteric Fever	—	1	1	1	—	—	3	—	
Ague	1	1	1	2	1	—	6	—	All imported.
Remittent Fever	—	2	—	—	—	—	2	—	
Cholera	—	—	—	—	1	—	1	1	
II.—General Diseases.									
Section B :—									
Rheumatism	—	—	2	1	—	1	4	—	One case acute, the rest chronic.
Syphilis,—Primary	1	2	1	3	1	1	9	—	
" —Secondary	1	2	2	2	—	2	9	—	
Phthisis Pulmonalis	—	—	2	—	2	—	4	—	All imported.
III.—Diseases of the Nervous System and Organs of Special Senses.									
Epilepsy	—	—	1	—	—	1	2	—	Treated by the bromide of potassium with good result.
Heat Malaise	—	—	—	—	—	—	—	—	Not so much as usual.
Neuralgia	—	1	—	—	—	—	1	—	
Iritis	—	1	1	1	—	—	3	—	
Conjunctivitis	—	—	—	—	—	—	—	—	Many cases.
V. & VI.—Diseases of Absorbent System.									
Bubo, (Sympathetic)	—	—	—	1	—	—	1	—	
VII.—Diseases of Respiratory System.									
Bronchitis	—	2	2	—	—	1	5	—	
Pneumonia	—	1	—	—	—	—	1	1	
VIII.—Diseases of Digestive System.									
Boils	—	—	—	—	—	—	—	—	Not so numerous as usual.
Dyspepsia	—	—	—	—	—	—	—	—	Many cases in the hot months.
Dysentery	—	1	1	3	2	1	8	—	
Diarrhœa	—	—	—	—	—	—	—	—	Numerous cases.
Worms, Lumbrici	1	1	—	1	—	—	3	—	
" Tænia	—	—	1	1	1	—	3	—	
Congestion of Liver	—	—	—	—	1	1	2	—	
IX. & X.—Diseases of the Urinary and Generative Systems.									
Stricture	—	1	1	2	1	—	5	—	
Gonorrhœa	1	3	2	2	2	4	14	—	
Bubo	—	—	—	—	—	—	—	—	About a dozen cases.
Orchitis	—	—	—	2	—	—	2	—	
XII. & XIII.—Diseases of Cutaneous System.									
Carbuncle	—	—	—	—	1	—	1	—	
Erysipelas	—	—	1	—	—	—	1	—	
Unclassed.									
Alcoholism	—	1	2	—	—	1	4	—	
Delirium Tremens	—	—	—	—	—	1	1	—	
Wounds and Injuries.									
Wounds	1	1	1	—	—	1	4	—	
Fractures	—	1	—	—	—	1	2	—	
Sprains	—	—	1	—	—	—	1	—	

Analysis of the Nosological Table.—The past summer was an unhealthy one, not that ordinary diseases were at all fatal, but nearly every one was ailing more or less during some part of it. It was in short what might be called an "irritating" season. It says a good deal for the salubrity of the locality that among the numerous cases of illness there were only two deaths. It is true there was another death only a few days out of the period, the case of carbuncle to be referred to.

The great nosological feature of the season, however, was an epidemic of cholera among the Chinese.

(*a*) *Cholera.*—Every year, during the summer, there are a few sporadic cases of cholera in the city, but this year it appeared as an epidemic and was very fatal. Dr. OSGOOD of Foochow informs me he is "not aware that true Asiatic cholera has prevailed to any extent in Foochow for the last 10 years until this year. As to the rate of mortality he "judges that 75 per cent. of the cases died. The total mortality in and about Foochow is estimated by the Chinese at from 5,000 to 7,000. The disease still continues (Nov. 9th). A great number of prescriptions have been posted about the city. The most of them recommend external irritation and 'hot' medicines, as ginger, pepper, etc."

In the case of an epidemic of this kind the Chinese find themselves quite helpless in the absence of anything like sanitary arrangements, and take refuge in gong-beating, paper-burning, and "sing-songs." It is fortunate for them they have an epidemic so seldom, for with their habits of filth and over-crowding they have no chance but to be decimated. There was a good deal of the disease in the villages in the neighbourhood of the Anchorage, and several cases at the Arsenal.

In at least two instances (that I saw) the Chinese adopted the highly objectionable practice of placing the patients out to die on cane couches by the side of the road. This was far from a pleasant sight for the passers-by, and we protested against it to the native authorities.

Fortunately only two Europeans were attacked, one in my own practice, the other in Foochow. Both men died. My case began with slight diarrhœa and pain early in the morning of the 6th September. There was nothing alarming in the symptoms till after 7 A.M., when cramps and a certain amount of lividity set in, and the pulse began to fail. Then the characteristic "washerwoman's fingers" showed themselves, the respiration became embarrassed, and by noon the pulse at the wrist had gone altogether. I then stopped the frictions we had hitherto been using, and had the patient packed from neck to heel in cloths soaked in strong mustard and water, and kept plastered every now and then with the same mixture. This produced a considerable effect for the time; the pulse rose so that I could count it readily, and I had really then some faint hope of recovery. After sunset, however, the pulse disappeared again, and there was no rallying the patient this time. He died just after midnight. The rest of the treatment consisted mostly of hypodermic injection of morphia, and the free administration of champagne. Brandy could not be retained. The disease of course caused rather a "scare" among the foreign residents. The drinking water was boiled, salads interdicted, fruit almost expelled the community, and even boiled vegetables objected to. It is just as well we did not know then what appeared in the *Lancet* the other day, viz. the conclusion to which Drs. LEWIS and CUNNINGHAM in India and Dr. BURDON SANDERSON at home have come, independently of each other, and after years of observation, that

the contagion of cholera, whatever it may be, *is something that withstands the temperature of boiling water.* Drs. LEWIS and CUNNINGHAM'S words are—

Therefore, until it be proved that living substances can withstand immersion in a fluid at a temperature of 212° F. of some minutes duration, we have no hesitation in stating that the morbid phenomena which we have observed to follow the introduction into the animal economy of strained solution of choleraic and normal alvine discharges, and of other decomposing animal substances, are not the result of infection with a material the poisonous properties of which are dependent on its possessing vitality.

There is always a certain pleasant sense of security when one has taken precautions, even though the science of the latter may be somewhat doubtful, and it was, I think, rather lucky that we were ignorant of these facts at the time. The disease commenced in this neighbourhood about the beginning of the last week in August, and the final case, so far as I am aware, happened on the 18th November. I may add that there was no doubt at all as to the epidemic being one of true Asiatic cholera; in the cases I had the opportunity of seeing the symptoms were unmistakable.

(b) Heat Malaise.—Cases of this kind were fewer and mostly of the dyspeptic variety, on account of the comparatively low temperature of the season. There were, however, several very hot days in July, days when the sun blazed through a humid atmosphere with fearful power. On one of these, the 16th July, I found about 20 men in one steamer completely knocked over by the heat. At first sight I could not help thinking that the men and officers had got access to liquor, but I found on strict enquiry afterwards that this was not the case.

Some of the men were raving; all had high fever, flushed faces, intense headache, and prostration. One was a decided case of heat-stroke. I removed the two worst cases to hospital and applied ice (that is, as much of this commodity as I could get, which was but a scanty supply) and administered quina internally. They all recovered. The temperature charts of the two hospital cases are given on page 92, and they show the rapidity of the recovery. It is to be noted that in the case No. 1 quinine had been given and ice applied some time before the first observation was made. Had the temperature been taken at the beginning I have no doubt it would have been found as high as in the other case.

(c) Rheumatism.—Only one of the cases was acute, and in it I gave salicin from the first, in 20 grain doses every 2 hours, and afterwards every 3 hours. The result pleased me much, the patient being convalescent within a week. I should be very glad to give the drug or one of its derivatives again, but that is all one can say of a new remedy from a single case. It is, I think, highly desirable that practitioners in China should return in these Reports cases of rheumatism treated by salicin, salicylic acid, or the salicylates. Many will remember what trouble there used to be in the old days with the old remedies.

(d.) Fevers.—These cases were very instructive. Intermittents and remittents were few, and all imported. One case was genuine typhoid but without much diarrhœa, and two more were cases that formerly would have been returned under the vague designation of *continued fever*, but which I have no hesitation in recording as *abortive typhoid.* AITKEN says,

There are cases so mild that towards the end of the second or beginning of the third week the symptoms have all disappeared. LEBERT has proposed the designation of "abortive" for these cases; and on this point NIEMEYER makes some very important observations. He considers the designation preferable to such names as "febricula," "febris typhoides," because it better expresses the fact that these cases are

only modified, benign, brief forms of enteric fever, and not a peculiar variety of disease. . . . Many of the cases which former writers call "gastric fever," or "nervous fever," are to be regarded as abortive typhus. The old customary precaution of *waiting till the ninth day* of the disease, was and still is very justifiable.

The designations *gastric* and *nervous* fever, in common use, exactly correspond to what modern physicians mean by "*abortive enteric fever*," or, as the Germans call it, "*abortive typhus*."*

The temperature chart of the case of true typhoid from the day he came under my care in hospital is given on page 93.

It will be seen that the fever repeated itself on the 38th day of the disease, and that convalescence was much protracted beyond the ordinary time. Indeed this man went through a very severe illness. He was a British marine of fine physique, and I had besides all the advantages of a well regulated hospital to treat him in. A poor, uncared-for merchant sailor would almost certainly have succumbed to an attack of the disease as severe as this was.

I give on page 92 the temperature charts of the two cases of "abortive typhoid."

It will be seen that they had very much the same course, convalescence in each case being established at the end of the second week.

Next comes a case of *Mixed fever*, a form I have already said a good deal of in these Reports.

This one was complicated with severe double pneumonia, and it was so mixed in character that I do not pretend to be able to unravel it, and say what was remittent, what typhoid, and what pneumonia. The subject was a French man-of-war's man, and was passed over to me in hospital on the 8th May, by the surgeon of the *Laclocheterie* as a case of remittent fever of 11 days' duration. Next day double pneumonia was detected, and the case went on with a high temperature till the evening of the 38th day of the disease. Convalescence then, to all appearance, set in. The patient (who had been more or less delirious since his admission) was now found to be a man of more than ordinary intelligence; he became cheerful, and the appetite returned. The temperature also fell to normal. This favourable state lasted for 6 days; then, all of a sudden, without any appreciable cause, the temperature mounted to 103°, 105°, and nearly to 106°, and in a few days it became evident that the patient was *in extremis*. He died on the morning of the 17th June, the 52nd day of the disease. There was no autopsy, and it is idle to speculate as to the lesion that was the immediate cause of death.

The case of course was a very disappointing one, and showing, among other things, how guarded one ought to be in giving a favourable opinion in such instances, even after apparent convalescence has set in. It is a significant fact that quinine, given both in large and small doses, had no effect on the progress of the disease. For chart see page 94.

(*e*) *Carbuncle.*—This was the worst case of the disease I have yet met with. The patient was a gunner who had been upwards of 30 years in the British Navy. His age was said to be 49, but he looked older. He first came under my care towards the end of June for an abscess of the leg said to be the result of erysipelas. The wound healed readily enough, and, with the exception of an oldish look, I did not then observe anything particularly debilitated about his appearance. It was very different when he again came for treatment in hospital, at the end of August. He had spent the interval on board one of the new Chinese heavy-armed gunboats, where his quarters were most unfavourable for hot weather. He was now

* AITKIN'S *Science and Practice of Medicine*, 6th Edition, vol. I, pp. 563-4.

evidently much broken in health, and looked an old man. There was, first, an abscess in the neighbourhood of the perinæum, which I opened and let out about 10 oz. of pus. The wound healed, but not kindly. Then two enormous carbuncles formed on the back, occupying when fully developed its whole surface. These were followed by other carbuncles of smaller size, and abscesses in different parts of the body. There was at this period much debility, and hectic was marked at the case went on. The patient sank from exhaustion on the 10th October.

In the treatment of this case I was ably assisted by Dr. HURLESTONE of H.M.S. *Magpie*, and I believe everything possible was done for the poor fellow. The first large carbuncle I treated in the ordinary way, by free incisions and linseed poultices. The result did not encourage me to repeat the treatment with the second, and I then availed myself of Sir James PAGET's experience in these cases, viz. not to use the knife at all. He says:—

> *On these three points, which are the grounds that have been assigned as reasons for cutting carbuncles,* I have now given you the evidence on which I have ceased from the practice. I fully believe that crucial incisions do not prevent extension; that there is only a limited set of cases in which the incisions diminish pain; and that with regard to the time that is occupied in healing with or without incisions, the healing without incisions is very clearly and certainly the quicker.*

I cannot say that I noticed any difference in the progress of the two large carbuncles treated in these different ways, and it was not till I tried plugging the various openings with lint and loose cotton thread soaked in a solution of carbolic acid in olive oil (1 to 4) that I observed any improvement in the character of the sores. Almost at once the carbuncles contracted and flattened, and the discharge became less, and more healthy in appearance. I believe, in ordinary circumstances, the man would from that time have recovered. Unfortunately, however, other carbuncles of lesser size, and numerous abscesses appeared, showing a hopeless state of physique on the part of the patient, and he sank on the 10th October under an exhausting discharge that issued from about half the surface area of his body. It struck me as strange that there was no albumen in the urine, and TROMMER's test showed no sugar. The internal treatment was nourishment in various forms, and from time to time stimulants in the shape of porter, brandy, champagne, etc. Of drugs he had iron and quinine, chlorate of potash, and the sulphide of calcium. The latter drug, so highly lauded by RINGER in the last edition of his book,† I found of no use; but it is only right to say that this case was of too desperate a nature to give the power of any remedy a fair chance of trial.

(f) Notes on Minor Therapeutics.—This summer I found, for the first time, a good remedy for that irritating and all-prevailing affection of the hot months, prickly heat. There is nothing original in the mixture, which appeared in a letter from a correspondent of the *Lancet*.‡ It is as follows:—

Sublimed Sulphur	80	per cent.
Magnesia	15	„ „
Oxide of Zinc	5	„ „

The skin is first to be bathed with warm water and a little soap; some of the powder is then placed in a saucer, and a squeezed sponge pressed on the powder. A portion of the powder will adhere to the sponge; this is to be rubbed carefully in all the patches of prickly heat, and the process is to be repeated morning and evening.

* *Clinical Lectures and Essays*, London, 1875, p. 258.

† *A Handbook of Therapeutics*, 5th Edition. London, 1876, pp. 63-64.

‡ 1877, i. p. 672.

In every case in which I tried this remedy relief was immediate, and in many cases only a few applications were required. People will sometimes ask, "but is it not dangerous to remove prickly heat, for fear of the eruption going inwards?" I think one may safely answer in the negative, for the affection, besides being a source of intolerable discomfort to the subject, is, we know, entirely a local disease. There is a wide-spread popular belief that prickly heat is healthy. This notion, according to my experience, is fallacious, and has its origin probably in the fact that when one becomes the subject of an acute disease, the eruption of prickly heat usually disappears.

(2) *Treatment of Bubo.*—Most practitioners in the East have doubtless been annoyed at the tedious way in which cases of bubo heal after incision. I tried this summer the injection of boracic acid into the cavity, and dressings of four folds of boric lint externally. The first case did admirably, but the man was in hospital and there was every convenience and security for efficiently carrying out the method. Several cases occurring afterwards outside the hospital were by no means so successful. The fact is that boracic acid being only very sparingly soluble in cold water it is useless to inject a cold solution, and a busy practitioner in the hot months has not time in most cases to wait till a hot solution of the required strength is prepared. On the whole, I prefer the injection of a watery solution of carbolic acid, but in the treatment of a hospital case, or a patient at home, I should follow the boracic acid plan. I have had no experience of the abortive plan of treating bubo by M. MALPLAQUET's method of blistering and applying a saturated solution of corrosive sublimate.*

(g) *Notes on Native Practice. Vaccination versus Inoculation.*—A learned friend called my attention this autumn to the following curious document, and very kindly translated it for me. It was posted on the walls in the neighbourhood:—

朱玉亭佈種洋痘

牛痘眞種來自西洋其法種在肘上左右各三粒此穴名曰消爍清冷淵卽此種處成漿結痂不發遍體旬日奏功萬無一失可免添花之患亦無重出之虞且此受種之兒不避風雷寒暑不服藥餌不忌飲食遊戲如常凡要種者須先到寓登號以便按期備種

訂九月廿八日開期佈種

寄中岐開

源什貨店

* *Lancet*, 1877, ii. p. 159.

TRANSLATION.

Vaccination was introduced hither from Europe. It is practiced by "planting" three "seeds" of *virus* in a spot upon the left and right arms above the elbows. This spot is called the cold-dispelling pool, and upon it is formed the *virus* and a scab, there being no eruption upon the body generally. The result is effected in ten days, and no failure can possibly take place, whilst security is obtained from any natural and original attack of small-pox, or from a second attack, if the patient has already had it. Children vaccinated in this way need not be afraid of exposure to cold, thunder, chills, heat, etc., nor need they take any medicine whatever, or avoid any particular kinds of nourishment, but may play about just as usual. Persons wishing to be vaccinated should come to the house of the undersigned and make an appointment for the operation. Vaccination will commence on the 1st of November, 1877.

[*Translator's Note.*—In Shanghai the customary charge is $2, which is reduced to $1 if the child is brought back to have its *virus* collected.] *

It is amusing to note (what is well shown in the translation) the droll mixture of practical science from the west with the transcendentalism of the Chinese system of medicine. It is hardly necessary to remark that the poetic imagery in the document is entirely of native growth. I have taken some trouble during the last two years to enquire into the progress of vaccination among the Chinese at this port, and to get intelligent and independent native testimony, as to how the Chinese regard the foreign method of vaccination contrasted with their own old-established system of inoculation for the prevention of small-pox. In this investigation I have to express my indebtedness to Messrs. MANSFIELD and PARKER of H.M. Consular Service, and to Dr. OSGOOD of Foochow for their kind and ready assistance. The following is the result, and I think the facts may be accepted, as I have carefully eliminated all possible sources of error:—

Inoculation has been practiced in China for some hundreds of years. The Chinese call small-pox "Heaven's flowers," and inoculation "Cultivating Heaven's flowers." The mode of procedure in inoculation is to pulverise the scabs taken from a small-pox patient, and to blow the powder thus obtained up the nostril of the child. They inject the powder into the left nostril in the case of a boy, and into the right in a female child. It is impossible to tell whether the disease thus induced will be severe or not. In some years there are few if any deaths; at other times the mortality is much the same as that from small-pox. Another method is to put the clothing of a patient suffering from small-pox upon the child. The result in either case is, of course, that the child takes small-pox. They do not observe any particular rules in selecting the matter, except that they always take it from a mild case of the disease.

They are careful to choose a lucky day for the operation, and a time when the child is in good health. They say they prefer to induce the disease at an early age, for in this way they are able to prevent the child from scratching the pustules and causing pitting.

It is most satisfactory to find that this barbarous and highly dangerous operation is on the wane all over China, and that vaccination is taking its place more and more every year. I have it from intelligent and reliable native sources that inoculation is not very much practiced in this province now, and that the suspicion with which vaccination was formerly regarded as a subtle device of the wily foreigner is dying out, though of course it will be a work of time. Dr. OSGOOD of Foochow, who has every opportunity of knowing, informs me that "vaccination is gaining ground every year, and is destined in time to quite drive out inoculation." He says, even now, in Foochow and the neighbourhood "it is the rule to vaccinate," and he thinks there must be at least from 20 to 30 natives engaged in the work at this port.

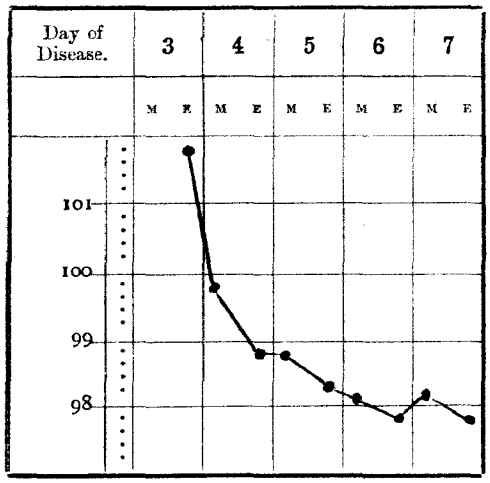
* [Nothing is publicly known in Shanghai about this charge, if it be made at all.]

Information from the other ports is alike favourable, and I think one may mark this at least as a point of real progress on the part of the Chinese.

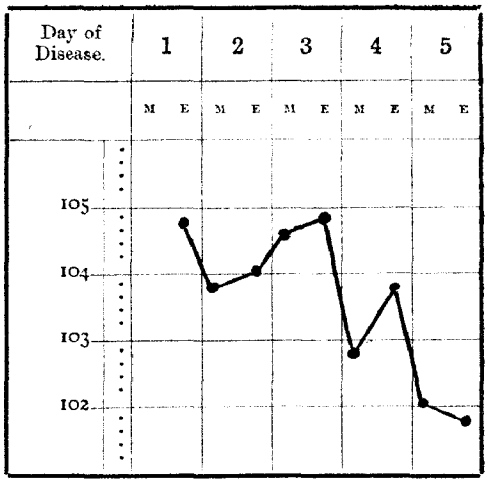
(h) Notes on Obstetric Practice.—I follow the good example set by Dr. JAMIESON in a late number of these Reports (xii. 9) with a small contribution of obstetric practice among foreigners at this port. For obvious reasons it is impossible to go into details other than statistical of these cases, and the cases themselves are so few that no general conclusions can be drawn from them. They are therefore to be regarded simply as a contribution. My cases are 38 in all. Of these, 4 were abortions before the 4th month. By the 34 labours at term there were born 18 boys and 17 girls. One was a case of twins, which accounts for the odd infant. Of the whole 38, two mothers died, one either from cerebral hæmorrhage or embolism on the 7th day after delivery, and the other from puerperal fever of the septicæmic variety on the 17th day. All the children of the 34 labours at term were born alive, and of the 35 children, 3 died within a few days. These include the twins. The latter were boys: the first-born, strong and over the average size, died on the 5th day from what was apparently obstruction of the biliary ducts, for he was jaundiced all over. The second-born was rather weakly and undersized, and he, after surviving his stronger brother by one day, also succumbed, without any appreciable cause except debility. The 3rd death was from trismus nascentium on the 4th day. Of the 34 labours at term, 33 were head presentations, and 1 a breech presentation. The forceps was used in 4 of the cases: twice on account of inertia of the uterus, once to rectify a mal-position of the head (antero-posterior), and once in a face presentation. The breech presentation, though in a primipara, did not present any peculiar difficulty except that great care had to taken to prevent pressure on the cord. In none of the 34 cases at term was there post-partum hæmorrhage or placenta prævia. In one of the abortions there was free bleeding, which necessitated the use of the tampon; in the other abortions the loss of blood was very small.

TEMPERATURE CHARTS OF CASES OF HEAT MALAISE (page 86).

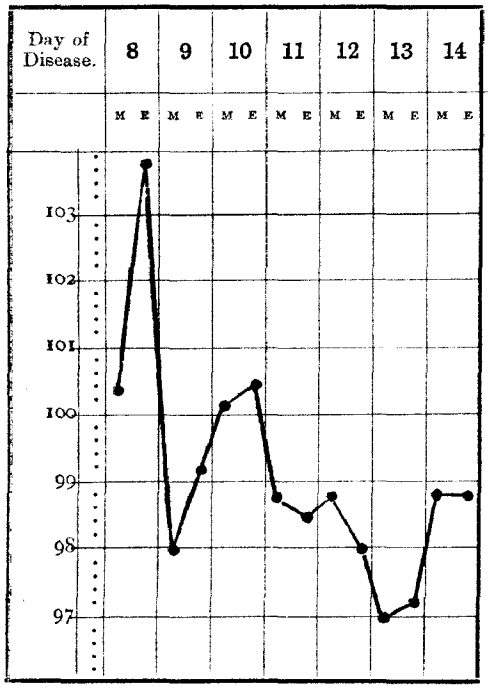
No. 1.

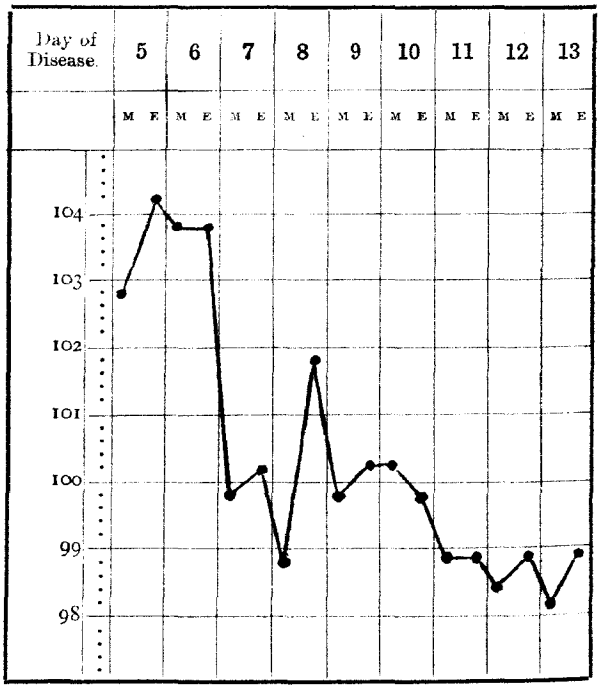


No. 2.

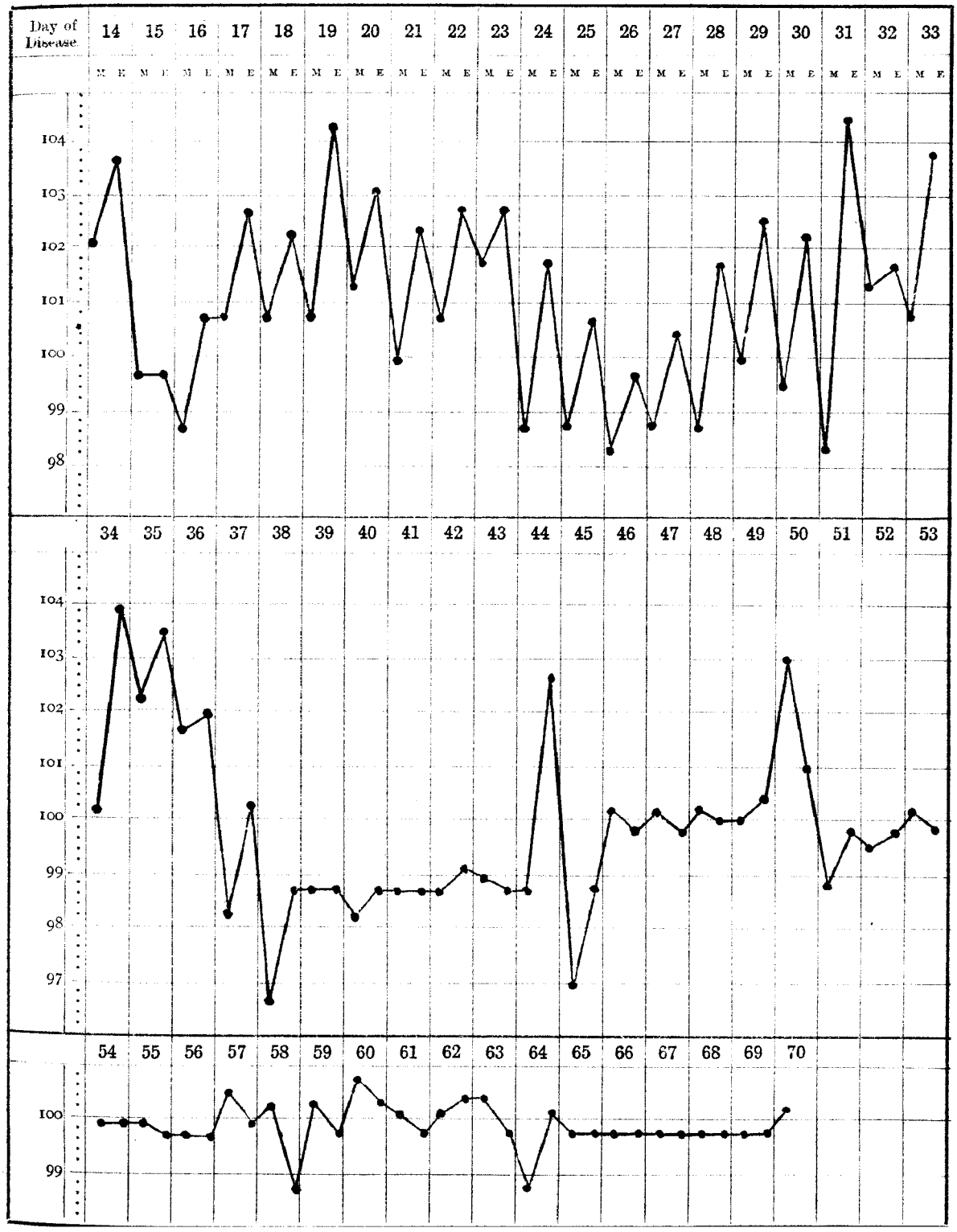


No. 1. ABORTIVE TYPHOID (page 86). No. 2.

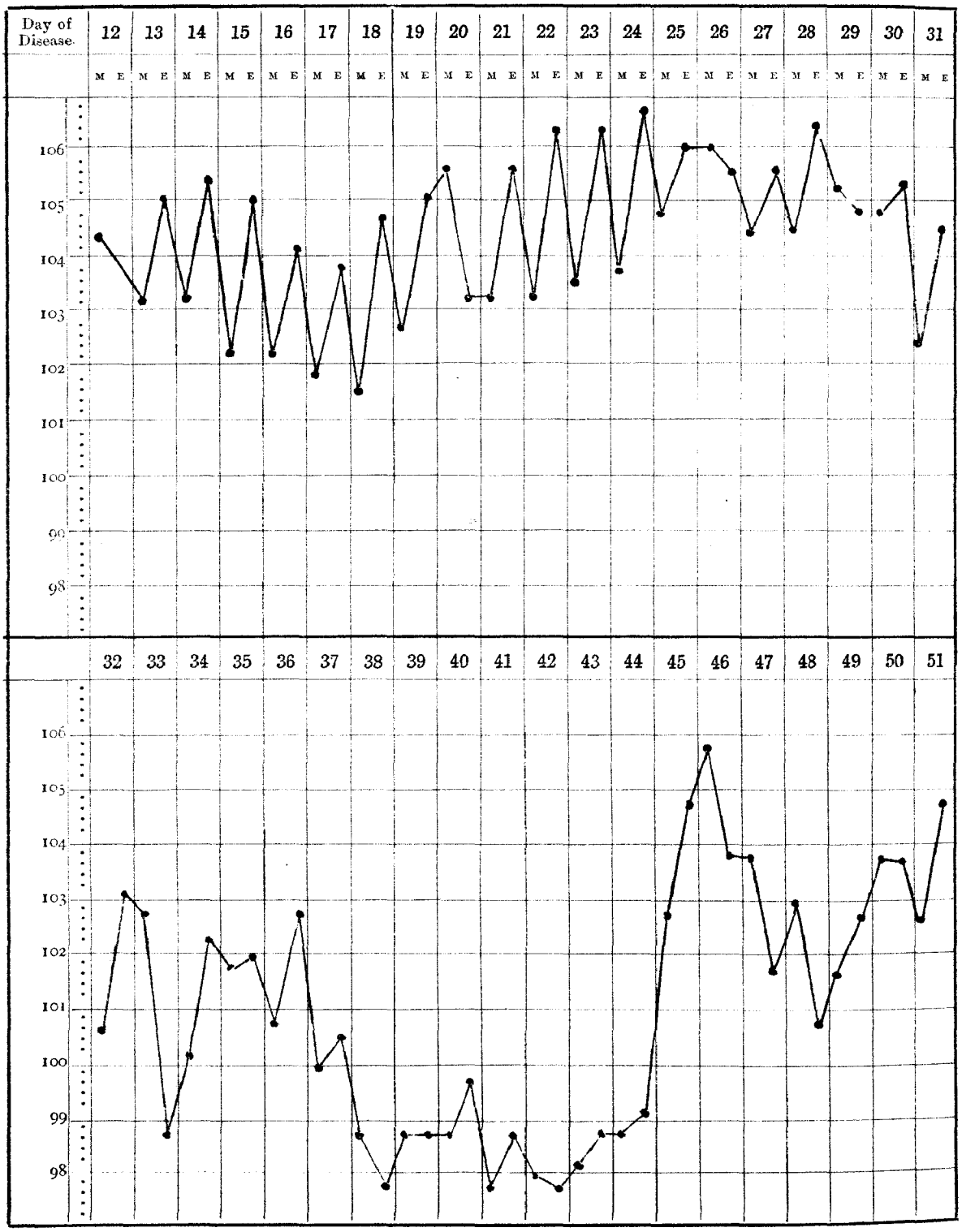




TYPHOID FEVER (page 87).



TEMPERATURE CHART OF A CASE OF "MIXED FEVER," WITH DOUBLE PNEUMONIA (page 87).



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„ **2.**—MEDICAL REPORTS..... First Issue, 1871.