

CHINA.

IMPERIAL MARITIME CUSTOMS.

II.—SPECIAL SERIES: No. 2.

MEDICAL REPORTS,

FOR THE HALF-YEAR ENDED 31ST MARCH 1884.

27th Issue.

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SHANGHAI:

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

AND SOLD BY

Messrs. KELLY & WALSH, SHANGHAI, YOKOHAMA, AND HONGKONG.

LONDON: F. S. KING & SON, CANADA BUILDING, KING STREET, WESTMINSTER, S.W.

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National Oceanic and Atmospheric Administration

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December 20, 2000

INSPECTOR GENERAL'S CIRCULAR No. 19 OF 1870.

INSPECTORATE GENERAL OF CUSTOMS,
PEKING, 31st December 1870.

SIR,

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

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

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

b.—Diseases prevalent at.....

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

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

e.—Peculiar diseases; especially leprosy.

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

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

(Signed) ROBERT HART,

J. G.

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

SHANGHAI, *1st July 1884.*

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:—

Report on the Health of Ichang, pp. 1, 2 ;

Report on the Health of Kiukiang, pp. 3-6 ;

Report on the Health of Canton, pp. 7, 8 ;

Report on the Health of Wênchow, pp. 9-18 ;

Report on the Health of Amoy, pp. 19-21 ;

Report on the Health of Shanghai, pp. 29-43 ; each of these referring to the half-year ended 31st March 1884.

Report on the Health of Newchwang for the eighteen months ended 31st March 1884, pp. 22-28.

A special article on Distomata Hominis, pp. 44-54.

An Appendix of translations of—

A monograph on Sprue, pp. 55-85 ;

Note on an Affection of the Sympathetic Plexuses of the Intestinal Wall, pp. 86-91.

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 :—

A. HENRY, M.A., L.R.C.P.Ed.	Ichang.
G. R. UNDERWOOD, M.B., CH.M.	Kiukiang.
J. F. WALES, B.A., M.D., CH.M.	Canton.
D. J. MACGOWAN, M.D.	Wênchow.
B. S. RINGER, M.R.C.S., L.S.A.	Amoy.
W. MORRISON, M.B., CH.M.	Newchwang.
WALLACE TAYLOR, M.D.	Osaka, Japan.
R. A. JAMIESON, M.A., M.D., M.R.C.S.	Shanghai.

For everything enclosed within square brackets [], the compiler is responsible.

DR. A. HENRY'S REPORT ON THE HEALTH OF ICHANG

For the Half-year ended 31st March 1884.

DURING the past six winter months the health of Ichang and surrounding district was very good, except in October, when much malarial fever occurred, being a continuation of the epidemic which had been prevalent in August and September. Within the last few days, again, cases of ague are beginning to appear, but this is to be expected among the Chinese every year with the commencement of hot weather. The foreigners who live in the southern suburb are apparently safe from malaria, though it may attack the Chinese around; but inside the city, which is not in so good a sanitary condition, there is not the same security. In treating ague occurring in natives I have found that a very small dose of quinine or cinchonine is sufficient to ward off the attacks. Large doses may produce unpleasant results, as in a case I had lately, when, in anticipation of a third attack of severe tertian, I gave 12 grains of quinine. No shivering fit ensued, but a violent urticaria, beginning on the legs, spread over the whole body and proved extremely annoying for two or three days. In a previous Report (that for March 1883) I mentioned other symptoms (amaurosis, etc.) as having occurred from quinine. In the case of foreigners in the interior, away from medical advice, there is a tendency in every febrile attack to resort to quinine when often a purgative would be more suitable, as many of these cases of feverishness are due to disorders of the alimentary canal. I have seen several cases where the irritation of round worms apparently caused slight gastritis and consequent fever. Diarrhoea becomes troublesome, mucus appears in slight quantity in the stools, there is irritation about the end of the rectum, and the patient becomes alarmed, thinking he has dysentery. Some day headache, constipation and feverishness set in; but on the exhibition of a smart purgative these symptoms disappear and one or two round worms are expelled.

Scarlatina does not seem to occur here, and the following case is somewhat interesting, as if it had occurred during an epidemic of that disease it would most likely have been considered a case of modified scarlet fever.

The patient, a Chinese girl, aged 19, first noticed a sore and enlarged gland at the angle of the jaw on the left side. In two or three days fever set in, the temperature being $102^{\circ}.6$, and the left tonsil was seen to be reddened. Next day temperature the same, tonsil projecting, swallowing very difficult, constant flow of saliva, and breath offensive. Urine was highly concentrated, and contained one-eighth albumen. During the next five days the fever abated and the throat became well, no suppuration occurring. On 6th December (11th day of the illness), albumen being one-third, general dropsy appeared, and continued until 24th December, when the symptoms, albuminuria, dropsy, occasional vomiting, etc., cleared up, and the patient rapidly recovered health and strength and is now quite well. There was no eruption. Copious desquamation in large flakes occurred, but this may be set down to the dropsy distending the skin.

Cases of aneurism are supposed to be uncommon among the Chinese. In view, however, of the sudden deaths that are often reported, it is possible they may occur with some frequency. In the following case of thoracic aneurism the cord seems to have become affected by pressure:—

The patient, aged 39, of quiet habits of life, enjoyed good health until 17th June of last year, when his left leg became swollen, painful and weak. In the next few days the right leg, left hand and right hand in succession were affected. On 24th July, the date of my seeing him, he was unable to walk. In the upper extremities loss of power was confined to the fingers, which could not be extended. There was no loss of feeling. In the lower limbs the leg could not be extended on the thigh, but flexion was possible. The thigh could only be lifted up a little, and he was able to move the toes but very slightly. When the legs were touched there was a numbing sensation felt, and there was anaesthesia to some extent. The left side was more weakened than the right, both in the upper and lower extremities. On stripping the patient pulsation was visible in the epigastrium, and a murmur was heard there with the first sound. In the right supraclavicular region there was strong pulsation towards the middle line, and a thrill and sense of expansion to the hand. A systolic bruit of great intensity was to be heard over the pulsating area. Pupils equal, no dropsy, no affection of the sphincters. There was some difficulty in swallowing and some affection of the sense of taste, the exact nature of which I could not clearly make out. I did not see the patient again, but I heard he gradually became worse, the breathing being affected. The day before his death, which occurred suddenly on 2nd August, the right arm swelled down to the wrist.

During the past half-year the health of the Customs staff was fairly good. Only one serious case of illness occurred; the patient, a Chinese, died of fever. I was not asked to see the case, but from the symptoms described to me, namely, a continuous fever, proving fatal in 15 days, and accompanied in its course by much diarrhoea, wasting, delirium at night, etc., I considered the case to be probably one of typhoid. It was called by the Chinese *shang-hun* (傷寒).

METEOROLOGICAL TABLE.

MONTH.	THERMOMETER (FAHR.).				BAROMETER.		RAIN.	
	Highest.	Lowest.	Average Highest.	Average Lowest.	Highest.	Lowest.	Rainfall in Inches.	Number of Days.
1883.	°	°	°	°	<i>Inches.</i>	<i>Inches.</i>		
October	80	49	69	62	30.54	30.06	7.11	13
November	64	39	54	48	30.50	30.01	1.67	15
December	56	34	52	41	30.56	30.12	0.34	5
1884.								
January	56	34	49	41	30.64	30.02	0.73	11
February	64	29	49	39	30.56	30.03	1.17	5
March	69	39	57	48	30.48	29.90	4.03	14

DR. G. R. UNDERWOOD'S REPORT ON THE HEALTH OF KIUKIANG

For the Half-year ended 31st March 1884.

THE health of foreigners residing at this port during the past six months has been slightly under the average. In winter there is as a rule very little sickness, but in the season just ended the weather has been colder and the atmosphere more damp than usual, and colds and bronchial affections—not of a serious character, however,—have been rather frequent. In March there was one death from typhoid fever, the second within 12 months. There have been no births during the half-year. The following were the cases treated, the foreign population being 62:—

Intermittent fever 5	Habitual constipation 1
Typhoid fever 1	Diarrhoea, simple 4
Gout 1	Dysentery, subacute 2
Anæmia 1	Hæmorrhoids 2
Congested sore throat 1	Hepatic congestion 1
Ulcerated „ 1	Intestinal worms 1
Bronchial catarrh 7	Neuralgia 3
Acute bronchitis 1	Eczema, simplex 1
Chronic „ 1	„ intertrigo 1
Pulmonary congestion 1	Varicella 1
Hæmoptysis 1	Ecthyma 1
Gastric catarrh 1	Tinea circinata 1
Acid dyspepsia 2	Conjunctivitis, acute 1
Atonic „ 1	Scald 1
Cramp of stomach 1	Fracture of femur 1

Four of the cases of intermittent fever were slight and yielded readily to quinine; the fifth, which was complicated with hepatic congestion, was uninfluenced by the alkaloid, and was only got rid of by the administration of full doses of arsenic.

The patient who died from typhoid fever had suffered repeatedly from intermittent fever during a residence of two years in Kiukiang, and had just recovered in January from a mild attack of dysentery. She was much troubled with neuralgia in February, and early in March symptoms of irregular intermittent, which quickly developed into characteristic typhoid of a severe type, came on. The evening temperature at the end of the first week was from 104° to 104°.5, and the pulse 112 to 120. Congestion of both lungs was then superadded, and evening after evening the temperature ranged from 104°.4 to 105°.2, and in the morning 1° to 1°.5 less. Hæmorrhage from the bowels first appeared early in the second week, only once in quantity, and continued to be noticed occasionally up to the end of the third week, when death took place. From the beginning the patient's weak state left little hope of a successful issue. With several ways in which the disease might have originated, it is impossible to fix on any particular cause.

The cases of dysentery did well under the ordinary treatment.

The patient who is mentioned in last year's Report* as having had the forearm broken for the fifth time has been so unfortunate as to have the femur broken just outside the capsule of the hip-joint. Out of doors one afternoon she became giddy while looking upwards, and fell to the ground, with the untoward result. Rest in bed, with extension apparatus, for seven weeks was a severe trial for advanced years, but the patient is now able to stand and to walk with crutches. In a few months I expect that she will be able to walk—a success, considering her age and the brittleness of her osseous system.

During the past six months there has been, to judge from the numbers coming to the hospital, about the usual amount of sickness among the Chinese. Malarial diseases, their accompaniments and consequences, and skin diseases, especially eczema and scabies, have been, as usual, the most common. Many cases of contagious disease of the genito-urinary system, and syphilis, have been treated of late. Contrary to what one might expect, considering the amount of filth among those who suffer especially from these maladies, the type is not more severe than at home. A good number of the lowest class of Chinese women have come, suffering from primary and tertiary syphilis, encouraged by the good results of treatment among their neighbours. One difficulty in regard to all these cases is that as soon as the patient is relieved from urgent symptoms she ceases to take medicine, though strongly urged to, and recurrence follows. Non-contagious diseases of the bladder and urethra are uncommon in this neighbourhood, so far as my experience of the last three years goes; and I have met with only one case of stricture of the urethra among 5,000 patients in the last 12 months. The low diet of the Chinese does not tend to keep up urethral irritation, and is probably one reason why gonorrhœa is less frequently followed by stricture than at home; and yet one meets with a good many cases of gleet. One patient suffering from calculus applied for relief, but of cystitis I have seen very little. Retention from enlarged prostate, or spasm at the neck of the bladder, has not been met with at all; it is difficult to understand why, when there are so many old men, badly fed, badly clothed, and frequently exposed to cold and wet in the winter.

The leprosy cases treated during the year, some 30, were put on gurjun oil, chaulmoogra oil, tincture of eucalyptus and other preparations, but in no one instance did the patient benefit in a marked degree. Even among those in whom the disease was just beginning the result was the same. In a special hospital, with good food and care, and in which the patients might remain for months, there would be a greater amount of satisfaction to be got from treatment.

The following case of difficult labour is noteworthy as showing how far a patient is allowed to go before help is asked for:—

On the 11th October, at 6 p.m., I was called to see KAO SHIH, who was said to have been in labour four days. The patient, aged 20, primipara, under the middle size, delicate looking, was in bed and supported by two women in a semi-recumbent posture. The attendants said that labour began on the evening of the 7th, and that the membranes had been ruptured during a severe pain at 9 p.m. that evening. The pulse was 130, weak; the respirations 30; and the sufferer moaning, and at times talking

* *Customs Medical Reports*, xxvi, 28.

incoherently. Abdominal palpation showed that the bladder was much distended, and it was reported that no urine had been passed for 24 hours previously. The lower part of the hypogastric region, the pubes and the inner part of both thighs were brawny and oedematous. The labia were much swollen, especially the right labium majus, which at the posterior part resembled the prepuce in phimosia, and was twisted on itself so as almost to block the vaginal entrance. Examination revealed that the vagina was much swollen and tender, and the head presenting—the position, right occipito-anterior—fairly within the brim of the pelvis. The os was fully dilated, and grasping the child's head. A catheter was introduced into the bladder and over 90 ounces of urine drawn off. The relief did not restore the uterine contractions, which had entirely ceased. Forceps were applied with difficulty on account of the swelling of the labia and vaginal walls, and delivery attempted, but without success. The patient's condition being dangerous, and judging from the absence of foetal heart sounds and from the time that labour had lasted that the child was dead, to perforate at once and deliver, after breaking up the skull, seemed to be the only indication. The perforator and BARNES'S craniotomy forceps were used, and the body removed with comparatively little bruising considering the state of the parts. Ergotine was then administered, and the placenta expressed after a delay of 20 minutes, and the uterus remained well contracted. An opiate was given, and the patient left an hour afterward, her pulse being 140, she being now quite coherent and feeling comfortable. Next morning she was better, though suffering from retention, and it was evident that there would be considerable sloughing. Injections of carbolic acid (or CONDY'S fluid) largely diluted were used twice a day for 10 days, and the use of the catheter was necessary twice daily for two weeks, when the bladder recovered its tone. An attack of bronchitis made recovery very slow, and inability to move the right limb continued for several weeks. Eventually the patient recovered completely. The chief cause of prolonged labour in this case was uterine inertia.

Unless there happens to be a lady doctor in the place, foreign medical assistance in obstetric cases is only asked for in extremity. In country districts especially the people have much faith in the power of certain *p'u-sa* to effect delivery in difficult labours, as the following case shows:—

In February of last year a messenger came requesting that I should go to a village near Wu-chang-lin Temple, on the Lushan, some 11 miles away, to see a poor woman who had been in labour four days. Snow had fallen the day previous, and we did not arrive at the temple till 11 P.M., after five hours hard walking. The village was now, instead of near at hand, said to be 5 miles off, and we did not get there till 1.30 A.M., not without falls on the part of the chair-coolies. The patient had been delivered half an hour before, and her mother-in-law was exceedingly annoyed at having sent to Kiukiang, and not in the least thankful that I had come. They had waited long, as it seemed to them, for my arrival, and at last someone suggested that the *p'u-sa* SZE-KUNG KUNG, famous in the district for its oxytocic powers, should be brought to the patient. The suggestion was acted on, and the accompanying priest on arrival said that the woman was possessed by a demon. He then wrote two charms, one of which was put in the hands of the image, the other burnt and the ashes mixed with tea and drunk by the sufferer. Immediately after the demon was expelled, and the child too—still-born. Although the demon had been driven out of the woman, he continued to hang about the house, and the priest ordered the patient to be put on a man's back and carried to a house clear of evil spirits 2 li distant. This was done at 1 o'clock on a cold winter morning, and whether the poor wretch survived I do not know.

The influence of the joss was also tried in the former case, but without result, much to the general disappointment.

I am indebted to Mr. Harbour Master GÜNTHER for the following table:—

ABSTRACT of METEOROLOGICAL OBSERVATIONS.

MONTH.	TEMPERATURE.		TEMPERATURE, MEAN.		RAINFALL.	
	Max.	Min.	Max.	Min.	Days.	Inches.
1883.	°	°	°	°		
October	81	47	75	63	9	3
November.....	67	39	55	48.5	17	5½
December.....	60	33	51.5	39.5	4	2½
1884.						
January.....	58	31	48.5	39	11	4½
February.....	64	28	47	37	6	1¾
March.....	74	36	56	46.5	15	9½

Number of days on which rain fell during the six months, 62; inches, 25½.

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

For the Half-year ended 31st March 1884.

DURING the winter half-year the health of the foreign residents here has been fairly good.

There have been four births and two deaths.

One death was in the case of an infant, previously healthy, who was discovered dead in bed one morning. In the absence of an autopsy it is only possible to surmise the cause of death, which was, as far as I could determine from an external examination, due to suffocation, the child having probably been overlaid by its Chinese amah, with whom it slept.

The other death was that of a Chinese sailor who fell from the topmast of a steamer, fracturing the base of the skull.

The chief diseases were malarial fevers, hepatic congestion, diarrhœa, subacute dysentery and venereal ailments. I attended two cases of acute rheumatism and two of tonsillitis. Of skin affections, eczema is the most common and, during the hot months, the most difficult to treat. I have met with several cases of urticaria, both acute and chronic. I also attended five cases of impetigo contagiosa, two adults and three children, all members of the same family.

Malarial fever occurs here generally in the form of a mild remittent, the average duration of which is from five to eight days. The remissions are well marked and take place early in the disease. The evening temperature, as a rule, does not exceed from 103° F. to 104° F., although in one case it rose to 107° F. Well-marked symptoms of hepatic congestion usually accompany this fever.

On 30th December I made an autopsy in the case of a Chinaman, aged 33 years, who, a few hours after admission to the Canton Missionary Hospital, died of acute cystitis, the result of stone in the bladder, from which he had suffered 14 years. The stone was composed of uric acid coated with a deposit of phosphates, and weighed $10\frac{1}{2}$ oz. It was $3\frac{1}{4}$ inches long and $2\frac{1}{2}$ inches broad.

As to the causation of the numerous cases of calculi occurring in and about Canton, it is difficult for me at present to offer a satisfactory explanation. That it is not owing to lime salts contained either in the water or in beancurd, which is here an important article of diet, I am tolerably well convinced, because the great majority of the calculi extracted are composed of uric acid and its combinations. I have frequently been consulted by foreigners residing here who suffered from gravel which in every case examined was composed of lithates. These cases occur most frequently during the very hot months, when the renal secretion is most scanty and concentrated. In no instance hitherto have I here met with a patient who exhibited symptoms of gravel during the winter months. The stone cases admitted to hospital mostly come from the farming classes, who are compelled by the nature of their occupation to undergo severe physical exertion while exposed to great heat.

The appended abstract from the meteorological tables for the past half-year has been supplied by Captain PALMER.

ABSTRACT from the CUSTOMS METEOROLOGICAL TABLES from October 1883 to March 1884.

MONTH.	WINDS.							WEATHER.			BAROMETER.				THERMOMETER.			
	No. of Days N. to E.	No. of Days E. to S.	No. of Days S. to W.	No. of Days W. to N.	No. of Days Variable.	No. of Days Calm.	Average Hourly Force.	No. of Days Fog.	No. of Days Rain.	Rainfall in Inches.	DAY.		NIGHT.		DAY.		NIGHT.	
											Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.
1883.							<i>miles</i>				<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>	°	°	°	°
October	14	12	1	2	2	...	3.2	...	3	3.72	{ 30.21 30.09	{ 29.91 30.03	{ 30.20 30.02	{ 29.90 29.71	{ 89 85.2	{ 67 76.6	{ 83 78.74	{ 67 74.48
November ...	13	3	...	2	6	4	5.74	...	5	4	{ 30.21 30.12	{ 30.00 30.06	{ 30.17 30.11	{ 30.00 30.07	{ 84 72.7	{ 57 66.2	{ 80 70.7	{ 57 65.5
December....	19	...	1	3	8	...	6.5	...	1	0.75	{ 30.44 30.24	{ 30.08 30.19	{ 30.35 30.23	{ 30.08 30.18	{ 72 66.6	{ 50 66.5	{ 70 62.25	{ 50 56.9
1884.																		
January.....	9	10	...	3	8	1	5.21	...	2	0.375	{ 30.42 30.20	{ 29.98 30.13	{ 30.38 30.18	{ 29.98 30.14	{ 76 70	{ 54 63.8	{ 72 65.6	{ 52 61.13
February....	17	5	...	1	6	...	6.24	...	13	10.73	{ 30.38 30.17	{ 29.98 30.11	{ 30.32 30.15	{ 29.87 30.08	{ 74 61.5	{ 44 56.7	{ 68 56.7	{ 40 52.7
March	7	11	4	...	9	...	5.69	...	17	10	{ 30.23 30.04	{ 29.80 29.98	{ 30.19 30.03	{ 20.89 29.27	{ 79 68.9	{ 58 64.9	{ 74 66.7	{ 54 57.8

DR. D. J. MACGOWAN'S REPORT ON THE HEALTH OF WENCHOW

For the Half-year ended 31st March 1884.

IN my last half-yearly Report I remarked that the cholera epidemic then prevailing in so many portions of the Empire had left this port unscathed, but I was obliged to append a footnote admitting its appearance in the middle of October, about the time of its subsidence at Foochow, Ningpo and other places.

During the months preceding, the rainfall was less than usual, while from September to the rise of the disease no rain had fallen. Rice-fields, usually very moist, had become dry, and the water in the canals (no longer flowing, but dammed up) was greatly reduced in quantity, and consequently more charged with excreta. At such times, on the alluvial coast region of Chékiang and Kiangsu certain telluric and atmospheric conditions tend to develop zymotic disease. In other parts of the country, however, the same disorder occurred under dissimilar conditions, unusual rainfall being followed by cholera, the same as where drinking water had been scarce and polluted.

References to the cholera outbreak of 1883 are to be found in the last issue of these Reports, which I supplement by a summary of what has appeared on the subject in the vernacular press. It extended on the coast from Canton to Newchwang, and from Shanghai to Hsüchow, on the upper part of the middle Yangtze, over 1,500 miles from its mouth; but while visiting all the towns of the central and lower divisions of the Great River, it spared those situated on its affluents.

Dr. EDWARDS of the Inland Mission at Chéngtu informs me that that city (provincial capital of Szechwan) was exempt.

Accounts of its appearance at Canton, Swatow, Foochow, Ningpo, Shanghai, Newchwang, Hangchow, Soochow, Yangchow, Nanking, Wuch'ang and Ichang were published in the native papers, but the information is not of much value. At Wuch'ang it prevailed in July and August (two months later than at Ichang), and followed a protracted wet season, when that weather was suddenly interrupted by a period of cold.

At Soochow, medicines proving inert, recourse was at last had to snails (with which the shrivelled fingers were tipped), when some recovered, which caused the disorder to be styled "snail-head disease."

It lingered at Yangchow until the end of September. It is stated that the opium smokers of that city suffered from the epidemic more than other classes.

In Soochow it continued until October, 9 cases out of 10 being fatal. At Ningpo the epidemic was denominated the "midnight-moon disease," because of the periods of its commencement and fatal termination. "Not 1 in 10 of the attacked survived."

The history of Indian cholera in China remains to be written. As a contribution I submit the following, which embraces information derived from an *Essay on Leg-contracting Spasms*, published in 1860 by Hsü Tzūmo of Kiahsing, in which it is stated that the disease

made its first appearance in 1821.* He does not say whence it came, but medical tradition at Ningpo refers its origin to the Straits, whence it was conveyed to Fukien by junk. From that province it extended to Canton, and passing thence into Kiangsi, it next advanced into Chèkiang and Kiangsu, presenting the features of an imported epidemic.

Wênchow tradition gives 1820 as the date of its appearance in southern Chèkiang, which, if correct, shows that it had come from Fukien, which is very probable. That year may therefore be accepted as the date of the advent of Indian cholera in China.

It slowly advanced up the Yangtze, a fearful outbreak which is still remembered for its violence occurring at Ch'ungch'ing in 1825. Northward it seems to have travelled less leisurely, but definite information is still wanting from that quarter of the Empire, and from Korea and Japan, where it proved extremely virulent.

Becoming endemic in all parts of the Empire, it has for over 40 years frequently assumed an epidemic character, sometimes extending over the whole of Eastern Asia, at others restricted to a single province or part of a province.

A remarkable and tragical medical delusion characterised the first epidemic. Theory and almost universal practice forbids the employment of the class of "warming medicines" in warm weather, as also the use of cooling ones in cold weather. Cooling remedies alone were resorted to when this form of cholera first appeared, and apparently for a generation later, the result being that "not 1 in 100 patients were cured." The credit of reversing the practice is ascribed to our author. Hsi' commences his essay on epidemic cholera by saying that the term "contracting-leg spasm" was formerly unknown, but dates from the summer and autumn of 1821, when it arose suddenly.

The disease is characterised by either vomiting or purging, or both together, accompanied by abdominal pain, which feature is sometimes absent. After several discharges from the stomach and bowels, the feet contract, or the hands and feet, when the pain becomes more severe, and immediately the skin and muscles shrink, the breath is shortened, the voice falters and fails, the eyes sink, there is a craving for cold drinks, the body is covered with icy cold perspiration, the six pulses (three are recognised at each wrist) cease, and death supervenes in half a day. Persons attacked in the morning die at evening, or attacked at night, die in the morning, or, still more rapidly, fall down dead in the street. Persons attending on patients or visiting them catch the disorder and succumb sooner than the patients themselves.

Doctors treated the disease as common cholera, and did not cure 1 in 100. Since the malady has been recognised as originating in the three *yin* (lungs, heart, kidneys), warming remedies have been administered to correct the *yang* (positive or male principle, as contradistinguished from the *yin*, negative or female principle), such as ginseng, ginger, aconite (*A. variegatum*), and cinnamon. Patients have been loath to use those warming medicines, or have employed them too sparingly, and they were not cured. Wealthy people in particular were averse to the change.

Those are to be compassionated who, living in secluded places, are unable to obtain medical attendance, and those in cities who, attacked at midnight, are unable to call a physician until the disease becomes incurable.

* A year earlier has been given by the Rev. W. C. MILNE (*Chinese Repository*, "Asiatic Cholera in China") for its first appearance in Chèkiang, owing to his assigning 1820 as the first year of TAO KUANG, according to rule. But that Emperor decreed that the year following his accession should be styled the first of his reign.

Generally the disease is violent in proportion to the heat of the season; as the weather cools, the disorder abates. In winter there are few that die after half a day's illness; although the treatment may be slight, patients gradually recover. In summer and autumn, on the contrary, light attacks rapidly become violent, and if not promptly treated terminate fatally. "On this account," says the author, "I have carefully prepared this essay, selecting prescriptions to avert calamity, with the request that gentlemen will bear them in mind, to be prepared for epidemics."

It is not a little marvellous that such a misapprehension should have long existed touching the proper way of treating the new epidemic, seeing that Chinese systematic works on medicine describe one form of cholera as characterised by all the symptoms that impart to epidemic cholera an extraordinary degree of terror, including contractions, which gave its name to the epidemic from India, and for which warming remedies are prescribed by those old writers. Retraction of the testicles is also named, but suppression of urine is not mentioned in those works, nor by our author, although that symptom has always been mentioned in cases reported as Indian cholera in this country.

In fine, Indian cholera in China differs from the common cholera of the country only in its epidemic character, the former being migratory, the latter stationary. In its marches from region to region it is as irregular here as in its Gangetic home, leaping over certain districts, sometimes to return, and at others not. Instead of moving as though air-borne or conveyed by persons, it rises here and there as if it had been awaiting the concurrence of certain telluric and atmospheric conditions for its development—conditions that exist in one district but are absent in a contiguous locality, and that are wholly absent sometimes for successive years. Its history indicates either that a specific germ was conveyed from abroad or that there suddenly arose successively from south to north a series of conditions which favoured the development of a virulent form of endemic cholera which became epidemic.

The account of the cholera at Soochow makes us acquainted with a Chinese superstition that is familiar to all Western peoples, namely, the belief that owls are harbingers of evil, their discordant hooting prognosticating death. The cholera epidemic in that city was characterised by screams of the "cat-head eagle" (horned owl). Men on hearing its notes rushed out with flambeaux to kill or drive it away. It seems that the owl of those parts appears and disappears at intervals, its visit proving always fatal to somebody.

Concerning the processions that take place to exorcise demons of pestilence, a writer in the *Shênpuo* makes sensible remarks: "Epidemics are ordered by Providence; neither gods nor demons have any influence in the matter. Men ignorant of this resort to superstitious practices as if they were insane." He then proceeds to describe the processions, and he might have added another reason against them besides their uselessness. Being usually conducted in hot weather, with great exposure to heat, and involving excessive fatigue, they render the participants more susceptible to morbid influences.

CATTLE DISEASE.

In 1882 northern Chékiang suffered from an epizootic that extended to horses, goats and dogs—cattle chiefly suffering. Last year cattle suffered extensively from the same cause. A rinderpest is endemic in the mountainous region of Taichow, whence this last epizootic reached Ningpo as epidemic cholera subsided. I find no account of Foot-and-Mouth disease in China.

A correspondent of the *Shên-pao* advised the killing of diseased animals to prevent contagion spreading, and the burial of carcasses, instead of their being cast into canals and rivers. The Huangp'u received so many that the authorities of Sungkiang and Kiabsing were petitioned to interdict it. Interment is objected to because decomposition in the soil is regarded as unhealthy. The same writer recommends *Robinia amara*—a pleasant, bitter root- tonic— to be mixed with the animals' food. Cattle-sheds should be fumigated by burning aromatic pastilles, whose odorous fumes are used for disinfecting the rooms of the dead and of patients suffering from contagious fevers and the like. It would appear from the inertness of their medicines, the uselessness of their writings on cattle maladies, and from the great mortality that attends their epizootic murrains, that the Chinese have no remedy for rinderpest.

PORPOISE POISON.

As a supplement to what I wrote in my last Report on this subject, I would add the following. Five persons died at Anch'ing in April last from eating porpoise. In one family a father and son were the victims; in one vomiting was induced, in the other emetics failed to act; both died. In another family a father, mother and daughter died from the same cause. They suffered much pain, with swelling of the abdomen, skin purple and benumbed, with greenish saliva from the mouth. This is the only report of cases of this kind where symptoms are given. It would seem that porpoise-poisoning is commoner on the Yangtze than on the coast, as if the ascent of the Great River rendered porpoise less fit for food, as it does the shad. It is well known that sailors eat porpoise caught at sea with impunity, and islanders, as the Japanese, rarely suffer from porpoise eating.

NOTES ON CHINESE SYPHILOGRAPHY.

The last issue of these Reports contains a translation of a "Contribution to the History of Syphilis," by Dr. SCHEUBE of Leipzig, in which the author quotes a Japanese work showing that syphilis was known in Japan anterior to A.D. 806. Having had long in hand a treatise on the history and treatment of syphilis in China, I am moved by Dr. SCHEUBE's article to publish at once so much of my essay as is of present interest.

Unless syphilis had an independent origin in Japan, its genesis must be referred to China, as it was a common disorder in Canton at a period probably anterior to the ninth century, whence it spread to all portions of the Empire.

The earliest Chinese work in which syphilis has been described is the *Dermatology* of TOU HANG'ING, imperial physician during the Northern Sung, at an uncertain period of the eleventh century. The blocks from which that early book on cutaneous diseases was printed having perished, it was recut by a descendant of the author in the reign of LUNG CH'ING (1567-72) and printed with additions that are not distinguishable from the original treatise. Although ancient, the work is much valued, and is now to be found in almost every medical library. It is in six volumes, containing 13 sections. Soyang in Honan was at that time the metropolis, and the residence of the court physician.

According to our dermatologist, syphilis invaded Central China from Canton, then known only as a fit place for penal servitude, criminals being banished to that province, and officers who were in disgrace sent to govern it, or, in other words, there was little intercourse between

the far South and the Great Plain. From Canton it spread over the Empire, the period assigned being the latter part of the eleventh century of our era. How there happens to be a record of its existence in Japan at the beginning of the ninth century, as shown by Dr. SCHEUBE, at a period so much earlier than the date of its appearance in Central China, is matter for conjecture; possibly it had an independent origin in that country, extending thence to Canton. Most probably the disease was conveyed to Japan by junk from that port, where it is likely that it prevailed for ages before it commenced its northward course. Assuming that syphilis was imported into Europe, its place of export is determined by this record. It may have been by caravan, but presumably it was by ship, Arabians being the carriers of commodities between Canton and the Arabian Gulf in the eighth century, if not anterior to the Hégira.

Not only did syphilis originate in China (perchance one of several spots on the globe entitled to that bad distinction), but the Chinese were the first to employ mercury in its treatment, a mode of cure repudiated by our author, who claims merit for neutralising its poisonous effects on those who had been subjected to a mercurial course. It will be observed, however, that he employed it (unconsciously) in another form. According to his etiology, syphilis owes its origin at Canton to a predisposing climatal diathesis; persons having sexual intercourse while suffering from malarial cachexia developing a poison communicable even by means of ordinary fugitive contact in crowded thoroughfares—a notion that has been long abandoned by practitioners.

It is fit that some of his views should be given in his own words. He begins his chapter on syphilis by saying:—

Veneral ulcers [*Mei-ch'uang*, "trec-strawberry ulcers"] were formerly unknown. An examination of their origin shows that they arose in Canton towards the close of the Wu Wei period and calamitously overspread the land, and now, in the early part of the present cycle, the human frame has deteriorated and the seasons are irregular, and sexual intercourse is rendered very liable to communicate the syphilis poison. Once effected, the morbid action is of more than ordinary violence, penetrating the marrow of the bones and permeating the muscles, flowing into the blood-vessels, and entering the male and female genitals, or abiding in the system or coming to the surface, or attacking the intestines or the orifices (eyes, nostrils, mouth, ears, fundament, urethra). There are some lesions that from beginning to end remain in one place, and there are some that move to other regions; some that leap from one viscus over one adjacent to a more distant one, and some that remain fixed in one organ. The various appearances are numerous, each requiring its special treatment.

Next follows an account of the *tu* or poison in each of the five viscera—liver, kidneys, stomach, lungs and heart.

Liver.—When the poison enters the liver it first affects the urethra,* when the tendons become painful, and next ulcers appear on the ear or neck or axilla, resembling amomum capsules. In severe forms the tendons cannot be moved. Extending from the liver to the stomach, the limbs become tumefied and painful, the legs and skin as if worm-eaten; advancing

* [History repeats itself in medical theories just as in political and social theories and combinations of circumstances. HARBER (*Lehrbuch der Geschichte der Medicin und der epidemischen Krankheiten*. Jena, 1882, Bd. iii, S. 259) thus sums up the views of the earliest European writers on syphilis:—"Man dachte sich das syphilitische Gift . . . als eine dem kranken Körper in seiner Totalität bewohnende verborgene Eigenschaft (*totius substantiæ qualitas occulta*), welche im Körper des Angesteckten vor Allen auf die Leber, den Herd der Blutbereitung, wirkt, indem sie daselbst eine Veränderung des Blutes, eine Art der *putredo* erzeugt. Durch die von der Leber entspringenden Adern verbreitet sich die Verderbniss zu allen Körpertheilen, am frühesten zu den Genitalien, welche sich vor allen übrigen Organen durch die Weite ihrer *Poren* auszeichnen."]

to the heart, ulcers appear on the skin like dark specks, causing both pain and itching. When instead of moving from the liver to other viscera it becomes lodged in that viscus, the large tendons become painful, and after a long time ulcers appear on the neck and knees.

Kidneys.—When syphilis penetrates the kidneys, it begins by producing sores on the genitals, followed by pains in the bones. Ulcers appear within the ears, on the scrotum, on the vertex, on the back between the shoulders, presenting the appearance of rotten persimmon, and are called *genital corroding ulcers*. When virulent the poison destroys the male and female organs of generation.

Stomach.—When the poison enters the stomach, ulcers appear on the margin of the hairy scalp, round the mouth, and on the arms. When virulent it extends to the kidneys; the bones become painful and their marrow heated, and tumefactions appear over the coccyx, in the popliteal space and soles of the feet. Advancing to the lungs, the skin becomes scabby, resembling purplish-red flowers; the scales falling, leave white spots. Remaining lodged in the stomach, lesions of that organ and of the intestines are caused, and reddish lines appear on the skin.

Lungs.—When the poison enters the lungs, ulcers appear in the armpits, on the chest, and on the cheeks, like blooming flowers, and are vulgarly called “cotton-flower ulcers.” When severe, the poison, concentrating in the throat, extending from the lungs to the liver, causes pain in the tendons on certain days of the calendar, or in cloudy weather from 4 to 7 P.M.

Advancing from the liver to the kidneys, eruption of the scrotum is caused, both painful and itching. The poison lurking in the lungs produces reddish-white spots on the skin, and when chronic occasions lesions of chest, arms, and legs.

Heart.—In the heart the poison displays its action in ulcers on the shoulders and chest, the heads being dark purple, exactly like “tree-strawberry ulcers.” In severe forms the virus attacks the iris, extending to the lungs, breaking out in the throat, and gradually the septum of the nose becomes as if worm-gnawed and destroyed, attended with great salivation. Moving on to the stomach, it produces “goose-feet scales,” benumbing hands and feet. Remaining stationary in the heart, the poison causes the fall of finger-nails. Our author remarks on the mode of communication and the prognosis as follows:—

This disease is not due solely to sexual intercourse, but arises in vitiated constitutions, or it may be caught, either by young or old, in crowded thoroughfares or in latrines, or when chatting with the infected,—the poison in those cases appearing either immediately or long after exposure. The whole body suffers pain. Sometimes it is painless, and incautiously communicated in the marital couch; in some cases women not themselves suffering transfer the poison to children.

It is a disease of the vessels, and the poison is either superficial or deep, and the medicines act, some slowly, others promptly. Examining the pulse, the symptoms and appearance of the malady indicate whether it is to be vigorously attacked, or the patient fortified (heroic or expectant, according to circumstances), avoiding an error of a hair's breadth. Half a month suffices for the cure of a case in which the poison has not extended beyond the viscus first attacked. In cases where three viscera are affected, a month's treatment is required for cure; when all are affected, 50 days are required for restoration to health; but only by that mode of treatment which is admitted by the intelligent throughout the land. The disease is as easily cured (by my treatment) as it is easily acquired, and no purplish-red discoloration is left behind; no pain or inconvenience follows, nor danger of communicating it, nor of impairing progeny, nor of injuring the digestion, nor of harming the constitution. The remedies will continue to be used unchanged

through the remote future, they being like the royal way—beneficial, genii-like. There are those who bunglingly rely on sudorifics, laxatives, topical applications, fumigations, lotions, as remedies that quickly afford relief, ignorant of the lurking of the poison in the system, which, later, causes lesions of the intestines and all the above-named affections of the five viscera, which shows their treatment to be inefficacious.

I, on the contrary, am able to name the time of recovery, and am able also to expel the mercurial poison (administered according to the prevailing mode), so that to the end of his days the patient shall not suffer.

The controversy that our author commenced regarding the use of mercury in the treatment of syphilis still continues, but those who, like him, denounce its employment in one form—protochloride,—ignorantly use the bisulphide. In the great work that was compiled by and issued under imperial auspices in 1717, *Golden Mirror of Eminent Medical Authors, compiled by Imperial Authority*, the chapter on syphilis states that while mercury appears to effect a speedy cure, it merely drives the poison into the bones, whence, after a protracted lodgment, it reappears in the forms that we designate secondary and tertiary.

Further information is then conveyed in answer to questions that are supposed to be propounded by a pupil to the author—a most ancient mode of communicating instruction by Chinese writers.

The answer to the first question is interesting:—

If it be asked “How did the venereal malady arise?” I answer that, Canton being marshy and hot, without frost and snow, insects and serpents there do not burrow or become torpid, and garbage accumulating on the ground, in the eleventh month (commencement of winter) its moisture and the mountain malaria, mutually fermenting, induced in the physically vitiated what were called genital corroding ulcers, which, like creeping plants or permeating dyes, infected brothels; originating in telluric influences, it became epidemic.

If it be asked “Seeing that syphilis arose from telluric causes, how comes it to be called the Canton ulcer?” I answer, the “Canton ulcer” belongs to the small-pox class of disorders, which also was formerly unknown. Small-pox arose in the North; its infection came thence to the South during the Han period (B.C. 206 to A.D. 220), and was called “Hun pox.”

Next follows a record of cases illustrating the author’s method of treating primary, secondary and tertiary forms of syphilis, although not recognising such distinctions. I translate the first and second cases.

A student, 18 years of age, living in the country, suffered from loss of hair and eyebrows; his whole frame was bent and contorted: he had been treated for rheumatism. On examination of patient’s pulse I found it sunken, impeded and slow, which indicated that the metal element (lungs) oppressed the wood element (liver), owing to syphilitic poison. I administered the discutient infusion composed of [here follows a prescription containing 10 vegetable ingredients].

Next I gave the compound bezoar and toad-venom pill [composed of bezoar, toad-venom,* musk, olibanum, red sulphide of mercury and bisulphide of arsenic]. This induced a profuse perspiration.

Next I gave the antidotal pill No. 2 [composed of bezoar, amber, silkworms, nitrate of potash, sulphate of iron, salt, alum, burnt hair, etc., with mercury and arsenic as before]. With that antidotal pill I gave at the same time the “gentian-decoction laxative” [composed of gentian, rhubarb and other

* No account has yet been given to foreigners of this acrid article. It is obtained from the toad by tying oil-paper over its head and then striking the animal, when it ejects the secretion in considerable quantity. The material is carefully removed from the paper, dried, and formed into thin circular cakes an inch or two in diameter, which, from being milky white at first, turn nearly black. When of good quality it is worth its weight in silver. Inferior kinds are imported from Siam and Japan: the Chinese comes from Szechwan, and is chiefly employed in sternutatory powders.

vegetable simples]. After 10 days' use of those medicines a milary eruption appeared, which soon desquamated. In something over 20 days the poison had been neutralised; the hair of the eyebrows and of the head grew again.

The second of the 29 cases given by the imperial dermatologist was that of—

A poet's wife, to whom her husband communicated the Canton ulcer. After taking many medicines they were both cured, as they imagined; but all their children dying in early infancy, I was consulted. I told them that their children had all died from inherited syphilis.

In such cases children are born without integument, or with various ulcers or tumefactions or scaly eruptions—all congenital. I could find nothing abnormal in the pulse of the father; his system was in equilibrium. But the disorder lurked in the mother's system in a severe form, to the injury of the uterus. I prescribed the "comforting decoction" [consisting of 10 vegetable ingredients].

Twenty of these decoctions were given, and at the same time pill No. 9 [composed of tiger-bone, terrapin plastron, red sulphide of mercury, bisulphide of arsenic, etc.].

After administering the above I gave the compound flavouring pill [vegetable].

Under this treatment the patient in less than a year bore a son, and two years later a daughter; the children took small-pox inoculation mildly, and were free of disease.

INTRODUCTION OF SMALL-POX AND INOCULATION INTO CHINA.

Incidental allusion is made by the imperial dermatologist to the first appearance of variola in China, which he assigns to the period of the Han dynasty (B.C. 206 to A.D. 220), and names the hereditary enemies of China, the Huns, as communicating that disease, which was accordingly denominated "Hun pox." More precise is the statement of the *Eastern [Korean] Precious Mirror of Medical Practice*, which states that the disease first appeared at the close of the Chou and commencement of the Han dynasties (B.C. 256-205). Indubitably, then, it made its first appearance (since history began) in the middle of the third century before the Christian era, whither it came from Mongolia; but two and a quarter centuries later it entered China from the South, when it was regarded as a new disease. In A.D. 48 the renowned warrior MA YÜAN conducted a campaign against the Wuling aborigines (south-west of Tungting Lake, Hunan), and brought back with him the "captives'-pox," implying that his prisoners conveyed the infection, and according to several high authorities, such as the *Sombre Pearls of Chihshui* (genii remedies from a place of genii) and the *Correct Treatment of Small-pox*, the "captives'-pox" was the origin of small-pox in the Middle Kingdom. It would seem that the epidemic from the steppes had so long disappeared as to have been forgotten at the time when it was conveyed into the country by barbarians from sub-tropical regions.

The earliest medical writer on small-pox was CH'ÏEN CHUNGYANG, of the Northern Sung—10th century.*

INOCULATION.

Dr. COLLINSON (*Small-pox and Vaccination medically considered*) is quoted as saying "The Chinese practised inoculation from the sixth century." I have been unable to discover an earlier account of its origin than that given in the above-named *Correct Treatment of*

* When the Chinese had occasion to devise a character for expressing the new disease, they united two radicals (疒, ping, "sickness," and 豆, tou, "lentil-bean," and made 痘, tou, using "bean" as the phonetic, both being ideographic: "a disease with bean-shaped pustules."

Small-pox, which states that the art was first taught by a nun in the reign of JÉN TSUNG (A.D. 1023-63). That reign was signalised by a famous premier, WANG TAN, a great statesman and scholar. Small-pox had deprived him of all his children, and when in old age a son was born to him he was most solicitous to secure for that child a safe attack of the fell disorder, and summoning a council of physicians whose speciality was infantile diseases, he inquired if they understood the treatment of small-pox. The faculty disclaimed profound knowledge of the malady, but knew something of it. They were dismissed, each with a fee of 77s 10, the minister remarking that what they understood they could accomplish, adding that when the child was attacked they should be sent for to prescribe, and in the event of their success they should be liberally compensated.

An officer at the capital, a native of Szechwan, hearing of the circumstance, obtained an introduction to the minister and gave him the following information. A young woman of Kiangsu vowed to quit the world, and, rejecting marriage, devoted herself to the worship of Buddha, but refused submission to the tonsure, preferring to retain her hair. She wandered to Omei Mountain (sacred to Sakyamuni, contiguous to Thibet), and on its summit lived in a reed hut. The women of all that region became her disciples, fasting, reciting prayers and doing good. Recently she told her followers that she had been inspired to impart instruction in implanting small-pox, which consisted in selecting scabs from cases that had had but few pustules, and these pointed, round, red, and glossy, full of greenish-yellow pus that became thick. The scabs to be used when a month old, or in hot weather those that had fallen only 15 or 20 days might be used, while winter ones should be 40 or 50 days old before using, which may be in spring or autumn. Take 8 grains of the desiccated scabs and 2 grains of *Uvularia grandiflora*; pound the two together in a clean earthen mortar. Select lucky and eschew unlucky days for implanting. Employ for the operation a silver tube curved at the point; blow the prepared matter into the right nostril in the case of a boy, and into the left in girls; six days after there is slight fever, which on the following day increases greatly; in two or three days more an eruption appears, charged with matter, and then scabs. Not one in 10, not one in 100, that does not recover. All the inhabitants of the region adjacent to Omei Mountain adopted the practice, praying her to perform the operation. On hearing this the minister sent for the venerable recluse, who came to the capital and operated successfully. She refused to accept reward, saying "I am a pilgrim, and have no need of silver or silk. If your excellency will on the one hand serve the Emperor loyally, and on the other be an exemplary model to the mandarinates, giving stability to the State and soothing outside regions, thereby preserving the people in peace, that will be a greater recompense for me than gifts of silver or silk." She returned to the sacred mountain, and some years later informed her followers that she was not uterine born, but was an incarnation of the Goddess of Mercy, and had come to preserve the lives of children by implanting small-pox, "which," said she, "I have taught you, that you should impart the art to others." On hearing this announcement the women all worshipped her, lauding her righteousness, asking by what title they should invoke her. She answered, "As Your Ladyship the Celestial Mother," adding, "whenever anyone shall offer incense and prayers to me, invoking my intervention, I will from heaven manifest myself by turning malignant into benignant cases;" whereon she was

transformed, that is, she died. Every official temple has a shrine to this "Goddess of Small-pox," and many cities have temples for her exclusive worship. Evidently, inoculation had been taught at Omei Mountain by some Thibetan monk, who had acquired his art in India, where it appears to have been known in high antiquity.

METEOROLOGICAL.

Again I am indebted to Comte d'ARNOUX for a half-year's meteorological record.

ABSTRACT of METEOROLOGICAL OBSERVATIONS taken at WENCHOW during the Half-year ended 31st March 1884.

DATE.	Barometer.	THERMOMETER.		Hu- midity, 0-100.	Ne- bulosity, 0-10.	RAINFALL.		REMARKS.
		Diurnal Mean Temperature in Shade.	Extreme Temperature in Shade.			No. of Days.	Total during Month.	
1883.	<i>Inches.</i>	<i>° F.</i>	<i>° F.</i>				<i>Inches.</i>	
October ...	Max 30.46 Mean 30.19 Min 30.00 Range 0.46	77.4 72.8 68.3 9.1	83 ... 58 25	91 65.6 32 59	4.8	1	0.01	
November ...	Max 30.39 Mean 30.25 Min 30.02 Range 0.37	62.1 60.9 59.7 2.4	76 ... 47 29	100 79 44 56	8.6	19	7.10	Heavy rain on 6th, 8th, and 21st.
December ...	Max 30.64 Mean 30.36 Min 30.20 Range 0.44	54.0 49.6 45.2 8.8	63 ... 39 24	93 71.7 37 56	4	5	0.87	
1884.								
January ...	Max 30.55 Mean 30.32 Min 30.05 Range 0.50	53.6 50.3 47.0 6.6	64 ... 36 28	100 79.7 40 60	7.7	11	1.35	
February ...	Max 30.54 Mean 30.30 Min 30.00 Range 0.54	49.2 46.1 43.0 6.2	65 ... 34 31	100 79.5 56 44	6.6	13	5.54	On the 4th, snow on the hills.
March ...	Max 30.44 Mean 30.12 Min 29.80 Range 0.64	58.2 54.6 51.1 7.1	74 ... 41 33	100 82.2 50 50	7.1	16	7.61	Heavy rain on 6th and 16th. 6th: moon halo. 28th: very high tide, 19 feet, being 2 feet higher than ordinary high springs.

DR. B. S. RINGER'S REPORT ON THE HEALTH OF AMOY

For the Half-year ended 31st March 1884.

DURING the past six months one death has to be recorded at this port.

The patient was a South Sea Islander, a sailor by occupation, who was brought into the Kulangau Hospital in a state of extreme exhaustion, suffering from chronic dysentery and prolapse of the rectum, from which he died in a few days.

Two births took place, the labour in each case being natural.

Quite an epidemic of measles broke out among the children of the foreign residents of Amoy, which is a somewhat unusual occurrence, notwithstanding the fact that the disease is common among the Chinese. I am led to understand, however, that the latter do not regard it in at all a serious light, and children are often allowed to run about while suffering from it. This statement is borne out by the fact that we very rarely meet with measles at the Chinese Hospital; indeed, only those cases are brought in which there exists some severe complication.

In one of the cases attended, a little girl about 3 years old, some curious cerebral symptoms occurred. A few days from the commencement of the attack, the child, who was usually extremely good-tempered and affectionate, was from time to time seized with violent fits of passion, crying and screaming lustily, and struggling desperately to free herself from the arms of her mother or amah. If lying down on the bed at the time, she would leap upon the floor and endeavour to escape from the room, or if allowed to walk about without restraint, she would try to pull the cloth from the table, overturn the medicine bottles or any other small object within her reach, dash her playthings to the ground when offered to her, and utterly refuse to be pacified. There was almost complete loss of appetite, and some cough, which was treated with a simple cough mixture; a dose of calomel was exhibited with some benefit, the bowels at the time being somewhat confined; but as the attacks of irritability continued and recurred frequently, sometimes lasting more than an hour, entirely destroying the child's rest at night and that of all the other inmates of the house, I determined to cautiously try the effect of a sedative. On the third night, therefore, 5 minims of tincture of opium was administered, but not producing much relief, the same dose was repeated, with the result of causing a sound and peaceful sleep of about five hours' duration, from which the little patient awoke much refreshed. Although during the next few days one or two crying fits came on, the violent attacks never returned. I have no doubt that the sedative, in consequence of having been exhibited in a somewhat full dose, not only produced sound sleep but had the beneficial effect of quieting the nervous system for a considerable time subsequently, thereby preventing a return of the attacks.

A case of remittent fever in a very persistent form, originally contracted in Hongkong, presented itself in the early part of 1884, and proved most obstinate. Quinine and salicylate of soda had been tried without effect, and change of air being advised, Amoy was chosen as the health resort.

On the patient's arrival his temperature was 102°.2 F. in the morning, rising a degree higher at night; he complained of great thirst, burning skin and troublesome constipation, together with complete disinclination for food; the pulse was 104 to 108, somewhat feeble, and the tongue dry and furred.

Arsenic, in 4 minim doses of the solution, was now exhibited three times daily; the bowels were acted upon by an aloetic pill, and diaphoretics were administered. This treatment was carefully persevered in for a fortnight, and at one time the fever gave some signs of mitigation, the temperature ranging between 99°.2 and 100°.6 for a few days. The skin, however, remained very dry, refusing to reply to the diaphoretics, and causing great discomfort to the patient, who was reduced to a condition of great exhaustion. At this period a relapse occurred, the temperature again reaching over 103°. I therefore determined to try the effect of WARBURG'S tincture, in doses of ʒj to ʒij, three times daily, knowing that it is much esteemed in India both as a powerful febrifuge and diaphoretic. The result was very satisfactory; the skin acted gently and continuously, and the temperature fell 3° in the course of a few days, and on the tenth day after using it a normal temperature was recorded for the first time for 32 days. The patient steadily improved, constipation diminished, the tongue cleaned, and more nourishment could be taken without trouble.

A mixture of citrate of iron and quinine was now substituted for the tincture, but in a few days signs of another relapse presented themselves, and recourse was again had to the specific. Although the temperature rose as high as before, the skin was more readily influenced, and the general discomfort was by no means so great. In a few days this exacerbation passed off, and in a fortnight more, under the continued use of the tincture in small doses, convalescence, though gradual and protracted, was complete.

The composition of WARBURG'S tincture is somewhat peculiar. It was formerly a patent medicine, the ingredients at that time being kept secret, and to those who do not call to mind its mode of preparation as published in the medical journals some years ago, it may be interesting to read the following extracts, taken from an original communication by Professor MACLEAN, C.B., to the *Medical Times and Gazette* of 13th November 1875:—

DR. WARBURG'S TINCTURE.

R Aloes (socotr.) libram;	Cretæ preparatæ; † ana uncias duas.
Rad. rhei (East Indian);	Rad. gentian;
Sem. angelicæ;	„ zedoariæ;
Confect. Damocratis; * ana uncias quatuor.	Pip. cubeb.;
Rad. Helenis (s. enulæ);	Myrrh. elect.;
Croci sativi;	Camphor;
Sem. fenicul.;	Bolet. laticis; ‡ ana unciam.

The above ingredients are to be digested with 500 ounces of proof spirit in a water bath for 12 hours, then expressed, and 10 ounces of disulphate of quinine added; the mixture to be replaced in the water bath till all quinine is dissolved. The liquor, when cool, is to be filtered, and is then fit for use.

It will be seen that quinine is the most important ingredient in the formula, each ounce bottle containing 9½ grains of the alkaloid. Its presence has been detected by every chemist who has attempted its analysis, and never doubted by any medical man of experience who has used the tincture.

Many will say, "After all, this vaunted remedy is only quinine concealed in a farrago of inert substances for purposes of mystification." To this objection my answer is,—I have treated remittent

* This confection, which consists of an immense variety of aromatic substances, was once official, and is to be found in the *London Pharmacopœia*, 1746.

† Dr. WARBURG informs me that this ingredient was added to correct the otherwise extremely acrid taste of the tincture. Many other substances were tried, but none answered so well as prepared chalk.

‡ This is the *Polyporus laticis* (*P. officinalis*, *Boletus purgans* or Larch agaric), "formerly," says PRINCEPS, "used as a drastic purgative, and still kept by the herbalist."

fevers of every degree of severity, contracted in the jungles of the Deccan and Mysore, at the base of mountain ranges in India, on the Coromandel coast, in the pestilential highlands of the northern division of the Madras Presidency, in the malarial rivers of China, and in men brought to this [Netley] Hospital from the swamps of the Gold Coast, and I affirm that I have never seen quinine when given alone act in the manner characteristic of this tincture; and although I yield to no one in my high opinion of the inestimable value of quinine, I have never seen a single dose of it given alone, to the extent of $9\frac{1}{2}$ grains, suffice to arrest an exacerbation of remittent fever, much less prevent its recurrence; while nothing is more common than to see the same quantity of the alkaloid in WARBURG'S tincture bring about both results.

The tincture is administered in the following manner:—

One half ounce (half of a bottle) is given alone, without dilution, after the bowels have been evacuated by any convenient purgative, all drink being withheld. In three hours the other half of the bottle is administered in the same way. Soon afterwards, particularly in hot climates, profuse, but seldom exhausting, perspiration is produced. This has a strong aromatic odour, which I have often detected about the patient and his room on the following day. With this there is a rapid decline of temperature, immediate abatement of frontal headache—in a word, complete deferescence,—and it seldom happens that a second bottle is required; if so, the dose must be repeated as above. In very adynamic cases, if the sweating threatens to prove exhausting, nourishment in the shape of beef tea, with the addition of LEMME'S extract and some wine or brandy of good quality, may be required.

DR. W. MORRISON'S REPORT ON THE HEALTH
OF NEWCHWANG

For the Eighteen Months ended 31st March 1884.

DURING the period under review the general health of the foreigners residing here has *continued satisfactory*.

The table appended to this Report exhibits the climatic conditions which obtained during the period.

During the winter months of 1882-83 the cold exceeded that experienced in the preceding and subsequent winters, but the days were few on which out-door exercise could not be enjoyed. The sudden changes of temperature which often take place about the commencement of winter and again in early spring are more trying. Colds and sore throat are then not uncommon. Children are specially susceptible. The form of sore throat which frequently attacks them, when exposed to sudden falls in temperature without sufficient protection, approaches in character to and sometimes occurs as tonsillitis. As a rule this sore throat is not difficult to control, but treatment requires to be both prompt and energetic, as on more than one occasion the disease has rapidly led to a fatal issue.

During the summer months the heat has not been excessive. There was a period of great dryness extending from early in July till the middle of August 1883. During this drought an outbreak of cholera occurred in the native portion of the town. The crops in the adjacent country threatened to fail owing to the want of rain, and numbers of the rural population had recourse to the temples. Their fears were happily dissipated by a copious fall of rain about the middle of August. It is significant that very soon after the abundant rainfall cholera disappeared. With the exception of cholera, which was confined to our Chinese fellow-townsmen, no epidemic occurred.

There have been six births during the 18 months, one premature at six months and one breech presentation, the others normal.

Five deaths fall to be recorded, but of these only two, strictly speaking, were those of residents, viz., one infant (male), *æ*t. 6 months, from convulsions, and one adult (male), *æ*t. 47, from diarrhoea.

The death from diarrhoea took place during the choleraic outbreak. The illness lasted for 10 days. The patient was a poor waif whom drinking habits had reduced from respectability to beggary.

Of the non-residents, one death was that of a suicide, from the shipping, the other two deaths were due to phthisis. Of these latter, one was complicated by specific marasmus and presented no feature of particular importance. The other case was one of some interest in its bearings on the relations of our climate to the treatment of pulmonary disease.

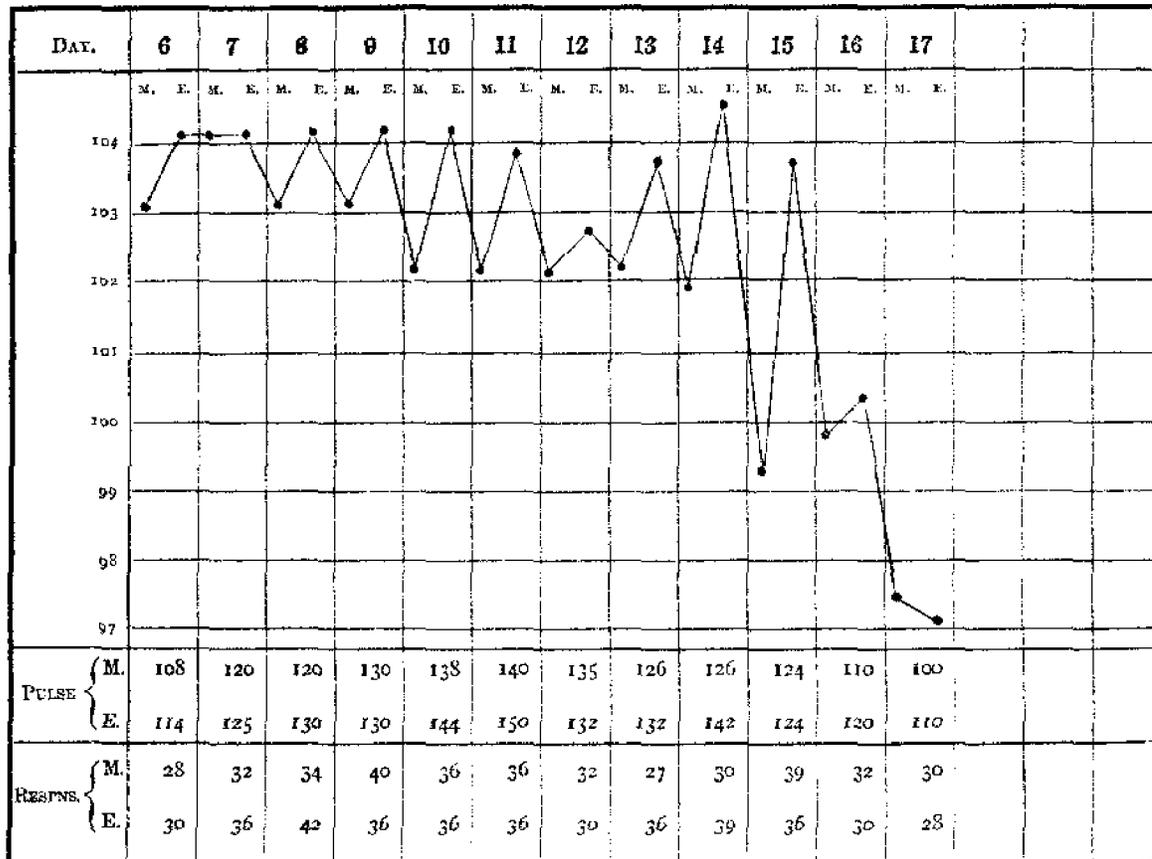
Phthisis.—A. B., male, æt. 37; had been a sufferer from chest complaint for many years. During the earlier portion of these years his complaint was of bronchitic asthma, but latterly it had assumed the form of fibroid phthisis. He came from a southern port in August 1882, and resided here till his death on 11th March 1883. At the date of his arrival physical examination indicated cavity in right lung, together with considerable areas of consolidation in both lungs. In addition to the ordinary symptoms of phthisis, there were present constant albuminuria, and dropsy. The patient was subject to occasional slight attacks of nephritis, and one of these was the immediate cause of death. In fact, in addition to these complications, he presented on arrival all the appearances which in Europe would have been regarded as sufficiently advanced to have contraindicated resort to Davos, the climate of which furnishes some analogies to that of this district, which will naturally suggest themselves.

During the winter the patient's bedroom was maintained at, as nearly as possible, a uniform temperature of 60° F. by means of piping connected with a stove in the adjoining room. Vapour of water was furnished from a vessel which was fitted on to the hottest portion of the piping. The patient was precise in his habits, and the nursing was unexceptionable. From the date of his arrival there could be little doubt about the final issue. He went on gradually losing strength as the disease progressed. But during his seven months' residence, which included the most trying months of the year, there was no evidence to show that climate accelerated the course of the disease. The winter was one of considerable severity, but the patient lived through it till 11th March, and would doubtless have lived a short time longer but for one of the complications which attended the primary disease. No doubt the particular lesion as well as the manner in which a constitution is affected by climate require some separate consideration for each individual case, but the general inference from the study of this case would seem to be that cases of phthisis, even though advanced, may with ordinary care be safely brought through the rigors of our northern winter.

A severe case of well-marked typhus fever occurred in May.

Typhus Fever.—The patient, a lady æt. 35, had scarce recovered from the exhaustion incident to a recent confinement. The constitution was neurotic, and there was cardiac weakness. The characteristic rash appeared on the sixth day; it was abundant and dark coloured. Delirium of the low muttering type set in on the eighth day. There was subsultus and carphology. The chart appended will show the range of temperature and pulse. Crisis occurred on the evening of the fourteenth day, and was ushered in by profuse diarrhœa with fall of temperature. When the temperature reached 103° F., cold baths were commenced. The method adopted was the graduated bath, where the patient is immersed in a plunge water bath at a temperature of 90° F., which is gradually cooled to 70° F. The bath is used twice a day or oftener, as may be deemed necessary. During the earlier days of the pyrexia this method was followed, but during the later days the state of the heart was such that a less trying method was deemed safer. Instead of the bath a succession of bath towels wrung out of iced water was applied to the surface of the body. These were rapidly replaced, the applications lasting for from 15 to 20 minutes. No bad results followed either of these methods of treatment. On the contrary, the remissions of temperature obtained and the soothing effects exerted upon the nerve disturbances were most satisfactory. The results were quite in accordance with the claims of cold-bath treatment to be regarded as one of the most valuable therapeutical agents we possess for the treatment of continued fevers. The patient made a good recovery.

TEMPERATURE CHART: Observations taken at 7 A.M. and 9 P.M.



Regarding sequelæ, a troublesome one has resulted in this case, in the form of a cardio-respiratory neurosis. The attacks are sudden, but they are generally preceded by some gastric disturbance. They are characterised by violent palpitation, rapid pulse, dyspnoea, sighing, and distressing sensations about the præcordia. On one occasion there was loss of sensation, beginning in hands and passing up the arms, together with failure of vision, and on this and some other occasions delirium. The attacks last generally from one to two hours. Change, open-air exercise, with attention to diet and general hygiene, have been of most service in procuring immunity from these attacks.

This case forcibly recalls the disadvantages we labour under in comparison with our home colleagues in procuring invigorating change of air and scene for convalescents, as well as the no less important "setting up for the winter" which the annual autumnal holiday is justly supposed to accomplish. Only a little effort and arrangement are required to get away from the flat country surrounding the port. There is a range of hills at a distance of 10 to 12 miles, and sea bathing, with good scenery, can be had within 30 miles from the settlement. These have already been partially resorted to. Were the advantages to be procured from a short residence at either of these stations fully realised, the enterprise necessary to put a visit

to either of them within the reach of any member of the foreign community would certainly be forthcoming.

Beri-beri (?).—There occurred on board a ship what appeared to be an outbreak of beri-beri. The crew were Japanese. One of them died from this disease shortly before the ship entered port. When visited, two slight cases and one severe one were presented for treatment. In the last-mentioned case there was anesthesia of lower limbs and of the trunk, nearly to the level of the umbilicus. The skin of the affected parts was brawny, and there was considerable œdema, and deep-seated pain in the hypogastrium and in the tibial region of right lower limb. There was also considerable impairment of motor functions in lower limbs, so that the patient could not stand without aid, and walked with difficulty even when well supported, the gait being weak and staggering. The constitutional symptoms were such as accompany a febricula of ordinary severity. He improved under antipyretic internal treatment, together with the local application of stimulating liniments, aided no doubt by the rest and attention which could be procured only during stay in port.

The following are extracts from notes (taken at the time) of two gunshot injuries, which may be of some interest:—

Gunshot Injury to Left Hand; Amputation of Index and Medius, with portions of their Metacarpals.—C. W., æt. 41; mate on board a ship; was out shooting with a double-barrelled gun, one barrel loaded. He placed the gun between his knees, with his left hand resting on the muzzles. He then with the right hand endeavoured to pull the ramrod out of its socket with a jerk, which exploded the loaded barrel. The shot first passed through his left hand, then grazed the left side of his face, blackening and scratching the cheek. Hemorrhage from the hand had been arrested by handkerchiefs and cold water. On examination I found that the shot had entered the palmar aspect of left hand, at a point about the middle of and between the metacarpals of index and medius, shattering the metacarpal of former and injuring the metacarpal of latter, and leaving a blackened and rough-edged wound on dorsum of hand. Chloroform having been administered, the index and medius, with portions of their metacarpals, were removed. On his leaving port there was every prospect that the patient would make a good recovery, retaining a useful hand, though with prehension much impaired.

Pistol-shot Wound of Abdomen; Traumatic Peritonitis; Death.—O. H., æt. 30, mate on board schooner, a strong, muscular man, suffering from mental depression and irritation, was, at 1.30 P.M. on 17th April 1883, reported to have shot himself. I found the patient lying in bed, evidently suffering pain, but in a condition of partial stupor. A small blackened wound, firmly closed, occupied a spot $\frac{1}{2}$ inch below level of umbilicus and 3 inches to the left of the middle line. The bullet lay under the muscles at a point $5\frac{3}{4}$ inches from the spine and immediately above the crest of the ilium, and was readily extracted. There were no perforations in the clothes of the wounded man. I administered an opiate, ordered ice to be placed over abdomen and perfect rest to be observed. The patient was restless, and complained of cold and of hypogastric pain during the evening. Stupor had passed off. Vomiting.

18th April, 2 A.M.—Retention of urine; passed catheter with some difficulty; much congestion about penis and scrotum.

8 A.M.—Temperature, 100° F.; pulse imperceptible; heart's contractions, 132 per min. At 11 A.M. patient was at his own request carried ashore. His mind was now perfectly clear. At 1.15 P.M. the catheter was passed with increased difficulty, and at 2 P.M. fœces mixed with blood and blood clots escaped involuntarily. This continued until 5 P.M., when death occurred.

The patient was perfectly conscious from 7 P.M. on 17th April till shortly before his death. He admitted having shot himself, the reason assigned being mental worry. Circumstances prevented a postmortem, but the course of the bullet was apparent. It had entered the peritoneal cavity, wounding in all probability the descending colon, causing internal hæmorrhage, and death from peritonitis.

Scirrhus of Breast; Excision; Recovery.—The patient, a Cantonese woman, aged 43, married, no children, was in good general health, presenting no sign of cachexia. No family history of cancer. No history of local injury. A gradually increasing tumour had existed in the right breast for two years, attended from the first by intermittent pain of a dragging and compressive character sufficient to prevent sleep.

The affected breast was prominent, but not much enlarged laterally. A hard mass, with irregular nodulated surface, presenting no fluctuation, totally occupied the normal position of the gland, sending a short but deeply-seated prolongation inwards and upwards towards the sternum. The skin was not involved, but the nipple was retracted and bound down to the mass of the tumour by a dense process. Lateral pressure on the nipple was painful. The axillary glands did not appear to be infiltrated. The superficial veins were distinct, but not remarkably prominent.

The operation was performed with strict Listerian precautions at the patient's house. The form of the tumour rendered an incision at right angles to the direction usually adopted, more convenient. Some difficulty was experienced in removing the inward prolongation from its deep attachments, and a portion of the pectoralis major had to be excised with it. Hæmorrhage was slight, and there was no vomiting and but slight pain when the effect of the anæsthetic had passed off. The wound was daily dressed antiseptically for five days. There had been some oozing on the first day, which ceased before the next dressing. The highest temperature registered was 99°.8, on the evening of the second day, and pulse and temperature were normal on the sixth day. The patient ate and slept well, and bowels moved spontaneously. On the tenth day the antiseptic dressings were replaced by boracic lint, the wound having healed by first intention.

On section the tumour was gritty. The greater portion of the gland had been replaced by tissue densely fibrous, containing lacunar spaces filled with yellow, fatty matter.

Cholera—if it can be so styled—broke out in the native quarter of the town in July. It continued till about the middle of August. The number of deaths has been variously estimated at from 300 to 500; probably 400 is about the correct figure. The leading symptoms were pallor, with severe vomiting and purging, followed by a period of collapse, when no pulse could be felt at the wrist. In the fatal cases death took place at periods varying on an average from 6 to 24 hours from the onset. In the earlier stages it was amenable to treatment, and a large number of those attacked recovered. The Chinese did not regard the epidemic as having been imported from a distance and communicated by contagion, but as having originated in the town; and the facts would seem to justify the correctness of this conclusion.

Among the causes assigned were want of rain, deficient drainage, decomposing substances accumulating in streets and drains, the filthy state of the houses, bad drinking water, and the large quantities of water-melons, cucumbers, and other cucurbitaceous fruits used as food. The disappearance of cholera soon after the deluge of rain which fell about the middle of August would seem to indicate that the rainfall had been instrumental in removing at least some of the sources of its production. The people were so far convinced of the connexion between food and the disease that melons fell greatly in price, and in some cases failed to find purchasers. The onset of the disease was so sudden in some of the cases that the sufferers

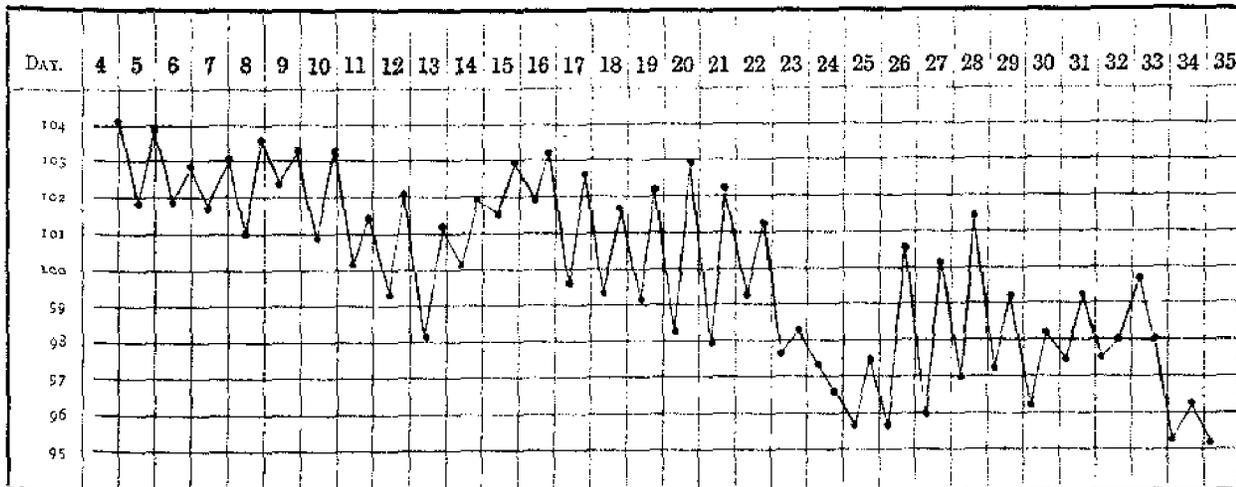
who were not fortunate enough to possess friends who could take charge of them perished in the streets. The wealthier Chinese recognised the fact that it was their duty to help the helpless. Cakes and pills were served out by them gratuitously, but only to applicants and at one place. These were supposed to be useful as prophylactics as well as for cure. The expense was defrayed from the "Taotai's benevolent fund." This fund is kept up by voluntary subscriptions, chiefly for the purpose of supplying food, but also to some extent native medicine, in times of emergency.

At Moukden the epidemic commenced about 17th August, and lasted until October. It first appeared to the north of the city, and entered the town from that side. Another report says the western suburb was first affected. The disease moved to the eastern quarter, and then became general. In the western and southern quarters the epidemic was most severe; the deaths were about 300 per day. The total of deaths is thought to have reached 10,000. For 50 years there had been no such visitation.

At Newchwang city, Kaichow, Fuchow, and Haichung the epidemic was not by any means so severe. At Newchwang city the deaths did not exceed 100; at Fuchow, 300 to 400; and at Kaichow, 200 to 300. About the same time cholera was present at Pa-tehai-tai, a large village 60 miles north from us; and a few cases occurred also among the villages in our immediate neighbourhood.

A case of fever occurred in the fall of 1883 which afforded another illustration of the difficulties which attend attempts to classify fevers as they occur on the China coast. The patient was a foreign male aged 13.

The fever was ushered in by rigors, high temperature, with rather frequent epistaxis. At no period in its progress were the symptoms very severe, although it proved to be a lingering case. There was considerable wasting and prostration. The symptoms had a general resemblance to those of typhoid, but there was no diarrhoea, no gurgling on pressure in iliac fossa, nor rash of any kind. The following is the temperature chart:—



I have to thank Mr. Harbour Master E. V. BRENAN for his kindness in assisting me with the following meteorological table for the period:—

YEAR AND MONTH.	BAROMETER.		NO. OF DAYS ON WHICH THE TEMPERATURE FELL BELOW					NO. OF DAYS ON WHICH THE TEMPERATURE ROSE ABOVE					No. of Days on which Rain fell for 2 Hours in the 24.	No. of Days on which Snow fell for 2 Hours in the 24.	No. of Days on which there were Dews/fogues.	No. of Days on which high- Winds lasted 2 Hours in the 24.	
	Highest.	Lowest.	Zero.	10°	20°	32°	42°	65°	70°	75°	80°	85°					
	Inches.	Inches.															
1882.																	
October	30.54	30	...	...	...	1	13	10	1	...	...	...	5	...	...	2
November	30.93	29.96	...	...	6	22	1	...	...	...	...	...	2	...	...	1
December	30.95	29.63	...	19	8	3	1	...	...	...	...	...	4	...	...	6
1883.																	
January	30.78	30.14	...	17	14	...	...	...	...	...	...	...	1	...	...	6
February	30.73	30.25	...	10	10	8	...	...	...	...	...	...	6	...	...	3
March	30.58	29.62	...	...	2	25	4	...	...	...	...	...	4	1	...	4
April	30.53	29.80	...	...	...	...	15	1	...	...	...	...	6	...	1	2
May	30.13	29.67	...	...	...	...	2	10	8	2	2	1	8	...	2	7
June	30.18	29.40	...	...	...	...	...	2	2	8	16	2	4	...	...	4
July	30.08	29.54	...	...	...	...	...	...	1	2	18	10	6	...	...	1
August	30.24	29.68	...	...	...	...	...	...	4	16	7	4	6	...	2	2
September	30.35	29.80	...	...	...	...	...	12	8	6	...	...	3	...	1	5
October	30.62	29.74	...	...	...	1	5	11	7	...	...	...	2	1	...	2
November	30.64	30.12	...	...	6	12	12	...	...	...	...	...	1	1	...	3
December	30.58	30.01	1	6	19	5	...	...	...	...	...	...	1	1	...	1
1884.																	
January	30.54	29.94	12	12	7	...	...	...	...	...	...	...	5	2	...	7
February	30.69	30.07	5	11	10	3	...	...	...	...	...	...	4	3	...	3
March	30.61	29.92	...	1	6	13	9	...	...	...	...	...	3	1	...	3

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

For the Half-year ended 31st March 1884.

ABSTRACT OF METEOROLOGICAL OBSERVATIONS taken at the Observatory of the Jesuit Mission at Zikawei, for the Six Months ended 31st March 1884. Latitude, 31° 14' 41" N. (Shanghai), 31° 12' 30" N. (Zikawei). Longitude E. of Greenwich, 121° 28' 55" (Shanghai), 121° 25' 11" (Zikawei).

DATE.	Barometer at 32° F.	THERMOMETER.		Elastic Force of Vapour estimated in Inches of Mercury.	Hu- midity, 0-100.	Ozone, 0-21.	Velocity of Wind per Hour.	Mean Direction of Wind.	Total Evaporation during Month.	Total Rainfall during Month.	REMARKS.
		Diurnal Mean Temperature in Shade.	Extreme Temperature in Shade.								
1883.	<i>Inch.</i>	° F.	° F.	<i>Inch.</i>			<i>Miles.</i>		<i>Inch.</i>	<i>Inch.</i>	
Oct.	Max... 30.465 (25) Mean 30.130 Min... 29.934 (7) Range 0.531	73.2 (22) 65.2 48.4 (31) 24.8	83.5 (16) ... 46.6 (12) 36.9	0.257	93 (19) 74 53 (31) ...	15 (23) 11 8 (9) ...	6.8	N. 14° E.	3.829	1.029	Eight days rain. 3rd, beginning of red sunrises and sunsets. 21st, thunder.
Nov.	Max... 30.475 (27) Mean 30.269 Min... 29.942 (10) Range 0.533	64.3 (10) 51.5 42.0 (12) 22.3	70.7 (8) ... 36.0 (15) 34.7	0.299	96 (9) 78 52 (1) ...	17 (7) 12.5 9 (3) ...	7.9	N. 11° E.	2.243	3.911	Seventeen days rain. 14th, first sleet. On 3rd, 20th, and 22nd, magnetic storms.
Dec.	Max... 30.689 (21) Mean 30.377 Min... 30.154 (8) Range 0.535	47.0 39.4 31.6 (31) 15.4	56.8 (28) ... 24.8 (7) 32.0	0.169	81 (1) 71 56 (4) ...	16 (23) 10.9 7 (21) ...	7.6	N. 46° W.	2.515	0.606	Six days rain. On 3rd, first ice on the ground. On 4th, first frost (last year this occurred on 5th November).
1884.											
Jan.	Max... 30.626 (19) Mean 30.332 Min... 30.012 (23) Range 0.614	49.8 (22) 40.2 31.1 (8) 18.7	56.7 (22) ... 24.3 (2) 32.4	0.193	91 (26) 77 56 (18) ...	17 (3) 12 8 (9) ...	7.4	N. 25° E.	2.038	0.794	Eleven days rain. On 29th, first snowfall.
Feb.	Max... 30.644 (11) Mean 30.332 Min... 30.046 (15) Range 0.598	51.3 (28) 37.8 23.6 (8) 27.7	60.4 (27) ... 17.4 (8, 9) 43.0	0.177	78	19 (3) 13.3 9 (10) ...	8.2	N. 23° E.	1.951	2.429	Eight days rain.
March..	Max... 30.454 (12) Mean 30.116 Min... 29.735 (16) Range 0.719	58.5 (15) 47.3 38.4 (12) 20.1	68.7 (15) ... 30.9 (12) 37.8	0.248	76	20 (6, 31) 14 10 (11) ...	9.5	N. 63° E.	2.979	2.855	Ten days rain.

NOTE.—The figures in parentheses indicate the days on which the observations to which they are appended were made. Under the headings "Diurnal Mean Temperature in Shade," "Humidity," and "Ozone" they indicate the days on which the mean readings were respectively highest and lowest.

For the above table I am indebted to the Rev. MARC DECHEVRENS, S.J., Director of the Observatory. It offers but little opening for remark. The season was unusually mild, true winter weather having been experienced only in February.

At the end of last summer and during the autumn, severe attacks of boils were prevalent and obstinate. This is of course a common occurrence, and is only worth mentioning on the ground that recent investigations render it probable that the specific cause lies in a micro-organism which flourishes luxuriantly in weak solutions of alum (LÖWENBERG). Now that the water supplied by the Waterworks Company has come into general household consumption, and that water cleared by alum is no longer used for baths, we may anticipate, if this view be correct, less annoyance from this troublesome affection.

Many cases of diphtheria among Chinese children were reported during October. I saw nothing of the disease in natives, and but one case in foreign private practice.

This was a lady who had suffered from diphtheria as a child, and who ever since had found her throat peculiarly sensitive to cold and other hurtful influences of a more or less trivial character. She had moreover retained a slight parietic dysphagia, to which she had become accustomed. I saw her on the 29th October. She attributed her illness to a chill caught two days before, but it was evident that she had been obscurely ailing for several days. There was already a large patch of exudation on the left tonsil. Temperature in axilla, 103° . The symptoms followed the usual course, with considerable fever, prostration and dysphagia. On the 30th a patch similar to that on the left tonsil showed itself on the right, and in the evening a second patch was observed on the left. Next day the left posterior pillar was invaded, after which there was no fresh exudation. Without obvious cause, violent vomiting occurred on the 2nd November, leaving the patient extremely weak. Convalescence was, however, tolerably rapid.

Treatment consisted in the free administration of wine, concentrated soups and milk, together with hourly irrigation of the throat with a mixture of glycerine of borax and boiling water in equal parts. Sulpho-carbolate of soda in 15-grain doses every three hours was taken during three days, and a chloral draught was occasionally necessary.

There were no sequela.

This was an instance of KLEBS'S second form of diphtheria, in which, without very severe constitutional disturbance, exudation is most extensive and of earliest appearance on the tonsils. Secondary paralytic phenomena are relatively rare, but relapse is not infrequent.*

Typhoid fever may now be regarded as endemic in Shanghai. It is, I think, beyond doubt that year by year remittent fever as it presents itself here assumes more and more of the typhoid character. The type is still ill defined. As usual during winter and spring, many cases of greater or less severity came under observation. I postpone until next Report a discussion of the temperature curves in cases of Shanghai typhoid.

One case which occurred in December was noteworthy on account of its apyretic course. All the usual symptoms were present, including the eruption, yet the highest temperature registered was $99^{\circ}.8$. The patient made a lingering recovery.

An epidemic of scarlatina in a severe form prevailed during the early months of this year in the island of Tsung-ming, proving fatal mainly to children. I cannot find that the disease spread to other parts of the province.

* *Allgemeine medicinische Central-Zeitung*, Oct. 1883.

Typhus fever was reported from various districts in the neighbourhood of Shanghai, but a few cases of advanced fever marked by a deeply typhoid condition which I saw at St. Luke's Hospital, and two others (natives) of a similar character which I was asked to see in private, appeared explicable on the supposition of their being neglected remittent. From neither of the latter two cases, one of which proved fatal a few hours after my visit, did the disease spread to other residents in either house, although in the fatal case the room in which the patient was lying was occupied by several other persons.

I fancy I got the credit of killing the patient who died, for I ordered and administered a table-spoonful of brandy with a raw egg, which doubtless was held to be the immediate cause of death.

A few cases of typhus have been diagnosed among foreigners since the close of the period under review, but I have not happened to see any. The need for a hospital where contagious diseases may be suitably isolated will perhaps be acknowledged presently, should this fatal and hitherto rare form of fever become prevalent.*

Measles was of frequent occurrence among foreign and native children, but I know of no instance in which the disease was of more than average severity.

One well-marked case in a lady aged 45 may be mentioned on account of its rarity. The source of infection could not be ascertained. The patient became feverish on the 9th March. Next day the malaise was more pronounced. No sleep was obtained during the night of the 10th-11th. On the 11th, coryza, injection of conjunctivæ, frontal headache. 12th March (4th day), groups of papules on temples, cheeks and neck. Early in the morning the eruption had appeared fugitively on the wrists. 13th (5th day), eruption disappearing from face, appearing on chest. Next day, eruption and coryza had disappeared. Slight conjunctivitis lasted for a day or two longer. The highest temperature registered was 103°.4 in the afternoon of the second day of the eruption (5th day of the fever).

Many cases of mumps were observed during January and February, and whooping-cough became epidemic in March.

When treating of epidemic diseases one is naturally led to consider the milk supply. Among the more pressing sanitary needs of the settlements is a careful and skilled supervision of this important element in the daily food of foreigners. A certain control is, I believe, at least nominally, exercised over the quality of the alcoholic liquors sold in the licensed grogshops, but impure milk, which is far more dangerous than impure liquor, may be sold, and in fact is sold, without hindrance. The Council of the National Association for the Promotion of Social Science has lately presented a memorial to the English Privy Council, in which the following passage occurs:—

It has been proved that during the last 12 years at least 53 epidemics of typhoid fever, 17 of scarlatina, and 12 of diphtheria and throat illness have been due to the drinking of infected milk in the United Kingdom alone.*

Among recent instances which skilled investigation has brought to light may be cited the Hendon epidemic of diphtheria (January 1883), which was clearly traced to the use of sewage-tainted water for the washing of the cans in which the milk consumed in the affected district was distributed. There seemed to have been no intentional adulteration or dilution of the milk itself. Curious if not agreeable results would doubtless follow an inquiry into

* Il semble que chaque siècle porte son renouvellement de malheurs yssans sur nous comme de la boîte de Pandore.—
AMBROISE PARÉ, *OEuvres*. Av Lecteur.

† *British Medical Journal*, 1884, i, 788.

the character of the water used by Shanghai milkmen for can and bottle washing, to say nothing of dilution. Diphtheria has never yet appeared in an epidemic form in Shanghai, but it is evident that there is ample provision for the spread of that or any other disease capable of being disseminated by the agency of milk.

But apart from the possibility of the local milk supply becoming a medium for the spread of specific diseases, we have every right to demand that it should be, in the ordinary sense of the words, pure and wholesome. In a matter so vital, and with respect to which individual consumers are well-nigh helpless, the community may be expected to institute measures whereby the purchaser will have some security for receiving what the vendor professes to give him. Licenses, and rigorous supervision of all dairies, both foreign and native, afford the only means to this end. The health of the cows; the precautions, if any, taken in milking them; the hygienic condition of the dairies; the cleanliness of the vessels used and of the persons employed; the healthfulness of these latter; the character of the water supply; the presence or absence of adulteration with buffalo milk; the mode of storage and of transport; the means for securing a suitable temperature for milk not immediately distributed; the use made of surplus milk; the means, if any, employed for freshening it; the quality of particular samples, taken at random, as to richness in cream, addition of water, etc.—none of these important points should be utterly neglected, as at present, or slurred over as being in a vague way provided for under our phantom sanitary arrangements.

In Zurich, with a population of 76,000, milk inspection is sedulously carried out. Milk sellers are obliged to register and obtain a license. Inspectors selected from the police take samples when and where they please, examine them in some adjoining convenient place with the MÜLLER-QUÉVENNE lactometer, and in case of doubt submit them to one of two competent chemists who hold the appointment of public analysts. Punishments are inflicted in accordance with published regulations. These regulations recognise two grades of milk—"whole milk," which must possess a specific gravity of 1,029 to 1,035 before skimming, and a minimum of 1,033 after skimming; and "mixed milk," which is defined as a mixture of equal parts of skimmed evening milk and whole morning milk, and must have a specific gravity before skimming of 1,030 to 1,036, and a minimum after skimming of 1,033. "Whole milk" must contain 12 per cent. solids, including 3 per cent. of fat, while "mixed milk" must yield 11 per cent. solids, of which 2 to 3 per cent. must be fat. It is thus evident that a somewhat elaborate system of inspection, and one which is reported to work extremely well, may be carried out without the aid of any complicated or expensive machinery.

Meanwhile, it cannot be too often repeated that in order to ensure absolute safety all milk ought to be boiled before being drunk. BOLLINGER* has lately shown that while the subcutaneous injection of unboiled milk from tuberculous cows transmits bovine tuberculosis, the same milk when boiled is inert. DEMME† of Berne has compiled statistics establishing the fact of infection by the ingestion of milk yielded by tuberculous animals, which, however, had long before been proved by KLEBS and by CREIGHTON.‡ The existence of the danger is beyond

* *London Medical Record*, 1883, 515.

† *Ibid.*, 516.

‡ *Bovine Tuberculosis in Man*, pp. 27 sqq. See also *Berl. kl. Wochenschrift*, 1883, 297.

doubt, but the rarity with which the propagation of tuberculosis can be traced to infected milk is, at least in part, due to the fact that the tubercle bacillus occurs in milk only when the mammary gland is itself tuberculous, which is relatively uncommon.* KLEBS established that tuberculosis conveyed by milk declares itself among the lower animals first by gastro-intestinal catarrh, followed by infiltration of the mesenteric glands, invasion of the liver and spleen, and finally by miliary tuberculosis of the lungs.† The micro-organism of malignant pustule (*charbon*) has recently been discovered in the milk of diseased animals.‡

Closely allied to the question of milk supply is that of water supply. The water of the Shanghai Waterworks Company would appear to be beyond reproach, as is testified by the subjoined extract from the report of an analysis made by Mr. GREEN of the Shanghai Medical Hall:—

The results of our analysis enable us to certify to the extreme purity of the supply, and its suitability for domestic and manufacturing purposes. The minuteness of the organic matter present, as represented by the "ammonia estimate," the freedom from mineral contamination, together with moderate hardness, compare very favourably indeed with the London waters and those of large manufacturing towns. The slight opacity noticeable (removed on filtration through paper) we find to be due to small quantities of silicate of magnesia, which are in no way injurious.

This no doubt is very satisfactory, although it would have been better had a microscopical examination supplemented the chemical analysis. But the limits of the value of chemical and microscopical examination of drinking water should ever be borne in mind. The presence of gross impurities or of living organisms in a given sample is sufficient to condemn it. But the means whereby disease is propagated are too subtle to be in all cases discovered by reagents or by the microscope. WANKLYN (*Water Analysis*, 3rd edition, p. 51) says, "if the albuminoid ammonia amount to less than 0.05 parts per million, the water belongs to the class of very pure water." In his 5th edition he is still more emphatic, speaking of such water as "of extraordinary organic purity." Nobody possessed of sufficient faith in the chemist charged to report on a given water would, were such an opinion as this expressed regarding it, hesitate to use it for drinking purposes. Yet the intentional pollution of a gallon of water with all the soluble and the finer particulate matter from 3½ grains of a typhoid stool, gave in WANKLYN'S OWN hands an increment of only 0.02 parts of albuminoid ammonia per million.§ The following experiment is equally suggestive:—

Mr. ALFRED ASHBY of Grantham reports having found that a dried *daphnia pulex*, weighing rather less than $\frac{1}{200}$ grain, yielded on distillation with permanganate of potash an amount of albuminoid ammonia which would have appeared in a water analysis as .005 per million. A yeast cell weighs one ten-millionth of a grain, and it is unlikely that a disease germ weighs as much. Assuming that its weight equals that of the yeast cell, it would take 50,000 disease germs to equal the weight of the daphnia and yield the insignificant quantity of albuminoid ammonia mentioned. If, therefore, half a pint of a water yielding no more were drunk, about 2,200 disease germs, and probably many more, might be swallowed, yet an empirical standard based upon the organic indication would declare the water to be absolutely safe.||

* KOCH, quoted in *Lancet*, 1884, i, 494.

† JACCOUD, *Curabilité et Traitement de la Phtisie pulmonaire*, p. 87.

‡ Académie des Sciences, 19th November 1883.

§ *Annual Report of the Medical Officer of the Local Government Board for 1881*, pp. 142, 155.

|| Society of Medical Officers of Health, 18th April 1884.

That is to say, a water of (chemically considered) extraordinary organic purity may be charged with matters eminently capable of spreading disease, and thus it happens that the more elaborate the arrangements made for securing periodical examination of drinking water, and the more confidence they inspire, the more dangerous they may be to the community. Fortunately, we possess in prolonged boiling a means of destroying organic contamination, which is practically infallible.

The subjoined table is compiled from the sexton's books and from the municipal registers:—

BURIAL RETURN OF FOREIGNERS for the Half-year ended 31st March 1884.*

CAUSE OF DEATH.	OCTOBER.	NOVEMBER.	DECEMBER.	JANUARY.	FEBRUARY.	MARCH.	TOTAL.
Small-pox.....	...	...	...	...	...	1†	1
Measles.....	...	...	...	...	f 1‡	...	1
Enteric fever.....	...	1	f 1†	1	1	...	4
Cholera.....	1†§	...	...	...	...	...	1
Diphtheria.....	...	...	...	1‡	...	...	1
Rheumatism.....	...	...	1||¶	...	...	...	1
Tuberculosis.....	...	...	1†	...	...	...	1
Cancer.....	...	...	...	...	...	f 1||	1
Marasmus.....	1‡	...	...	...	1‡**	...	2
Alcoholism.....	...	...	...	2†	...	...	2
Convulsions.....	f 1‡||¶	...	...	...	1‡||¶	...	2
Cerebral hæmorrhage.....	...	1	...	...	...	...	1
Hemiplegia.....	...	...	1**	...	...	...	1
Acute mania.....	...	...	1†	...	...	...	1
Croup.....	1‡§	...	...	1‡	...	...	2
Capillary bronchitis.....	...	...	...	f 1‡	...	...	1
Broncho-pneumonia.....	...	...	...	...	1‡**	...	1
Pneumonia.....	...	...	...	...	...	1†||	2
Phthisis.....	...	1 f 1	...	1	...	...	3
Disease of the heart.....	...	...	...	...	...	1**	1
Aneurism of aorta.....	...	1†	...	...	...	...	2
Cirrhosis of liver.....	...	1	...	...	...	...	1
Hepatitis.....	...	1	...	...	...	...	1
Abscess of liver.....	1	1	...	...	...	...	2
Gastro-enteritis.....	...	...	...	...	...	f 1‡	1
Dysentery.....	1	1	...	...	...	...	2
Intestinal obstruction.....	...	...	...	...	f 1†	...	1
Premature birth.....	f 1‡	...	...	...	...	...	1
Fracture of base of skull.....	...	...	...	...	...	1	1
Concussion of brain.....	...	...	...	1	...	...	1
Laceration of spleen.....	...	...	...	...	1†	...	1
Drowned.....	...	...	...	...	...	1†	1
Uncertified.....	...	...	...	...	...	1‡**	1
TOTAL.....	7	10	5	8	7	9	46

* Not including deaths (if any) among the Catholic religious bodies, among Eurasians or Japanese; exclusive also of still-births.

† Non-resident (11).

‡ Infant (13).

§ Died at sea (2).

|| Malay (5).

¶ Consular certificate (3).

** Macao parentage (5).

Subtracting 1 case of cholera which proved fatal at sea during the last week of October, 1 death from croup on board a steamer bound to Shanghai, 3 cases of accidental injury, and 1 case of drowning, there remain 40 deaths attributable to disease, which occurred in the place during the half-year. To this number young children contributed 12. The foreign adult mortality was thus 28 (24 males and 4 females),

as against 48 (36 males and 12 females) during the corresponding period of 1882-83. A full analysis of the figures is given in the appended tables:—

CAUSES OF DEATH FROM DISEASE AMONG RESIDENT EUROPEAN ADULTS.

Enteric fever	3	Diseases of liver	4
Aortic aneurism	1	Phthisis	3 (1 female).
Cerebral hæmorrhage	1	Dysentery	2

13 males and 1 female, the number for the last previous corresponding period having been 17 males and 8 females.

CAUSES OF DEATH FROM DISEASE AMONG NON-RESIDENT EUROPEAN ADULTS.

Small-pox	1	Acute malaria	1
Alcoholism	2	Intestinal obstruction	1 (female).
Aortic aneurism	1	Tuberculosis	1
Enteric fever	1 (female).	Pneumonia	1

7 males and 2 females, as against 8 males and 1 female during the corresponding period of 1882-83.

CAUSES OF DEATH FROM DISEASE AMONG EUROPEAN INFANTS.

Measles	1 (female).	Marasmus	1
Croup	1	Gastro-enteritis	1 (female).
Diphtheria	1	Premature birth	1 („)
Capillary bronchitis	1 (female).		

3 males and 4 females, as against 2 males during the winter six months of 1882-83.

CAUSES OF DEATH FROM DISEASE AMONG RESIDENT NON-EUROPEAN ADULT FOREIGNERS.

Rheumatism 1 (native of Manila).	Hemiplegia	1 (native of Macao).
Cancer 1 (female, Malay).	Disease of heart	1 („ „).
Pneumonia 1 (native of Manila).		

4 males and 1 female, as against 9 males and 3 females in the last previous corresponding period.

CAUSES OF DEATH FROM DISEASE AMONG NON-EUROPEAN FOREIGN INFANTS.

Marasmus	1 (Macao).	Convulsions	2 (1 female, Manila).
Broncho-pneumonia	1 („).	Uncertified	1 (Macao).

4 males and 1 female, as against 2 males and 2 females in the corresponding period of 1882-83.

No fatal case of CHOLERA was observed during the six months, although severe choleraic diarrhœa was not uncommon during October. Had there been any mortality, "Cholera" would no doubt, and perhaps justly, have been inscribed on the death certificates. Under such circumstances the result unavoidably influences the diagnosis.*

The question cannot fail to suggest itself—why does a dominant disease diminish in prevalence, and finally disappear? It certainly is not because every susceptible person within

* GALEN (*Comment. iii. in HIPPOCRATIS Epidemiorum, lib. iii.*) points out (§§ 20, 21) that when diseases arising from common causes prove widely fatal, they acquire the reputation of malignancy.

the affected area has been attacked, and has either fallen a victim or successfully resisted the assault. Nor is it that the *materies morbi*, whatever it may be, is exhausted, for on any theory of the action of a poison of the class of ferments, the material available is practically unlimited. It is a curious and important fact that the more benign a given poison becomes under cultivation for one class of animals, the more virulent it may become for another. Thus the saliva poison announced by PASTEUR in 1881, while eminently fatal to rabbits, has no effect on adult guinea-pigs. Young guinea-pigs are, however, killed by it, and by successive inoculations from one young guinea-pig to another it is so elaborated and intensified that it at length kills adult guinea-pigs with great certainty and rapidity. But by this time it is no longer fatal to rabbits, although it still affects them sufficiently to protect them against the original poison. Whence it is manifest that in order that a disease should breed true, something else is necessary besides the purity of the infecting material. The direction in which an answer should be sought is thus indicated, and we may safely accept the indication without pledging ourselves to accept the germ theory of disease as commonly promulgated. For whether that theory be true or not, it is fair to assume *a priori* that in any given case the unknown condition which constitutes the fitness of the soil must be as important as the energy and purity of the unknown seed. In the remarkable instance just cited the virulence of the organic poison obviously depends on its environment, and a generalisation from this would be borne out by many well-known facts regarding the cultivation of lowly organisms. Of these facts, one of the most noteworthy is the extreme delicacy of the conditions which make or mar a culture. For example, ROLLIN, experimenting on *aspergillus niger*, arrived after a series of trials at a fluid containing some dozen or so of different substances in solution, in which the maximum of growth and development was attained. Among the ingredients of this culture fluid is a trace of sulphate of zinc, so minute as hardly to be appreciable, yet if it be withheld the growth is diminished to one-tenth of its previous amount. On the other hand, DUCLAUX has shown that ~~traces~~ of a silver salt added to the culture fluid instantly arrests *aspergillus* in its growth. Indeed, so great is the influence of silver salts on this plant that it cannot be grown in a silver vessel. It is worth noticing that such results as these upset the objections made to the theory of antiseptic treatment of zymotic diseases. That theory as hitherto carried into practice has, it is true, proved somewhat disastrous, but it is clearly possible that some substances may yet be discovered which, even though the blood and tissues be supposed swarming with pathological organisms, may be introduced in quantity too small to be hurtful to the host while proving as puzzling to the guests as silver salts are to *aspergillus*. If this be realised, JACCOUD's pungent description of the antiseptic treatment of typhoid fever—"on vise le microbe et l'on abat le patient"—will lose its savour. Meanwhile, however, the experiments above described, as well as many others, show sufficiently that the environment of low forms of life is all-powerful in determining their growth and development, and that while for each there may be only one complex and unstable combination of conditions compatible with full development, there certainly are not many, while in all probability every such combination shares in the character of instability. Hence the greater chance of one condition or more being lacking, or of two or more being wrongly grouped. Thus, if in no other way, may be explained the stories of persons who, either for a bribe or for the sake of knowledge, have swallowed rice-water evacuations, slept in the clothes of cholera

patients,* and in other ways exposed themselves to the most likely chances of infection, without contracting the disease.†

On this supposition advocates of the germ theory might reasonably argue that were a little more neglect lavished on the sanitary condition of Shanghai, cholera and perhaps other diseases might be excluded altogether. Without questioning the soundness of the deduction, the difficulty and danger of the experiment will probably prevent its being tried. But the analogy which links the history of disease development with the life history of low organisms is sufficiently close to suggest an explanation drawn from inappreciable alterations in local conditions, which may suffice to solve the problem with which I started.

The corresponding question—why anyone recovers from a zymotic disease—may be answered in a corresponding way. Probably because the patient's initial power of resistance has enabled him to live long enough to reach a time when in the natural course of events by-products make their appearance in the bodily tissues, which by-products, though arising from the interaction of the poison and its environment, are hurtful or fatal to the poison itself.

It is here not out of place to remark that the garbage carts used for the scavenging of the English and Hongkew settlements appear to be specially designed to favour the dissemination of disease germs. It is fair to assume that much of the sweepings and kitchen refuse from the native quarters, which is gathered into heaps to await the passing carts, is of a dangerous character. At different periods of the year it must contain dried small-pox crusts, and substances of various kinds soaked or smeared with the discharges of cholera, typhoid fever or dysentery. Other discharges of a more or less virulent kind are also certainly represented, while putrid animal matter is not wanting. The whole forms a collection which it might be thought advisable to remove with as little disturbance as possible. So far is this from being the rule followed, that as the cart approaches fulness every shovelful of miscellaneous dirt is necessarily flung from 5 to 7 feet into the air before it can reach its destination. In dry weather the lightest and presumably most dangerous portions are widely spread by this ingenious winnowing process, and I have little hesitation in attributing to infection thus distributed some of the mysterious cases of violent ophthalmia which I too frequently encounter. This obvious and absurd danger might easily be done away with by altering the axles of the carts so that the floor of the body should stand not more than a few inches above the street surface.

The settlements were remarkably free from SMALL-POX during last winter. Only one fatal case among foreigners is reported.

On the 11th March a Watcher, who had been employed during the 6th and 7th in examining the holds of a vessel laden with Straits' produce, reported himself sick, and on the 13th was sent into hospital with small-pox. He had been replaced on the 8th by another Watcher, who on the 12th likewise reported himself sick, and on the 14th was evidently suffering from small-pox. In neither case was the disease

* *British Medical Journal*, 1883, ii, 832, 897.

† The precautions that ought to be taken against cholera occupy a large share of people's thoughts during an epidemic. With regard to this matter nothing wiser can be written to-day than was written à propos of the plague by GUY PAIN, under date of the 18th October 1631:—"Pour tout antidote, je m'en fie après la grâce de Dieu . . . à n'être ni pléthorique, ni cacochyme, ni à faire aucun excès, et ne crois non plus à la thériaque, mithridate, alkermins, hyacinthe, bézoard, corne de licorne, qu'à des cornes de bœuf."—*Lettres*, ed. REVUELS-PARIS, i, 8.

severe. Both men when seeking advice complained of an overpowering, nauseous smell which pervaded one of the holds.

Under the existing Port Sanitary Regulations no one has any power to interfere in such a case as this. It would have been advisable to remove the vessel in question to a point outside the harbour limits for disinfection, but in the absence of any sanitary authority nothing was done.

At the annual meeting of ratepayers held on the 28th February*—

Mr. KINGSMILL moved [as an amendment to the Municipal Estimate for 1884]—

That no portion of the sum of £5,000, appropriated for the construction of small-pox wards, be applied to the use proposed, until, by means of a committee appointed by the ratepayers, full information shall have been obtained regarding the advisability or the reverse of building such wards in the middle of a crowded neighbourhood and in connexion with the General Hospital.

The Rev. W. J. BOONE seconded the amendment, which was lost.

Comment upon this is needless. In the course of an able speech Mr. KINGSMILL cited the experience and opinions of those English practitioners who can speak with most authority on the rules which should govern the construction and location of small-pox hospitals, as set forth in the Report of the Royal Commission on Small-pox and Fever Hospitals in London (August 1882). The ratepayers had not therefore the excuse of lack of information regarding the importance of the question to explain their definite refusal to obtain information as to its merits.†

A steamer from Nagasaki was detained on the 6th March under the Port Sanitary Regulations, on suspicion of having small-pox on board. The master had been attacked on the 2nd March in Nagasaki and had been removed on shore, after which all necessary precautions were taken for the disinfection of his cabin and effects. The steamer left Nagasaki for Shanghai on the 4th March. On the 28th February, the steamer being then at Fusan, the second officer had gone off duty, feeling unwell, but returned to work on the 1st March quite recovered, and worked as usual on the voyage from Fusan to Nagasaki, at Nagasaki, and on the voyage to Shanghai. He was eating, drinking, sleeping and smoking as usual, and when seen by me on the 7th March presented no appearance of illness of any kind. His temperature was normal; there was no sore throat and no skin eruption. Having mustered and carefully examined the entire ship's company, I found all in excellent health, and after seeing what had been done in the master's quarters I gave permission for the steamer to go to her berth. The doctor attending the steamer, however, being of opinion that the second mate was suffering from a mild attack of small-pox, had him removed to the General Hospital, where he was detained for some weeks, not in the small-pox department but in a room on the ground floor of the main building, where of course there was not even the semblance of isolation. No symptoms of the disease were developed, and finally the man was discharged.

This case illustrates fairly well the need for a complete change in the arrangements for the reception of small-pox patients. This man either had small-pox or he had not. If he

* *North-China Daily News*, 29th February 1884.

† In the case of one of the Watchers mentioned in the text, I permitted his wife—a Japanese—to visit him daily in his private room. The woman had herself had small-pox, she lived close by the hospital in a quarter exclusively native, she came directly from her house to the hospital early in the morning and went straight home late in the evening, and thus had no relations of any kind with foreigners. I understand that my action in giving this permission has been sharply criticised, and no doubt it would be open to the severest criticism if the patient had been in a properly isolated small-pox hospital. But inasmuch as the term isolation when applied to the small-pox wards in the Shanghai General Hospital is altogether illusory, matters would not be improved were the pretence of isolation rendered vexatious.

had not, then, as there was no question of anything else being the matter with him, he had no business in hospital. If he had small-pox, then he ought to have been placed in the special wards; and it is certain that if his illness of the 28th February was the beginning of the period of invasion, some symptoms must have declared themselves by the ninth day, sufficiently distinct to enforce the necessity for isolation.

The case of HEMIPLEGIA, fatal in November, had lingered for rather more than two years. The patient was an aged Portuguese who in September 1881 was struck by paralysis of the right side of the body and face, with aphasia. The facial paralysis, which as usual was only partial, began early to disappear, some power was regained over the leg, but never sufficient to make standing possible. Aphasia was at first complete, but in a couple of weeks the patient found it possible to make known all his wants. His intelligence was in no way affected, but he became irritable in temper, and emotional. Contracture of the paralysed limbs set in in due course and rendered him completely helpless. At the end of spring 1882 a severe attack of pneumonia nearly killed him, and again, early in 1883, he barely escaped from bronchitis. Death was due to a second hemorrhage, which, judging by the symptoms, was ventricular. A postmortem could not be obtained.

The following cases are not without interest:—

Intermittent Subretinal Hæmorrhage; Recovery.—A Chinese girl, aged 20, brought up at a missionary school, was first seen on the 5th January 1883. For eight or nine months her vision had gradually failed, and within the last three months her left eye became totally blind in a few minutes whenever she assumed the erect posture. Upon lying down for half an hour a certain amount of cloudy vision returned, and after two or three hours she could, she said, see fairly well. This blindness was accompanied by a painful feeling of tension in the left eye, which disappeared shortly after lying down. There was a history of an accidental blow received on the left temple a few weeks before marked failure of vision was first noticed, and it was remembered that this blow was received during a menstrual period. Further questioning elicited the fact that for years the patient had noticed slight dimness or uncertainty of vision at the periods.

The patient had remained during the greater part of the winter in a darkened and imperfectly ventilated room. She was habitually constipated, and appetite had long disappeared. The catamenia were painful and irregular, appearing on an average every seven weeks, lasting from three to five days, and attended by marked hypogastric tenderness on pressure. For some days before each period headache was so severe as to prevent any attempt to rise from the recumbent position. At these times, too, vision was almost abolished in both eyes, and humming in the ears was constant and distressing, sometimes preventing sleep.

The girl was well grown and developed, but deeply anæmic. She had not wasted much. Examination of the heart revealed a diastolic murmur, most audible at the base, propagated downwards along a vertical line about 1 inch internal to the nipple. This murmur disappeared shortly after treatment was begun. The urine contained neither sugar nor albumen.

At the moment of examination there was but slight perception of light with the left eye. The pupil was somewhat dilated, and sluggish. The right eye was myopic (= 4 dioptries). Its media and fundus appeared normal. The fundus of the left eye was for the most part normal, but the macular region was involved in an ovoid extravasation of a tolerably uniform deep red, covering a space about once and a half that of the papilla, and the long axis of which was directed obliquely downwards and outwards. Its edges were badly defined, fading into a narrow yellowish border. Next day, the recumbent position having meanwhile been maintained, I saw the girl at her own house. With the left eye she could then count fingers and discern large objects, but could not recognise faces at any distance. After many trials I was unable to get a view of the fundus without sitting the patient up.

Two circumstances were greatly in favour of fair play being given to treatment. The girl was engaged to be married, and it was evident that the event could not come off unless her condition improved. Moreover, having become familiar with foreigners, there was no initial prejudice against foreign treatment. Accordingly, the recommendations made were, I think, faithfully carried out. They were directed solely to restoration of the general health. She was rapidly sponged down to the waist with cold water every forenoon, and then rubbed with a rough towel until the skin was reddened. Her diet scale was enlarged and made to include at least half a pound of red meat daily. Every fine day she was carried out for an hour's drive. Rising about 8 A.M., she lay down for an hour in the forenoon and for an hour twice in the afternoon. So long as she remained up she wore a light cotton pad with moderate pressure over the left eye. This she found, or fancied she found, sufficient to relieve all the painful bursting sensation which had previously caused her to dread the sitting or standing posture. Aloes (in diminishing doses, as the constipated habit disappeared) with iron (in increasing doses), arsenic and nux vomica in pill, three times daily, helped to get rid of the anæmic condition. Whenever the first premonitions of a catamenial period were experienced the pill was replaced by a mixture of the bromides of potassium and iron.

I saw the patient but rarely. Improvement, however, speedily declared itself. On the 27th April she came to my house in a chair from somewhere in the city, but it happened that I was myself ill and could not make an ophthalmoscopic examination. She told me that for a week she had not worn the compress, that sitting up for three hours at a time now made hardly any difference in her sight, that she could distinguish faces without difficulty when the right eye was covered, and that the previous two periods had been painless, and separated by only 24 days. Her appearance was greatly improved, her lips being now red, and the conjunctivæ no longer pearly white. On the 20th June I saw her for the last time. Two more periods had occurred after intervals of 26 and 28 days respectively. She professed herself to be perfectly well, and could in fact distinguish all the objects, books, etc., about the room. The pupil was normally sensitive to light. With the ophthalmoscope I could get but an unsatisfactory view of the fundus through the contracted pupil, but I could at least ascertain that no strikingly abnormal condition was present.

In August I heard that she had gone into the country and got married. A curious circumstance connected with this case was that by no amount of persuasion could I obtain permission to draw a drop of blood from the girl's finger. Both she and her friends opposed it vehemently, and I thought it wiser not to insist.

Comminuted Fracture of Orbital Plate of Frontal Bone; Death.—A foreigner was galloping along the Sicawei Road on the evening of the 3rd March, when his pony, slipping on a wooden bridge, fell, throwing his rider, who remained motionless on the ground. The occurrence was seen by a Chinaman, who at once ran with the news to the Jesuit establishment. Assistance arrived within 10 minutes. The man was found lying on his face in a pool of blood, breathing heavily, and perfectly unconscious. He was turned on his back, and his head raised, soon after which a large quantity of blood poured from his mouth. A few minutes later he died quietly, the pulse continuing to beat for more than a minute after breathing had ceased.

Postmortem, 34 Hours after Death.—Body that of a muscular, tolerably fat male, about 6 feet high, weighing probably 130 lbs. Rigor mortis passing off. Lateral and dependent portions of body deeply congested. Blood-stained fluid running from mouth and right nostril. Right ear full of clotted blood, and membrana tympani ruptured. When the external ear was thoroughly cleansed there was no further discharge of fluid from it. The right eye was closed by effusion of blood into both lids, the extravasation occupying, besides, the right temporal region. A lacerated wound, 2 inches long, extended nearly vertically from the external angle of the right eye, exposing the bone. The scalp and muscles were turned down so as to expose all the convexity of the skull lying above a line passing along the upper border of each

zygomatic process and through the occipital protuberance. The exposed surface was carefully washed and examined for external fracture. There was, however, no visible injury to the bone. The skull cap was removed with difficulty, the dura mater being firmly adherent to it. The arachnoid was smooth and glistening. Surface of brain covered with distended veins. An effusion of fluid blood, estimated at 2 ounces, occupied the left parietal region, over an area included between the middle of the supramarginal convolution and the posterior limb of the superior frontal sulcus. The inferior half of the ascending frontal convolution was untouched, as also was the posterior two-thirds of the superior parietal lobule. When this blood was washed away the cortical substance of the middle of the ascending parietal convolution was seen to be disintegrated over an extent of about 1 square inch. The internal surface of the part of the skull corresponding to the effusion showed no sign of injury. On lifting the brain a comminuted fracture of the right orbital plate was discovered. The cribriform plate of the ethmoid was shattered and the crista galli displaced laterally. The orbital plate was broken into five pieces, two of which were nearly vertical in position, and one of these had penetrated the brain substance to the depth of about $\frac{1}{2}$ inch. There had been no hæmorrhage into the anterior fossa, but the orbit was filled with semicoagulated blood. Having removed the fragments of bone and washed out the orbit, the ophthalmic artery was seen to have been cut across immediately in front of the origin of the supraorbital branch. The ethmoidal branches could not be made out, as the right lateral mass of the ethmoid had given way, the orbit communicating with the right nostril through a large opening. The ophthalmic vein was bruised and probably lacerated. There was a ragged opening on its inner side, which, however, may have been accidentally made while twisting out one of the pieces of bone. The rest of the brain was somewhat shrunken, but otherwise seemed normal. The lateral ventricles contained a little clear fluid. The basal ganglia had sustained no apparent injury.

A delicate layer of blood clot was moulded to the floor of the fourth ventricle. This extravasation probably arose from injury of one of the choroid plexuses by a sudden reflux of cerebro-spinal fluid, which had been sufficiently violent to lacerate the border of the foramen of MAGENDIE.

The trachea and main bronchi contained a small quantity of semi-fluid blood. The lungs were healthy. There was no serum in the pericardium. Heart covered with fat. Walls thin; commencing fatty degeneration. Valves normal. Great vessels healthy.

The œsophagus contained much foul-smelling, claret-coloured fluid, a small quantity of which had penetrated into the stomach, which was the seat of chronic inflammation.

Cerebral Hæmorrhage; Death.—The patient, a male foreigner aged about 30, had suffered from specific disease nine years previously, but its manifestations had gradually died out, and for some five years nothing had occurred to remind him of it. For three days he had been in an excited condition, attributed by his friends to drinking, although there was no definite history of any particular excess. Later on it was remembered that during this time his manner had been strange, that he had been quarrelsome, that his hands and arms had continually been twitching, and that he had had difficulty in sitting upright on a chair. On the second of the three days referred to he had got into a row, in the course of which he received a few superficial cuts and bruises about the face. Next day he was about, in the same condition as on the two previous days, that is, quite rational, but excited and quarrelsome. Nothing peculiar was observed about his gait. On the third evening he appeared to get stupidly drunk immediately after dinner, and he was helped to his room. Here he was shortly afterwards heard falling about, so a couple of his friends came to his aid and got him to bed. Nothing more was known about him until 5 o'clock next morning, when he was heard snoring deeply, but no attention was paid to this. At 8 A.M. his boy, on opening the shutters, observed that he had passed urine and fæces in bed. He was now profoundly insensible, cheeks puffing at each expiration, blood-stained fluid trickling from mouth and blood from nose. There was occasional convulsive twitching of hands, most marked on the left side. The legs were not moved. Assistance was at once sought.

At 9.30, when I saw him, 10 grains of calomel had already been administered, and the chest had been dry cupped. The pulse was small, rapid and intermittent. Breathing slow, laboured, irregular; temperature in axilla, 103°. Skin uniformly dusky. Profound coma. No one-sided paralysis of face. Paralysis of all four extremities seemed complete, but the right arm and leg were more flaccid than the left, which showed slight rigidity. At this period the previously observed muscular twitching had ceased. Conjunctivæ insensible to touch. Pupils contracted, insensible to light. Nystagmus. The tongue had been severely bitten, and the mouth contained a quantity of altered blood. Clots were seen in both nostrils, explained probably by a severe recent bruise on the bridge of the nose, doubtless sustained before being put to bed the night before. Having with considerable difficulty found a vein at the bend of the elbow, I withdrew 4 ounces of blood, whereupon the skin assumed a natural colour, and the conjunctivæ became slightly sensitive. The breathing also at once changed in character, becoming less laboured. Soon afterwards, disorderly movements of the extremities began, which by noon had become violent and continuous, the left hand constantly plucking at the penis. Bladder empty. At 3 P.M. the bladder and lower bowel were emptied involuntarily. Breathing superficial, irregular, interrupted by occasional deep sigh or groan. Pulse 92, weak, soft, regular. Temperature in axilla, 102° (probably higher). Pupils insensible to light; less contracted. Either leg slightly jerked when deeply pricked, but the spontaneous movements of a couple of hours before had almost disappeared. No response to pricking of arms. Skin of chest deeply ecchymosed where cups had been applied. At 7 P.M. the skin was covered with perspiration; pulse, 168; respirations, 52, shallow but regular. Pupils insensible. Nystagmus. Great restlessness. Within previous hour several attacks of general convulsions. 2 ounces of urine withdrawn by catheter; red, full of flocculi, strongly acid and densely albuminous. No sugar. Patient still swallows when fluid is gently poured over tongue. 10 P.M.—Respirations, 60; trachea full of mucus. 10.30 P.M.—Death.

Postmortem, 17 Hours after Death.—Body rigid; general lividity, intense at site of cupping. Under scalp, immediately above occipital protuberance was a thin layer of fluid blood occupying a space about as large as a dollar. No corresponding scalp wound or injury of the skull. On removing the skull cap the dura mater was found deeply injected. A certain amount of fluid blood lay beneath it, and could be shifted by pressure from place to place. The arachnoid membrane was adherent in patches to the surface of the brain, and on either side of the longitudinal fissure it was in several places raised by small purulent collections. The surface of the brain was covered by distended veins. When the brain was removed a large clot was found occupying the middle fossa of the base of the skull, and on turning the brain over, blood was seen to have burst through the posterior perforated space and transverse fissure, tearing up the brain tissue in this region and leaving a ragged opening round which the cerebral substance was diffuent. This was washed away under a gentle stream of water, when the general ventricular cavity was exposed. It was full of loosely clotted blood, and the septum lucidum had disappeared. What was left of the aqueduct of SYLVIVS was distended by a clot which terminated in the fourth ventricle but had not disorganised it. It was difficult to discover the source of the hæmorrhage, but it seemed most probably to have proceeded from the choroid plexus of the left lateral ventricle. The basal ganglia appeared to be intact or to have suffered only from pressure.

The following case is of interest as an example of the transmission of the mixed form of venereal disease (*chancre mixte* of ROLLET):—

A. B. had intercourse with X. on the 23rd November 1883, and immediately afterwards started on a voyage, during which he remained strictly chaste. Three days after leaving Shanghai he noticed two small soft chancres, one on the corona, the other on a corresponding point of the prepuce, which he treated with black wash, the sores partially healing and then breaking out again. On the 24th December he

came for treatment, when the presence of very slight induration led me to give a guarded opinion as to the nature of the sores. On the 28th induration was so marked as to remove all doubt, and the characteristic rosary had appeared in each groin. On the 31st December A. B. had intercourse with Y., a woman kept by a foreigner, C. D.

C. D. presented himself on the 6th January with a soft chancre, which by the 12th had healed under iodoform, leaving a slightly tender, depressed cicatrix. Exactly one month later, on the 12th February, this cicatrix showed signs of induration, and the inguinal glands became perceptible. Ulceration followed, which was healed on the 3rd March, leaving but a faint trace after it. On the 10th March C. D. presented a roseolar eruption and specific sore throat. Meanwhile A. B. had been lost sight of.

Making allowance for defective testimony in such cases, it would seem that a mixed chancre was transmitted as such from X. through A. B. and Y. to C. D.

DISTOMATA HOMINIS.

By WALLACE TAYLOR, M.D., Osaka.

IN the Customs *Medical Reports*, vol. xx, page 10 (September 1880), Dr. MANSON of Amoy drew attention to a distoma discovered by Dr. RINGER in the lungs of a Portuguese, and mentioned that he himself had found the ova of the same parasite in the sputum of a Chinaman suffering from chronic intermitting hæmoptysis. Shortly before, Professor BÆLZ of Tokio, whose paper, published in the *Centralblatt f. d. ges. Med. Wissen.*, 1880, No. 39, was summarised in the *Lancet*, 1880, ii, 548, had announced the presence of ova, which he erroneously believed to be gregarinæ, in the lungs of persons suffering from hæmoptysis in Japan, and had stated that the disease was common in that country. An exhaustive article upon the development, anatomy and life history of the parasite, which had been pronounced a new species by Dr. COBBOLD, and by him named *Distoma Ringeri*, in honour of the discoverer, appeared from Dr. MANSON'S pen in the Customs *Medical Reports*, vol. xxii, page 25 (September 1881). The subject was taken up by the same author in an article entitled *Endemic Hæmoptysis*, published in the *Lancet*, 1883, i, 532 (March). In April Dr. BÆLZ, in the course of a paper inserted in the *Berliner klinische Wochenschrift* (1883, page 234), referred to the *Distoma Ringeri*, which he prefers to term *Distoma pulmonale*, and stated that his researches upon this and other distomata were communicated in October 1882 to the Deutsche Gesellschaft für Natur- und Völkerkunde Ostasiens, established at Tokio. Lastly, in May 1883 Professor REMY of the Paris Faculty translated and summarised for the *Archives générales de Médecine* (1883, i, 525-528) the article by Professor BÆLZ just referred to. The subject of certain distomata infesting man has been carefully worked up in Japan, in emulation of the fruitful and now classical researches of BILHARZ, GRIESINGER, HARLEY, COBBOLD, BUSK, LEWIS, CUNNINGHAM, and many others. A *résumé* of what has been done here will therefore not be devoid of interest.

So far as I know, the *Distoma Ringeri* is found only in Formosa, Corea and Japan. It is unknown in the neighbourhood of Osaka, the cases that have fallen under my observation having come from other parts of Japan. Unfortunately, even these cases remained here but a short time, and furnished only scanty specimens of ova. What follows is therefore mainly derived from the contributions of Professor BÆLZ of Tokio and Dr. NAKAHAMA TOICHIRO of Okayama, to the native *Tokio Medical Journal* for 1883.

I.—DISTOMA PULMONALE *vel* RINGERI.

Distribution.—Formosa, Corea and widely throughout Japan, each infested district, in Japan at least, appearing to have very distinct boundaries, which, however, are as yet only imperfectly defined.

It is much more prevalent in some parts than in others, and is especially common in southern Japan. Some large districts afford but few cases, while other small districts furnish many. As previously stated, none living in Osaka have yet been found infected, while at Kobé (Hiogo), but 20 miles to the west, 6 cases have been seen at the Ken Hospital and 4 at the Hiogo (Mission) Dispensary. The region around Okayama, 100 miles to the west of Hiogo, and near

the sea, has thus far furnished 54 cases to the hospital in that place. The Kumamoto district, about 100 miles north of Nagasaki, has yielded a still larger number. Those infected come not only from the flat land near the sea and along the rivers, but from mountain regions. It is only as Japanese investigators become accustomed to use the microscope that the limits of this disease will be definitely ascertained.

While as a general rule sufferers are young or middle aged and otherwise in good health, the parasite is found among almost all classes, irrespective of age, sex, occupation or physical condition. The very young and the very old appear, however, to be exempt. It is too soon to make estimates as to the ratio of the victims of this fluke in any district. As the disease can only be diagnosed by the aid of the microscope, and since very few Japanese doctors have access to such an instrument, many of those seriously affected are considered as having consumption or bronchitis.

Symptoms and Course.—The symptoms are often mild. The patient at first has a slight cough, and occasionally ejects discoloured sputa. This may occur frequently or only once during the day; it may continue for a day only, or for a week or 10 days, after which it disappears, not to be noticed again for some time. Advice is seldom sought on account of any feeling of illness due to the disease. The patient may incidentally mention the fact of his spitting blood, or, having a cough, he may be curious to know the cause of his discoloured expectoration. The sputa, generally small in quantity, consist of small pellets of blood mingled with mucus, or they may be dark, or resemble the characteristic expectoration of pneumonia. The patient seldom knows when the affection began; all that he can say is that he happened to notice it at a certain time. As the expectoration increases, the cough, which seems to depend on it, increases also. Neither is constant, but both occur at intervals, at first of long duration. As the disease progresses the intervals become shorter, and the periods of coughing and expectoration continue longer. After a time the expectoration remains permanently bloody, and can be induced at any time by voluntary coughing. The cough is not generally distressing, but as the disease progresses it may become so. The amount of expectoration, which, as I have said, is generally small, does at times become quite large, so that as much as 10 or 12 oz. may be ejected in a few hours. When these large hæmorrhages occur, as they sometimes do every few days, they rapidly reduce the patient. When, however, the disease, as is often the case, makes but slow progress, the patient, after having occasional bloody sputa for 6, 8, or even 10 years, is apparently no worse. This form of hæmoptysis is but seldom associated with phthisis or other serious lung trouble.

Physical examination seldom reveals anything abnormal, except in the worst cases. But as the patient fails, auscultation detects diminished respiratory murmur, the breath sounds becoming bronchial in character. The temperature is normal, or but slightly elevated in bad cases. As time progresses the patient, exhausted by cough and hæmorrhage, becomes deeply anæmic and suffers severely from dyspnoea on trifling exertion. Slight œdema often occurs. There is a sensation in the chest variously described as one of oppression, or of heat, or of mere irritation. Occasionally there are wandering pains in the chest, most probably neuralgic. The patient feels worse before a hæmorrhage and weaker after it. After a time spent in bed these symptoms abate, and he so far recovers as to be up and about, sometimes apparently almost well,

excepting the cough and expectoration. Months may pass by before he relapses, but relapse is certain to happen. The same series of events occurs again and again, but after a time the constitution becomes gradually undermined, convalescence becomes less complete, the periods of relief shorter, those of prostration severer and longer, œdema increases, anæmia becomes more pronounced, and at length, worn out by cough and repeated hæmorrhages, the patient dies.

Treatment.—No benefit has yet been derived from medicine, although the great majority of anthelmintics and antiparasitics have been tried as well by the mouth as by inhalation. Patients have improved under medicine, but a like improvement is observed when no medicine is taken, the hygienic surroundings remaining the same. And from the nature of the case it seems reasonable to suppose that no antiparasitic could be given in sufficient quantity to destroy the parasite or drive it from its lodgment in the lungs without seriously endangering the life of the patient. General treatment according to well-known principles is undoubtedly useful, viz., tonics, quinine, iron, cod-liver oil, occasionally expectorants, and at times, when the patient is reduced, stimulants, and, above all, rest and good food.

Exertion aggravates the cough and expectoration. Many patients have learned by experience to be quiet and spend most of the time in bed when at the worst. In one case which came under my observation the patient was much reduced, spitting large quantities of blood, anæmic, with some œdema, and no appetite. Under a simple tonic of quinine and iron, stimulants, expectorants, good food, and enforced quiet, marked improvement, with diminished cough and expectoration, was noted after a few days. The number of ova became less and less, and in a comparatively short time he was up, feeling quite comfortable. Such cases as these occurring constantly are calculated to make us very sceptical as to the influence of special remedies. But no amount of improvement announces a cure. Whatever is effectively done must be done in the way of prophylaxis.

Morbid Anatomy.—Four postmortems have been reported: two at Okayama in 1881, one at Tokio in 1882, and again one at Okayama in 1883. Others may have been made and reported, but they have not come under my observation.

Externally the lung presents little or no change in appearance. The parasites are found in the smaller bronchi, and also burrowing in the lung tissue. Whether the parasites in the bronchi are found adhering to the mucous surface by their suckers is not stated. When the lung is cut across, their burrows are laid open, and though varying somewhat these are generally about the size of a filbert. They frequently communicate with one another, and always with the smaller bronchi, sometimes by several openings. Some communicate directly with a bronchus, the lumen of this latter and the burrow forming one cavity, while the bronchus presents the appearance of having a sac-like dilatation on one side. Such cavities are probably formed by the exit from a burrow to the bronchus becoming enlarged, and, finally, the partition between adjacent burrows breaking down and forming one cavity. Each cavity is surrounded by a ring of irregular induration, extending much further into the parenchyma of the lung in some directions than in others. The adjacent bronchi are congested and more or less inflamed. So also the circumjacent lung tissue is congested. The cavities contain broken-down lung tissue, hæmatoidin, ova and *débris*, or dead specimens of the parasite. In one case 20 distomata were found. The contents of these cavities mixed with the mucous secretion of the bronchi

form the characteristic sputa. It is evident that the irritation of the parasite may at times so increase the bronchial secretion as to give rise to a large amount of expectoration, while exercise, especially when the patient is at his worst, aggravates the condition. Though the mortality from the disease is not high, there is no difficulty in realising the condition of "physiological misery" that must necessarily accompany lungs in the condition described.

As all special treatment must be prophylactic, the most important question in connexion with the disease is that of the mode of ingress of the parasite. It seems established that food is the medium. The Japanese consume large quantities of fresh-water snails and clams. Since the larvæ of various species of distoma are harboured by mollusks, it is probable that the parasite under consideration is in its larval state to be found in some of the mollusca consumed by the Japanese. The larvæ of other trematoda are found occupying one particular species as their host, and almost exclusively confined to that species. Such a species may be restricted to well-defined geographical limits, and thus the restriction of any parasitic disease, such as Endemic Hæmoptysis, to certain regions would be satisfactorily explained by the corresponding restriction to the same regions of the conditions essential to the development of the parasite. What the intermediate host is remains to be determined, and when this is accomplished prophylaxis will take a definite and certain direction.

How the expectoration is produced has been pointed out, but the cause of the hæmorrhage, which is always arterial, is not quite so clear. It is probable, however, that the parasite attaches itself to the mucous surface of the bronchi by its suckers, and when it releases its hold a drop of blood oozes out and appears as a pellet of blood in the expectoration, the larger hæmorrhages being caused by the rupture of some of the capillaries or smaller arteries. Professor BÆLZ explains the bleeding by the passage of the larvæ from the circulation to the bronchi.

Hæmorrhage, however, appears to be rather accidental than essential. In some cases it does not occur, and in these the expectoration is smoky or rusty, even when large in quantity. When small pellets of blood appear in the sputa from the first, they may and often do increase, small bleedings of half a drachm or a few drachms occurring frequently during a long period. But it is only in exceptional cases that the hæmorrhages become frequent and large. Ova are not found in the pellets of blood nor in the blood ejected during the course of a larger hæmorrhage, but in the discoloured expectoration, either with or without the bloody pellets.

A marked peculiarity of the disease is the irregular periodicity seen in so many cases. The occasional appearance of pellets of blood has substantially been accounted for, and the increased expectoration may be caused by the accumulated contents of the cavities being poured out into the bronchi. The coughing thus produced keeps up expectoration until the cavities are comparatively empty, when the patient begins to convalesce. The fact that keeping quiet adds so much to the comfort of the patient at these times gives countenance to this hypothesis. But what becomes of the parasites themselves? Are they partially cast off in the abundant expectoration? One of my patients informed me that he had coughed up a worm. It was shown him under a low power by the doctors in a native hospital, and from his description it probably was a distoma. I cannot, however, be certain, as I did not myself see the specimen. It is probable that some of the parasites may be got rid of in this way; but how long does each individual distoma live in the lungs, and is an acute attack an

indication that a reinforcement of the parasites has secured entrance? These are questions which I cannot answer. Many cases are known to have been troubled with bloody expectoration for as many as 10 years, and in one the condition had lasted for 20 years. It is not at all likely that the individual life of a parasite will cover these extended periods, nor is it necessary that it should. Living under the same conditions renders the patient liable to again and again receive into his person this insidious intruder. Nor can it yet be said whether a change of locality to a place where the disease is not known is attended with permanent advantage. Persons thus afflicted seem to have derived at least temporary benefit after a change of locality. Whether those affected with endemic hæmoptysis are more liable to other pulmonary diseases is not yet determined. The probabilities are that a lung thus affected would be more vulnerable than a normal lung.

One of the officials from Corea residing in Tokio had been for eight years troubled with bloody expectoration. He applied to a Japanese doctor, and was told he had consumption. Afterwards he was seen by Professor BÆLZ, who reports the case. The characteristic ova of the distoma were found in abundance in his expectoration, but there were no symptoms of lung disease other than the cough and expectoration. To what extent the disease occurs in Corea is not yet known. It may yet be found in some parts of China. Two of the patients seen at the Mission Dispensary in Hiogo were Chinese residing in Kobé, but whether they had contracted the disease in Kobé or in China could not be satisfactorily ascertained, but most probably while in Kobé.

II.—DISTOMATA HEPATICA.

History.—A liver fluke was first accidentally discovered in 1875 at Okayama, in the liver of a subject who had died of lung disease. The Japanese practitioners who found it were not aware that they had made an important discovery, but considering it a curiosity they preserved it in alcohol. Again, in 1878, at the same hospital, while making a postmortem upon a subject who had died with diarrhœa, enlarged liver and œdema, parasites were found in the liver, and preserved. Nothing definite, however, was known in regard to the affection till 1883, when a patient suffering from pulmonary phthisis, complicated with diarrhœa, enlarged liver and œdema, and in whose stools the ova of distoma were found, entered the Okayama Hospital. Here, again, parasites were found in the liver, and on comparing them with those preserved from the previous postmortems, they were found to be identical.

Distribution.—The parasitic hepatic disease, like Endemic Hæmoptysis, is confined to well-defined geographical limits, which, from the articles in the *Tokio Medical Journal*, would seem to be much narrower than those within which the *Distoma Ringeri* prevails. Two small adjacent villages in Okayama ken, and two other villages in Hiroshima ken, some 40 miles further to the west, are the only localities known to be affected. These villages have each a population of some 150 or 200 poor farmers, whose surroundings are anything rather than hygienic. Both villages are on the coast, situated on ground reclaimed from the sea within the last 100 years, and protected by dykes. The water in the ditches is tidal and more or less brackish. The water supply is drawn from the ditches when not too salt, or, more generally, from wells the water in which is but little better than that in the ditches, except that it is fresh. Waste water

and garbage are thrown into the ditches or into the streets, and the wells, as is generally the case in such villages, are in close proximity to the ditches. The people eat snails and ciams, as well as eels, caught in the ditches; but whether the inhabitants of adjacent villages, wherein the disease does not appear, eat mollusks taken from the same locality is not stated.

The dwellers in these villages are attacked irrespective of age, sex or physical condition. Young children are among the sufferers. When one in a family is found infected, several members of the family generally present the same symptoms in a greater or less degree. In this respect this disease offers a contrast to Endemic Hæmoptysis. A very large ratio of the inhabitants of the villages mentioned are victims of the parasite. Some native practitioners place the estimate at 1 in every 7, while others put it as high as 1 in every 5 of the whole population.

Symptoms and Course.—One of the first and most prominent symptoms is enlargement of the liver, followed, attended or preceded by diarrhœa. At first the diarrhœa is irregular and intermittent, the attacks gradually becoming more frequent and lasting longer, till, after a period of from two to five years, there may be hardly any interval between them. The stools, which may or may not be dark and bloody, sometimes reach 12 in the day. In some cases bloody diarrhœa becomes after a time almost constant, while in others blood appears in the stools only at irregular intervals. The liver continues to increase in size, though at times it apparently diminishes temporarily. There may be occasional tenderness over the hepatic region or more or less constant pain. Jaundice, sometimes intermittent, is a frequent symptom. There is generally a dark ashen discoloration of the skin. The temperature varies between 99° and 100°.5 F., or may remain normal. The pulse, though generally about normal, frequently rises to 85 or 100. After a time anasarca, likewise intermittent, appears and affects the legs especially. Ascites also is very likely to occur, increase for a time and then gradually diminish, to return again and again. The patient is reduced by the diarrhœa, becomes emaciated and grows anæmic and weak, but the appetite is usually preserved. Thus it happens that the victims of this disease are frequently reduced so low that their life is despaired of, yet they gradually recover and become apparently almost well. By and by, however, relapse occurs, and the same process is repeated again and again, ground being lost on each occasion until at length, worn out by exhaustion, the patient, after many years of illness, dies. Whether any fully recover is not stated, or whether a change of locality is attended by continuous convalescence is not yet known. Recovery after becoming the victim of *Distoma Hepaticum* must at best be problematic. When in an affected locality a case of enlargement of the liver and diarrhœa presents itself, careful examination of the fæces is generally rewarded by finding the ova of the distoma.

Many of these patients are troubled with skin diseases, but being of a poor class and living in a more or less filthy condition, the skin disease may have no connexion with the diseased liver.

Treatment.—This can only be of a general character.

Morbid Anatomy.—Four postmortems have been made, all at Okayama. The first was in 1875, the second in 1878, and two were obtained in 1883.

In one case the liver was found enlarged, congested and dark purple. In another, though somewhat enlarged, it presented the natural colour. *Distomata* were found in the

gall-bladder and hepatic ducts, in burrows in the parenchyma of the liver and in the duodenum. The burrows varied in size, but were generally about as large as the kernel of a walnut, and communicated with the hepatic ducts. Some of the burrows were so intimately connected with an hepatic duct as to form with it one cavity. In the gall-bladder, in the hepatic ducts and in the burrows in the liver the parasites were found in great numbers, as many as 100 having been taken out of one burrow. In the biliary ducts and in the gall-bladder they were attached to the mucous surface by their suckers. Ova in great abundance were present in the gall-bladder, hepatic ducts and in the burrows within the liver; they were also found in the cystic duct, ductus communis choledochus and duodenum, and scattered along the upper portion of the intestinal tract. The gall-bladder and biliary ducts inhabited by the parasites and ova were very much enlarged and congested. The burrows and biliary ducts were surrounded by irregular induration, and the neighbouring tissues were the seat of more or less congestion and inflammation.

The disease produced by *Distomata Hepatica* is much more grave than that caused by *Distoma Pulmonale*. Though confined to narrow limits, and the population within these limits comparatively small, yet the large number of those who become victims, the amount of misery thus caused and the fatality of the disease render it one of much importance. The conditions surrounding the sufferers strongly indicate that a faithful search for the channels by which the parasite finds entrance into the human body would be rewarded by definite results. Professor BÆLZ inclines to the belief that water is the medium, but it is probable that the mollusca which enter into the people's diet must also be incriminated.

The two diseases resemble each other very much in their irregular periodicity through a series of years, till, worn out and exhausted, death closes the victim's sufferings.

It is likely that further investigation will show that this disease is endemic in other localities than those mentioned above. Though none may be found where the infection is so general, yet scattered cases will probably be brought to light in other and larger districts, where the symptoms are less intense and patients linger long, finally dying with some other disease or from some other supposed cause. Professor BÆLZ states that he has seen patients in Tokio presenting the symptoms of this malady with liver somewhat enlarged and occasional diarrhoea, yet he failed to find ova in the stools, and having had no opportunity for a post-mortem he could not be positive as to the real nature of the cases.

In November 1883 a post-mortem was made in Kiyoto on a subject who had died of pulmonary phthisis, with enlarged liver and occasional diarrhoea. *Distoma* burrows were found in the liver, and a few (straight) parasites, with a quantity of ova in the gall-bladder and biliary ducts, together with more or less of the pathological changes before mentioned. This case has not yet been reported. I accidentally met Dr. SAITO, who is in charge of the hospital, in consultation, and learned the particulars from him. I went with him to the hospital to see the specimens, but, much to my disappointment, the liver with its contents, except two or three of the parasites, had been thrown away. The patient had lived in Kiyoto for 12 years, and had been ill some three years.

A post-mortem was made in Otsu, 8 miles east of Kiyoto, on Lake Biwa, some three years ago, and *mushi* (worms) were found in the liver, which was in a disorganised condition.

This case was reported at the time in the local paper. I wrote to the doctor who performed the postmortem, asking him to send me some of the specimens, but he replied that they had all been carried off by one and another as curiosities. These *mushi*, from the description given of them, were probably distomata.

I well remember seeing some years ago, while residing in Kiyoto, a number of patients with obscure liver trouble, attended with some enlargement, but I have no recollection of the presence of diarrhœa. At that time I frequently made medical tours to Hikoni and along the east shore of Lake Biwa, and it was a common thing to see patients with enlarged liver and obscure hepatic symptoms and occasionally diarrhœa. I was so much struck by the frequency of these cases that I informed the native doctors that there must be some local cause for the prevalent liver trouble in that district. I attributed it to malaria and syphilis, while the real cause may have been *Distoma Hepaticum*. Nowhere else in Japan have I met with so large a number of cases of enlarged liver.

III.—THE PARASITES.

I shall offer but a brief description of these organisms. The accompanying woodcuts, reproduced from the *Tokio Medical Journal*, give a sufficiently clear idea of their appearance.

Distoma Pulmonale.

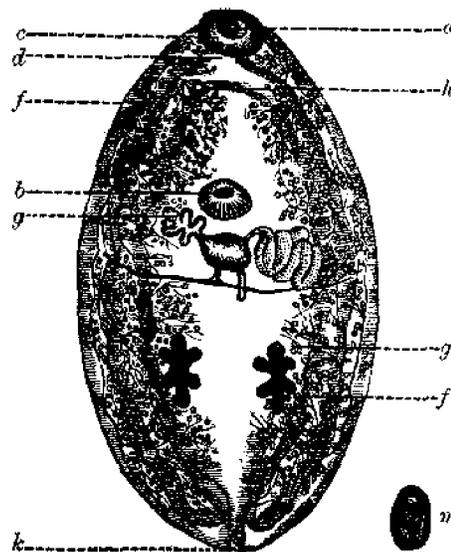


FIG. 1.

The length is from 8 to 10 mm. and the breadth from 5 to 6 mm. The form is oval, with an oral and caudal extremity. The extremities are fully rounded, and the caudal broader than the oral. With a low power the outline appears obtusely crenated, being made up of articulated rings like an earth-worm. Locomotion is effected as by the leech. In the fresh state the colour is a reddish-brown, but after remaining in alcohol for a time the specimens become mottled. A transverse section approaches a circle. There are two suckers, oral and

ventral. The alimentary canal is bifurcated shortly behind the mouth, with the single opening in the oral sucker, and ending in blind extremities. The parasite is hermaphrodite, the genital pore opening between the suckers, and with the reproductive organs situated around the bifurcation of the alimentary canal. The branched water-vascular system opens at the caudal extremity.

The ova are ovate, sometimes almost oval. The length is from $\frac{1}{13}$ to $\frac{1}{16}$ mm., and the breadth from $\frac{1}{20}$ to $\frac{1}{17}$ mm. They are of an amber colour, sometimes pigmented, with an external testa and operculum at the broader extremity.

Distoma Hepaticum (Perniciosum).

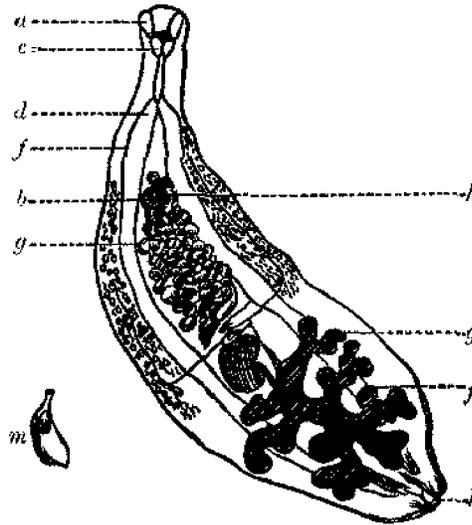


FIG. 2.

The length is from 8 to 11 mm. and the breadth from 3 to 5 mm. The *Distoma Hepaticum* is thus seen to be somewhat longer than the *Distoma Pulmonale*, while the breadth is slightly less. The general outline is that of an ellipse, but towards the oral extremity it becomes narrower and is slightly curved upon itself, so as to present a convex surface on one side and a concave surface on the other. The oral extremity narrows down very much more than does that of the *Distoma Pulmonale*. The parasite is flattened in the dorso-ventral diameter, so a transverse section presents an ellipse. The oral sucker is surrounded by cilia, and the oviducts are deeply pigmented. Omitting minor differences, the general description given of the viscera of the *Distoma Pulmonale* will answer for this.

The ova are of a reddish-brown colour and frequently deeply pigmented; ovate in form, with an operculum at one extremity. The length is from $\frac{1}{16}$ to $\frac{1}{20}$ mm. and the breadth from $\frac{1}{18}$ to $\frac{1}{26}$ mm. The ova are thus about one-fourth of the size of the ova of *Distoma Pulmonale*.

From this description and also from the woodcuts the *Distoma Pulmonale* (Fig. 1) and *Distoma Hepaticum* (Fig. 2) are seen to be of different species, both differing from the *Fasciola Hepatica* (LINN), well known in Europe as the cause of "sheep rot."

Professor BÆLZ calls the parasite (Fig. 2) *Distoma Perniciosum*, and that represented in Fig. 3 *Distoma Innocuum*. They are undoubtedly of different species. His chief reason for calling the one pernicious and the other innocent is that the first was found in a patient who died of disease of the liver, the liver being much enlarged and disorganised, while the other was taken from a patient who died of lung disease while the liver presented but little enlargement. But whether a parasite that adheres to the mucous surface of the ducts of so important an organ as the liver, and burrows in its substance, can be called innocent admits of grave doubt. [Compare with the *Distoma Sinense* of MCCONNELL and MACGREGOR, which appears to be identical with this second form of BÆLZ.] Further, the distomata found in the subject who died in Kiyoto of lung disease were of the straight species (*innocuum*), and in this case the liver was enlarged and, as I was informed, somewhat diseased.

Distoma Hepaticum (sc. Innocuum).

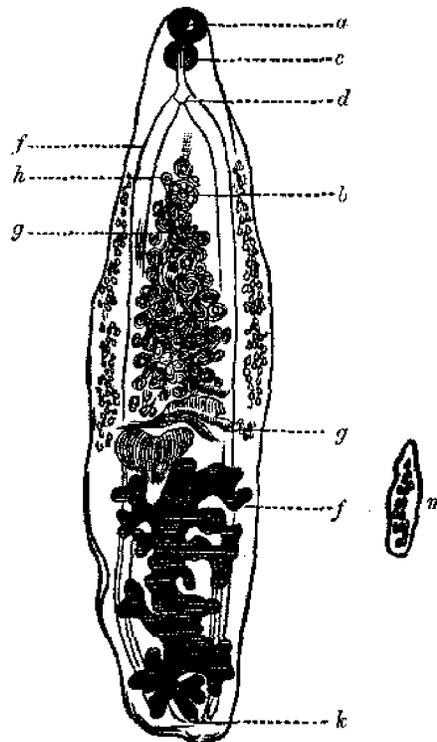


FIG. 3.

The length of the *Distoma Hepaticum Innocuum* (Fig. 3) was in some cases 20 mm. It is longer than the *Distoma Perniciosum*, and is straight. The mouth and oral extremity differ somewhat from the former, and the oviducts are not pigmented. The ova also are larger than the ova of *Distoma Perniciosum*, being from $\frac{1}{10}$ to $\frac{1}{8}$ mm. long and from $\frac{1}{15}$ to $\frac{1}{10}$ mm. broad, yet somewhat smaller than the ova of the *Distoma Pulmonale*.

The regions in which *Distomata Hepatica* abound appear to be fruitful in different species of distoma.

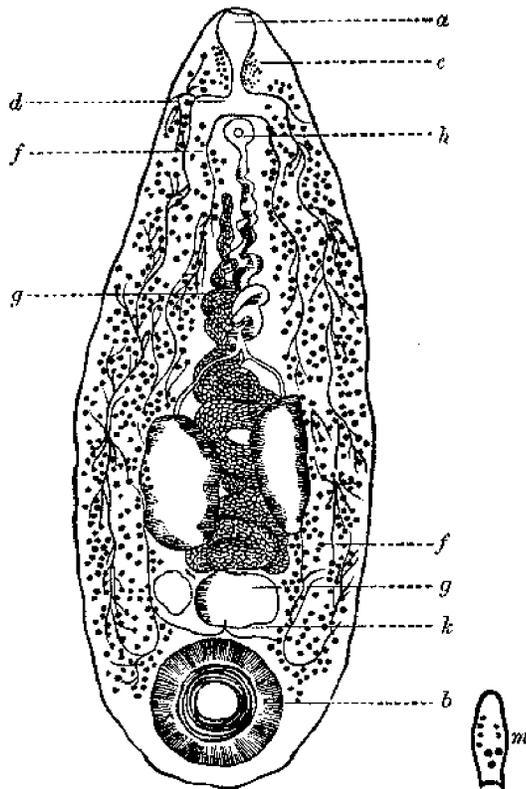


FIG. 4.

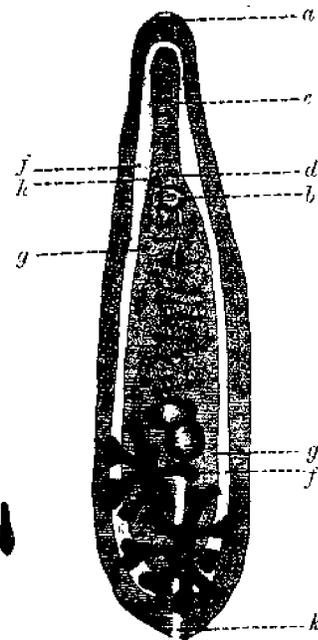


FIG. 5.

Fig. 4 represents a distoma found infesting the stomach of cattle. It is about 17 long and about 5 mm. broad. In the fresh state the colour is a reddish-brown, but after 1 in alcohol for a time it becomes pale yellow. Many cattle die from its ravages.

Fig. 5 represents a distoma that infests the liver of cats. It is about 10 mm. l The distress it produces is very much greater than that caused by the corresponding part in man. The course of the disease is more rapid, death occurring in from 60 to 100 days, the fatality is greater.

For the sake of uniformity, the lettering in all the cuts corresponds:—

- a. Anterior sucker, within which is the mouth.
- b. Ventral sucker. In Fig. 4 this becomes the caudal sucker.
- c. Pharynx and oesophagus.
- d. Bifurcation of alimentary canal.
- f. Alimentary canal.
- g. Generative system.
- h. Genital pore.
- k. Mouth of water-vascular system.
- m. Natural size of distoma.

Illustrations of the ova of the *Distoma Pulmonale* were given by Dr. MANSON in *Customs Medical Reports*, vol. xx, page 10. The ova of the other distomata being essentially like these, differing principally in size and pigmentation, it is not necessary to give illustrations of them here.

APPENDIX.

SPRUE.

Translated and edited from the Dutch of Dr. C. L. VAN DER BURG.*

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- 7.—GREINER, *Aphthæ tropicæ*, in *Geneeskundig Tijdschrift voor Nederlandsch-Indië*, Part vi; New Series, Part i, p. 315.
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* *Indische Spruw* (Aphthæ tropicæ). Batavia: ERNST & Co., 1880. A work which obtained a prize offered by the Society for the Advancement of Medical Science in Netherlands India (Vereeniging tot bevordering der geneeskundige Wetenschappen in Nederlandsch-Indië), and was published by the society.

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13.—C. SWAVING, *Eene bijdrage tot de studie der Oost-Indische geneesmiddelen uit het plantenrijk*, in *Tijdschrift voor Geneeskunde*, 1864, p. 424.

14.—A. NORMAND, *Mémoire sur la Diarrhée de Cochîn-chine*, in *Archives de Médecine navale*. Janvier, Février 1877, pp. 35, 102.

[To these should now be added :—

MANSON, *Notes on Sprue*. Chinese Customs Medical Reports, xix, 33.

FAYRER, *Tropical Dysentery and Chronic Diarrhoea*, etc. London : CHURCHILL, 1881, pp. 133 seq.]

CHAPTER I.

INTRODUCTORY.

It may safely be asserted that there are but few diseases about which so much is said and so little published as about Indian Sprue. The Society for the Advancement of Medical Science in Netherlands India has, however, recently proposed it as the subject of a competition.

The bibliography given above is, as far as I can make out, complete. There may be one or two other works on Sprue in existence, but if so, I have been unable to find them in any of the libraries which I have had an opportunity of searching. Be this as it may, it is at least certain that the subject has never been adequately treated, and therefore the action of the Society in propounding it for discussion is fully justified.

Except in BOSCH's short treatise and in SCHORRENBERG's articles, little of value is to be found. QUARIN WILLEMIEK's description need not be taken into separate consideration, as it is mostly made up of quotations from BOSCH. GREINER's observations give the most minute account of the disease. HASPER devotes but one solitary chapter to it, and indeed hardly enters into any particulars. Sir RANALD MARTIN's account only serves to point out the resemblance which Sprue bears to other affections. JOHNSON's and CHISHOLM's essays, though more descriptive, do not fully satisfy our expectations. As for WAITZ, he confounds Indian Sprue with common Mouth Sprue. SWAVING merely makes one or two remarks off-hand, while Mrs. VAN GENT concerns herself solely with receipts and prescriptions. The reports of the meetings of the Society for the Advancement of Medical Science in Netherlands India contain nothing but brief remarks, which can be regarded only as aphorisms.

But what about DOZIJ's *Medical Guide*? Perhaps nothing could be less accurate than the statements which he makes, as follows :—

This disease should not be confounded with the Sprue that often fastens on the mouths of children, covering the tongue, palate, gums and lips with white specks and a creamy coat. *Indian Sprue is generally accompanied by dysentery*. Its wont is to begin by inflammation of the stomach, whence it rises to the mouth. *Small, transparent vesicles, not bigger than the head of a pin, make their appearance on the tip and edges of the tongue, and steadily increase in number until they cover the tongue, palate and inside of the lips. Then they burst, the tongue loses its soft and delicate coat and becomes red and irritated. The symptoms go from bad to worse, diarrhoea makes its appearance, and the patient grows thin, pale, and progressively weaker. The skin becomes dry, and finally death snatches away its victim. Very often the only means of escape lies in a voyage to Europe, and this should not be postponed if treatment be not at once successful. The treatment is the same as that suitable for Chronic Dysentery, to which the reader is referred.*

On the previous page DOZIJ states that he has found *tambara maridja* (*Brucea Sumatrana*) of great service "in cases of Sprue," and he recommends the same drug in "some kinds of Chronic Dysentery, where the stools, though containing no blood, are yellow, pultaceous and frothy, and where there is neither fever nor pain."

The italics in the above citation are my own. I bring Dozij's description forward in this introductory chapter in order to dispose of it once for all. A mere glance suffices to show how little truth there is in it, while where the author is right he is so in the wrong place. His remarks on Chronic Dysentery amount to the same thing as his remarks on Sprue, though he expressly adds the words "especially when Sprue complicates the case." I need not dwell on this.

Even in ordinary life Indian Sprue is much spoken of. People constantly tell of numbers of their acquaintances, chiefly females, who are suffering from it or from something like it. We shall presently see that the disease is not so common as is imagined, for the name is readily applied to any affection of the mouth, ulceration of the gums, abrasions of the tongue caused by decayed teeth, slight stomatitis, epithelial and syphilitic ulcers in the throat; in short, to any disease that may attack the mouth. I have even heard it invoked to explain a red nose. In all such cases it will be found that the patients are so wedded to their home-manufactured medicine that the physician must take account of the fact, and it will often be prudent for him to admit the diagnosis which is so readily made. It is certainly better to countenance conversation about Sprue even when nothing of the kind is present, and to prescribe according to the indications of the case, than to allow ignorant bunglers to permit the real disease to become aggravated during the administration of mere "Sprue medicines."

Although it is tolerably difficult to recognise Indian Sprue at the very beginning of an attack, its characteristic features declare themselves so clearly at a later period that no one who has had any experience of the disease can fail to diagnose it. It is because it is not distinctly indicated at first that the term *seriawan*, by which it is known, is so grossly misapplied, and that the women who sell Sprue medicines can turn it to such profitable account.

CHAPTER II.

NOMENCLATURE.

It would be next to impossible to assign with any certainty the origin of the names of many diseases. Several of those in use are inaccurate, but we need not care about this if only we can get at the things denoted. In the Malay tongue spoken in Batavia, Indian Sprue is commonly called *seriawan*, but the same term is applied to other diseases also. H. VON DE WALL, in his Dutch-Malay dictionary for the use of physicians, does not give the word *sprue*. P. P. ROORDA VAN EYSINGA and W. A. P. ROORDA VAN EYSINGA write *sariawan*. In the heading of receipts that have come before me I find *serijawan* and *sereawan*. Mrs. VAN GENT DETELLE gives *sriawan* and *srieawan*. As I cannot lay claim to a profound knowledge of Malay, I dare not decide which among these modes of spelling is the best. Mr. D. GERTH VAN WIJK, Professor of Malay at the Gymnasium Willem III, however, kindly informs me that the Malay word is *seriawan*, *serijawan* or *sriawan*, or in the Java dialect *srijawan*. Non-Dutch European settlers use the Dutch word *spruw*. That the name Indian Sprue is applied to the disease is probably to be explained by the fact that the mouth affection bears some resemblance to the Mouth Sprue which is encountered among children all over the world, and to that apthous eruption which appears on the mucous membrane of the mouth in the last stage of chronic wasting diseases.

QUARIN WILLEMIER describes the disease as follows:—

A peculiar inflammation characterised by the occurrence of congestions and eruptions on the intestinal mucous membrane and extending sometimes from the mouth to the anus.

This conception of the disease led him to give it the name *aphthæo-gastro-enteritis tropica*. Starting, probably, from the same point, another writer has suggested *gastro-enteritis aphthosa indica*. BOSCH, who entertains the opinion that there is indubitably a chronic inflammation of the mucous membrane both of the digestive and respiratory tracts, approves the term *phlegmasia membranae mucosae gastro-pulmonalis*, "although," he adds, "every particular form under which Indian Sprue may appear is not therein expressed." QUARIN WILLEMIER adds the word *indica* to BOSCH's term, which he accepts, while offering as a substitute *aphthoides indica chronica*. This latter is, I take it, more exact, because the termination *-oides* expresses only a resemblance, because the disease is proper to India and is always chronic, and, finally, because the presence of inflammation is not asserted. In the title of his book BOSCH mentions *aphthæ orientales*, but when designating a tropical disease the latter adjective is not so suitable as *indica*. WARTZ uses the term "Tropical Sprue," which leaves nothing to be desired.

After the denomination "Indian Sprue," which is a short and satisfactory name of general acceptation, the most accurate seems to me to be "chronic catarrh of the gastro-intestinal tract with atrophy of the mucous membrane." This at least conveys an idea of the symptoms, although I consider it unnecessary to go beyond the term which I have chosen as my title, and which is sufficiently comprehensive—Indian Sprue.

CHAPTER III.

GENERAL DESCRIPTION.

Indian Sprue is an endemic disease encountered in hot countries. It is found in the Dutch West Indies as well as here in Netherlands India, and the circumstantial account given by MARTIN of a case occurring in the person of a colonel in the British Indian army shows that under another name it is known in India. There it is called "white flux," and the "hill trot" or "hill diarrhœa" bears a great resemblance to acute Tropical Sprue.

According to Dr. C. H. LA LAU, who edited BOSCH's treatise, JOHNSON's essay on *Morbid Sensibility of the Stomach and Bowels* shows considerable familiarity with Indian Sprue. CHISHOLM, too, gives a description of the disease. From information supplied to the Society for the Advancement of Medical Science in Netherlands India by its correspondent Dr. F. J. VAN LEENT, it is evident that the Diarrhœe de Cochinchine described by Dr. NORMAND of the French navy is in its essential symptoms very like *Aphthæ tropicæ*.

If STILLMANN is to be believed, a similar form of diarrhœa exists in California.*

BOSCH states that he found Indian Sprue more prevalent at Padang in Sumatra than anywhere else in India, but my personal experience of 19 years, spent chiefly in Batavia, has not led me to acquiesce in this opinion. I find nothing to justify it either in my own observation of patients coming from Sumatra or in the information I have received from that place. It is probable that local circumstances have changed there, which is likely enough to have happened in the course of 30 or 40 years. It is true that I have found the disease most prevalent in places where there is great humidity, and this is the condition of Padang. Residence in the Preanger districts (Java) predisposes strongly to Indian Sprue among women, and especially among children.

As far as I know, it does not originate in Europe. It is met with only among people who have lived long in India, or who while suffering from it have left India to seek relief in the temperate zone. It is true that even in Europe an affection of the tongue is observed, chiefly among women, which closely resembles that of the first stage of *Aphthæ tropicæ*, namely, small red specks, engorged papillæ, chiefly

* MARTIN, l. c., p. 702.

at the tip and along the edges, which cause acute pain. But in Europe the red surface is shed, while nothing of the kind occurs in Indian Sprue.*

Indian Sprue is never epidemic. Although "hill diarrhœa" has been known to affect a great number of soldiers at once, owing to the influence of cold morning air, and to have often become chronic, exhibiting the symptoms of Indian Sprue even after the patients had returned to the plains or to Europe, yet, as has been justly observed, such cases had been sent to the hill districts in a sickly condition or exhausted by malarial disease, and thus the observations recorded relate to persons who were under anomalous conditions.†

Indian Sprue is always protopathic: it never appears as a consequence of another disease. It does not, however, necessarily follow that it cannot co-exist with other diseases in one and the same person. It may, indeed, attack those who have already some constitutional affection, and, on the other hand, sufferers from Sprue are liable to all the diseases enumerated in the indexes to works on pathology.

It is always of passive character. Its symptoms are chronic, not acute. It is not contagious. Its progress is always slow, but from time to time the condition is found to have become more hopeless. It is not unusual to find patients dragging along for years. As a general rule it follows a remittent course, but in a few exceptional instances it is truly intermittent. In these latter the intermissions are irregular, and are not seldom due to temporary residence in a mild or cold climate.

Recovery is not at all impossible, and frequently occurs; but those who have recovered are extremely prone to relapse, especially if, having got over the disease in a temperate climate, they return to a hot country.

Death, chiefly from exhaustion, is observed, but not commonly. In many cases the sufferers, undermined and worn out by Indian Sprue, perish by some other disease.

As to the nature of Indian Sprue, I have arrived at the following conclusions. The disease usually begins as a consequence of suppressed skin action, and expulsion of the blood from the superficial vessels. Hence arise hepatic congestion and modification of bile secretion. There is first an excess of bile poured into the intestine, producing stools which sometimes seem to consist of that alone. But very soon, even within the space of a few hours, things take quite a different turn. The secretion diminishes, and the stools become pale, pungent and irritating.

So far, it must be remembered, there is nothing indicating Indian Sprue. The disturbance may be taken simply for a bilious diarrhœa. I do not enumerate the events just described among the symptoms of Indian Sprue, because they do not belong to the disease itself. It is only after these bile-lacking stools have persisted for a considerable time, and have determined an intestinal catarrh, in which the stomach shares, that we may think of Indian Sprue. It is not yet apparent why about this time the tongue exhibits red specks, and the inside of the mouth and nose assumes the condition described as proper to the second and third periods. There is certainly a very superficial inflammation of the intestinal mucous membrane, but it is never in the least acute, and gives rise only to passive symptoms. I put out of consideration any violent inflammatory or ulcerative process, because should either present itself we have no longer to do with Indian Sprue only.

During the further course of the disease hepatic derangement invariably persists and grows worse. This is made manifest by the two facts that the liver continuously, though very slowly, contracts, and that bile is altogether absent from the stools. The change in the liver must, however, be of a character totally different from that of the lesions in many other affections of this gland. There is no jaundice, except, at most, about the beginning of the first period, when a slight tinting of the lowest part of the conjunctiva, namely, the conjunctival sac of the lower eyelid may be observed. The urine does not contain any bile elements, nor are the stools characteristic of any of the conditions under which the constituents of the bile are retained.

* C. CANSTATT, *Bijzondere Ziekte- en- Geneezingsleer*. 2nd ed., by Dr. J. H. DUSSEAU. Utrecht and Amsterdam, 1857. 3rd Part, p. 26.

† *Indian Annals of Medical Science*, vol. i. A. GRANT'S Memoir on *Hill Diarrhœa and Dysentery*.

Anæmia, which is always present, must not be regarded as a consequence of Indian Sprue. The disease, however, makes it more profound. I shall return to this point.

That Tropical Sprue is a disease *sui generis* is beyond doubt. Attentive consideration of the symptoms as a whole overthrows any objections that can be set up against this proposition; and I emphasise this statement because I have heard the question asked whether we have not to do with a simple gastro-intestinal catarrh or with Follicular Dysentery.

The combination of symptoms declaring themselves in the mouth, intestinal tract and liver furnishes the key to the diagnosis of Indian Sprue.

CHAPTER IV.

MORBID ANATOMY.

It is, as I have already remarked, but rarely that death from Tropical Sprue is observed here, and more rarely still is it possible to obtain an autopsy, because the victims of the disease are for the most part found in private practice. Many physicians after residing here for several years are obliged to confess that they have never had an opportunity of examining the lesions. There is therefore but little to be said about the morbid anatomy of Indian Sprue. When a patient dies in consequence of complications, such as Follicular Dysentery, which is not an uncommon event, the condition of the intestines cannot be taken into account. Moreover, the morbid changes produced by intestinal catarrh are usually but little developed.

The changes observed during life in the mouth and throat are limited to redness and atrophy of the mucous membrane. During the first period this redness is punctiform. Some of the fungiform papillæ, chiefly at the edge of the tongue, are seen to be of a deep red colour, but there is no swelling. During the second and third periods the tongue presents very much the same appearance as in the affection described by WUNDERLICH under the name of *Glossitis dissecans*, wherein the surface is divided by deep furrows into several lobes. NIEMEYER regards many of these apparent clefts as mere wrinkles of the mucous membrane, analogous to the creases of the skin on old people's faces.* Atrophy of the liver is invariable during the later stages. The gland loses its deep colour, but the blood-vessels remain patent. Occasionally, when shrinkage has occurred, the appearances are those of cirrhosis.

The dead body always shows signs of profound anæmia. The heart is soft and flabby, the omentum thin and shrivelled, translucent, bloodless and containing but little fat. The spleen is sometimes enlarged and soft, at others small and hard, but in most cases it has no very deep colour. LOEBELL has announced as the result of his microscopical investigations that there is a general atrophy involving the mucous membrane of the entire intestinal tract, and that when recovery takes place there is no reproduction of the mucous membrane, but merely formation of a thin epithelium.

NORMAND found in the stools of patients suffering from Diarrhée de Cochinchine thousands of male and female worms (*Rhabditis stercoralis*) measuring 1 mm. in length. CRISHOLM describes exudations of lymph occurring usually throughout the entire intestinal tract and bearing some resemblance to minute granules. This is probably a more advanced stage of that process which declares itself by red specks on the tongue.

WAITZ thus reports the autopsies on two children who suffered from "Sprue diarrhœa":—

I designate the disease by this name because the two autopsies that I performed showed that both children died from the same cause, and had been attacked by Sprue in the lower part of the intestine without any trace of the disease appearing in the mouth.

These words do not throw much light on the matter.

When ulceration of the intestines is found, the case is not one of simple Tropical Sprue.

* NIEMEYER, *Lehrbuch der speciellen Pathologie und Therapie*, 8te Aufl., i, 480.

CHAPTER V.

ETIOLOGY.

Indian Sprue is a climatic disease, but it forms no part of the process of acclimatisation. Although we here rarely encounter diseases which are not also found in other countries, there are affections peculiar to certain climates, of which bubonic plague, Indian Sprue and others are examples. Many works have been written to show the influence of tropical climates on European settlers, among which the following may be consulted with reference to Netherlands India :—

HEYMERING, *Opmerkingen over acclimatisatie*. Batavia: Government Press, 1846.

SWAVING, WAITZ and DE STURLER in *Tijdschrift voor Nederlandsch-Indië*, 5th, 7th, 8th and 10th years.

JUNGHUHN, in *Indisch Magazijn*, First Series.

SWAVING, HEIJMANN and BOSCH, in *Natuur- en Geneeskundig Archief voor Nederlandsch-Indië*, 1st and 3rd years.

SWAVING, in *Indisch Archief*, Part i.

Many other sources of information might be mentioned, but I would draw special attention to the notes appended to BOSCH's treatise on Dysentery.

The process of acclimatisation is accompanied by symptoms which may be briefly enumerated. They are—palpitation; variable frequency of the heart's action, which increases towards the middle of the day; dilation of the superficial veins, chiefly about the head, varices, hæmorrhoids; hepatic obstruction; thirst; irregularity of the bowels, hepatic congestion; violent perspiration, prickly heat, boils, frequently ringworm, pigmentary deposits in the skin; congestion of the reproductive organs, sexual excitement, hypersecretion of smegma in the case of males, and in the female leucorrhœa and increased catamenial flow; drowsiness, which at first is invincible; impairment of memory, which is sometimes permanent.

Indian Sprue, however, as I have said, does not form part of the acclimatising process. New arrivals rarely if ever contract it. It is less prevalent among natives and Chinese than among Europeans, but it does not follow that through being born here Creoles and coloured people enjoy any greater immunity. The difference of race does not completely account for the fact that Europeans are more subject to Indian Sprue than are the coloured races—Malays, Javanese, Sundanese, Papuans, negroes, Arabs and Chinese. Inasmuch as Chinese are oftener attacked than are races of a deeper hue, we are led to surmise that some other cause is at work; and as a matter of fact the mode of living has much to do with it. The diet of the dark races is totally different from that of the white, in which latter I for this purpose include Mongolians as well as Caucasians. The dark races live on very simple food—rice, dried fish, and vegetables cooked in water. Their drink is water or weak coffee or tea. On the contrary, the white races enjoy a much more delicate and complex dietary, including many kinds of preserves and pickles, some of which have spoiled by keeping. Physique and mode of training are totally different in the two classes, and it is a fact, which I am not here called upon to explain, that the dark races possess a greater power of resisting the fatal influences of the climate.

What I have said about the comparative liability of Europeans and natives applies only to adults. I will consider the case of children when we come to the symptoms.

Among 203 cases enumerated in the summary reports of the Netherlands India Medical Service, I find 171 Europeans and 32 natives; but the value of these statistics will be discussed in the chapter on Prognosis.

Generally speaking, patients are found to have reached middle life, but the extremes of age are not exempt. Persons in the higher ranks of life—that is to say, rich people—are more prone to attack than poor people; the weak are more liable than the strong, and females are more liable than males. Pregnancy appears to be a predisposing cause, though the symptoms are not very violent in pregnant women. According to BOSCH, 8 out of 10 pregnant women at Padang present the symptoms of the disease, but for the most part recover after delivery.

Usually the primary causes of Indian Sprue are identical with those of gastro-intestinal catarrh. It is well known that Europeans in hot climates live under conditions favourable to the production of that catarrh. Acute cases with violent inflammatory symptoms are not very rare, while the gradual establishment of catarrh and its passive evolution is quite common. Nor is this to be wondered at, inasmuch as the hepatic circulation is usually disturbed in Europeans who reside long here, and although violent liver derangements are not a necessary consequence, congestions are of frequent occurrence. There is good reason to assert that no European can remain here for years without perhaps some disturbance, however slight, of his constitution, or certainly without disturbance of at least his hepatic function.

The course of events is generally as follows. Soon after a man's arrival the liver becomes more active and the secretion of bile is increased. Later on the secretion is diminished, and it would seem as though a like series of events attended blood formation. Such modifications of the natural condition, along with altered function of the lungs, and the operation of miasmata, are in WASSINK'S opinion the chief agents in producing all the tropical internal diseases, both endemic and epidemic. This opinion I fully share. Every practitioner knows that intestinal catarrh is a constant accompaniment of disturbed hepatic circulation. Any obstruction in the course of the portal blood must necessarily cause dilation and over-filling of the mesenteric veins, and, secondarily, intestinal catarrh. Now, since the modifications in the discharge of the hepatic functions, and the various abdominal symptoms presented by residents in hot climates, lead to the conclusion that the portal circulation is being carried on with difficulty, or, in other words, since we often encounter symptoms due to what was formerly called "superabundance of blood in the abdomen," we ought not to wonder if intestinal catarrh presents itself in the course of the most common diseases. This occurs even in temperate climates, but here it is still more frequent. It is true that in cooler climates diseases of the respiratory organs may throw difficulties in the way of the portal circulation, but here we need take no account of such causes, for, with the exception of Tuberculosis, grave pulmonary affections are most unusual. On the other hand, cardiac, and especially valvular, diseases are very common, as instantly appears from the summary reports, incomplete as they are. These cardiac diseases enter into the list of causes of intestinal hyperæmia, with consequent catarrh and a condition of the mucous membrane that may be described as cyanotic. The upshot of all this is that in hot climates the mucous covering of the intestines is more liable to serious affections than in cold climates, and consequently is more obnoxious to disease.

In Netherlands India rheumatic affections and colds are common, and are to be explained by the great and sudden changes of temperature. Information as to the meteorological phenomena observed here may be obtained from many sources. The following may be enumerated:—

Natuur- en Geneeskundig Archief voor Nederlandsch-Indië; *Natuurkundig Tijdschrift*; *Geneeskundig Tijdschrift* (the topographical descriptions). Also various publications of the Bataviaasch Genootschap van Kunsten en Wetenschappen, and many others. PRÆGER (*Indische studien*, p. 18) gives a description of the Indian climate, which ought to be carefully read. Professor VETH'S *Java*, which, however, is by no means up to date, contains some remarks on the climate, but the author did not avail himself of the *Observations made at the Magnetical and Meteorological Observatory at Batavia*. Published by order of the Government of Netherlands India. Made under the direction of Dr. P. A. BERGSMAN. The first part of this work, comprising five years' observations, was published in 1871; the second and third parts appeared in 1878. In the first section of the third part Dr. BERGSMAN reviews the observations for 10 years (1866-75).

BERGSMAN'S ponderous quarto, with its voluminous statements, tables and graphic charts, is not likely to attract many readers; but as it gives much information of value to scientific medicine, a few extracts may fitly find place here, dealing with the meteorology of Batavia for the last 10 years.

I.—There is comparatively little barometric variation. The average reading is 758.62 mm., or, reduced to the sea level, 759.40 mm. The minute oscillations noted need not be reproduced, as they possess no value for medical purposes.

II.—The temperature observations are of more importance. The mean for 10 years was 25°.84 C.; maximum, 33°.7 (1 P.M., 6th September 1875); minimum, 19°.4 (6 A.M., 3rd July 1875). The highest mean for an entire day was

27°.92 (19th October 1868). The lowest mean for an entire day was 22°.57 (18th July 1874). The maximum range of the thermometer for the whole period was 14°.3, while the maximum difference between the highest and lowest daily averages—that is, between the hottest day and the coldest—amounted to only 5°.35.

The hottest months are April, May, June, August, September, October and November, during which the thermometer commonly registers higher than the mean for the year. The cooler months, or those during which the readings are below the annual mean, are January, February, March, July and December.

In general, the W.S.W., W. and W.N.W. winds, which prevail in December, January and February, lower the temperature, while during the east winds, which blow from May to October, the heat is increased.

At full moon the weather is usually somewhat hotter.

With reference to diurnal changes, the temperature is above the mean for a period of from 10½ to 11 hours. The minimum occurs between 5 and 6 A.M., about 15' before sunrise, the precise moment varying with the month. The maximum diurnal range was 11°.2 (13th August 1870 and 3rd July 1875); the minimum was 1°.3 (14th February 1868 and 3rd June 1869). As a rule, the diurnal range is least in February and greatest in August.

Hence, taking into consideration what is said further on about the influence of temperature changes, it is clear why the westerly monsoon is less disagreeable in its effects than the easterly.

If now we divide the day into four parts, we get the following results:—

- A. *From sunrise to noon.*—Highest readings in October and November. Lowest in January and February.
- B. *From noon to sunset.*—Highest readings in May, August and September. Lowest in January and February.
- C. *From sunset to midnight.*—Highest readings in April, May and September. Lowest in December, January and February.
- D. *From midnight to sunrise.*—Highest readings in July and August. Lowest in April and May.

It must not, however, be forgotten when considering these observations, that they are taken from a standard thermometer protected as completely as possible from the influence of radiation, wind, damp, etc. But man, as a living and moving being, is subjected to all the contingencies from which the thermometer is guarded. The conditions which surround and affect him are therefore altogether different. He is constantly running about, exposed to sun, wind and rain, evaporation is going on from the surface of his body, and so on. The variations of temperature to which he is exposed are therefore much wider than those noted here.

III.—Saturation of the atmosphere being represented by 1,000, the mean humidity was 838. The maximum, 882, was observed in February; the minimum, 790, in August. The maximum annual range was 679; upon an average, however, the range does not exceed 341. From January to May, and during August and September, the period of greatest humidity is 6 A.M. Note in this connexion what is said further on about British India. The maximum humidity attends westerly winds, the minimum N.N.E. winds. The humidity decreases regularly as the prevailing winds pass from W. through N. to N.N.E. There is a secondary maximum point when E.S.E. is reached, and a secondary minimum at S., as the wind passes from N.N.E. through S. to W.

IV.—The elastic force of vapour is on an average 20.62 mm. of mercury. The maximum, observed in April, was 21.40 mm.; the minimum, in August, was 19.47 mm. Diurnally there are minima at 6 and 11 A.M. and maxima at 9 or 10 A.M. and 6, 7 or 8 P.M.

V.—The average annual rainfall is 1,928 mm. The maximum (1872) amounted to 2,501 mm.; the minimum (1868) was 1,377 mm. These figures are confirmed by the more precise statistics given in the *Natuurkundig Tijdschrift voor Nederlandsch-Indië*, Part xxxviii, p. 235, where, moreover, it is noticed that rainfall is very unevenly distributed over the year. It is most abundant in January and least in August. In June and October there are two secondary maxima, and in May and November two secondary minima. Half the annual rainfall occurs in December, January and February.

Other meteorological phenomena observed here are hardly worthy of notice. We hear thunder from 67 to 77 times a year, mostly in November, least in June.*

Such being the meteorological conditions, we have also, when considering the liability to colds and rheumatism, to bear in mind the increased sensitiveness of the skin in tropical climates, the care devoted to keeping it clean, the lightness of the clothing worn, the excessive sweat and the great rapidity of its evaporation, this rapidity being increased by motion in the open air during the heat of the day under a

* The Meteorological Observatory at Batavia is situated in latitude 6° 11' S. and longitude 7h. 7' 19" E. of Greenwich. The instruments are 7 m. above sea level.

scorching sun, or sometimes in a drying wind. So rapid is the evaporation that it is not uncommon to find small crystals deposited like coarse dust on the surface of the skin, and thus exercise in the sun is frequently the antecedent of colds and rheumatic affections. All that has here been said applies more forcibly to Europeans than to natives and coloured people. The skin of the former is much more sensitive to changes in humidity and temperature than is that of the latter, which to the touch is always cool and very slightly moist.

Taking all the surrounding conditions into consideration, there is nothing surprising in the fact that gastro-intestinal catarrh is prevalent. An attack may be brought on by exposing oneself to the open air during early morning or late in the evening. Diarrhœa thus acquired presents, generally speaking, peculiar light coloured stools consisting of fœcal matter deficient in bile. The lack of bile is due to hepatic congestion, which is in turn the effect of cold and damp acting on the skin capillaries while relaxed by the high atmospheric temperature. In British India, and especially in mountainous regions, particular attention is paid to the avoidance of exposure during the morning * cold and moisture, and military exercises and movements are prohibited at this time.

The use of alcohol does not appear to predispose to Sprue. Females, though less addicted to alcohol than are men, are indeed the chief sufferers from the disease. And the fact that Sprue is rarely found in the military hospitals, but almost exclusively in civil practice, points to the same conclusion. For as regards the abuse of alcohol, I must reluctantly admit that private soldiers are far greater offenders than are civilians or officers.

BOSCH includes among the causes of Indian Sprue an excessive consumption of potatoes, which he repeatedly asserts are often dug before they are mature. Since he wrote his book the use of potatoes has largely increased, without any corresponding increase in the prevalence of Sprue. As it is hardly possible to believe that any greater care is paid to the potato harvest now than in Bosch's days, this suggested cause may be left out of consideration.

My experience does not warrant my raising the question whether the absence of customary skin eruptions or the suppression of existing eruptions should be reckoned among the causes of Sprue. BOSCH takes the affirmative view. Theoretically it may certainly be admitted that severe congestive dermatoses may, when suppressed or driven back, lead to hyperæmia of the digestive canal and other viscera.

The greater liability of women than of men I attribute to the greater sensitiveness of the female organism and to the periodical pelvic congestion. The indoor life led by women renders them peculiarly obnoxious to atmospheric influences, and some would assert that their sedentary occupations are predisposing causes. For my own part I do not find that European mothers of families in India lead a sedentary life, and most European females become mothers at the average age. Of course there are exceptions, but as a general rule the multifarious occupations of an "Indo-European" household keep them bustling about all day long.

Dr. C. SWAVING ranks anæmia among the conditions predisposing to Aphthæ tropicæ, but in this case everybody should be predisposed, for anæmia is the lot of all.

Local irritation, produced by very hot or very cold beverages or by exceedingly stimulating food, such as *roetjak* (unripe and, above all, very sour fruit, mixed with Spanish pepper and sugar) or *tjabe* (*capsicum*), is probably a cause. So also is prolonged constipation, with fœcal decomposition and excessive evolution of gas, which, distending the ascending and transverse colon, exerts pressure on the liver, and gives rise to so much pain that some hepatic affection is suspected.

All the causes above enumerated would account for gastro-intestinal catarrh, but they cast little light on the special symptoms of Indian Sprue, and notably on the condition of the mouth, tongue and throat. Happily we cannot nowadays attribute these troubles to the abuse of mercurials, and particularly of calomel, which latter used even to be employed as a family medicine without any prescription. BOSCH

* A. GRANT, in *Indian Annals of Medical Science*, vol. i.

cites this abuse among the causes of Indian Sprue, and I myself have had occasion in one or two cases to confirm the truth of his observation, when patients have informed me that they had been treated, or rather ill-treated, with calomel for bowel derangements. On the other hand, the many instances of treatment of syphilis by mercurials, though not by calomel, have to be remembered, in which Indian Sprue did not occur.

Hence the only cause that can be stated in explanation of *Aphthæ tropicæ*, and which is not at the same time fit to explain any of the forms of gastro-intestinal catarrh, is some particular influence of hot climates upon persons predisposed to the disease.

GREINER,* from the observation of an isolated case, does not hesitate to admit a hereditary predisposition transmitted through the mother. I feel safe in asserting that here there was no more than chance coincidence. I have never encountered a similar instance. Malaria cannot, it appears, be justly incriminated.

One case of fully developed Indian Sprue which occurred in my own practice is worth mentioning. It followed the protracted administration of potash lye mingled with other drugs unknown, the mixture being intended to promote the catamenial flow.

If I have treated the Etiology of Sprue at great length, I have done so in conformity with the axiom "*Rerum cognoscere causas, medicis imprimis necessarium, sine quo nec morbum curare nec præcavere potest.*" I deeply regret that I have been unable to bring forward more positive information.

CHAPTER VI.

SYMPTOMS AND COMPLICATIONS.

SYMPTOMS.

It is very convenient, especially with a view to treatment, to divide the course of Indian Sprue into distinct periods. It must not, however, be thought that these periods are definite as regards time. The symptoms of the second period may have fully evolved themselves within a month, or, on the other hand, patients may for many years exhibit only the symptoms proper to the first period.

There are three distinct stages, though it is not easy to determine exactly the point where one passes into the next. The first is characterised by gastro-intestinal catarrh, which is often unaccompanied by any other indication of the disease. The second is the most distinct, and during it the affection assumes its special features. The third is the *dénouement* and is, relatively speaking, but rarely observed.

FIRST STAGE.

Slowly evolving Gastro-intestinal Catarrh, manifesting itself by Irregularity of the Bowels and sometimes by Vomiting; ravenous Appetite; general Malaise; slight affection of the Mouth.—Here, just as at the outset of many other diseases, the first indication is a general and indefinable malaise. Soon, however, symptoms arise pointing to trouble in the digestive organs. At first complaint is made of epigastric pressure and fulness, an uneasiness which increases after eating. Although the sufferer is conscious of this effect of eating, he generally cannot refrain from satisfying his hunger, which at times is intense. It occasionally, but rarely, happens that appetite temporarily deserts him. Distinct pain in the stomach is uncommon.

The epigastrium is somewhat swollen, and as this stage advances the tumefaction may become considerable, so as to raise the soft parts into the form of a tense tumour. The contour of the abdominal region varies greatly from time to time, so that clothes which fit well in the morning cannot be got to meet at night. Percussion shows that the distension is caused by accumulation of gas, whereof large quantities are expelled by eructation. Along with these escapes of gas it often happens that

* *Geneeskundig Tijdschrift voor Nederlandsch-Indië*, Part vi, p. 320.

portions of the liquid contents of the stomach are brought up, causing a burning sensation in the œsophagus and pharynx, and an acrid, sour or rancid taste in the mouth. This symptom is most highly marked a few hours after the ingestion of alcohol; during the morning, for instance, after indulgence the night before in brandy or any similar liquor. The relief afforded by eructation is almost counter-balanced by the burning sensation produced in the throat. Patients have, however, fancied that the wider they opened their mouths and the more violently they expelled the gas the more relief they experienced. A vague, gnawing pain beneath the right shoulder-blade, more intense close to the spinal column, which is often experienced, disappears after the expulsion of gas from the stomach. The escape of gas is favoured by swallowing iced water, which by its coldness induces muscular contraction in the stomach walls, and by lying down and frequently changing the position of the body. The swollen epigastrium is not very sensitive to pressure, but although pressure does not produce intense pain, it causes, when continued, a sense of oppression, which, by the way, is readily provoked.

Vomiting is not a constant symptom, but in some cases occurs occasionally. It is sometimes periodic, making its appearance about 9 or 11 A.M., but more commonly towards noon. With persons who are accustomed to sleep at this time it occurs as soon as they rise. So, after dining at 12.30 P.M. and lying down until 3.30 or 4 P.M., a patient can at once tell whether or not a fit of vomiting is about to come on. The premonitory symptom is slight frontal oppression, usually on one side, followed by a pricking sensation in the throat, which is generally referred to the right tonsil. Thereupon the contents of the stomach are violently ejected, in the shape of undigested food mingled with viscid mucus. FRERICHS asserts that this mucus approaches gum in its chemical composition, and is derived from the carbohydrates of the food.*

Sarcinæ ventriculi were not present in any of my cases.

Sometimes the act of vomiting is merely accompanied by a strange, indescribable but very unpleasant taste, but usually the vomited matters themselves possess a sour taste. These variations may alternate irregularly in the same patient. The sourness is often so overpowering that persistent movements of deglutition are provoked and a vast quantity of extremely tenacious saliva is poured out. If any of this saliva or even a little water is swallowed, straining to vomit recommences, while spasm of the glottis with urgent dyspnoea and a whoop resembling that of pertussis follow the passage of the smallest quantity of the vomited matters into the larynx. It should be remarked that the act of vomiting is performed without difficulty and produces marked relief. It is but seldom that vomiting occurs at other periods of the day.

Catarrh attacking the mouth is rarely observed. The tongue retains its normal appearance, and in but a few cases is it covered with a yellowish glossy coat. Even when this occurs the entire surface is not always affected. Sometimes one half, generally the left, remains free, but when the coating is more extensive it is bounded by small cherry-red specks. As the disease advances careful examination reveals along the edges and at the point, and even protruding through the coating, injected papillæ clavatæ, which are not prominent on other parts of the mucous membrane. Complaint is made of sensitiveness along the borders of the tongue, and this sensitiveness is proportional to the number of specks. I have never observed the swelling of the papillæ at the root, which some claim as a symptom. REICHE asserts that he has seen hypertrophy of the basal papillæ, and even ulceration, but LOEBELL and LUOFTMANS explain this apparent hypertrophy by atrophy of the mucous membrane, which latter symptom I have myself observed at a more advanced period of the disease.

The more remote parts of the digestive tract now share in the disturbance. The bowels act irregularly, constipation alternating with diarrhœa. On one occasion the fæces will be perfectly natural in appearance, but next day, or perhaps after only a few hours, a thin or watery light-yellow stool will

* NIEMEYER, l. c., 549.

be passed containing undigested or half-digested food. Nothing can exceed the irregularity observed in this respect.

The urinary secretion varies within wide limits. It is generally more or less concentrated, according as the stools are more or less liquid, but up to the present there is no clearly established relation between a certain condition of the urine and intestinal catarrh.*

There is nothing to be noted as regards the respiratory and circulatory systems.

The skin is usually normal, but it ceases to secrete for hours at a time when the stomach disturbance is considerable.

As a rule patients look well. There is, however, a yellow discoloration of the lower part of the conjunctiva. Fever is totally absent. When the first stage is prolonged there is some shrinking of the liver, to which I will return when describing the second stage. Terrifying dreams and nightmare are frequent.

SECOND STAGE.

In this stage, as in the preceding one, nearly all the symptoms are indistinguishable from those presented by chronic gastro-intestinal catarrh, the characteristic red specks on the tongue forming the only exception. Still the second stage presents us with a more precise image of Indian Sprue.

The peculiarity of this stage is that all the gastro-intestinal symptoms are intensified, that characteristic lesions are discovered in the cavity of the mouth, while emaciation may begin, anæmia may declare itself and the area of liver dulness may diminish.

The epigastric region presents the same vaulted appearance, but to a greater extent. The stomach may be felt and seen like a distended bladder, and a certain degree of pyloric sensitiveness can be made out. Accumulations of gas in the stomach, which before were intermittent, now become constant. While appetite for certain kinds of food, generally solid, is preserved, other kinds excite so much disgust that merely thinking of them induces vomiting. The same thing is observed in the case of odours, but in neither instance is it possible to say beforehand what will be relished or the reverse. All depends on individual peculiarity. As a general rule, however, pungent dishes and alcoholic beverages are avoided, on account of the pain they produce in the mouth and the increased gaseous accumulation and diarrhœa they occasion. The eructations sometimes smell of sulphuretted hydrogen. Vomiting is a regular consequent on the swallowing of food, occurring some hours after each meal, and being preceded by uneasiness and anxiety, due to the epigastric tension and pressure, with consequent oppression. As soon as the stomach is emptied hunger re-asserts itself, with slight pain. There is commonly a craving for coffee, and patients like to drink it hot. The decoction of coffee made here is stronger than that usually drunk in Europe, and is mixed with hot milk. It is well borne, and not only seems to afford relief, but has no unfavourable after effect on the stomach. An hour or so after drinking coffee there is generally slight abdominal pain, followed by a stool. Smoking, although always painful to the mouth, relieves in some cases, but in others, where the use of tobacco was formerly habitual, it produces discomfort.

The condition of the tongue is now so fully characteristic that whoever has once seen it can never mistake its significance as a symptom, although when observed for the first time it might perhaps be easily mistaken for the before-mentioned Glossitis dissecans. Red specks cover the whole surface of the organ, and become confluent, nothing remaining of that mouldy coating of the first stage. The roughness of the papillæ disappears, so that when the tongue is protruded it resembles the normal tongue only in its shape, and presents a smooth, glossy, red mass resembling raw meat except for the smoothness of its surface. The epithelium and papillæ seem to have altogether disappeared, and sometimes fissures are present. But these I will describe under the next stage. The under surface bears the same resemblance to raw meat as the upper, but a bluish tinge pervades its redness. The mouth is parched, the tongue dry to the touch,

* NIEMEYER, l. c., 551.

though glossy. Occasionally small but very sensitive vesicles appear along the edges and at the tip, but present no specific characters. These are common aphthous patches occurring in persons suffering from *Aphthæ tropicæ*.

The depth of the redness of the tongue is a sure indication of the general condition at this period. Should the patient from any cause become worse, the tongue deepens in redness and its sensitiveness is increased, while to any temporary improvement corresponds a diminution of the redness and sensitiveness. The gums, palate, pharynx and œsophagus share in this coloration. It should be remembered that always after taking food or drink, especially if hot, the redness is increased. To prevent mistakes, one should therefore, before judging of the tongue's condition, inquire whether the patient has recently swallowed anything. The unnatural smoothness of the mucous membrane gives rise to a greasy taste in the mouth, which is more than merely unpleasant, as the taste is often rancid. When the patient is asleep the tongue often becomes adherent to the lining membrane of the mouth.

At this period the functions of the bowels become more and more disturbed. The stools are frequent and preceded by intestinal rumblings, which also occur independent of dejections. These latter vary in appearance. They sometimes contain old, hard, fecal masses, dark grey or even black in colour, mixed with a quantity of liquid matter. At other times they are more uniformly pultaceous, and whitish grey. Much wind escapes with them, filling them with bubbles, and so forcibly expelled as to produce a peculiar vibratory sound. The solid masses just mentioned are old accumulations in the sacculi of the colon, and alternate irregularly in the same patient with the grey pultaceous discharge of which the stools mainly consist.

Percussion now usually demonstrates diminution in the size of the liver. Even during inspiratory descent of the diaphragm it does not reach the costal border. The shrinking process proceeds and may go to great lengths. Diminution in the area of hepatic dulness is not here due to distension of the colon, for when there is temporarily less gas in the bowel the border of the liver can sometimes be felt, though with difficulty, behind the ribs. The gland, moreover, is not displaced upwards, and, finally, shrinking has been proved by postmortem examination.—(MARTIN).

The urinary secretion is diminished in quantity, probably on account of increased loss of fluid by the bowel. It is deep red, highly charged with uric acid, and deposits on standing a brick-red sediment of urates. Albumen is sometimes found, but the microscope does not reveal any casts. A remarkable circumstance is the frequent occurrence of albumen in the urine of anæmic patients. The urine is more abundant and clearer on days when the stools are less frequent. In both sexes there is irritability of the external meatus, and herpes preputialis is sometimes observed in males.

There is no disturbance of the respiratory or circulatory apparatus. The pulse occasionally is slow.

The catamenia are generally regular but profuse, thus adding to the exhaustion.

The dryness of the skin, which during the first stage was intermittent, is now nearly constant. Perspiration is almost absent, and the patients, missing the refreshing sensation due to evaporation from the surface, crave for cold baths.

Patients do not generally look ill except at moments of exacerbation; their faces do not betray their condition, as is the case in so many abdominal affections. There may be profound anæmia, which, however, in females especially, does not preclude a considerable degree of *embonpoint*. But if it suddenly happens that many pultaceous stools follow one another in rapid succession, the face assumes for some days a pale and haggard appearance, and presents a peculiar transparent greenish hue.

The muscles lose their sharp outlines and become soft and weak. The least bodily exertion causes great and disproportionate fatigue, even when judged by the standard of tropical climates. From time to time the voice becomes hoarse or hollow.

Mentally, there is much depression, bordering on melancholia. A curious satisfaction is derived from dwelling on the symptoms, studying their smallest details, and making them the constant subject of conversation. Enforced idleness, both mental and physical, accounts for all this, which renders intercourse

with sufferers by no means pleasant. Patients are discontented, and rude and irritable in manner. Mental causes exert a great influence on the progress of the disease. Fear and anger are especially hurtful, their effects being chiefly manifested by increased vomiting and diarrhoea. As any slight mistake in diet, after perhaps temporary improvement, brings on a relapse, complaint is made that the treatment prescribed does no good. Sometimes a patient under these circumstances refuses further treatment and abandons ordinary prudence, only, however, to seek advice again after a few days, generally from another physician or from some native or Eurasian quack.

Months and even years may thus pass by, the patient dragging out a life rendered miserable chiefly by the antiperistaltic action of his stomach.

Some sufferers think that they observe a reciprocal variation in the condition of the mouth and of the intestinal tract. MARTIN mentions this. For my own part I see no reason to believe in anything of the kind, and I fancy that the facts have been misinterpreted, and that the alternation may be simply explained. There are remarkable variations in the course of the disease in the same patient, corresponding to the more or less faithful adherence to strict diet. Patients are prone to become remiss upon the smallest sign of improvement, but before the consequent aggravation of the intestinal symptoms has had time to declare itself, the mouth exhibits signals of distress. A little later the mouth begins to improve, while the intestinal symptoms follow their course.

Recovery from this second stage frequently occurs.

THIRD STAGE.

Carelessness in the matter of diet is the main cause of the disease passing on into the final stage, which, happily, is not often observed.

Wasting progresses steadily; whatever is swallowed, even cold water, induces vomiting, gas continually rumbles in the intestines, the stools become more and more liquid, fever makes its appearance, and death by exhaustion ensues. This affords a general view of the disease in its third stage. I will now describe the symptoms more minutely, following the order observed when considering the preceding periods.

The epigastric region becomes exquisitely sensitive to pressure, but there is no spontaneously arising pain. Appetite almost disappears, and nothing is borne except thin farinaceous preparations or soaked bread crumb. Anything else produces severe oppression, followed by vomiting. There is continual burning pain along the œsophagus, in the mouth and even in the nose, which is intensified whenever the pungent, stinking gas secreted in the stomach is expelled. The tongue, cavity of the mouth, pharynx and interior of the nose are fiery red. The epithelial layer of the mucous membrane has totally disappeared, leaving a glazed surface without any tumefaction. The gums retract, and the roof of the mouth, especially immediately behind the incisors, becomes sore. The tongue is sometimes divided into lobules by what are apparently deep fissures running at right angles to a median longitudinal fissure. These fissures are merely superficial, and show no tendency to ulceration, not even when food is allowed to accumulate in them. REICHER, however, asserts that he has seen ulceration (*ante*, p. 12). The edge of the tongue is often the seat of small but extremely sensitive clefts.

The secretion of saliva seems to be diminished; at least patients never cease complaining that their mouths are parched. Some relief is afforded by allowing ice to dissolve in the mouth, without, however, swallowing it. The greasy taste complained of during the second stage has now disappeared.

Intestinal movements may be observed through the abdominal walls. The stools, which are generally passed early in the morning, are liquid, profuse, of varying colour but generally like much-watered milk, sometimes grey or yellow. I have occasionally seen them black when there was nothing in the ingesta to account for it. The quantity evacuated is almost incredible, reaching one-half or three-quarters of a bucketful in one night. The odour is fetid or musty, not rarely fishy, as is well indicated by the Malay term *amies*.

The anus is red and sensitive. The area of liver dulness becomes, if possible, less, and the deranged condition of the urinary secretion observed in the preceding stages is aggravated.

Respiration is laboured, as though the mere contact of atmospheric air had become a source of irritation. There is a dry cough, and patients complain of roughness in the air passages, of stitches in the side and throughout the chest, and occasionally of dyspnoea. The pulse is hard, small and irregular in rhythm and volume. Its frequency increases, varying between 120 and 140 beats per minute.

Subjectively there is a sensation of cold due to anæmia, and occasionally accompanied by deafness, and formication in the lower extremities. Objectively there is a rise of temperature, especially at night, to 38°.5 or 39°, reaching a yet higher point as death approaches. It must, however, be remembered that the natural bodily temperature is not an invariable quantity. DAVIL has observed temperatures ranging in health from 35°.8 to 38°.9, and I myself know of a man whose temperature is continuously 38°.3. Moreover, the thermometers used for clinical purposes are, unfortunately, not always reliable. This much I think it right to say as a caution against attaching too much importance to temperature records.

The catamenia, usually after a period of irregularity, are completely suppressed.

The skin is colourless, opaque, wrinkled, and sticky to the touch. Its former harshness has given place to profuse moisture, ill-smelling, and most abundant at night. These colliquative sweats are important factors in the progressive exhaustion. The face now betrays the gravity of the condition. It is shrunken, and strikingly exhibits the so-called abdominal furrows along the alæ of the nose and round the corners of the mouth. The complexion is grey or dirty yellow, the eyes have lost their brilliancy, and slight conjunctivitis is not uncommon.

All the muscles are flabby, but, as is common towards the close of all severe diseases, they are very irritable. Movement without assistance is impossible, so that the patients are bedridden. The voice is harsh, hoarse or inaudible.

Thus sufferers present in this stage much the same general symptoms as are presented at the close of many other chronic exhausting diseases. They are less easily excited to anger than in the preceding period, bodily weakness no doubt helping to effect this change. Up to the last moment they hope for recovery.

The foregoing description offers a picture, as accurate as possible, of typical Indian Sprue in adults. But the reader cannot fail to have observed how frequently the words "sometimes," "occasionally," "generally," recur, showing that the disease presents many variations in detail. The cardinal point, however, is that the physician in India should always suspect the imminence of Indian Sprue when red specks appear on the tongue simultaneously with symptoms of gastric or intestinal catarrh. In such a case he will derive valuable information from the condition of the lower surface of the tongue. There may be no vomiting, the lower part of the intestinal tract being alone involved. Shrinking of the liver may be concealed by pre-existing hypertrophic processes. The symptoms of the first and second stages may be intermingled, and some may be absent, for, with a view to perspicuity, the stages are more sharply defined in my description than they always are at the bedside. I set, however, the greatest value on shrinking of the liver and concomitant affection of the mouth as distinctly marking off Indian Sprue from other gastro-intestinal catarrhs.

When recovery takes place, the liver remains shrunken, and the probability of relapse is proportional to the degree of hepatic diminution. The organism accommodates itself in time to the abnormal condition of the liver, just as in chronic phthisis it accommodates itself to a diminished respiratory surface, but in both cases alike a *locus minoris resistentiæ* is established. An instance from my own practice sufficiently proves that under favourable circumstances a considerable diminution of the liver bulk may be tolerated.

A Creole lady was seen in the third stage of Indian Sprue, when the liver had become so much reduced in size that dulness on percussion extended only 2 centimetres in the mammillary line. She got rid of her more urgent symptoms, remained here during 4½ years, then went to Europe, where she stayed for 2 years in the enjoyment of

fair health. On her return to Java, however, the disease reappeared in a severe form a few days after she landed, and proved rapidly fatal.

Pregnancy and lactation are predisposing causes, and hindrances to recovery. I have never been able to satisfy myself that the disease in the mother affects the fœtus. On the contrary, from among many similar instances I recall one where the mother died of Indian Sprue two weeks after delivery, no other complication having occurred, yet the infant, suckled by a wet-nurse, did admirably. To complete what I have to say on this part of the subject, I should notice that when recovery takes place, amelioration of the symptoms always progresses with extreme slowness.

COMPLICATIONS AND DIFFERENTIAL DIAGNOSIS.

Under this head I shall consider only such affections as influence the course and symptoms of the disease, and, naturally, among these all other affections of the digestive tract take the first place. What I shall say of them will, however, be confined to those symptoms which are important for diagnostic purposes, and incidentally the differential diagnosis will be discussed.

Stomatitis.—This is easily recognised. In adults there is not, at all events at first, any bowel disturbance. The secretion of saliva is largely increased; a lichenoid eruption comes out on the lips; fever is present; moreover, the redness does not assume the form of specks, but is more diffused and more frequently accompanied by swelling and pronounced inflammatory symptoms.

*Stomatitis, with Caries of the Maxillæ.**—This caries, which chiefly attacks the upper jaw, is frequently found as a consequence of the habit of filing the teeth. It occurs also in coloured people, and is easily recognised.

Aphthæ oris.—This affection is known in Dutch as *Mondspruw*; in French as *muguet, millet, blanchet, stomatite, aphthes*; in German as *Soor, Schwämmchen, Mundschwämmchen, Kahn, Mehlhund*; in English as *thrush or sprew* (the latter obsolete); in Swedish as *Torsk*. It is only in Dutch, Malay and Javanese that the same word is used to designate both Aphthæ oris and Indian Sprue. In Malay thrush is also called *goeam*, but this term is oftener applied to diphtheria, and is used in Sumatra as equivalent to gingivitis.

Mr. VON FABER, Chinese interpreter at Batavia, has had the kindness to supply me with the following note:—

Sprue when attacking children is called 舌苔, *shé-t'ai*, in Chinese books. In the Fukien dialect this is pronounced *sial t'ai*, literally "tongue moss" or "tongue froth." In Fukien colloquial the disease is called *peh kô 'tiam*† or "white musty or frothy specks." To catch sprue is expressed by *tj'oei k'i peh kô 'tiam*, or, shortly, *tj'oei k'i peh kô* or *tj'oei k'i kô*. *Tj'oei* signifies "mouth," *k'i* "to arise" and *kô* "mouldiness" or "froth."

Chinese physicians recognise two forms, which, however, are not distinguished by different names. One is marked by dry specks or dots of a yellowish white colour, and is attributed to feverish conditions of the infant or its nurse; the other is evidenced by white specks, with a profuse fluid secretion, and is attributed to errors of diet on the part of the nurse. Neither form threatens life, at least in infants. The first form is graver than the second, and may affect adults, in whom it may prove dangerous.

I do not know what treatment is adopted by physicians. The household remedy is to cleanse the infant's mouth with a linen rag dipped in water in which rice has been half cooked, and to which sesamum oil is added.

The Hakkas call Aphthæ oris *ngó-k'eeuw-kaam*,‡ literally "goose beak's pimple or wart."

* See on this subject, VETH, *Java, geographisch, ethnologisch, historisch*. Haarlem: BOHN, 1875, Part i, p. 609; also MEYER, in *Mittheilungen der anthropologischen Gesellschaft in Wien*, Bd. iv, "Einige Bemerkungen," u.s.w.; and Bd. vii, "Notizen über das Feilen der Zähne bei den Völkern des ostindischen Archipels."

† [The characters corresponding to the sounds given in the text are no doubt 白疙點, *pai-ko-tien*; 嘴起白疙點, *tsui-ch'i-pai-ko-tien*.]

‡ [No doubt 鷄口關, *o-k'ou-kang*. Chinese medical writers give 疔, *kan*, as the *kuan-hua* term for Aphthæ oris. To contract the disease is expressed by 發疔, *fa-kan*, or 生疔, *sheng-kan*.]

CANSTATT'S and RICHTER'S pathological treatises should be consulted for full information on the subject of Aphthæ oris. In the adult the affection mostly occurs in the course of very chronic diseases, for instance, in the last stage of pulmonary pithisis, and in all diseases and conditions attended with *anæmia*, such as scorbutus, chronic abdominal affections, dropsies, diabetes, extensive ulcerations, and in the marasmus of old age. In syphilitic cases care must be taken not to confound Aphthæ oris with specific or mercurial affections of the mouth. In Chlorosis aphthæ are also observed, but they do not begin as specks,—rather as a diffused redness, accompanying, perhaps, a coated tongue, and dotted with minute vesicles, either solitary or in groups, which when they burst leave ulcers with sharply defined edges and often a yellowish-white surface. Much tenacious ill-smelling secretion gathers in the mouth, and is expelled by constant spitting. The breath is sour and the superficial cervical glands often become prominent. *Oidium albicans*, which is probably the same as *Oidium lactis*, and is found in the mouth in cases of Aphthæ, is absent in Indian Sprue. The distinction between this affection and the typical local lesions of Indian Sprue is therefore clear.

Stomatitis mercurialis can hardly give rise to any mistake.

The *tongue affection in women* mentioned in Chapter III (p. 58) puts on the appearance observed during the first stage of Indian Sprue, but it is not accompanied by any gastro-intestinal disturbance. It is worthy of remark that MÖLLER* found *Bothrioccephalus latus* in five out of six females who presented the tongue lesion described.

Anæmic ulceration of tongue and palate is identical in character with that accompanying Chlorosis.

Scorbutic, croupous and diphtheritic inflammations of the mouth and throat require no particular description. Their characteristics are even better defined than are those of Syphilis.

Glossitis is easily distinguished by the swelling and other inflammatory symptoms which attend it.

Glossitis dissecans, when far advanced, might, it is true, cause an erroneous diagnosis, were it not for the absence of the other unmistakable symptoms of Indian Sprue. But, in fact, in ordinary life here every mouth affection is regarded as indicative of Sprue. It has even happened to me to have a case of Epithelioma submitted to me as one of Indian Sprue.

A few words are necessary to draw attention to the effects of chewing betel on the mouth. To this habit coloured people are addicted. The mucous membrane is reddened, the tongue is stripped and glazed, and other similar alterations are brought about which sometimes resemble those produced by Sprue. The blackening of the teeth cannot be relied on as a distinctive mark, but the excoriation of the lips, which sometimes extends all round the opening of the mouth, should set the physician on the right track.

Among diseases of the œsophagus, *Œsophagitis alone* might be mistaken for Indian Sprue, but the history and symptoms cannot fail to remove any difficulty.

There are many gastric and intestinal affections which may accompany Indian Sprue and obscure the diagnosis. I will speak only of the more important. If such diseases are primary, even though they may have reached a somewhat advanced stage, Indian Sprue may by a process of exclusion be dismissed from the diagnosis. If there be no mouth trouble and no shrinking of the liver, then there is no question of Aphthæ tropicæ. On the other hand, diminution of the liver may be present as the result of a past attack of Indian Sprue, and it may thus complicate the diagnosis of other diseases. *Dilatation of the Stomach* to a greater or less extent, due to the atony which characterises the disease, is generally present in cases of Sprue. *Acute Gastritis* has clearly defined symptoms of its own. The violent vomiting of Indian Sprue might, if we were unacquainted with the other elements in the history of the disease, raise the suspicion of an acute stomach inflammation. *Chronic Gastritis* in the form of catarrh is of course present in Tropical Sprue. *Perforating Ulcer* may accompany the disease, but pain and hæmorrhage will betray it. We shall in this case be prompted to look carefully for other symptoms of *Cancer*.

* *Deutsche Klinik*, 1851, No. 16.

The history will clear up cases of *Vomiting of pregnancy* when unattended by other symptoms of Sprue, and the same process of diagnosis by exclusion will shut out other forms of *Nervous Vomiting*.

Diseases of the intestinal canal are frequent complications, and as for the most part they are attended by catarrh, it is sometimes difficult to come to a conclusion about them when the mouth affection is likewise present. Intestinal catarrh is a necessary concomitant of Indian Sprue, and therefore it is only by careful search that we shall get at complicating conditions. When, as sometimes happens, one is called to see a patient for the first time during a violent aggravation of the ordinary symptoms of Indian Sprue, when vomiting and purging are excessive, it is not always easy to distinguish between this condition and the onset of *Cholera*. It might also happen that we should overlook the beginning of cholera in patients whom we know to be affected with Sprue. A case has occurred to me in which the diagnosis was impossible for 12 hours, but generally the condition of the skin is a sufficient guide. It is during the second stage of Sprue that doubt is most likely to arise, but at this period the secretion of sweat has already greatly diminished, whereas it is profuse in cases of *Cholera*.

Lumbrici may be present in the first and second stages, not in the third. They do not lead to any complication, and santonine is well borne. *Tania* occurs, but is rare. I found it once, but as I did not venture to attack it by the usual treatment, I cannot say whether sufferers from Sprue could bear that treatment. I imagine not, inasmuch as the decoction of fresh pomegranate-root bark determines vomiting even in healthy people. The extract might be tried, but it would be risky.

Lientery, *Meteorism*, *Flatulency* present themselves as symptoms, but when occurring by themselves can cause no mistake. *Ulceration of the bowel* independent of dysentery I have never observed in the course of Sprue. If it did occur, the history, the localised pain and the course pursued by the affection would speedily clear up any doubt.

Dysentery is an occasional complication. As in itself it is much more menacing to the patient's life, it is important to recognise it without delay. BLEEKER's minute and accurate description indicates the distinction between Dysentery and Indian Sprue:—

Dysentery is an exudative process . . . it is characterised by localisation of the exudative process chiefly between the mucous and muscular coats of the colon and rectum.*

This is not the place to describe Dysentery. We may, however, contrast the account given of the stools in *Aphthæ tropicæ* with that of dysenteric stools as given by BLEEKER. The latter, he says, consist, in the first stage, of mucus, sometimes blood-streaked; in the second stage they consist of blood or of a red or chocolate coloured fluid; in the third stage they contain exudation flakes; and in the fourth they consist of plastic mucus and normal fæces. To this I would add that exudation masses may be expelled before the third period. In the case of Indian Sprue, blood and exudation masses are not found, and mucus is rare. Hence if any of these be present, it is a sign that Dysentery has arisen as a complication. On the other hand, the cavity of the mouth may be attacked by *Aphthæ* during the course of chronic Dysentery, which may cause confusion in the inexperienced. Many experienced physicians regard Sprue as *Follicular Dysentery*. For a long time I myself believed that besides the form described in the preceding pages there was a second form that might be described as *Follicular Dysentery*. But more accurate observations have modified my first opinion, and when considering Sprue I now rigorously exclude all ulcerative intestinal affections. It would be beyond the purpose in hand were I to describe *Follicular Dysentery*. The term itself contains a description. Suffice it to say that the presence of blood and flakes of exudation matter in the stools shows the nature of the case.

Hæmorrhoids occur in most cases of Indian Sprue, but, as is well known, most people in tropical countries suffer more or less from them. Their cause is sometimes obscure, but obviously lies in some

* BLEEKER, *De Dysenterie van een pathologisch-anatomisch en practisch standpunt beschouwd*. Batavia: LANGE & Co., 1849, p. 1.

disturbance of the circulation. There is no danger of hæmorrhoids and Sprue being taken one for the other, nor does their concurrence give rise to any difficulty, as the presence of the tumours may always be ascertained, while bleeding from the lower bowel is not a symptom of Indian Sprue. Any catarrhal inflammation arising from piles shows its cause by the discharge of mucus.

A case related by MARTIN* shows that Sprue may be mistaken for *Bright's Disease*; but microscopic examination of the urine ought to make such an error impossible. I have found albumen in the urine, but never casts.

It is hardly credible, yet I have once seen a strongly marked case of Tropical Sprue in the last stage mistaken for *acute yellow Atrophy of the Liver*.

Anæmia.—A new-comer is invariably struck by the pallor of the residents. Formerly, in British India chiefly, this appearance was spoken of as "tropical pallor," but the term has fallen into disuse, and the condition is now recognised as a consequence of the anæmia common to all hot countries. Chronic anæmia, as is well known since HAYEM's classical researches, consists in an alteration of the red blood corpuscles, those oxygen-carriers which maintain the combustion which we call life. They diminish in size, bear an indistinct central depression, are elongated, and their contained hæmoglobin is lowered to one-half or even to one-eighth of the normal. Their number, although varying from day to day, is decreased. There is an increased and abnormal development of hæmatoblasts. The white corpuscles are apparently unchanged. No race, age or sex is proof against tropical anæmia. Its causes must be traced back chiefly to modifications in the functions of respiration and nutrition. The activity of the liver and skin is enhanced, and their increased secretions are alone sufficient to give rise to anæmia. It is seldom that infants are anæmic. As they advance into childhood they continue strong, but begin to lose colour. At a later period anæmia is sure to mark them down. Females, perhaps in consequence of their periodical losses of blood, are more prone to it than are males. Every intercurrent disease favours its further advance.

Europeans become sallow. The dark races exhibit a greenish tinge, and their skin loses its softness and brightness. These changes are most striking in the skin of the palms and soles. As the condition advances the lips and mucous membranes become pale, the eyelids assume a milky whiteness and the conjunctiva puts on a bluish tinge. A blowing murmur is audible in the carotids, probably of hæmic origin; the heart's action is violent; arterial pulsation is visible in the neck; the pulse, which at first is rapid, becomes full and slow. Respiration is superficial and laboured. Rhonchi are sometimes audible, and pulmonary œdema is observed. Headache, ringing in the ears, alarming palpitation, throbbing in the temples, add to the distress. Puffy swellings form, chiefly round the ankles and on the upper lids. The liver and spleen frequently remain unchanged, though the spleen sometimes swells. Fainting fits occur occasionally. The arterial system is relaxed, so that in case of operation many vessels require ligature. Menstruation is generally profuse, although amenorrhœa is likewise observed. Leucorrhœa is often present. Appetite diminishes or becomes depraved, or is totally lost, but there is intense thirst. The urine is scanty, deposits an abundant sediment and is often albuminous. Intestinal catarrh frequently occurs, and finally the sufferers fall into a condition of marasmus, waste, lose strength, acquire a dry cough, and complain of violent headache, shifting pains in the chest and abdomen, coldness of the extremities, and formication in the soles of the feet. The skin becomes dry and rough, and all secretion of sweat is arrested. Sensitiveness to external cold is extreme, the slightest decrease in the temperature bringing on fits of shivering.

Death is caused by serous effusion into the pleuræ, pericardium or under the arachnoid; more rarely by colliquative diarrhœa or fever.†

* L. c., p. 677.

† SULLIVAN, *The Endemic Diseases of Tropical Climates, with their Treatment*. London: CHURCHILL, 1877.

I have, I think, gone as fully as is necessary into the description and differential diagnosis of those diseases which in adults may complicate Indian Sprue or be confounded with it. In order to complete my account of the symptoms, it is only necessary to mention the modifications they undergo when the disease attacks children. WAITZ is the best authority on this subject, though he is too prone to confound "thrush" with *Aphthæ tropicæ*. It is true that in words he continually distinguishes them and warns his readers against confusing them; but this very confusion is manifest in the following sentence:—

There is no chronic disease in those countries (the tropical colonies) that I remember which is not often accompanied by Sprue as a complication; and, on the other hand, I can recall hardly any bowel affection which does not frequently derive its origin from Sprue.

In the first clause of this sentence the author speaks of Mouth Sprue, while in the second he refers to Indian Sprue. And in the same way he proceeds all through his work.

I have not encountered Indian Sprue in nurselings, but I have done so often enough in children from 1½ year to 4 years old. From the age of 4 to puberty I have not found a single case, although for the last nine years I have had hundreds of youths under my charge at the Gymnasium Willem III. The cases I have observed have occurred among the infants of Europeans or of persons in whose families for at least three or four generations there had been no admixture of native blood. I had one case in a Chinese child whose mother, Chinese, had been born here. But among native children I have never seen a case. Whenever the disease has occurred it ceased with weaning, and indeed improper feeding [while the infant was still at the breast] might often be incriminated. Among such errors of diet I count the giving of underdone rice sometimes with plantain, or sour milk and other hurtful things, which are administered surreptitiously. I have not seen a death among children, but I heard of a fatal issue in the case of a child whom I had treated for some months and who, against my advice, was afterwards taken to a mountainous district. WAITZ, however, reports 4 deaths in 12 cases.

The mouth symptoms are similar to those observed in adults. Careful observation will therefore prevent any confusion between Indian Sprue in infants and Mouth Sprue, with concomitant intestinal catarrh. A valuable diagnostic sign is that minute ulcerations are present in Mouth Sprue, while nothing of the kind is to be found in *Aphthæ tropicæ*.

Although the gastro-intestinal symptoms differ from those observed in adult life, it is not possible to ascribe them to simple catarrh. At the outset the stools are slimy, acid and yellow, becoming grass-green after exposure to the air and consequent changes in the colouring matter of the bile. Soon, however, bile pigments are no longer present, or are present only in minute quantity, while the evacuations become extremely irregular. Accumulated feces are occasionally discharged in the form of small hard, dark lumps mingled with watery stools. If the watery portion be allowed to stand, a brown or black sandy sediment is thrown down, which is a source of great anxiety to mothers, but seems to consist merely of fecal matter which has remained long in the bowel and has crumbled into powder. Drum-like tumefaction of the abdomen is frequent. I have satisfied myself that shrinkage of the liver occurs, but it is not easy to make out its exact degree. There is often mapping of veins on the abdominal wall. The little patients waste, but they do not present that indescribable appearance which is so often noticed in the course of intestinal catarrh. Dentition is arrested or seriously retarded. Vomiting may be present at first, but in children the stomach symptoms occupy rather the background. Appetite is generally good. Fever is never present except as an accident. Edema, mainly confined to the dorsum of the foot, is oftener present in children than in adults.

On one occasion I found Diarrhoea associated with mouth lesions closely similar to those of *Aphthæ tropicæ*; but the deep redness of the tongue and mucous membrane of the mouth had developed so quickly that I doubted the presence of the disease. I subsequently discovered the truth; the child had eaten some lime plaster.

CHAPTER VII.

PROGNOSIS.

Under faithful obedience to the rules of treatment, and especially of diet, the milder cases of Indian Sprue commonly end in recovery. The more violent forms have the same issue if (under certain restrictions) they are removed to a temperate climate. These statements, although true, are true only in a certain sense. The prognosis may be favourable as regards the question of life but must be doubtful as regards that of complete restoration to health. The difficulty lies in the great danger of relapse following the most trivial acts of imprudence at a time when recovery seems to have been long established. BOSCH is also of this opinion. Speaking of the third stage, he says:—

From my own experience I am, I think, justified in believing that if patients would submissively and scrupulously carry out the treatment, the disease would be cut short in the second stage. Unfortunately, after many days or weeks of assiduous attention, with but slight apparent benefit, ravenous appetite may suddenly appear and prove irresistible.

Relapse may occur even in Europe, but the chances of complete recovery are certainly greater there than they are here. If there be any noticeable diminution of the liver, permanent recovery can be hoped for only on the condition that a hot climate is never revisited. I know of no instance in which a patient returning to the East, even in apparently the most perfect health, escaped relapse when there had been previous diminution of the liver area. And this is the experience of all physicians. Patients who return from Europe, where they have generally been under the charge of someone who has practised in the tropics, invariably state that they have been recommended not to come, and charged to leave immediately on the occurrence of the least symptom of relapse. We thus arrive at this conclusion, that Tropical Sprue does not necessarily endanger life, and can almost certainly be cured if the required measures of diet, treatment [and residence] be sedulously observed. The disease is more menacing in children, although I have not myself witnessed a death. Recovery is the rule, and the disease once conquered does not appear to exert any far-reaching hurtful influence. So far as I can make out, adult patients have not suffered during childhood.

Statistics do not afford much information; nor, indeed, is such information as they give very reliable. For instance, in certain reports before me two recoveries are recorded from "mors violenta." The disease is, however, regularly entered in the returns of the civil medical service and in the Government reports. In the *Geneeskundig Tijdschrift voor Nederlandsch-Indië* the summary reports of the military and civil medical services from 1847 to 1878 are published. In these I find 1,204 admissions for Indian Sprue, with 162 deaths, or a mortality of 13.45 per cent. This certainly seems contrary to the favourable view I have taken of the prognosis; but these reports cannot be accepted without explanation. According to the regulations, the diagnosis must be entered on the register within two days of a patient's admission, and when once entered it is never altered. Thus a man who enters hospital with a dislocation of the thumb, and dies of cholera, appears on the register as a death from "dislocation." No doubt the postmortem records would reveal the true cause of death, but these are never consulted in the compilation of the reports. All, therefore, that can be concluded from the figures above given is that in the space of 32 years 1,204 patients were treated for Indian Sprue in the military hospitals and the so-called exterior service of the garrisons all over Netherlands India. In some of the reports patients seen outside the hospitals are also entered. During the five years 1856-60, 3,385 candidates for military service were rejected. Among these there was but one (a European) reported as suffering from (Indian?) Sprue. Most probably he was an officer.

In 1854 and 1855, 99 cases were treated, viz., of Europeans, 26 males 24 females and 28 children; and of natives, 8 males, 3 females and 10 children. There were 11 deaths, viz., 1 male native; and of Europeans, 2 males, 2 females and 6 children. But these figures are vitiated by the fact that among the

persons entitled to medical attendance, and who therefore appear on the register, adult males far exceed in number the females and children. The average annual death rate from Indian Sprue in the army during the 31 years 1848-78 was 1 in 3,989 of total strength; and, considering the Europeans apart, 1 in 2,359 of strength.

CHAPTER VIII.

TREATMENT.

To treat a case of Tropical Sprue is one of the most embarrassing duties that can fall to a physician. The result would be more satisfactory if patients would follow out the directions given them; but as carefully regulated diet is the main point, without which medicine, however necessary, is powerless, they quickly tire of the restrictions laid on them, and, if they are conscious of the slightest improvement, commit some indiscretion. They cannot be divested of the notion that a physician's duty is to write prescriptions, and that medicine must give relief, no matter what the lack of ordinary precautions. Before describing the medical treatment, I will enumerate some of the conditions most obviously essential to a successful result.

Habitation.—The dwelling should be dry and not draughty. Most of the houses occupied by Europeans are built on a plan originally suggested by MULTATULLI,* and which seems to be practically the best suited to the climate. I cannot here give a minute description of all that hygiene would demand in an Indian house, but one or two remarks will not be amiss. The best houses are those whose apartments, facing east and west, are exposed to the breeze and to the morning and evening sun. There should be no verandahs; at most small awnings may screen part of the windows. Here too little attention is paid to the need for free access of sunlight, though the proverb *ove non entra il sole entra il medico* finds ample justification. Dryness and ventilation are best secured by allowing the sun to shine into the house on both sides for two or three hours every day. A house situated as above described is easily protected against rain, and against westerly winds to which many people are sensitive, while the alternating sea and land breezes during day and night respectively, which have no disagreeable effect, may be allowed to blow through it when it happens to be built near the shore. I think it almost essential that covered passages should lead to the bathrooms and closets, which themselves ought to be separate from the main building. In general, the larger the open space round a dwelling the healthier it is.†

Habits.—During the early period of the disease ordinary duties may be performed, unless prevented by frequently recurring attacks of vomiting. Moderate driving or walking exercise in the open air during the cooler hours of the day should be recommended, special attention being paid to sufficiency of clothing and careful protection of the abdomen and feet from cold. The morning fog and dew are dangerous. A bath may be taken every day, until advancing weakness compels its abandonment. Baths are taken here in wooden or stone tubs and at a temperature of 26° or 27° C. The water is generally thrown over the body with a sort of big ladle, and thus used it lowers the temperature of the skin, but not that of the mouth. A full bath is sometimes taken. This seems to raise slightly and temporarily the mouth temperature. When, as sometimes happens, a feeling of epigastric oppression is experienced after a bath, it is well to wet the head and breast first, then receive a full douche on the stomach, and finally ladle water over the rest of the body. BOSCH very sensibly advises that the bath should be taken about noon, after which the patient should lie down in bed, have his limbs rubbed with dry flannel, and take a short sleep. This would secure increased skin action, but it is seldom done. Early in the disease the patient does not feel unwell enough to give up his business, and so takes his bath in the morning or at 5 or 6 in the evening as usual. BOSCH's advice suits women better than men, and is chiefly followed

* *Max Havelaar*. Amsterdam: DE RIJSTER, 1860. 2nd ed., Part II, p. 14.

† See also PRAXER, *Indische Studien*, p. 50.

by them. When the douche disagrees, full baths may be tried, the patient staying no longer than 5 or 10 minutes in the water. The siesta may be enjoyed, but as a general rule it should not exceed an hour. Cheerful surroundings are essential, as patients are almost always depressed.

Dress.—From the very first a flannel belt or some similar contrivance must be worn. For women, especially during pregnancy, the *goritas* as made here are excellent. They consist of two pieces of cotton cloth or flannel stitched together up the middle. The inner piece is left entire, while the outer is cut into strips, which can be tied so as to exert graduated pressure on different parts of the abdomen, according to need. For children I prefer the *oto*, which is an isosceles triangle of doubled cotton cloth, with its apex rounded inwards, so that it presents four corners, at each of which a strap is fastened. This pad is placed on the abdomen and chest, so that the concave top is brought just to the throat. The straps are then fastened round the neck and loins. Flannel clothing and a flannel belt should be insisted upon, especially for women, and for those who wear a sarong at night, as all Englishmen here do. People like to go about in nothing but a cotton dressing-gown and pyjamas, which do not afford the least protection against changes of temperature. The need for flannel becomes still more urgent as the disease advances. Stockings, too, are most important; not the openwork articles displaying the skin beneath, in which ladies delight, but serviceable stockings adapted to keeping the feet warm.

Change of Residence.—Removal to a mountainous district is hurtful rather than beneficial. Catarrhal diarrhoea becomes more severe, a result not due to the drinking of mountain water, as many suppose, but to carelessness about extra clothing in a colder region. My advice is therefore adverse to residence in the hills. I have seen a European lady suffering from a benign form of Indian Sprue who, by spending two days among the hills, developed all the most profoundly marked symptoms of the disease. I therefore recommend patients to seek open situations not more than 28 or 30 metres above sea level. After recovery, of course, a stay in the mountains, with the necessary precautions, will be advisable, in order to get rid of anæmia and to acquire strength.

Diet.—This claims the closest attention. Among articles of vegetable origin, those of a farinaceous character are well borne, and of these the best are such as are also mucilaginous. A little sugar, too, does not spoil them. The first place must be accorded to arrowroot, which here is generally prepared from the root of *M. indica*; sago (*Cycas circinalis*); rice, usually administered in diarrhoea, either as ordinary congee or as an infusion of the scorched grain (for which toast-water is often substituted); maizena; corn-flour; wheat meal; and other things of a like kind. I have more than once seen good effects follow the use of HARD'S farinaceous infant food and NESTLÉ'S *farine lactée*, and no doubt other similar preparations are equally valuable. When patients tire of the dishes ordinarily made from these materials, the flour may be roasted before use. Obi (*Batatas edulis*, sweet potato), well baked; stale bread, though it is difficult to find good bread here; biscuit, especially the "Samarang extra biscuit," Dutch biscuits or any of HUNTLEY & PALMER'S plain Reading biscuits, may be taken, as also rice cooked with or without chicken or pigeon.

Vegetables seldom agree, and especially the different kinds of cabbage, onions, salad and such like produce enormous distension with gas, and all its consequences. Some patients are particularly intolerant of purslane; it causes vomiting, and its undigested leaves are found in the vomited matters and in the stools. Carrots, scorzoneras and asparagus are relished and are wholesome, but peas, beans and haricots are hard of digestion on account of the quantity of cellulose in the pods and testæ. Pine-apples and acid fruits of the citron genus are to be avoided. Pickles, spices and such things as fresh sorrel do much harm.

With regard to animal food, it must first be observed that beef always disagrees. Broths and soups made with vegetables aggravate diarrhoea. Chicken and pigeon, lean mutton, veal, pork and ham, well minced smoked meat, and wild or tame water-fowl are relished and are unobjectionable. Too much salt must be avoided. Eggs are specially to be commended. Fish is in general hurtful, but dried fish roasted, scraped into powder and sprinkled on sago or rice forms an excellent addition to the food. Prawns, crabs

and oysters are suitable only to those persons with whom they do not disagree in health. There is a thin cake made here from prawns which is appetising and digestible. Milk increases the catarrh, and must be withheld until convalescence has been long established and no symptom whatever of the disease persists. Both tea and coffee should be avoided. Patients prefer coffee to tea, as it gives momentary relief. But the best drink is cold or iced water, or iced weak tea without milk or sugar. Wine and spirits must be prohibited. Now and then one solitary glass of beer seems to do no harm. Some patients like the various seltzer waters, while others cannot endure them. Experience must decide in each particular case.

All the above recommendations must be taken in a general sense. During the third stage and the exacerbations of the second nothing but farinaceous food should be thought of. It may sometimes seem expedient to endeavour to cut the disease short by instituting a severe diet from the very first; but such an attempt is seldom successful. Observers are not agreed as to the best way of distributing meals. Some think it advisable to eat sparingly and often, while others recommend an opposite course, with the object of securing a certain number of hours of repose to the digestive canal. But in practice it is not always possible to carry out a theory, and for my own part I have had to congratulate myself on the results of consulting each patient's own sensations.

Medicinal Treatment.—Under this head I shall have to consider the treatment adopted by European physicians, and that by means of native drugs, the difference between the two not, however, being always very distinct.

The first stage of *Aphthæ tropicæ* must be considered exclusively from the point of view of intestinal catarrh dependent on hepatic disturbance. BOSCH was the first to indicate a rational treatment, and although he does not specially mention the liver, it is clear from the plan he proposed that he regarded re-establishment of the hepatic functions as a capital point. Advancing knowledge has modified BOSCH's treatment and his terminology, but there can be little doubt that what 40 years ago he called "considerable weakening of the stomach" he would now call catarrh. As we know nothing about the specific cause of the disease, our treatment must necessarily be symptomatic. Accordingly, attention should be directed to the removal of every source of intestinal irritation, to amendment of liver action, to improvement of the tone of the intestinal mucous membrane, to restoration of strength, and, finally, to the treatment of accessory symptoms, such as those presented by the mouth, which distress the patient beyond measure. The treatment I am about to recommend is based exclusively on my experience in Netherland India, and therefore I do not assert that it is the best possible in cases of Indian Sprue that may happen to be treated in Europe under conditions altogether different from those that prevail here.

If we have reason to believe that excreta are retained in the stomach or bowels, we should cautiously secure their removal by gentle laxatives, and never by emetics. The nature of the disease enforces this caution against emetics, and indeed the spontaneous emesis prevents their ever suggesting themselves. I have never known castor oil disagree when not rancid; it should at first be administered in minute doses and in emulsion, until the sensitiveness of the particular patient to the drug is ascertained. Manna has been recommended, but, even when combined with magnesia or soda, it increases the secretion of sour fluid in the stomach. When castor oil cannot be taken, I give pills containing in every 30, 15 gr. each of the powder and of the watery extract of rhubarb, with 5 drops of fennel oil. Of these I order five to be taken every hour until the bowels are moved. If by chance the stools become watery, mucilaginous decoctions, with laurel water, must replace the laxative. Neutral salts are inadmissible, as are all cathartics; and this accentuates the difference between Indian Sprue and other intestinal catarrhs wherein the best results are obtained from combinations of various purgatives. Eumata are in general not well borne.

When relaxing drugs cause pain, the best results are obtained from a pad of cotton cloth wrung dry out of cold or iced water and applied to the abdomen or to the abdomen and loins. A flannel band, overlapping it all round, is wrapped round the body, and the pad is left untouched for three or four hours,

when it is rapidly replaced by another. This can hardly be dispensed with when treating children. Should it cause any skin eruption it must be abandoned.

Many writers recommend calomel, and BOSCH, while rejecting this, favours mercurial inunction on the epigastric region. Experience, however, has taught that all mercurials are hurtful in this disease, if for no other reason than that they may aggravate the mouth affection, or add another complication to it.

Sedative, mucilaginous preparations, either medicated or not, must be given all through the disease. Arrowroot is generally used here, but starch, marsh-mallow, gum-arabic, elemi (WAITZ), linseed, leaves and flowers of *Hibiscus rosa-sinensis*, and salep may be employed. Sugar should as far as possible be avoided, though later on syrup of mulberries has its uses. Laurel water and extract of henbane may advantageously be administered alternately in these mucilaginous drinks. They are far preferable to preparations of opium, to which patients suffering from Indian Sprue are extremely sensitive, and which induce a hurtful constipation. When abdominal pain is violent a few drops of laudanum may be given, but the greatest care must be observed that patients do not acquire the habit of taking opium, to which they are strongly tempted. Chlorodyne I believe to be irritating and therefore injurious in Indian Sprue, although it is invaluable in colic, simple diarrhoea and the like. For improving the activity of the liver mineral acids are specially serviceable, and although nitric, hydrochloric and phosphoric acids are useful, I trust more to sulphuric acid, which in all intestinal catarrhs, and even sometimes in dysentery, seems to me to work admirably. I give throughout the day 30 drops of dilute sulphuric acid in 10 ounces of decoction of arrowroot, to which, when the stools are very numerous, I add 15 mgr. of hydrochlorate of morphia. A little simple syrup improves the taste of this mixture. Watery infusion of rhubarb is excellent for children.

During the first two stages, and more particularly in the second, attention must mainly be directed to the gastric symptoms. I have never had occasion to apply leeches, although BOSCH, under the influence of BROUSSAIS' doctrine, does not see in the anæmia a formal contra-indication to depletion. He cannot, however, be regarded as a partisan of the practice. It is true that circumstances may arise to render local bleeding necessary even in anæmic persons, but I have not found it needful thus to combat the mouth symptoms in Indian Sprue. Revulsives to the epigastric region may be of service. I generally use frictions with aromatic spirit of ammonia to which a drop of mustard oil is added, or with a mixture of finely powdered cloves and dried ginger suspended in eau de Cologne, or with eau de Cologne and tincture of capsicum. When a more decided action is necessary sinapisms may be applied, or tincture of mylabris rubripennis may be painted on, or stimulating frictions employed. Especially in children, it is useful to excite derivation towards the skin of the extremities by brushing, rubbing with dry flannel, camphorated spirit and so forth. Stimulating foot-baths may be tried with adults, but they do not seem to have much effect. On only one occasion did a patient announce that he experienced relief from them. They should, if possible, be taken lying down, so as to avoid any chance of faintness.

Internal medication must be symptomatic. The increased acidity of the gastric secretions indicates the prudent administration of alkalies, among which the best is Carlsbad salts, in doses of one or two teaspoonsful dissolved in tepid water. Seltzer and soda waters may also be tried, but it often happens that they are ill borne. Then recourse must be had to mineral acids, and for this purpose hydrochloric acid is probably preferable to sulphuric. The study of each individual case is the only safe guide. Nitrate of silver in the dose of 5 mgr. in pill, with or without 7 mgr. of extract of belladonna, is sometimes advisable in nervous, hysterical cases. KÜSTER, by the way, has given valuable hints towards the treatment of gastric catarrh, in the *Deutsche Zeitschrift für praktische Medicin*, 1878. Subnitrate of bismuth alone, or combined with bicarbonate of magnesia and saccharated fennel oil, does well with children; and with adults also in doses of 2 grammes or more during the day. When the stomach is greatly distended, vegetable charcoal in powder often relieves. Charcoal lozenges irritate the mouth and are unsuitable. I have found salicylate of soda useful in children, but not in adults. Cotoin and paracotoin,

now much vaunted in the treatment of diarrhoea, I have not tried. Anticipating for a moment what I have to say about native medicine, I would here remark that the *obat-seriawan** and *legen*† go very well with the drugs just enumerated. In conclusion, no other remedies have seemed to me to be of any value, although I have witnessed the trial of many. Especially, preparations of lead, which are recommended by English physicians, are useless even in children, although they may find their place in the treatment of ordinary intestinal catarrh. Astringents and bitters are valuable only when convalescence is beginning.

The Fruit Cure.—Authors, with the exception of MARTIN, are mostly silent about this. It has been incidentally mentioned at various meetings of the Society for the Advancement of Medical Science in Netherlands India, but I believe that A. SONIUS, a physician at Pattie, was the first here to adopt it as a regular mode of treatment. He attained so great a reputation for success in cases of Tropical Sprue that patients came from vast distances to consult him. I myself have seen very striking results at his hands. Like, I suppose, most other practitioners, I was reluctant to adopt his plan, but it generally proved successful, and as, so far as I know, it has never been published, I will describe it.

The mode of living already described is generally ordered. The patients are directed to drink constantly a thin syrup of mulberries, to which a little laurel water is added when diarrhoea is severe. Nervous sufferers take, in addition, some mucilaginous mixture with laurel water, but this is chiefly to act on their imaginations. Meanwhile fruit is administered on a large scale, beginning with soft kinds from temperate climates, such as Australian and American apricots, peaches, apples and pears in tins, preserved without sugar. Too much syrup is employed in the preservation of French and European fruit in general. SONIUS liked to give at first strawberries and mulberries in water, and in most cases they are well borne; but the seeds in these fruits sometimes render them too irritating. No objection of this kind lies against the other fruits just mentioned, if care be taken to peel the apricots and peaches and to remove the cores of the apples and pears. Along with these cucumbers may be given and the juice of squeezed cucumbers; likewise a plentiful quantity of certain species of *Lagenaria* (*laboe ajar*), melon, white gourd, and, later on, ripe mangosteens and various species of *Nephelium* (lichi, lungan, rambutan); in short, all fruit containing a large quantity of water. Grapes, too, may be taken, but not those preserved in tin. The perfectly ripe juice of oranges and pumeloes is permitted, to the exclusion of all other species of the citron genus. Pineapples and very sour fruit must be avoided. I need hardly say that some courage is required to enter on this course, especially when diarrhoea is a prominent symptom; but the good results obtained by others and myself amply justify the treatment.

One of the first cases in which I adopted this plan was a child aged 2½ years, in the last stage of Indian Sprue, brought from the Preanger district. A practitioner who saw the infant on the way expressed a doubt that it would reach Batavia alive. On arrival the patient's first appearance suggested advanced infantile atrophy. It was pale and extremely emaciated, with prominent abdomen and swollen feet, but, in addition, the unmistakable characters of Indian Sprue were visible in its mouth. The stools were watery and numbered between 30 and 40 in the day, and vomiting was frequent. I at once, in spite of the mother's natural opposition, began with applications of cold water and the administration of peaches and apricots with cucumber juice. Five weeks later recovery was complete, and I have now the child's photograph taken three months after his arrival, and presenting the image of a perfectly healthy, fat and lusty boy.

I have already, when speaking of diminution of the liver, mentioned the case of a lady whom I saw in the last stage. She was at the time under the charge of an English physician, who was treating her with champagne, lime-water and morphia. All hope had been abandoned, and death was believed to be near. I advised the fruit treatment, to which, however, the patient was opposed. Her condition of weakness and my urgency luckily led to her dreaming of recovery through this means, and she accordingly adopted it with enthusiasm. She recovered, and for long afterwards enjoyed comparatively good health.

* An infusion or decoction of bitter herbs, including species from the Storax and Camellia orders.

† Expressed juice of the spathes of *Saguerus saccharifer* or Arenga Palm.

Judging from the results obtained here, I am of opinion that patients with Indian Sprue returning to their own countries should try a grape cure. I have often recommended this, and I hear from time to time of old Indian practitioners who do the same, but I am still ignorant as to the results. Dr. VAN LEENT of Amsterdam has recently written to me as follows :—

In the case of an old naval officer, now a pensioner, who returned from India two years ago suffering from Indian Sprue, I have very successfully employed the treatment by fruit alone which I saw you pursue. Last summer, after a course of about four months, by the end of which time he was eating 40 pears a day, there was very considerable improvement, and I purpose to follow out the same plan with him next summer.

It is probable that the beneficial effects of fruit depend on the acids contained in it. Some kinds containing very little acid have proved useful against chronic diarrhoea in the south of Europe, in the East and West Indies, and at the Cape of Good Hope, where grapes, swallowed with the skin, are in great repute. In Egypt figs are given for the same purpose. In British India the bael fruit is specially recommended. Much information about bael (*Egle marmelos* or *Feronia pellucida*), which, growing on low-lying ground in Eastern Java, is known as *boewa madja*, is to be found in the *Geneeskundig Tijdschrift voor Nederlandsch-Indië*, Part iv, p. 550, but I am not aware of the fruit being used here as a medicine. Preserved in sugar, it is exported to England, where it is known as "Bengal quince." It grows in Siam, and two species are found in Ceylon. According to MACNAMARA, it contains tannin (especially the ripe fruit), bitter extractives, sugar, vegetable acids and a peculiar æthereal oil resembling Peruvian balsam. In my opinion, trial ought to be made of it, especially after the papers published by FAYRER and CHRISTISON in the *Medical Times and Gazette* (1878).

The use of fruit for the cure of gastro-enteric catarrhs is no new thing. As early as the first half of the 17th century BONTIUS, who was chief physician at Batavia from 1627 to 1632, after stating that certain fruit (durian, jack, pineapple) is injurious in diarrhoea, adds "Hi fructus præterquam quod horarii sint, etiam humiditate sua et calore, temperamento nostro infesti sunt; melones et cucumeres (aquaticos) excipio, qui præter frigoris de humiditate non parum participant."*

Whey, alone or in combination with alum, as tried by GREINER, probably acts in the same way, lactic acid being the efficient agent. As a rule the treatment is ill borne. Even GREINER saw but one successful case. I have never tried it.

Turning now more especially to the condition of the mouth and tongue, I have found that when the red specks are discrete, washing the mouth with a 1 per cent. solution of carbolic acid gives relief. Stronger solutions are painful. When, however, the specks are aggregated, a previous superficial canterisation with sulphate of copper or nitrate of silver is generally advisable. When carbolic acid fails, weak solutions of alum or chlorate of potash should be tried. WAITZ speaks highly of solution of "chloride of soda." Cocoa butter or other grease applied to the tongue may be of great use. The bitter decoction before mentioned (*obat-seriawan*) may serve to rinse the mouth.

In the final stage of the disease the aspect of affairs is so completely modified that no part of the treatment hitherto described can be put in practice, except, in some cases, the fruit cure. "It is impossible," as BOSCH very sensibly observes, "to commit errors of diet." Nothing but thin, mucilaginous

* JACOBI BONTIUS, *Historiæ naturalis et medicæ Indiæ orientalis libri sex. Methodus medendi*, cap. iii. *De alvi profluvia et primum de dysenteria vera*. This work was published along with GULIELMI PRONIS, *De Indiæ utriusque re naturali et medicâ. Amstelædamî apud LUDOVICUM et DANIELEM ELSEVIRIOS. Anno MDCLVIII. Fol.*

The double sense of "excipere," to except, and to state expressly, renders the meaning of this passage doubtful. The second use of the verb is rare, and would appear to be excluded by the antithesis implied in the next clause. On the other hand, a few lines previously cucumeres and melones aquatici are enumerated among noxious fruits.

and farinaceous food can be borne, and that only in the smallest quantities required to appease hunger. Medicine can do little or nothing. Laurel water, given in cold water or other iced drink, is alone capable of affording some slight relief. Iced compresses to the stomach, and very rarely a blister or painting with tincture of capsicum, may be used as revulsives. I do not set much value on stimulating frictions of the body at this stage, but they prove agreeable, chiefly to natives and Eurasians. An infusion of aromatic herbs, among which vetiver (*Anatherum muricatum*) is the chief, in arrack is often used for this purpose. For the constant diarrhœa, enemata of a thick arrowroot mucilage, with aromatic wine of opium, are to be recommended. It is no use to give minute doses of laudanum in small clysters, as they are retained for too short a time to be of service, but 30 drops in an enema of 3 or 4 oz. suits very well. Where there is much local abdominal pain, painting with a mixture of laudanum and glycerine or with aromatic spirit of ammonia is sometimes of service.

When convalescence begins, prudence is the main point. Months may elapse before we can allow solid food or attempt to improve the general condition by the administration of bitters and astringents. After a few weeks we may try whether a very weak infusion of guava will be borne. If this be so, we can then in a couple of days have recourse to calumba or some other bitter, which must then be continued for a considerable time. If all goes well, a single glass of wine and water may be allowed, and so, progressively, other tonics. Among these I set a great value on genuine Quina Laroche, with or without iron, and, subsequently, on other ferruginous preparations, especially dialysed iron and Fer de Quévenne. I once saw excellent results follow the administration of fer diastase.

Finally, I cannot be too impressive in declaring that the best remedy is departure to a temperate climate. Australia, perhaps, might be taken into consideration. When such departure is impossible, the fruit cure should be at once adopted.

NATIVE TREATMENT.*

This treatment is for the most part prescribed by ladies of mixed parentage, and sometimes by native quacks. The drugs used are not, however, all drawn from native sources, as these irregular practitioners are known to buy large quantities of such things as calumba and simaruba barks at European drug stores. They also purchase compounded medicine, for instance, the so-called "Species antidysenterica." This latter consists of equal parts of the barks of simaruba, calumba and cascarilla and the leaves and roots of guava. Half an ounce of this mixture infused in six teacups of boiling water is taken daily by adults. It is useful in the chronic intestinal catarrh of children, and during convalescence from Indian Sprue; but it need hardly be said that this and all other treatment at the hands of the persons with whom we are now concerned is administered ignorantly and without any regard to the diagnosis of disease or to the knowledge of drugs.

At the outset of the disease one beer glass, or at most two, of palm juice is given early in the morning. This is held in high esteem and is sometimes useful. Occasionally, as in ordinary intestinal catarrh, a mixture of *brawas* (*Tetranthera*) leaves, turmeric and sugar is taken at the same time. The

* Those who are desirous of full information regarding the identification (when possible), the medicinal uses, doses and mode of administration, and the nomenclature in different British Indian languages of the plants here mentioned should consult:—

DRURY, *Useful Plants of India*; AINSLIE, *Materia Indica*, etc. (London, 1826); SCHEFFER, *Indische plantennamen*, in the *Tijdschrift voor Indische Land-, Taal- en Volkskunde*, published by the Bat. Gen. v. Kunst. en Wetensch., Part. XXV, p. 319; and OUDEMANS, *Plantenkunde*.

[To these should be added, for identification and nomenclature, WATSON, *Index to the Native and Scientific Names of Indian and other Eastern Economic Plants and Products*: London, 1868.]

medicine most in demand is *obat-seriawan*, under which name various combinations of herbs are sold as proprietary medicines, in substance or in infusion. The most usual forms are the following :—

Take two parts by weight, each, of the leaves of jequirity or of red sandalwood, of *semboeng* (various species of aromatic plants drawn from the Compositæ, Scrophulariaceæ and Loganiaceæ), pegagan (*Hydrocotyle Asiatica*), *seriawan* (bitter herbs from the Storax and Camellia orders), *Bidens pilosa*, and of liquorice root; and one part by weight, each, of cashew nut (or anise, dill or fennel), and *Alyxia stellata* bark. Cut up fine and mix.

This combination is sold in the Batavian drug stores under the name of "Species antiaphthosa."

A second form may be cited :—

Take three parts by weight of jequirity leaves; two parts each of the leaves of *semboeng* (see above), *Hydrocotyle Asiatica* and of an undetermined species of phyllanthus; and of liquorice root; and one part of cashew. Cut up fine and mix.

To these are occasionally added snake-wood, while, for purposes of concealment, catechu imparts a deep brown colour to the infusion or decoction. The doses ordered vary widely. When the case is complicated by hæmorrhoids, *Pemphis acidula* is added, and when diarrhœa is intense, cucumber leaves. If there be severe pain, recourse is had to *Cassipha filiformis* or *Hydrocotyle Asiatica*.

According to Mr. BERNELOT MOENS, the *obat-seriawan* of Mrs. BARKMEIJER (in whose honour a monument has been erected) is composed as follows :—

Take a handful each of the leaves of that kind of jequirity which bears a fruit half red and half black and of the leaves of *Hydrocotyle Asiatica*, a piece the size of the little finger of liquorice root, a little *Alyxia stellata* bark and a little of the roots of the bitter herbs known as *seriawan*. Boil in a bottle of water until the decoction is reduced one-half in bulk. Take in one day.

This decoction must not stand over night. Experience teaches that these preparations are useful in Indian Sprue and in all intestinal fluxes.

The following is recommended as a mouth wash :—

Jequirity leaves, *seriawan* (see above), *Conyza balsamifera* and *Bidens pilosa*, of each $\frac{1}{2}$ oz., infused in 16 oz. of water, to which $2\frac{1}{2}$ oz. of borax is added.

The ordinary *obat-seriawan* is also chewed dry, or the mouth is rinsed with the infusion, or with tea in which alum is sometimes dissolved.

Mrs. VAN GENT gives a variety of receipts, indefinite as to the quantities of the ingredients to be employed, the mode of preparing them and the manner in which they are to be used. I have lately seen a prescription containing 20 ingredients, of each of which "10 cents worth" is to be bought, reduced to powder, etc., etc. It is to be remarked, however, that the ingredients combined in all native receipts are emollients, bitters, astringents and aromatics. In a general way, therefore, they do not differ from the drugs ordinarily prescribed by European physicians in the treatment of Indian Sprue, but they are recklessly associated in ridiculously large groups, and are applied to the cure of all chronic intestinal affections. In spite of this, they are sometimes followed by good results of a temporary character, with which the patient is for the moment contented. Not only is *Tabes mesenterica* often mistaken for Indian Sprue, and treated as such with one of the nostrums, but an improvement in the attendant catarrh of the intestine is not infrequent. When the disease begins to make head again, the so-called relapse is attributed to cold, errors in diet and the like.

BOSCH has reported negative results from treatment with an infusion of the tender roots of *Hibiscus rosa-sinensis* and a bark unknown to him. The tongue was to be smeared with fresh cocoa oil in which young fern leaves had been bruised. Recovery in three days was promised by the native quack. Nor was he more lucky with the juice of *Cocos nucifera*, although he tells us that an esteemed physician in Java assured him that he had often found it succeed.

WAITZ used with benefit as mouth washes fresh infusions of the leaves of basil, *Cocos nucifera*, or jequirity, or the freshly expressed juice of lavender diluted with water. Many persons recommend repeated applications of various greasy substances to the lips and tongue. I have already mentioned cocoa butter. Besides this, various neutral vegetable tallows, almost identical in composition with cocoa butter, are employed. I have got good results in different mouth affections from washes made either by infusing chips of *Pterocarpus indicus* or by diluting the resinous juice of the stem.

During the period of convalescence WASSINK'S prescription in cases of indolent bowels is useful. It is as follows :—

Leaves of long pepper, 1 drachm; leaves of *Conyza balsamifera*, liquorice root, of each 4 drachms. Boil with 12 oz. of water until the bulk of the decoction is reduced to 8 oz. Add catechu juice, 2 drachms. Dose, three table-spoonsful every three hours.

I have never had any success with *Brucea antidysenterica*.

NOTE ON AN AFFECTION OF THE SYMPATHETIC PLEXUSES OF THE INTESTINAL WALL.

By Dr. A. BLASCHKO of Berlin.

(VIRCHOW'S *Archiv*, 1883, iv, 136.)

LAST winter, in the city hospital at Stettin, which was at the time under Dr. GEORG WEGNER'S charge, in the course of an unusually large number of postmortem examinations of the intestines, extending to about 70 cases, I was able on two occasions to demonstrate a well-marked and characteristic alteration of the nervous and ganglionic plexuses of the intestinal wall. The rarity of such observations of the condition of sympathetic plexuses and the uncertainty which attaches to the statements hitherto made about them lead me to consider these worthy of publication. The first of the two cases, which indeed prompted me to further and complete inquiries, possesses also a certain interest from a clinical point of view; I therefore reproduce an abstract of its history.

WILHELMINA P., aged 27, single, was admitted on the 30th September 1882 on account of extreme debility. In early life she had always been healthy. After childbirth, which occurred two years ago, she led an indigent and irregular life for a considerable time. In the winter of 1881-82, about a year after her confinement, she first showed symptoms of serious digestive disturbance; appetite disappeared; she took scarcely any nourishment; she had occasional but not persistent diarrhoea, which from time to time alternated with constipation, and she constantly complained of epigastric pain. At the beginning of the summer of 1882 a markedly anæmic condition declared itself, which rapidly deepened during the ensuing months.

On admission the patient was noted as of tolerably robust build, presenting a considerable degree of obesity, while, however, the waxy coloration of her skin announced extreme bloodlessness. The pulse was small, of normal frequency; over the origin of the aorta a distinct systolic bruit was audible; there was slight downward and outward increase in the area of cardiac dulness. The urine was free from albumen, spleen not enlarged, bones not sensitive on pressure, and no substantial alteration was discoverable in the internal organs. The blood was apparently not hydræmic, but it showed under the microscope a slight diminution in the number of formed elements; there was no alteration in the ratio of white to red corpuscles; it contained neither microcytes, transitional forms, nucleated red corpuscles nor collections of pigment.

The profound weakness from which the patient suffered on admission rapidly increased, so that she could no longer rise from her bed, and finally could hardly sit up. Severe pain, referred to the stomach, soon made its appearance, vomiting of sour-smelling stuff was continual, and complaint was made of acute epigastric pain; the breath became fetid, and the stools smelt abominably. Later on, towards the close of her life, hæmorrhages occurred from the gums, and after lying for two days comatose, she died on the 21st October 1882.

The autopsy revealed extreme anæmia of all the viscera. Heart large, valves competent, left ventricle moderately dilated, its walls slightly hypertrophied. Embedded in the mitral valve were isolated slightly developed nodules, and the chordæ tendinæ were somewhat short. The aorta was much narrowed above the semilunar valves, its walls thin and soft. The cardiac muscle was flabby, pale, yellowish red, intersected by yellowish white tracts which showed under the microscope as fatty degeneration. But for a few recent, scattered, dark red broncho-pneumonic foci, the lungs were normal. Spleen and liver small; kidneys normal. The wall of the entire intestinal tract from pylorus to anus was extremely thin, and in several places transparent. All the layers seemed to share in the atrophy, but especially the mucous membrane, which was pale grey, or rather white, in colour, smooth on the surface, and, on preparation, exhibited itself as a thin transparent film overlying the other structures of the wall. Scattered over it from the middle of the duodenum to the anus were minute black points visible to the naked eye. These were discrete in the upper portion of the small intestine, but in the ileum and colon they were innumerable, occupying the entire surface. Abstraction made of thinning referable to great wasting of the glandular tissue, microscopic examination both of fresh sections made with the freezing microtome and of hardened specimens showed a remarkable diminution in the number of villi, which stood far apart from one another, were very small, and mostly bore at their apices a shapeless

mass of granular dark brown, or rather black, pigment. In contradistinction to the rest of the digestive tract, the stomach was not at all atrophied; its walls were of normal thickness, the mucous membrane pale but velvety and nowhere showing any traces of pathological change. No cicatrices of old ulcers were discoverable.

It was reasonable to assume that in this case the nervous elements of the intestine necessarily shared in its general and advanced atrophy; indeed, the question suggested itself whether the excessive wasting which is no common result of chronic enteritis might not be regarded as altogether dependent on a nervous cause. Minute examination brought some surprising results to light. Investigation of the nervous structures of the intestine requires a somewhat peculiar process. Alike in fresh sections and in others hardened as usual in alcohol or MÜLLER'S fluid, it is difficult, if not impossible, to demonstrate the intestinal nerves, to say nothing of proving the existence of pathological change in them. Treatment with gold, which is generally useful in the investigation of non-medullated nerve fibres, was of no service in this instance, but the swelling with dilute wood vinegar, which was originally announced by MEISSNER as a means of disclosing the plexus which bears his name, rendered the nerves perfectly distinct. I plunged pieces about 10 centimètres long, taken from the intestine at different levels, in a 25 per cent. solution of wood vinegar, and began the examination when its action had lasted three or four days. Under this treatment the swelling of the connective tissue is complete in about eight days, and the pieces may then remain for an indefinite period in the solution without undergoing any further alteration. It is very important, however, to renew the fluid from time to time. Longitudinal and cross sections for immediate investigation, and fragments snipped, after removal of the investing layer, with small curved scissors out of the specimens, were examined. Permanent slides cannot indeed be obtained in this way, but fragments hardened in a watery solution of picric acid and afterwards treated with wood vinegar yield good and durable preparations.

In the case above detailed the ganglia and filaments of both AUERBACH'S and MEISSNER'S plexuses, as well as their communicating fibres, were, even under a low power, seen to be in a condition of fatty degeneration. The ganglionic cells of MEISSNER'S plexus, lying heaped round the nodal points in the most diverse arrangements, rarely single or in pairs, generally in groups of 50 or thereabouts, and connected one with another by fibrillar tracts, offered the most various pictures of fatty metamorphosis from the incipient stage to complete fatty granulation. A condition intermediate to these extremes was the rule. The cells of MEISSNER'S plexus are spherical or ellipsoidal bodies the boundary of which is strongly refractive, on which account the cell heaps have, under a low power, the appearance of vegetable structures. The resemblance is somewhat diminished by the presence of many minute fatty particles in them, yet never entirely abolished, so that the cells are always easily found. There is more difficulty with the ganglia of AUERBACH'S plexus, lying between the longitudinal and circular muscular layers in the form of large polygonal plates with many broad prolongations which at their origin are formed of congeries of cells, while it is only at a certain distance that they clearly exhibit nervous filaments. In the case under description fatty degeneration was not by any means so far advanced in AUERBACH'S ganglia as it was in those of MEISSNER, and it was more difficult of demonstration. To this corresponded the condition of the muscular coat of the intestine, which showed no signs of fatty degeneration or true atrophy.

The process of fatty degeneration must differ according as medullated or non-medullated fibres are attacked. The former are encountered only here and there in both intestinal plexuses, the vast majority of the fibres being non-medullated. The result of degeneration is, however, in both cases the same, so that when it has taken place it is impossible to distinguish between the two kinds of fibre. It is indeed easily intelligible that it is a matter of indifference whether the fat has been formed from the nerve protoplasm or from the nerve medulla. In isolated fibres, somewhat broader than others, strongly refractive masses here remained visible, which were probably remnants of medulla, and justify the supposition that such fibres had been medullated. But the non-medullated fibres also presented the most varied appearances, according to their width and arrangement. The finest branches, pursuing for the most part an isolated course, and whose terminations were extremely difficult to trace, were indicated only by con-

tinuous rows of fat granules and the cells which occur at the nodal points. The broader fibres, which generally ran in groups of two or three, commonly exhibited a distinct boundary with here and there nuclei belonging to their sheath, and a trace of the axis-cylinder.

Fatty degeneration was recognisable throughout the entire thickness of the intestinal wall, as far as nervous structures were at all demonstrable, from the connective tissue stratum lying between the villi and the muscularis submucosa, through the thickness of the submucosa and of both muscular coats, until the minute twigs were lost in the subserous areolar layer. The coarser nerve trunks which enter from without, but which probably contribute hardly one-hundredth part of the number of fibres present in the intestine, were least attacked, so that the process seemed not to extend beyond the structures lying exclusively within the intestinal wall. Neither the sympathetic trunk nor the solar plexus was examined.

Before I say anything about the signification of the results just enumerated, I will briefly describe the second case, in which a similar condition was found.

W., cachectic female, history very imperfect, 42 years old, known to have been a drunkard, treated in hospital a year ago for melancholia, and discharged cured. Admitted with symptoms of acute alcoholic poisoning. Quite unconscious, extremities rigid, temperature at first not raised. Next day, outburst of typical alcoholic delirium; with sudden elevation of temperature, which persisted and reached 41° C., pneumonia of right lower lobe declared itself. On the sixth day from the appearance of the lung affection the patient died with symptoms of pulmonary oedema.

Autopsy revealed, in addition to pneumonia of the right lower lobe, many recent broncho-pneumonic foci in the oedematous tissue of the other lobes, deep hyperæmia of the brain, chronic gastric catarrh, fatty liver, and venous congestion of all the pelvic organs. Intestinal wall somewhat thinner than normal, but to the naked eye offered no marked alteration, merely a rather glazed mucous surface and a dimly apparent whitish streaking lengthwise under the serous layer. Microscopical examination showed extreme fatty degeneration of the nervous plexuses throughout their whole extent, even more distinctly marked than in the former case. The fibres of MEISSNER'S plexus looked like tubes filled with fatty granules, and so closely resembled tolerably distended lacteals that frequently it was only their peculiar distribution, and especially their connexion with ganglionic cells, that disclosed their real nervous nature. Atrophy of the mucous membrane was also very distinct, but no pigment was found in the villi. AUERBACH'S plexus was far more deeply involved than in the first case, and to this difference corresponded the total absence, in that instance, of fatty degeneration of the muscular coats, which here was present in a very marked degree. The longitudinal and circular layers were alike involved in the lesion, which was in places so far advanced that the cell boundaries and often the nuclei had disappeared, leaving only a fatty detritus in which little collections of pigment indicated here and there the former positions of the vanished nuclei, while at longer intervals larger pigment spots represented the ganglia of AUERBACH.

I wish here to emphasise the fact that in neither case did the blood-vessels show any trace of pathological change, and especially that no fatty degeneration of their walls was present. There was, however, pigmentary deposit in the muscle cells of the vascular wall and in the cells of the adventitia.

The question now presents itself whether the alteration noted in both these cases is to be considered as a primary lesion of the nervous structures with subsequent intestinal atrophy, or, on the other hand, whether the fatty degeneration was not merely an accompaniment of the atrophy. Though this cannot be decided with certainty, the greater probability is in favour of the former alternative. Fatty degeneration of motor nerves in atrophied muscular tissue is a frequent and familiar phenomenon, while in the case of sensory nerves we may regard the occurrence of alteration in them simultaneous with the implication of their terminations as the rule. In the case, however, of the sympathetic plexuses whose functions are but imperfectly understood, we are (leaving the lack of pathological observation out of consideration) in a different position as regards explanation. What the physiological importance of the two intestinal plexuses may be is altogether unknown, and we are reduced to mere conjectures. Although we are ignorant of the mode of termination of the plexus which bears the name of AUERBACH, we may perhaps agree with its discoverer in considering its functions as motor. KRAUSE,* who holds that both plexuses are motor, has found the finest fibres of AUERBACH'S plexus ending in the muscles only, though he admits that the ultimate terminations may even pass through the submucous coat, and that occasionally a process may

* *Allgem. Anatomie*, 2 Aufl., Bd. i.

reach the villi, in which case, however, the terminations supply "the muscular layer of the mucous membrane and the perilacteal muscle." He does not appear to have thought of or looked for any other mode of termination such as is found in the motor apparatus. HENLE* likewise considers both plexuses as motor, as indeed is implied in his denominations of *Plexus myentericus externus* and *internus*. He finds that AUERBACH'S plexus, to which he applies the latter term, "spreads in extremely close and fine ramifications" over the outer surface of the muscular layer of the mucous membrane.

It is, however, beyond doubt that a multitude of minute twigs are not lost in the muscular tissue of the villi or submucosa, but, on the contrary, pass on between the villi to the mucous surface, to vanish among the epithelial cells, while other branches enter the villi and there form a close network. This is best demonstrated by specimens taken from the intestines of children in the first year of independent life, and treated with wood vinegar. DRASCH † has made a similar discovery in the intestines of rabbits and guinea-pigs, and lately v. THANHOFFER and FLESCH ‡ seem to have succeeded in making an accurate study of this terminal arrangement in the frog. It is but a step to the conception of a complete sympathetic reflex circuit within the intestine, where MEISSNER'S plexus should represent the posterior cornu and the cells of AUERBACH'S plexus the motor cells of the anterior cornua. Such an hypothesis is rendered probable not only by the special and differing arrangement of the two species of ganglion cells, but more particularly by the fact that the number of fibres running within the intestine is disproportionately great in comparison with those going in from the exterior, so that the greater number of fibres arise in the intestinal wall itself. It would thus seem that the intestine possesses a nervous system special to itself, and that the fibres entering it from without are purely regulative. Whether the secretion of the intestinal glands be not excited by means of this reflex circuit I will not here inquire, as I expressly insist on the absolutely hypothetical character of what has been above set forth. This much, however, is certain, that we have not to do with a purely motor apparatus, and thus the difficulty of explaining the phenomena described is increased.

Out of the great number of intestines which I have had an opportunity of examining, I have had at my command 12 simply atrophic specimens from cases of senile atrophy and general marasmus, among which three were from persons of 87, 81 and 79 years respectively, the others being mostly phthisical cases and instances of cancerous cachexia. As a rule, brown atrophy of the cardiac muscle and of the liver was present; the intestine showed no distinct disease, the walls were only thinner than normal, and the surface of the mucous membrane not always in its natural velvety condition. Under the microscope no specially marked atrophy of any part of the intestinal wall was demonstrable, the villi were apparently not lessened in number though somewhat undeveloped, especially as to bulk, but in relation to the other parts of the wall they were not really diminished. Nor was there any material atrophy of the intestinal glands, and the muscular layers had maintained their proportional thickness. What struck one was a tolerably plentiful yellow or yellowish brown pigmentation round the nuclei in the muscular fibres. The nerves and ganglionic cells betrayed no sort of pathological change, and any trace of fatty degeneration was conspicuous by its absence. Isolated fatty particles occurred in the ganglionic cells, as is the case in a vast number of normal intestines, to which matter I will return. Moreover, pigment granules of the same kind as were found in the muscular fibres were somewhat numerous in the ganglionic cells of both plexuses. I am not, however, disposed to accept this pigmentation as pathological, for it is present, though to a less extent, in the intestines of most adults, and increases with age. It is rather to be regarded as a physiological senile change, such as occurs also in the cerebro-spinal ganglionic cells. If this alteration be described as pigmentary atrophy, no objection can be offered, but in this case the physiological course of events must be kept in view. In all cases where pigment had been deposited in the muscles

* *Nervenlehre*, 2 Aufl., S. 638-41.

† "Beitr. z. Kenntniss des feineren Baues des Dünndarms," *Wien Sitzsber.*, Bd. 82, S. 168, with references to entire literature of the subject.

‡ *Med. Centralblatt*, 1883, No. 3.

and ganglionic cells the same condition was found in the vessels, as well in their external as in their middle coat.

As regards the collection just mentioned of fat particles in the ganglionic cells, this likewise is a tolerably common phenomenon, failing only in the young. The particles are, however, far less numerous though much larger than the granules which are found in degeneration, so that we must consider this condition as a fatty infiltration. This is confirmed by the fact that the nerve fibrils were always free from such deposits. When fatty infiltration and pigmentation occur together, as I have frequently seen, perhaps by chance, in phthisical cases, the condition is easily recognised by observing that under the microscope the cells of MEISSNER'S plexus are indistinguishable from hepatic cells.

In young subjects up to about 15 years of age I have never been able to demonstrate fatty infiltration or pigment granules in the cells, nor have I ever observed fatty degeneration of the plexuses, although some of the intestines examined were taken from remarkably atrophic children in the first year of life, one of whom had died of marasmus due to chronic intestinal catarrh.

As, therefore, there is an atrophy of the intestine linked with general senile atrophy and general cachexia, wherein it is not possible to demonstrate any involvement of the nervous system, we cannot consider degeneration of the intestinal plexuses as a necessary accompaniment of intestinal atrophy. If in certain cases we find such a condition, it is at least reasonable that we should seek its explanation elsewhere.

In the intestines of rabbits and guinea-pigs to which lead had during a long period been administered, R. MAIER* has recently found not only disease of the intestinal glands and vessels but likewise lesions of the two plexuses not unlike those observed by me. He describes a sclerosing degeneration of the ganglionic cells associated with the development of a partly fibrillar, partly fibrous connective tissue. He also seems, to judge by his illustrations, to have observed a kind of fatty degeneration of the substance of the ganglia in which the fibres of the ganglionic system shared; at least he admits that a pearly chain of fat granules often marks the earlier stage of these appearances.

There is evidently a certain relation between the two processes. Connective tissue had not been developed round the ganglia in my cases, which may perhaps be explained by the fact that under normal circumstances the ganglia are not, in men, generally embedded in a compact areolar capsule, as is the case in rabbits. Lead poisoning was moreover excluded in both cases; the histories gave no indication of anything of the kind, nor did the course, the final result or the postmortem appearances support any such suspicion.

The existence of an inflammatory affection cannot be denied in either of the cases described. In the first, the deep pigmentation of the villi indicated a previous intense chronic inflammation of the intestinal mucous membrane; and in the second, wherein there was no demonstrable relic of a past catarrh, the patient's alcoholic excesses suggested the probability of a previous inflammatory condition. Atrophy of the intestinal mucous membrane is, however, by no means the regular sequel of chronic catarrh. On the contrary, we are in such cases accustomed to regard thickening of the membrane as specially pathognomonic. I had many opportunities of examining intestines affected with chronic enteritis, mostly from drunkards and consumptives, and I am confident that there was no more question of disease of the nervous structures than of atrophy of the mucous membrane in general. NOTHMANN* has recently published a very complete monograph on intestinal atrophy, in which he asserts that this condition is a frequent, even common, result of chronic intestinal catarrh. Basing my opinion on my own observations, I must distinctly oppose him, and admit atrophy as only exceptionally the result of chronic inflammation. It seems to me much more likely that as an intermediate condition disease of the nervous structures must occur, which, however, may very well be regarded as a result of the foregoing inflammation.

* VIRCHOW'S *Archiv*, xc, 455.

* "Ueber Darmatrophie," *Zeitschrift f. Klin. Medicin von FERRICH und LEYDEN*, Bd. iii.

Clinically, the first case is of especial interest as a typical example of cachexia depending on intestinal atrophy, with an array of symptoms not unlike those accompanying ulcer of the stomach. We were able during life to exclude the presence of leucæmia and pernicious anæmia. The symptoms detailed pointed clearly to the digestive canal, and from the deep disturbance of nutrition, and epigastric pain, we suspected that the lesion was in the stomach itself. That the disease could have run so pernicious a course evidently depended on the complete abolition of nutritive absorption throughout the intestinal tract. Hence the extreme anæmia and weakness, and the fatal result, for which no other cause could be discovered.

Such cases of uncomplicated intestinal atrophy are not so rare as might appear from the amount of knowledge we have hitherto acquired about the condition. Perhaps this paper may lead to the publication of other similar cases. It would evidently be important to obtain fuller information about the frequency and symptomatology of this lesion, whereby the diagnosis of the condition would probably be rendered possible.

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