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Fig. 1.—Patient No. 1198. Parkinsonian facies and posture, two years after acute onset of Encephalitis epidemic.

Fig. 2.—Patient No. 1438. Acute onset; diplopia; lethargy; right hemiparesis; peculiar gait; head far back, trunk rotated. Effusive, foolish manner.

**Epidemic Encephalitis.** (A. H. Woods.)
A nineteen-year-old Chinese student (P.U.M.C. Hospital No. 1198) had been an alert, enthusiastic leader in the Chinese student patriotic movement. Eighteen months before we observed him he had had an acute fever, chill and delirium, with excitement lasting several weeks. His movements began to be stiff eight months after the febrile outbreak. When I saw him eighteen months after the onset he was catatonic. The wax-like fixation of his limbs and trunk in any position, his staring eyes, fixed features and intent look, gave the appearance of a cataleptic trance. But his mind was clear, though all replies were long delayed. He then passed into a typical Parkinsonian condition (Fig. 1). Saliva drooled from his mouth. He would fall over like a monument, at times injuring himself. There was a coarse tremor of his upper limbs. His pupils showed no light reflex. His muscles had good power, tendon-jerks were increased considerably, plantar reflexes normal, and the irritability of his muscles to direct tap was excessive. His hands and feet were cold and clammy.

He is now a wreck. His mind appears to have its old qualities, but it is imprisoned in a rigid cage and shut off from efferent communication. He is a victim of epidemic encephalitis.

This disease, with protean symptoms, disabling the body and mind, is epidemic in China, and has been present for several years. For 1919 two cases were reported in the China Medical Journal, one by Dr. Lennox and one by Dr. Cadbury; two for 1920, by Dr. Judson; two cases for 1921, one by Dr. Shibley and one by Dr. Wasseil. Probably hundreds of other cases have been observed in China, but not reported.

*Read at the Conference of the China Medical Missionary Society, Shanghai, February, 1923.
In Peking we examined in 1921 and 1922 thirty-five cases of encephalitis of one form or other. In 21 of these the symptoms definitely established the diagnosis of epidemic encephalitis; in two the symptoms and post-mortem examination showed a closely related encephalo-myelitis. In one of our cases of encephalitis the onset followed alcoholic poisoning; in another, typhoid fever. Two were infants with encephalitis, but whether of the epidemic or ordinary infective types cannot be shown. One patient had acute anterior poliomyelitis with nystagmus and prolonged neuritis. Five others had solitary symptoms suggesting encephalitis, the more so as the cases occurred during an epidemic, but there was not sufficient corroboration to establish the diagnosis of encephalitis epidemica.

It is disquieting to note that the epidemic continues, and possibly is increasing. In Peking we are having more cases and are seeing more freshly attacked patients this winter (1922-1923) than last.

The purpose of this paper is to attract attention to the presence of the disease among the clientele of our hospitals, and to outline a picture of it that will help us to recognize it when encountered.

**Pathology.**

*Encephalitis as a Pathological Entity.*—The emphasis laid in current literature upon encephalitis epidemica (lethargica) may have made some of us forget that encephalitis (inflammation of the brain cells, neuroglia and vessels) occurs from many causes, the morphological changes being practically the same in all.

The most frequent causative agents are the viruses of infectious diseases. Whether the ensuing brain lesions are due directly to the organisms and their toxins, or to some indirect effect, is not known. Encephalitis has been thus associated with proven influenza, with the so-called "influenzal colds," with measles, scarlet fever, erysipelas, pertussis, mumps, diphtheria, purulent naso-pharyngeal and bronchial infections, and endocarditis. It has occurred as part of a general pyemia. Syphilis probably is capable of producing an acute encephalitis. Cases clinically regarded as acute anterior polio-myelitis, because of their occurrence during an epidemic of that disease and because of the classical onset and anterior horn symptoms, have not infre-
Epidemic Encephalitis.

It has been known for many years that the virus of acute anterior polio-myelitis under suitable circumstances may affect the brain stem and even the cerebral hemispheres, producing encephalitis (myelo-encephalitis). Wernicke's type of encephalitis (polio-encephalitis superior, i.e. affecting the upper brain stem) is frequently associated with alcoholic poisoning.

In addition to the forms of encephalitis produced by the causes just mentioned, an epidemic form of encephalitis, an example of which was cited in the opening paragraph above, within the last six years has settled upon mankind. It is known as "epidemic encephalitis", often called "lethargic encephalitis". At first it was thought to be associated with influenza, and possibly identical with the old influenzal or "post-influenzal" encephalitis, but for some reason assuming epidemic habits. The Australian epidemic of myelo-encephalitis appears to be closely related to epidemic encephalitis, though not identical with it. It also appears possible that epidemic encephalitis is simply a more widespread polio-myelitis, modified in certain respects by conditions not yet understood. But the causative agent is not known, and all discussion is still speculative.

Microscopic Findings.—Sections of encephalitic brains show edema, infiltration of small cells about blood-vessels (Fig. 3) and scattered through the parenchyma, and varying degrees of destruction of the nerve cells. In the peri-cellular space around a degenerating nerve-cell, and within its cytoplasm (Fig. 4), are seen many mononuclear cells, apparently phagocytes removing the detritus. There is congestion of the blood-vessels. Hemorrhages are usually found; minute as a rule, but at times large. There is nearly always congestion and some lymphocytic infiltration of the pia mater. There is a slight increase in the cell, protein, and sugar content of the cerebro-spinal fluid.

Location of the Lesions.—In cases of encephalitis, of whatever origin, pathological changes are sometimes seen in the cortex; they are usually marked in the basal ganglions, but most severe as a rule in the mid-brain, particularly ventral to the aqueduct of Sylvins. The pons and medulla oblongata often suffer, and the process may occur in the upper parts of the spinal cord.
SYMPTOMS OF ENCEPHALITIS EPIDEMICA.

The onset is much like that of acute anterior poliomyelitis. It starts as an acute infectious disease. Its prodromal signs are often vague anxiety and restlessness; there may be excitement or depression. This may last several weeks or only a few hours, or it may not be noted at all by the patient. The onset may be insidious or fulminating. There is probably always slight fever, chill and malaise, though these may escape the patient's attention. In other cases they are severe and bring him at once to the physician. Nausea and vomiting are not infrequent. Convulsions and unconsciousness have been observed. Many patients have complained early of aching or lancinating pains. There is nothing distinctive of this particular disease in these prodromal symptoms.

The three symptom-groups that are distinctive of the full-formed disease are lethargy, or other disturbances of sleep, cranial nerve palsies, and disordered movements. In some cases one or more of these appear immediately after the onset. The whole group of symptoms will be discussed presently.

**Lethargy.**—The word "lethargy" is used in a special sense, justified by its etymology, to denote a morbid sleep-state. In unconsciousness, coma, or catalepsy, the patient cannot be aroused to clear perception and response. In lethargy, used in this sense, he can be aroused, and will answer questions and reason about affairs, but tends to sink back immediately into what seems to be a natural sleep. In many cases the patient will spontaneously awaken, get up and walk around like a normal person, then return, and even before his head reaches the pillow sink into profound sleep. This has occurred as a daily rhythm in several of our patients.

Lethargy may come early, at times being continuous with the unconsciousness of the onset. In other cases it comes later, after a week or more has passed. It is absent in many cases. It varies in degree from mere sleepiness to deep unconsciousness.

**Paralyses.**—Of all paralyses those of the eyes are most frequent. They may appear shortly after the onset, or a week or more later. In all of our cases the eye symptoms, when they occurred at all, have appeared early. In some cases the nuclei of other cranial nerves are injured with or without involvement of the III, IV, or VI. nuclei. Of these the facial has suffered most often,
Fig. 3.—Blood-vessel of pons, cut obliquely, showing perivascular lymphocytic infiltration. X 94.

Fig. 4.—Anterior horn and neighboring fiber column of Case No. 636. General lymphocytic infiltration with two denser collections (A and B), one of which (A) is in and around a nerve-cell (phagocytosis). Low magnification.

EPIDEMIC ENCEPHALITIS. (A. H. WOODS.)
Epidemic Encephalitis.

though the motor trigeminus and hypoglossus were involved in two instances. The auditory and labyrintheine centers were injured in one patient. Four of our patients had a hemiplegic distribution of stiffness or tremor.

Disordered Movements.—The disordered movements are tremors, chorea, athetosis and disturbances like those of paralysis agitans (Parkinsonian). Tetany has been reported in several cases.

Myoclonus.—One of the commonest and most clearly diagnostic symptoms of encephalitis epidemic is a series of sudden contractions of single muscles, or of several muscles not synergically related. These contractions resemble those induced by an electric current. The part subject to the particular muscle may be moved, or the contraction may spend itself in merely causing a twitch of the muscle fibers. This is called "myoclonus." It is due probably to irritation of single cells, or small groups of cells, of the lower motor nuclei of the brain stem or spinal-cord.

Illustrative Cases.

The common picture of encephalitis is not, then, hard to recognize. Take the history of one patient as a type, to which we can later add variations:—

P.U.M.C. Hospital. No. 04279. Male, 40 years old, examined 12 months after his illness began.

Onset.—Acute fever which lasted one month, during which his neck was stiff, and he felt drowsy. He then developed weakness of the tongue and lips. His lips fell apart and he could not keep them approximated. His right eye-ball rolled outward, and while he could move either eye-ball in any direction, the movements were feeble. The left pupil was larger than the right and the light reflexes were slow and of poor range. Later there appeared slowness of movement in all muscles; the muscles seemed stiff; his head and trunk leaned forward as he stood or walked. Slowly the whole Parkinsonian picture formed itself. From the first he was sleepy and dull all the time.

Summary.—Acute febrile onset, constant sleepiness, eye muscle and facial palsies, and the Parkinsonian syndrome. No one could mistake the disease.

The following case has the essential marks of the disease, but was at first naturally mistaken by the attending physician for a syphilitic hemiplegia.
P.U.M.C. Hospital No. 20. Male, Chinese, banker, aged 48, home in Chefoo. Had syphilis in early years, has suffered from chronic otitis media and carious teeth, and recently has had a bad air-passage infection. In mid-winter he had an attack of pain in his limbs with numbness of the face. Then followed jerking movements of the individual muscles in his right upper and lower limbs. He then sank into a deep sleep-like unconsciousness from which he could, however, be aroused. He would mutter at times, and would get up and walk about the room. His right lower limb was then observed to be weak and stiff.

Within a week or two of the onset his pupils were small and the light reflex poor. The right half of his tongue was weak. His upper limbs were not paralyzed; the right lower limb developed hypertonicity, increased tendon reflexes and ankle clonus, with an extensor plantar reflex. The myoclonic jerking now involved the diaphragm and many of the muscles of both lower limbs, more in the paralyzed right than in the left limb.

The patient gradually grew better. The myoclonus decreased and in six months he was walking with a hemiplegic gait. Slight jerkings of the muscles continued.

**Summary.**—No fever was observed at the onset. There were lethargy, myoclonus, eye and cranial nerve palsies and an upper neuron type of paralysis in one lower limb.

The pain in the limbs at the outset is common. Many patients show early rigidity of the neck, and increase of cells and protein in the spinal fluid. This indicates that in this condition, as in any infectious disease, meningitis may occur. The pain is probably the expression of root irritation.

The following patient had athetoid and choreic movements combined which produced a bizarre effect.

A Chinese accountant (P.U.M.C. Hospital), 30 years old, had fever, headache and vertigo; and within a few days somnolence, deepening into lethargy. After one month the muscles of his left lower limb began to move involuntarily; the movements spread to the left half of his face, then to the left upper limb and neck. These movements were not quick jerks of individual muscles, but were co-ordinated. They resembled the shifting of position due to restlessness, or the moving of a limb, shoulder or the neck as in making gestures. At times the man writhed and slowly revolted a limb as in athetosis. Patients with Huntington's chorea at a distance might be mistaken for fervent orators stepping up on tip-toe, advancing a foot, twisting the body, waving an arm and grimacing. As this accountant first approached, the resemblance to hereditary chorea led me to expect to find that disease. But the acute onset and the lethargy, the unilateral distribution of the movements, the absence of other cases in the family, with the existence of an epidemic of encephalitis, fixed the diagnosis.
The man's movements lessened when he lay on the bed, and ceased during sleep. Excitement increased them. At the time of examination his muscular power was decreased; but the cortico-spinal tracts were normal. His palms and soles sweated heavily. There were no cranial nerve palsies. Lethargy had entirely disappeared. His spinal fluid was normal and the Wassermann tests of the serum and spinal fluid were negative.

Summary:—Acute onset with fever. Lethargy, choreiform movements and athetosis. Hypidrosis.

The combination of delirium at onset with pains and myoclonus occurred in one case.

The patient was a Russian barber (P.U.M.C. Hosp. No. 3697). He was 25 years old. Syphilis was excluded by spinal fluid and serum tests. He became suddenly sick about a year before admission and said he had been "crazy" for seven months. During part of that time he recalled people and events, but for much of the period his memory is blank. From the first he suffered sharp pains, sometimes "boring", in his trunk and limbs. He had myoclonic jerking in his left cheek and lips, in the left temporal and masseter muscles, and in the left lower intercostal and abdominal groups of muscles. His upper lip on the left side showed fibrillary twitching in addition to the clonic jerking. The right pupil was larger than the left, but the reflex and associated pupillary movements were normal.

Summary.—Acute onset with delirium and a long period of excitement with amnesia, sharp pains, myoclonus and slight pupillary derangement.

Pronounced examples of the lethargic type were seen.

Two Chinese boys, one 12 years, the other 16 years old, walked into the hospital at different times, and as they stood talking to the examiner each would nod more and more deeply, closing his eyes sleepily, and finally would fall forward, wake up and go on talking. The older boy had actually fallen and cut his forehead. The younger boy (P.U.M.C. Hosp. No. 1887) had at the onset dizziness, convulsions with clonic jerking and abdominal pain. Sleepiness set in early, and he saw double.

Examination showed weak convergence, nystagmus on lateral movements, and with it a "batting" or winking movement of the lids in the same rhythm as the nystagmus. His speech was mumbling. This boy would waken for an hour or more at various times during the night, and sleep heavily during the day. He had terrifying dreams. His muscular power and reflexes were normal. The 16-year-old boy (P.U.M.C. No. 3741) had unequal pupils and no light reflex. He would sleep heavily, suddenly rise and walk about the ward, and then hurry back to his bed like a homing pigeon, clamber up and be asleep before his head rested on the pillow. In the sixth week of his illness Parkinsonian gait, station, facies, rigidity and failure in synergy set in and developed rapidly. He also had
at this period myoclonus of his right wrist-flexors and a tremor of his right hand, but the myoclonus had ceased at the 10th week.

Summary.—Acute onset, eye-muscle weakness, nystagmus, lethargy and disordered sleep, myoclonus and paralysis agitans syndrome.

In one case the symptoms resembled those of general paralysis of the insane.

The patient, a male, aged 38. History of syphilis 20 years ago. For a week recently he had bronchitis and a severe cough. One night at a dinner-party he began to talk excitedly, making pointless remarks, attracting undue attention to himself. He became confused and made the impression on himself and the other guests of being intoxicated. He had taken almost no alcohol. Later in the evening he had diplopia. He returned home and was heard during the night struggling in paroxysms of coughing. For 36 hours from that evening his memory is blank. The servants say he lay in bed, and they supposed this was due to his cough. The morning after this period of one day and two nights in bed he was found on the floor dazed, and foul with discharged feces and urine. He was brought to the hospital and put to bed. Shortly afterward he sprang out of bed arguing with a friend he supposed was present and seeking to convince him of the correctness of some point connected with the radiator in his room. Examination at this time showed no fever, but there were diplopia with weak convergence, tremor of the lips, tongue and lower facial muscles. He enunciated test sentences hesitatingly. Pupils were normal; tendon and skin reflexes were prompt. There was a general mild emotional excitement with self-satisfied statements as to his own talent and business ability.

Several weeks after his discharge he had a recurrence with similar symptoms, followed by complete recovery. There is no dementia.

Laboratory report.—Blood: Wassermannu test negative with one antigen, doubtfully positive with another. Second test more clearly positive. White cells, 10,050.

Spinal fluid: cells 11, protein 0.12 mg. per c.c. Sugar 0.08 per cent. Color clear, pressure normal. Wassermann test, negative.

Colloidal gold, negative. Three punctures with no variation from normal.

Patient recovered after 4 weeks. One recurrence a month later.

Summary.—A man in the period of life in which paralytic dementia occurs, with a history of syphilis, has a sudden attack of diplopia, then confusion followed by a period of oblivion, some hallucination with delusions, tremors of face and tongue, tripping on test sentences, mild euphoria. General paralysis ruled out by laboratory tests. The diagnosis of encephalitis epidemica rests upon the sudden onset, the cranial nerve weakness and the disturbance of consciousness, occurring during an epidemic of encephalitis.
Epidemic Encephalitis.

INCIDENCE OF SYMPTOMS.

Onset Symptoms:

Among these 27 patients reported in China:

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<td>Insomnia ... ... ... 2</td>
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<tr>
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<td>Pain in limbs, trunk or neck</td>
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<td>Convulsion</td>
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<td>8 (30%)</td>
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<td>Insomnia</td>
<td>6</td>
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<td>Palsy of extra-ocular muscles</td>
<td>11</td>
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<td>Consequent diplopia was noted by</td>
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<tr>
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<tr>
<td>Diminished or lost power of accommodation</td>
<td>6</td>
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<tr>
<td>Dyskinesia of hemiplegic distribution (includes the 3 hemiplegies.)</td>
<td>4</td>
</tr>
<tr>
<td>Choreiform movements</td>
<td>4</td>
</tr>
<tr>
<td>Athetosis</td>
<td>4</td>
</tr>
<tr>
<td>Paralysis agitans syndrome (Parkinsonian)</td>
<td>6 (22%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tremor without paralysis agitans</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myoclonus</td>
<td>3</td>
</tr>
<tr>
<td>Fibrillation of muscles</td>
<td>7 (26%)</td>
</tr>
<tr>
<td>Deafness</td>
<td>1</td>
</tr>
<tr>
<td>Tinnitus</td>
<td>2</td>
</tr>
<tr>
<td>Vertigo</td>
<td>1</td>
</tr>
<tr>
<td>Severe pains in limbs, trunk or neck</td>
<td>6</td>
</tr>
<tr>
<td>Loss of sexual desire</td>
<td>1</td>
</tr>
<tr>
<td>Increase of sexual desire with diminution of control</td>
<td>1</td>
</tr>
</tbody>
</table>

Mental:

| Odd conduct | 1 |
| Hypochondriacal anxiety | 1 |
| Terrifying dreams | 1 |
| Euphoria, boastfulness | 1 |
| Loss of memory | 3 |
| Retardation (includes Parkinsonian) | 8 |

Laboratory Findings.

Spinal Fluid.—The Wassermann test was negative in 15 of my 21 patients; in 3 adults and one child the spinal fluid was not taken. In one patient syphilis was present. One patient left without being punctured. In 14 out of the 27 patients the cells were 10 or less in twelve; 37 in one; between 50 and 70 in two; 240 in one patient. The protein was below 0.35 mg. per c.c. in eleven patients; between 0.4 and 0.6 mg. in three; 3.0 mg. in one patient.

Routine sugar tests were not started until late in the series.
The Urine.—In all the patients the urine was normal, a trace of albumin being reported in three.

The Blood.—Leucocyte count rose above 10,000 in 7 cases; the highest count was 16,000.

Age of Patients.

The youngest patient, seven years of age; the oldest, 49 years. Seven patients were between 7 and 20 years old; nine between 21 and 30; 8 between 31 and 40; and three between 41 and 50 years old. In statistical studies by Pearl of 549 cases in New York City and by Wechsler of 864 cases from all parts of the world, the greatest incidence was between the ages of 21 and 30.

Sex of Patients.

Only two of the 27 patients were women. When large numbers of cases have been studied the ratio of 6 males to 4 females obtained.

Nationality of Patients.

Naturally most of the 27 cases here reported were Chinese. More precisely, 22 were Chinese; 3 were Americans; one was Russian, and one British.

Seasonal Incidence of Disease.

In eleven of the 27 cases the onset was in the coldest quarter of the year (December—February); six of these cases occurred in December; in seven, the onset was in the early spring (March—April); in six, it occurred in the fall (September—November); in five, during May and June. None occurred during July or August. Other reports indicate that the incidence is greatest in the cold months.

Contagiousness of the Disease

No two patients came from the same house or had come into contact with each other, so far as is known, before admission.

Geographical Distribution in China of the Cases Reported.

Of the 21 patients seen in the Peking Union Medical College Hospital, 14 gave Peking as their place of residence; one gave Tientsin; one, Fuchow; one, Pao-ting-fu; two, Chefoo; one, Nanking; and one, Tung-chow.
Epidemic Encephalitis.

Of the six cases reported in the China Medical Journal, one was examined by Dr. Shibiey in the Hunan-Yale Hospital, Changsha; two by Dr. Judson at Huai-Yuan; one by Dr. Wassell in Wuchang; one by Dr. Cadbury in Canton, and one by Dr. Lennox in Peking.

### Occupation of Patients

| Students | ... | ... | 6 |
| Teacher | ... | ... | 2 |
| Missionary | ... | ... | 2 |
| Professional Accountant | ... | ... | 1 |
| Banker | ... | ... | 1 |
| Book-keeper | ... | ... | 1 |
| Shop-keeper and Merchants | ... | ... | 3 |
| Shoemakers | ... | ... | 1 |
| Housewife | ... | ... | 1 |
| Military officer | ... | ... | 1 |
| Domestic servants | ... | ... | 1 |
| Barbers | ... | ... | 1 |
| Hucksters | ... | ... | 1 |
| Rickshaw coolies | ... | ... | 2 |
| Coolies and laborers | ... | ... | 2 |
| Child | ... | ... | 1 |
| Unknown | ... | ... | 1 |

### Diagnosis.

Laboratory examinations give no specific findings for epidemic encephalitis. A positive Wassermann test or the discovery in body fluids of known micro-organisms turns the diagnosis away from encephalitis to the disease thus manifested. Increase in spinal-fluid cells or protein merely shows that meningitis is present, as it may be in any infectious fever. In encephalitis epidemic the cell and protein increase is usually slight and transitory. The sugar content has usually been normal, though frequently in the upper ranges of normal. In the later cases of our series the sugar estimation was done routinely. The highest was 0.1 per cent. In other forms of meningitis sugar is apt to be below normal in quantity.

### Treatment.

The ordinary hygienic and expectant treatment is all that can be prescribed. The use of hexamethylene-tetramine is a mere gesture.

Inasmuch as the motor cells and the cells involved in the higher functions of consciousness are poisoned, complete rest is indicated as plainly as it would in a case of fractured bone. Bed, assimilable food, a quiet and shaded room, are the proper conditions for such a patient. Return to work too early will mean the incomplete recovery or subsequent break-down of nerve-cells.
A consideration of the operative procedures best adapted for the treatment of glaucoma must necessarily involve a detailed study of the pathological anatomy of the condition. In what particulars does the glaucomatous eye vary from the normal? In other words, what anatomical details in the normal eye are altered and rendered physiologically functionless, or almost functionless, in the glaucomatous eye?

1. The first anatomical point I would call attention to is Professor Arthur Thomson's "Sulcus annulare corneae". When the iris, through contraction of its radial fibres, is thickened, its outer circumference presents a bevelled edge in front of its attached margin which fits into this groove situated immediately behind the sclero-corneal junction. The provision of this groove by nature permits recession of the iris into the angle of the anterior chamber without obliteration of the space between it and the cornea. It is well known that in glaucoma the surface of the iris and cornea may be not only in contact, but also actually bound together by plastic exudate. I therefore submit for your discussion that any operative procedure must, if it is to be effective, provide an alternative anatomical relationship which will physiologically serve the same purpose as Thomson's sulcus. If the sulcus is only temporarily obliterated, miotics will rectify the condition; if, however, the sulcus is permanently obliterated, then miotics are useless and operation must be resorted to.

It is interesting to note that it has been stated that glaucoma is more common in the winter months in temperate climates, when during the darker and cloudy days the pupil will be more dilated, whereas in the summer the pupil is contracted and the iris is therefore drawn out of Thomson's sulcus, which remains unobstructed.

*Read before the Section on Ophthalmology at the Conference of the C.M.M.A., held in Shanghai, February, 1923.
2. The second anatomical detail was also first called attention to by Professor Thomson; I refer to the scleral spur (Fig. 1). This lies immediately posterior to Schlemm’s canal, and forms the ligamentum annulare. The spur lies just external to the corneal sulcus, so that it is intimately related to the angle of the anterior chamber, an anatomical relationship to which I shall refer later. This spur has two further anatomical relations which are of great importance: the meridional fibers of the ciliary muscle are inserted into the posterior aspect of this spur, while into its anterior aspect some of the fibers of the pectinate ligament are inserted. Also, Thomson has shown that the fibers of the pectinate ligament form a triangular area of trabecular tissue, lined with endothelium, which is continuous with that which lines Descemet’s membrane. While some of the fibers of the pectinate ligament are inserted into the anterior aspect of the scleral spur, others sweep over it to become continuous with the stroma of the iris so that the channels of the ligament which are lined with endothelium are directly continuous with the iris stroma. I therefore submit for your consideration that we have, as Professor Thomson has suggested, an obvious pump in connection with the scleral spur. The meridional fibers of the ordinary muscle, by pulling the spur backwards, enlarge the spaces of the pectinate ligament and Schlemm’s canal situated laterally to the pectinate ligament. When the fibers of the muscle are relaxed, the fibers of the pectinate ligament by elastic traction pull the spur forward again, thus tending to reduce the lumen of Schlemm’s canal and force the contents onwards. When there is blocking of the angle of the anterior chamber by the root of the iris, there is an interference with this pump action, because the fibers of the ligamentum pectinatum are compressed and the canal of Schlemm is closed. According to the extent of this interference, symptoms of glaucoma ensue. This is borne out by clinical evidence, for it is a well-known fact that glaucoma is most apt to commence in its acute form during the night when the pump is out of action. Moreover, in the chronic form of glaucoma patients frequently state that their mists and haloes which are present when they wake up disappear as soon as they bring the iris and ciliary muscles into action.

3. The iris and its stroma act as a suction sponge. The crypts of the iris act as ducts leading to its stroma along the
spaces of which aqueous can reach the pectinate ligament when the angle of the anterior chamber is in danger of closure; for as we have already seen, some of the fibers of the pectinate ligament are directly continuous with the iris stroma passing over the point of the scleral spur. If, however, there is plastic exudation forming in the stroma of the iris, then the sponge-like action is interfered with and it is necessary for us to provide another channel through which aqueous can be drained off.

4. The canal of Schlemm is joined to the pericorneal plexus by 20 to 30 connecting trunks. It is lined with endothelium and is separated from the anterior chamber by the loose open network of the pectinate ligament, which is also lined with endothelium. Under normal conditions it contains no blood cells, but under the inflammatory conditions of congestive glaucoma it contains both blood and inflammatory cells which have worked their way through the spaces of the pectinate ligament from the angle of the anterior chamber. Any operative procedure for the relief of glaucoma should, therefore, be adapted specially to undo this block or to provide an alternative route for the flow of aqueous.

5. A study of the blood of the ciliary body and the parts adjoining it (Fig. 2.) shows how intimate is the relation of the venous system and the canal of Schlemm. In dealing with pathological conditions by operation we are often more successful if we imitate and assist nature in her curative efforts. Here, then, we have the interesting anatomical fact that the anterior ciliary vessels have perforating branches through the sclera in the region of the ciliary body, and it is by this channel that the only cases of natural cure have been reported. Two cases of natural cure by fistulisation through these channels have been reported, and both Holth and Elliot have reported cases of secondary fistulisation along the same channel after sclerectomy. Captain W. C. Gray, of the Indian Medical Service, reported the first case of natural cure to Elliot, and in doing so he said: "It looks almost as if a spontaneous trephining had occurred." In this case a definite filtration area was found at the usual seat of trephining. I submit for your consideration that such an occurrence speaks volumes in favour of the sclero-corneal trephining operation as one of the most rational of operations for the cure of glaucoma.
Fig. 1.—Meridional section through the anterior portion of the eye.
(Modified from Fuchs.)

Fig. 2.—Reconstruction of a schematic section, showing the blood supply of the ciliary body and the parts adjoining it. The connection of the various vascular plexuses is shown. L, limbus; C, conjunctival plexus of vessels; T, plexus of vessels in Tenon's capsule; PLe, episcleral plexus; PLi, intrascleral plexus; CSch, canal of Schlemm, with small collector vein, c; Ac.a, anterior ciliary artery; VCa, anterior ciliary vein; Mc, plexus in ciliary muscle; VMC, vessels of the ciliary muscle; PrC, ciliary processes; Sc, sclera.

Operations for Glaucoma. (Harston.)
Glaucoma Operations.

I have referred to the foregoing anatomical details because any discussion upon the value of a particular operative procedure cannot be rational, without taking these facts into consideration. If von Graefe's classical iridectomy is to be considered the proper procedure as an operative measure for the cure of acute glaucoma, why have so many eminent surgeons been at pains to devise some alternative procedure? Fuchs and his successors at Vienna have expressed a decided preference for von Graefe's operation in acute glaucoma, giving as their reason the fear of late infection occurring after sclerocorneal trephining. In fact, their experience with this complication seems to have been singularly unfortunate. On the other hand, both von Graefe himself and De Wecker recognized the failure of iridectomy in a large percentage of cases. The reason for this is not far to seek. I have only to call your attention to the anatomical details that I have already put before you. In acute glaucoma we have a complete blocking of the canal of Schlemm. Both it and its accessories, the spaces of the ligamentum pectinatum, are engorged with blood cells and inflammatory products; the iris root is closely applied to the cornea; Thomson's sulcus and the angle of the anterior chamber are entirely obliterated; the pump-like action or the scleral spur is at a standstill, and there may or may not be a complete sealing up of the whole area of the angle of the anterior chamber by plastic exudation, most effectually checking all physiological filtration of aqueous. Under such conditions as these, I submit for your careful consideration that we are bound to have a large percentage of failures for the following reason: As originally performed, we were taught to make a large scleral incision immediately behind the corneal limbus, insert the iris forceps at one angle of the wound, pull out the iris, make a snip with the scissors and then tear the iris away from its junction with the base of the ciliary body for the whole length of the wound, completing the procedure by a snip of the scissors at the opposite angle of the wound; in other words, an irido-dialysis. I submit that no procedure can be more calculated to be the subject of sequelae which defeats the object of the operation, viz., to provide an adequate filtration area at the angle of the anterior chamber. If plastic exudation has not already occurred, then I submit that it is only too likely to occur, with subsequent organisation of exudate as a natural sequela of plastic iritis, and entanglement of the remains of uveal tissue in the neighbourhood of the wound, thus effectively sealing up the
filtration channel. The successful cases are those in which by a happy chance this process does not take place; in other words, those cases which are operated on before plastic exudation has occurred from inflammatory congestion of the iris and ciliary body. The more zealous advocate of iridectomy will say, "Yes, but why perform irido-dialysis?" Such a surgeon will say at once, "That is not the operation I perform; I take a narrow grip of the iris as close up to the pupil as possible and, holding it as lightly as possible, I draw it out though the wound and cut it off with one snip of the scissors along the length of the incision as close up as possible to the wound, thus making a wide iridectomy close up to the base of the iris." It is in these last few words that the fallacy lies. Is the iris really cut off close to its base? In the successful cases doubtless it is, but in the unsuccessful cases a substantial tag of iris tissue is left still adherent in the neighbourhood of the angle of the anterior chamber (Fig. 3-6). This tag subsequently is the site of plastic iritis and the filtration channel is sealed. Iridectomy, then, is a successful procedure in the hands of some surgeons, but it is liable to be followed by a series of most unfortunate but purely accidental complications which cause failure to relieve the condition in a number of cases, some of which are unrecorded. It is not surprising, therefore, that alternative procedures have been devised.

Lagrange first brought forward his operation of sclerecto-iridectomy in May, 1906. I saw Lagrange perform the operation at the Oxford Congress of Ophthalmology in July 1910. He claimed that in cases of simple chronic glaucoma, to which his operation is confined, he was willing to be judged by results; certainly in his hands the operation has proved a great success. He lays stress on its restriction, however, to the chronic cases. I may state that Lagrange now uses a punch (Vacher's), somewhat similar to Holth's, for the sclerectomy, and that he insists that the sclerectomy must not be round. At the same Congress I saw Holth perform his sclerectomy. He has now modified his operation by using a tangential punch. He places his conjunctival flap to the temporal side of the vertical meridian; a sharp keratome makes a 3-4 mm. incision into the anterior chamber 1.5 to 2 mm. from the limbus and 3 mm. temporarily to the vertical meridian. His punch forceps has a blade 1 mm. wide. He introduces the blade of the forceps with the flat part parallel with the sclera in a tangential
Fig. 3—Shows diagrammatically the relation of parts in a case of trephining in which the iris base has not adhered to the cornea.

Fig. 4.—Shows diagrammatically the iris base adherent to cornea; the trephine hole lies just in front of the anterior attachment of the iris. The danger of iris prolapse is obvious.

Operations for Glaucoma. (Harston.)
Fig. 5.—Shows diagrammatically the trephine hole entering the chamber at the anterior part of its circumference, the posterior part being blocked by adherent iris.

Fig. 6—Shows diagrammatically the trephine hole passing through the cornea and the subjacent layer of adherent iris, in a case in which the iris is adherent to the cornea far forwards.

The diagrams have been modelled on a drawing by Thomson Henderson.

OPERATIONS FOR GLAUCOMA. (HARSTON.)
Glaucoma Operations.

direction below the nasal angle of the wound for a distance of 3 mm. into the anterior chamber. A piece of sclera 3 mm. long is excised, and subsequently a small basal iridectomy is performed. Holth makes his opening as far as possible directly over the canal of Schlemm. He aims to tap the Canal of Schlemm and the spaces of the pectinate ligament.

Finally, at the same Congress, Herbert came on the scene and performed his wedge-isolation operation. Each surgeon at the conclusion of his operation addressed the audience, each claiming special merits for his own procedure. In fact, the proceedings bore no very distant resemblance to a boxing match at which a succession of candidates is introduced to the ring, each candidate challenging all and sundry in various parts of the world to a match at his own weight!

It was at the end of the previous year, that is, 1909, that Elliot first commenced his epoch-making sclero-corneal trephining. About four years previous at an Ophthalmological Congress held at Heidelberg, Heine of Breslau introduced his method of cyclodialysis, his object being to create a communication between the suprachoroidal space and the anterior chamber. It will at once be perceived that such a procedure is in strict accordance with the rationale suggested by a consideration of the anatomical details for the relief of glaucoma. If such a channel can be made and kept permanently open, then relief from glaucoma will follow. Heine made an incision in the sclera parallel to the cornal margin and about 5 or 6 mm. outside it. He then introduced a spatula between the sclera and the uveal tract and broke through the fibers of the ligamentum pectinatum into the anterior chamber. That relief is not permanent in cases thus operated upon is due to the fact that the channel becomes closed again by plastic exudation. The result is that one never hears of Heine's cyclodialysis nowadays.

In May, 1912, Mayou and Zorab independently introduced the "thread" operation, which effected drainage by means of a silk thread which was introduced through the sclera into the anterior chamber, the ends of the thread lying buried beneath a conjunctival flap. I saw three of such cases exhibited at the Oxford Congress in 1914. In each case the tension was taken with the Schiotz tonometer and found to be normal, but the after histories of such cases were not of a favorable character, the thread
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working its way out and having to be removed. Personally I cannot look upon the introduction of a foreign body into the eye as a sound surgical procedure. 

The subsequent history of glaucoma operations has been the introduction of Elliot's trephine operation with various modifications suggested by different surgeons. I have not yet heard of any modification, other than Elliot's modification of his original conjunctival flap, which has been an improvement on Elliot's own method. One curious coincidence is, however, somewhat intriguing; it was not until I had read about modifications that I heard of late infections. The question of late infection was first brought to my notice at the Aberdeen meeting of the British Medical Association in July 1914. The surgeon who called attention to the danger of late infection and instanced cases he had in his own practice was rash enough to describe the operation he had performed, illustrating his description by a drawing on the blackboard. That operation was not Elliot's. Elliot's operation is now so well known that it is unnecessary for me to go into a detailed description. I will, however, refer to certain essential points in the operation without which the operation is not that of Elliot.

1. The first and most essential point concerns the flap, which must be as thick as possible. It does not end at the limbus; it is roughly concentric with the limbus, but it ends on either side opposite the highest point of the cornea about 8 mm. to its inner and outer sides.

2. In the dissection of the flap attention should be confined to the central area only, and the sides of the flap should be left untouched. In the upper part of the flap only the loose conjunctiva is raised, but in the lower part dissection should be carried down to the sclera so as to lay the sclera bare in the lower two-thirds of the wound, narrowing the dissection till the breadth of it only equals the breadth of the incision then made to split the cornea. The trephining area must be left free of all tags of tissue.

3. In splitting the cornea we must really split it and not cut it, otherwise the trephine hole is liable to fill up. The cornea should be split for 1 mm. only.

4. In applying the trephine, do so by tilting the apex of the handle towards the patient's feet so as to cut through the cornea.
Glaucoma Operations.

before it cuts through the sclera and thus hinge the disc of sclera. The reason for this is that the cornea is thicker than the sclera.

5. Use a very sharp trephine.

6. If successful in hinging the disc, perform a button-hole iridectomy, removing the disc and the portion of iris with one clean cut of the scissors.

7. Avoid impaction of uveal tissue in the trephine hole by using an irrigator applied to the trephine hole.

If I were to be asked to contrast the operation of iridectomy for glaucoma with that of trephining, I would say that in the former we have a counsel of perfection difficult to attain, and in the latter a perfection of counsel easily attained if the details laid down by Elliot are strictly carried out. Elliot does not record any late infections in his own practice, and I have so far been fortunate enough not to have to record any in my own practice.

The complications of the operation are most of them easily avoided. There is one, however, which is difficult to avoid, but fortunately it only rarely occurs. When it does occur it is apt to interfere seriously with the patient's subsequent vision. I refer to migration of pigment. Elliot does not definitely refer to this as a complication of trephining, but he does refer to ectropion of uveal pigment at the pupillary margin as a consequence of the shrinking of the iris stroma in glaucoma, and he shews a photomicrograph taken by that able helper of his, Mrs. Elliot, from a specimen lent by Mr. Treacher Collins. It is a complication which is liable to occur in any operation for glaucoma, and is by no means peculiar to trephining. It was brought to my notice somewhat forcibly by a European case of my own, a case which came very late for operation; in fact, four years after the patient had been warned by me. I had removed one eye which was blind and painful from absolute glaucoma. At that time I noticed that the tension was already increased in the other eye, but in spite of my warning the patient did not come for operation till four years later. I then trephined the eye with good results at first, but his vision in the course of time gradually began to fail. I found this was entirely due to a migration of pigment which had collected on the anterior surface of the lens completely obscuring his remaining vision. The complications peculiar to trephining are mostly those which should
not occur. They are (1) button-holing of the flap; (2) loss of the disc; (3) superficial haemorrhage, easily stopped when the scleral coat is cut through; (4) a vesicular filtrating scar, avoided by making a thick conjunctival flap.

As regards the loss of the disc it is stated that harm does not accrue even if it is left at the bottom of the anterior chamber. I do not feel competent to express an opinion on this point, as I have not yet observed it in that position. The trephine disc when removed should be lined with Descemet’s membrane to the exclusion of any fibers of the ligamentum pectinatum. Treacher Collins has shown that the line of junction between clear cornea and opaque sclerotic on the surface of the globe is 1 mm. internal to the point at which Descemet’s membrane breaks up into the ligamentum pectinatum. Therefore, if the cornea is split 1 mm. beyond the limbus, a 2 mm. trephine hole will ensure non-interference with the ligamentum pectinatum. A glance at the anatomical diagrams will show that trephining is a most rational procedure for the treatment of glaucoma. It does not depend for its success upon opening up the angle of the anterior chamber. It provides an alternative route in front of the angle and in front of the ligamentum pectinatum. In a very acute or in a congestive case of glaucoma you have none of that indelicate disturbance of the happy union of the root of the iris with the ciliary body which you have in iridectomy, neither do you get the violent congestion of the latter as a result of the disturbance of its intimate relations. A trephine filtration obviates the sponge-like action of the iris stroma and the closure of the canal of Schlemm. It imitates the only two reported cases of natural cure of glaucoma, but the channel is placed further forward. In late cases of chronic glaucoma, it is a far more advantageous procedure than iridectomy, for it is in these late cases that iridectomy most frequently fails. As regards the patient’s subsequent comfort, there is none of the dazzling that you get from the wide coloboma of an iridectomy. The cosmetic result is more pleasing to those who lay stress upon such details.

There has been some confusion in Europe between the Elliot operation and the Freeland Fergus operation, which is also a trephine procedure. There was, in fact, a somewhat wordy warfare between these two eminent exponents of the healing art. There cannot, however, be the slightest doubt in the minds of all clear-
thinking surgeons that the Elliot operation is essentially distinct from the Fergus operation. In the latter a 3 mm. trephine is used; the conjunctival flap is similar to the Lagrange flap, and has none of the protective virtues against subsequent sepsis that the Elliot flap possesses. The trephine hole is placed directly over the ciliary body, whereas in the Elliot operation the ciliary body is left severely alone. In addition, in his earlier operation Fergus introduced a repositor through the fibers of the pectinate ligament to free the angle of the anterior chamber, and he states that he still does so on occasion. He, therefore, as Treacher Collins has pointed out, performs a cyclo-dialysis in addition to trephining; but (and herein lies the danger) he leaves a 3 mm. trephine aperture immediately over the ciliary body, thereby asking for trouble, not only from subsequent sepsis, but from blocking of the trephine hole by the bulging ciliary body in all cases with the slightest congestion, and the inevitable entanglement of uveal tissue resulting therefrom. There can be no objection to rupturing the fibers of the pectinate ligament in order to free the angle of the anterior chamber. Such a procedure is based upon rational lines and is in accordance with the anatomical details I have referred to, but the procedure becomes quite irrational when a block is more than likely to occur in the alternative path provided for the drainage of aqueous, a path produced by this operation behind the angle of the anterior chamber and not directly communicating with the chamber as in the Elliot operation. For these reasons I do not recommend the Freeland Fergus operation.

I will now refer to the most recent operation which has been brought to my notice, namely, the operation of Law of Nottingham. At the annual meeting of the British Medical Association at Glasgow in July 1922, Mr. Bickerton of Liverpool called my attention to the brilliant results he had observed as the result of this operation as performed both by Law and subsequently by himself, and he kindly arranged to perform the operation, for those of us who were interested in the subject, on a case of chronic glaucoma at the Glasgow Eye Hospital. It is too early yet for me to offer an opinion on this operation, as I have not performed it frequently enough to enable me to do so. I have only adopted the procedure during the last three months since my return in November. One private case on which I operated I showed to Professor Fuchs. The case was a
long-standing one of chronic glaucoma in which the patient had but tubular central vision. The tension before the operation was 50 mm. and three weeks after operation was reduced to 25 mm. Charts of his field of vision before and after the operation showed a considerable recovery. I have so far only performed the operation on one case of acute congestive glaucoma in both eyes, but in this case there was complete relief of tension; the vision was saved in the left eye, but vision had already been reduced to bare perception of light in the right eye, and it has not since increased.

Law's operation is not a sclerectomy; it is a sclerotomy combined with what amounts to a cyclo-dialysis, but the latter is performed by a method which differs from Heine's method, in that a small bent keratome is used. The eyeball is fixed in the usual manner and drawn downwards, the small bent keratome is then inserted at a point 5 to 6 mm. from the limbus directly through the conjunctiva, and through the sclera between it and the uveal tissue till the point shows in the anterior chamber. At Bickerton's operation the fibers of the pectinate ligament could be seen caught up by the point of the knife and protruded by it into the anterior chamber. He stated that he had often observed this. The keratome is then withdrawn but in its withdrawal the wound of entry is enlarged laterally till it is about 6 mm. in breadth. It is immaterial whether the wound is enlarged towards the temporal or the nasal side. After the withdrawal of the keratome a Herbert's bent knife is inserted first on one side of the wound and then on the other; with this knife the fibers of the scleral spur forming the annular ligament are divided and the knife is subsequently withdrawn without injuring the conjunctiva. The exact amount of cutting to be done by sawing movements can only be judged by experience (according to Bickerton). I can only say as the result of my experience so far that very little sawing requires to be done, for one can feel the fibers give under the knife and then one knows one has cut through the fibers sufficiently to enable retraction to take place to an extent sufficient to maintain open a filtration channel from the anterior chamber to the suprachoroidal space. The introduction of the keratome was somewhat painful in the congestive cases, so that when operating on the second and better eye I injected the local anesthetic sub-conjunctivally and was able to perform the operation with complete freedom from pain. It will
be observed that the sclerotomy is a double one. There is left, therefore, a tongue of sclerotic which retracts by virtue of its elasticity and so restores, at one part of the circumference of the annular ligament, its function as a movable spur, and doubtless it obviates the blocking of the annular sulcus of Thomson in the same area. The relief of tension is immediate from the outflow of aqueous, which is at once observed on withdrawal of the keratome; and by virtue of the double sclerotomy this relief is maintained.

The operation would seem to be peculiarly well adapted to those cases (which we see so often in China) of glaucoma where the operation area is grossly obscured by the results of old trachoma and pannus in which the conjunctiva is intimately bound down to the subjacent tissue and in which the trephine operation takes longer in its performance by reason of this and excessive haemorrhage. It can be performed in a few seconds and the disturbance of the parts is reduced to the same minimum as in that of the trephine operation. It is well adapted to those cases in which it is desired to perform a cataract extraction later. Finally, I would call your attention to the fact that the channel of filtration also more closely imitates, than does the trephine operation, the natural channel formed in the two cases of spontaneous cure already reported.

If you will permit me once again to call your attention to the anatomical diagrams, you will see at once that if we confine ourselves to rational procedures for the relief of glaucoma (and such is the purpose of this paper), this operation has its limitations. It cannot replace the trephine operation in those cases where the iris is sealed down by plastic exudation against the cornea and the fibers of the pectinate ligament. In such cases, the point of the keratome will obviously impinge upon the surface of the iris and then cut through the latter in its passage into the anterior chamber, a very rude and rough procedure which would be only too likely to cause haemorrhage into the anterior chamber. Moreover, the gap cut through the iris would be a small one and would inevitably be sealed down again subsequently by plastic exudation, as the result of which the root of the iris would most surely be re-sealed more firmly than before to the fibers of the pectinate ligament. The alternative channel for drainage would thus be blocked and the end result would be that of an unsuccessful Fergus operation, but without its liability to subsequent sepsis. In all cases, however, where there is no permanent sealing down of the iris to the cornea
and ligamentum pectinatum, this operation is a rational and logical procedure, for judging by results at this early stage in its history, an adequate alternative drainage channel is provided, as evidenced by the relief of tension in those cases in which I have performed the operation and in those performed by Law and Bickerton. The operation has one point in its favour, that is, no conjunctival flap is made. There is, therefore, no disturbance of the sub-conjunctival tissue, the conjunctival wound unites in forty-eight hours, there is no wide gap left under the conjunctiva, so that the chances of subsequent sepsis are exceedingly remote, provided that all aseptic precautions have been taken at the time of the operation, and late infection would appear to be a more remote chance still.

In conclusion, I wish to place before you the following points for your consideration:

1. That in any operation for glaucoma preference should be given to the method which causes the least disturbance to the parts.

2. That the operation of choice should be that which causes the least subsequent plastic exudation.

3. That entanglement of uveal tissue in the filtration channel should be as far as possible avoided.

4. That the operation of iridectomy for acute and congestive glaucoma cannot be relied upon as fulfilling this third consideration.

5. That the late infection which has been reported after all operations for glaucoma can be avoided if the first, second and third considerations are taken into account.

6. That of the newer operations for glaucoma Elliot's and Law's operations more nearly fulfill the ideal requirements than any other operation.

**Causes of Blindness Among Chinese.**—Among 6,811 cases analyzed by Ling (*Nat. Med. Jour. of China*, September, 1923), blindness in one or both eyes occurred in 760. Trachoma was the etiologic factor in 398 cases; cataract in eighty-three cases; syphilis in seventy-six cases; glaucoma in seventy-three cases. Other causes were: bacterial infections, 48 cases; injuries, 44 cases; exanthemata, 37 cases; neoplasms, 15 cases; albuminuric retinitis, 2 cases; keratomalacia, 4 cases; focal infection, 2 cases; tuberculosis, 2 cases; toxic amblyopia (probably due to methyl alcohol). In 278 cases the etiology was not traceable.
A CHEMICAL STUDY OF THE COMPARATIVE VALUES OF THE ETHYL ESTERS OF CHAULMOOGRA AND HYDROCARPUS OILS.

By B. E. READ, Peking Union Medical College, Peking, China.

Development of Treatment with the Ethyl Esters of Chaulmoogra Oil. — The treatment of disease by chaulmoogra oil has probably dated back many thousands of years. The earliest literature indicates that it was regarded highly in the Orient, being used largely as an ointment. It was used as such in India and was introduced into the British Pharmacopoeia in 1914 as Unguentum Chaulmoograe containing 10 per cent of chaulmoogra oil mixed with paraffin.

Chaulmoogra oil taken by mouth becomes very nauseating. The Pharmacopoeia originally recommended a dose of 5 to 10 drops, gradually increasing to 30—60 drops. Because its taste and smell are disagreeable and it easily upsets the digestion, few patients were able to continue taking it for any great length of time. Usually it was considered necessary to continue the treatment for five or more years; consequently, medical men were constantly seeking for a preparation free from the digestive ill effects of the crude oil. In 1911 a purified form of chaulmoogra oil was prepared and named "Anti-lepral." This preparation had scarcely any smell and was without a disagreeable taste, so that to a certain degree the objectionable properties of the crude oil were overcome. This treatment likewise was recommended to be continued for many years.

Later, a number of well-known workers adopted the intramuscular injection of chaulmoogra oil in the treatment of leprosy. Injections were made weekly, beginning with 1 c.c. and increasing to 5 c.c. after prolonged injection. Dr. Heiser, of the Rockefeller International Health Board, had worked with a number of preparations in the treatment of leprosy and in 1914 he found that a mixture of chaulmoogra oil and camphorated oil with a small amount of resorcin was most beneficial. Other workers used a mixture of chaulmoogra oil with iodine. In the use of both methods claims of constant improvement and apparent cure of leprosy were made.
The China Medical Journal.

Sir Leonard Rogers in India, with the cooperation of Martindale, prepared the sodium salts of chaulmoogra oil, which he arbitrarily divided into three fractions, A-B-C. Fraction "A" contained a considerable amount of palmitate which was found to cause slight pain when injected. He adopted for his regular treatment the fraction "C", which contained chiefly sodium hydnocarpate.

Whilst in 1904 we had the details of the work of Power in preparing various esters of chaulmoogra oil, it was not until 1920 that any reports concerning them gripped the public attention. Previous to 1920, Dr. Dean, at the Philippine Islands, had been experimenting with the production of ethyl esters of chaulmoogra oil. Dr. McDonald, Director of the Leprosy Investigating Station at Honolulu, made use of these ethyl esters in treating a number of his patients. He reported that in two years 78 lepers had passed the scrutiny of examining boards appointed by the Board of Health and had been paroled as no longer a menace to the public health and that not one of the patients had thus far shown signs of recurrence. Of the patients 36 were male and 42 female; their average age was 23.5 years and their average stay in the hospital under treatment was 15 months. The treatment consisted of weekly intramuscular injections of the ethyl esters of the fatty acids of chaulmoogra oil beginning with one mil and gradually increasing until a dose of 6 mils was reached, according to the age and weight of the patient. This method of treatment has been tried by a large number of workers and they have found very satisfying results.

Recently, Dr. E. Muir, of Calcutta, has experimented with a number of preparations, with the object of obtaining rapid absorption and painless injections. The following mixture recommended by him is a type of those which aim at obtaining such results.

Ethyl esters of fatty acid of Oil
  of Hydnocarpus wightiana ... ... ... 1 c.c.
Camphor ... ... ... ... ... ... 1 gm.
Creosote ... ... ... ... ... ... 1 c.c.
Olive oil ... ... ... ... ... ... 2.5 c.c.

The creosote is added for its antiseptic value.

A Comparison of Oils of Chaulmoogra and Hydnocarpus.—There have been upon the drug market a number of vegetable oils
passing as chaulmoogra oil. That which is recognized as being official to-day is from Taraktogenos kurzii, a tree native to the East Indies, standing forty to sixty feet high, with alternate lanceolate leaves and bearing a large globular fruit about the size of an orange. The fruit contains numerous irregular oval seeds embedded in the pulp. It is collected by government license.

The Chinese Drug.—The Ta Feng Tzu (大 風 子) of China is Hydnocarpus anthelmintica, the seeds of which are also found in pods of about thirty or forty. The drug is cited by Li Shih Chen in the Pen T'sao (1590), as imported from Siam. It can be bought cheaply and plentifully all over China. It is sold at the wholesale drug fairs and subsequently passes into the hands of the retail dealers in the large cities. The writer has purchased samples in Peking, Tientsin, Paotingfu, Shantung, Fukien, and Yunnan and other places and they are all of the same variety. The seeds of H. anthelmintica can be bought in quantity from Dr. McKean of Chien Mai, Siam. With the licensed control existing in other countries this may be a useful source of supply. The appearance of the seed, its size and shape, are characteristic; there is no difficulty experienced to-day in distinguishing between the true seeds of chaulmoogra, and those of hydnocarpus and gynocardia.

The oil extracted from both chaulmoogra and hydnocarpus seeds has been found effective in the treatment of leprosy; that from gynocardia has been pronounced worthless. A long and interesting lawsuit which took place in 1915 in the Indian law courts established this fact. However, up to that time so indefinite was the knowledge concerning commercial chaulmoogra oil that it was classed as being identical with gynocardia oil.

The oil is obtained by cold expression from the seeds; so prepared it remains liquid at ordinary temperatures. When hot expression is used the oil partly solidifies even in the warm climate of India. Judging from the pharmaceutical valuation made of these oils we recommend the use of that obtained by cold expression. It is of the utmost importance that the oil be obtained pure (and unadulterated with any other foreign material.) Considerable work has been done with other oils such as cod-liver oil, soy bean oil, sardine oil, etc., which has given the drug dealer a sense of justification in adulterating the pure product. The oil as obtained on the Chinese market is found adulterated with at least 50 per cent
of some foreign oil, probably soy bean oil. On account of the similarity of the chemical properties of the oil from *Taraktoigenos* and from *Hydnocarpus* they are apparently of equal value in treatment and there is no clinical reason why we should object to their being mixed.

The exact identity of chaulmoogra oil is to-day quite apparent, although commercially this term is still held as representing oil from any one of the trees *Taraktoigenos kurzii*, *Hydnocarpus wightiana* and *Hydnocarpus anthelmintica*. There is no reason, as far as we know, why for practical purposes any sharp distinction should be made. Technically speaking the oils from these three trees are respectively named chaulmoogra oil, hydnocarpus oil and lukrabo oil.

On a recent visit to the Chi Chow drug fair of North China, we were able to procure Chinese seeds at seven cents a pound. It was found that 120 lb of the seeds yielded 33.15 lb of kernels, which again yielded in the cold, with moderate pressure as applied by simple methods, 7.4 lb of oil. By applying heat one can easily get up to 10 per cent. Southall states that the seeds contain 33 per cent of oil; this must refer to the percentage of oil from the kernels. Not counting labour, this would bring the price of the oil out between 94 cents and $1.65 per lb., which is cheaper than that paid for the Indian oils. The constants obtained were compared with known figures for hydnocarpus oil from India and also lukrabo and chaulmoogra oils, as follows:

**Table I.—Comparison of Physical Properties of Chaulmoogra and Similar Oils.**

<table>
<thead>
<tr>
<th>Chaulmoogra Oil, B. P.</th>
<th>Hydnocarpus anthelmintica</th>
<th>Hydnocarpus wightiana</th>
</tr>
</thead>
<tbody>
<tr>
<td>M. P. ... ...</td>
<td>22°</td>
<td>22-23°</td>
</tr>
<tr>
<td>S. G. ... ...</td>
<td>0.951 (24°)</td>
<td>0.946 (25°)</td>
</tr>
<tr>
<td>Rotation ...</td>
<td>+52°</td>
<td>+51.4</td>
</tr>
<tr>
<td>Iodine Value</td>
<td>103.2</td>
<td>85.8</td>
</tr>
</tbody>
</table>

After standing and filtering, the Chinese oil gave a Rotation +54.5°. This table shows that in most respects these three oils show little variation in physical properties.
EXPERIMENTAL.

The Ethyl Esters of Ta Feng Tzu.—The oil obtained from the Chinese seeds was treated by the method reported by Dean for the production of the ethyl esters.

The first step is to break up the glycerides into glycerol and the sodium soaps of the fatty acids by saponifying the oil with sodium hydroxide under pressure. Two hundred and forty grams of sodium hydroxide are dissolved in one liter of hot water; this is thoroughly mixed with 1,500 grams of chaulmoogra oil in a 5-liter, round-bottom flask, and heated in an autoclave under 15 pounds of steam pressure for one hour.

When the reaction is complete, the mixture is poured into 3 or 4 liters of hot water in a large precipitating jar and stirred until dissolved. The soap solution is now acidified with commercial hydrochloric acid, and the liberated fatty acids rise to the top of the water in the form of a thick oily layer. By means of a siphon, the lower aqueous layer containing sodium chloride and glycerol is drawn off and discarded. The remaining oil is washed with successive portions of hot water and finally transferred to a hot-water funnel, where, in the course of a few hours’ heating, all the
water settles out from the liquefied fatty acids and is drawn off. The acids are strained through linen before being allowed to solidify. The usual yield of mixed fatty acids at this point is between 1,350 and 1,400 grams.

These crude mixed fatty acids are treated in the following way to prepare the mixed ethyl esters.

The mixed ethyl esters are prepared by esterifying the crude mixed fatty acids with ethyl alcohol. Eight hundred cubic centimeters of 92-94 per cent ethyl alcohol are added to 1,000 grams of acids in a 2-liter flat-bottom flask, heated to 50°-60° C. under a reflux condenser, and dry hydrochloric acid gas is led into the flask. This treatment is continued for about 20 minutes after a separation into two layers occurs. The hydrochloric acid gas is conveniently prepared by allowing concentrated sulphuric acid to drop into concentrated hydrochloric acid and drying the hydrogen chloride gas evolved by passing it through sulphuric acid.

When esterification is complete, the contents of the flask are poured into 2 or 3 liters of warm water and washed to remove excess hydrochloric acid and alcohol. The ethyl esters come to the top on standing, and the lower aqueous layer is siphoned off and discarded.

The washing is continued with several successive portions of water. Any water held emulsified in the esters settles out upon being held for a time in a hot water funnel. These crude ethyl esters are reddish-brown in color. They can be used in this condition; but in order to get them as pure as possible they are distilled under high vacuum.

About 1,200 c.c. of the crude dry esters are put in a 2 liter distilling flask. A roll of wire gauze is inserted in the lower part of the neck of the flask and the neck is filled with glass beads or short lengths of glass tubing to form a fractionating column about 12 cm. in length. The flask is connected to the vacuum pump through a specially designed piece of apparatus with stopcocks so arranged that the receiver may be changed without interfering in any way with the distillation.

*Distillation of the mixed fatty acids.*—From the mixture of fatty acids, pure chaulmoogric acid and pure hydnocarpic acid have
been prepared by other workers by fractional distillation under high vacuum followed by a fractional crystallization, using the same apparatus as that described for distilling the ethyl esters.

The first 350 c.c. which distill over are worked for hydnocarpic acid. The next 200 c.c. composing the mixture fraction, are set aside to be redistilled as part of the next lot of mixed fatty acids. The remainder of the distillate is worked for chaulmoogric acid. It is impossible to make a quantitative estimation of the individual acids so an examination was made of the mixed ethyl esters.

Ten pounds of the expressed oil yielded four litres of ethyl esters, which is a slightly larger yield than that obtained from chaulmoogra oil, about 17 per cent more.

The results obtained are given in the following table, which also gives values obtained for the ethyl esters of chaulmoogra oil.

**Table II. Mixed Ethyl Esters.**

<table>
<thead>
<tr>
<th></th>
<th>Chinese Hydnocarpus oil</th>
<th>Chaulmoogra oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. P. (5 mm. pressure)</td>
<td>185 to 205° C.</td>
<td>185 to 220° C.</td>
</tr>
<tr>
<td>S. G. (25° C.)</td>
<td>0.892 to 0.893</td>
<td>0.895 to 0.898</td>
</tr>
<tr>
<td>Rotation</td>
<td>+46.78° to +49.84°</td>
<td>+46.6°</td>
</tr>
<tr>
<td>Iodine Value</td>
<td>81.67 to 81.69</td>
<td>96.1</td>
</tr>
</tbody>
</table>

**Discussion of Results.**

**Interpretation of Values.**—A lengthy outline of the development of this treatment for leprosy and the comparative tests for the various oils were given at the beginning of this paper to show what factors contribute to the value of one preparation above another. Rogers, in preparing his series of sodium salts for injection made three fractions; from these he selected the third fraction with the lowest melting point for regular treatment because it gave less pain and had comparatively excellent results. However, as Gardner points out, essential data are lacking in the method of preparation, there being conveyed to the worker the general principle that the higher fractions containing chaulmoogric acid and other bodies were not so useful as the lower fractions containing chiefly hydnocarpic acid, which is a member of the same series of fatty acids containing 2 hydrogen atoms less. Hence the difference between these two products, as judged from the boiling point, would be in favour of hydnocarpus oil.
Rotation.—The similarity of these oils does not depend upon their physical properties only but also upon their chemical constitution. The two most important constituents are chaulmoogric and linocarpic acid. These two fatty acids are isomeric with linoleic acid, one of the chief constituents of linseed oil. Their chief characteristic is that they are able to rotate the plane of polarized light to the right. This property, together with a number of chemical reactions first carried out by Power and his co-workers, showed that although they are members of the chemical series with the general formula \( C_nH_{2n-4}O_2 \), they have a characteristic allyl ring of tautomeric structure with only one double bond in the molecule. Apparently it is the character of its chemical structure which gives it unique value in the treatment of leprosy.

**CHaulmoogric Acid Series.**

\[
\begin{align*}
\text{H} & \quad \text{C} \\
\text{H} & \quad \text{H} \\
\text{H} & \quad \text{C} \\
\text{H} & \quad \text{C} \\
\text{H}_2 & = \text{C} \\
\end{align*}
\]

**Linoleic Acid Series.**

\[
\begin{align*}
\text{CH}_3 & \quad \text{(CH}_2)_n \quad \text{CH} = \text{CH} \quad \text{CH}_2 \quad \text{CH} = \text{CH} \quad \text{(CH}_2)_n \quad \text{COOH}
\end{align*}
\]

Iodine Value.—To interpret the iodine values one needs to look with greater detail at the constitutional formulae for the chaulmoogric and linoleic acid series. Power gives in his papers the following facts, upon which he established the above constitutional formula.

From genuine chaulmoogra oil (from the seeds of *Taraktogenos kurzii*, King), was obtained in colourless, glistening leaflets, chaulmoogric acid, which when freshly distilled, melted at 68.5° and had \((a)_D + 62.1°\) in chloroform solution.

Methyl chaulmoograte was prepared by the interaction of the acid, methyl alcohol, and hydrogen chloride.

Ethyl chaulmoograte, \( \text{C}_{17}\text{H}_{31}\text{CO}_2\text{Et} \), a colourless oil (b.p. 230° corr. 20 mm., sp. gr. 0.9079 at 15°/16° (a) \( D + 50.7° \)), was prepared in like manner.
Bromodihydrochaulmoogric acid, $\text{C}_{17}\text{H}_{32}\text{Br}.\text{CO}_2\text{H}$, optically inactive, is formed when chaulmoogric acid is treated with hydrogen bromide in glacial acetic acid.

Ethyl chaulmoograte absorbs two atomic proportions of bromine or iodine in the cold, forming ethyl dibromodihydrochaulmoograte, $\text{C}_{17}\text{H}_{31}\text{Br}_2.\text{CO}_2\text{Et}$, which is an oil.

When chaulmoogric acid is treated with sodium and boiling amyl alcohol, the ethylenic linking is not resolved, but there were obtained, after fractional distillation of the product, chaulmoogryl alcohol, $\text{C}_{18}\text{H}_{33}.\text{OH}$, chaulmoogryl chaulmoograte, $\text{C}_{17}\text{H}_{31}.\text{CO}_2.\text{C}_{18}\text{H}_{33}$, together with unchanged chaulmoogric acid.

In addition to this, a homologue, hydnocarpic acid, $\text{C}_{16}\text{H}_{34}.\text{O}_2$, was isolated.

In his formula the dotted lines represent a state of equilibrium between the hydrogen atom and two carbon atoms.

The results obtained by Sir W. H. Perkin for the molecular magnetic rotation of ethyl chaulmoograte, are quite in harmony with the given formula. The average value found lies between that calculated for the pentene structure and the bicyclic structure.

This formula with the facts above stated show conclusively that one molecule of hydnocarpic or chaulmoogric acid will combine with only two atoms of iodine. We know that the linoleic acid series of medically inactive bodies combine with 4 atoms of iodine.

Hence a low iodine value, so long as the other factors are good, indicates a greater percentage of chaulmoogric acids and the better the preparation for therapeutic purposes. The ethyl esters of the Chinese oil gave consistently low iodine values, and the other constants were good, indicating that it contains slightly less of the non-therapeutically active open chain acids than occur in the chaulmoogra preparations, and slightly more of the active acid.

The importance of ridding the products of foreign material is only realized if one follows carefully the development of the treatment with the ethyl esters. A painless injection of readily absorbed material is the ideal form for the presentation of this drug. The pure ethyl esters give no immediate pain when injected; the hydnocarpus esters are entirely painless at the time of injection. A discussion of the exceedingly painful reactions which are experienced a day or two after injection does not come within the
scope of this paper. We have mentioned Muir's method adopted for facilitating absorption and for reducing the painful reactions. We await with interest the results of clinical trials with other methods.

Chaulmoogra Soap.—It has been suggested that the fatty acid soaps should be made use of to prepare a special toilet soap for lepers, which might take the place of ordinary soap. Surely if benefit has been secured by the use of chaulmoogra ointment and by the injection of the sodium salts, some benefit may be expected from the use of a chaulmoogra soap. If this suggestion be new and commend itself to those interested in the subject, steps should be taken to secure the cooperation of one of the wholesale manufacturers, or, better still, let each hospital itself buy the Chinese seed, express the oil, and make the sodium soap in the manner described. One part of this incorporated into 5 to 10 parts of ordinary toilet soap should make a satisfactory preparation.

Acknowledgement is due to Mr. C. T. Feng for his able laboratory assistance in this work.

Summary.

1. Investigation has shown that Ta Feng Tzu, as purchased all over China is of one variety, namely, Hydnocarpus anthelmintica.
2. Its low price, and facility of purchase should make it of service to the medical profession in China.
3. A toilet soap made from this oil is suggested for the use of lepers.
4. The mixed ethyl esters of the oil from Chinese leprosy seed were prepared, the chemical properties of which were shown to be superior to those of the ethyl esters of chaulmoogra oil.

References.

Fig. 1.—Apparatus used in Globulin Precipitation Test.

Fig. 2.—Diagram Illustrating the Physical Changes in a Positive Test.

A = uniform cloudiness.
B = development of fine precipitate, evenly distributed.
C = settling of precipitate, coarse precipitate at lower portion of fluid.
D = final sedimentation.

Globulin Precipitation Test in Kala-azar. (R. H. P. Sia.)
A SIMPLE METHOD FOR ESTIMATING QUANTITATIVE DIFFERENCES IN THE GLOBULIN PRECIPITATION TEST IN KALA-AZAR.

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In the course of performing the globulin precipitation test 1, 2, in a great number of kala-azar patients, it was observed that in certain cases a very heavy turbidity and precipitation occurred, while in others only a slight haziness developed. This latter finding was especially noticeable in patients who had improved under treatment, so that when results were compared, various grades of positive reactions were encountered. The purpose of this communication is to introduce a standardized method for classifying these different grades of positive reactions.

In order to differentiate the strongly positive tests from the weakly positive, a slight modification of the original technique was found to be necessary. The introduction of complicated methods, such as the direct chemical quantitative determination of serum globulin, or the use of additional apparatus in the test, was carefully avoided, and the simplest possible means chosen. It was thought that in so doing the test could be more readily applied, especially in places where a well-equipped laboratory is not available, and thus the test would be more generally useful.

The principle on which the quantitative reading of the test, here reported, is based, depends upon the fact that the degree of turbidity which develops on adding distilled water to the blood of a kala-azar patient is directly proportional to the amount of precipitable globulin present in the serum; furthermore, that the rate of sedimentation of the precipitate is also directly proportional to the amount of precipitate formed.

To insure a uniform technique and a standardized method of recording the results, both of which are essential in any clinical test, these points are considered in detail.

Apparatus.

The necessary apparatus used in the test is illustrated in Fig. 1. It consists of small test-tubes 7-8 mm. in diameter (if such tubes are not obtainable the tube that accompanies the Sahli
hemoglobinometer can be used instead), a rack to hold the test tubes; pipette to measure 20 cmm. (also the one that is ordinarily employed for Sahli's hemoglobin determination), a medicine dropper or a small pipette calibrated to measure 0.6 c.c. of water, and a small flask of distilled water.

**Technique.**

The lobe of an ear is cleansed with alcohol. A skin puncture is made. The first drop of blood is wiped off with a piece of dry sterile cotton or gauze. Twenty cmm. of blood is then collected by means of a pipette and emptied immediately into a small test-tube containing 0.6 c.c. distilled water.* The contents of the tube are quickly mixed by whirling the tube 8-10 times with the hand. The tube is allowed to stand without further shaking. Observations are made first at the end of 5 minutes for the presence or absence of turbidity, and then at intervals of 15, 30 and 60 minutes for the physical changes in the precipitate. The presence of settling or fairly complete sedimentation of the precipitate is taken as the end-point, the occurrence of which terminates the observation.

**Results.**

With a technique such as given above, 50 tests have been performed on 29 kala-azar patients. Fourteen of these tests were on untreated cases, while the remainder were on cases that had received during treatment various amounts of antimony. Repeated tests were made at frequent intervals on most of the patients. It became evident that all of these positive tests fell within definite groups according to the rate of sedimentation, and for the convenience of recording results, different numbers of plus (+) signs, varying from one plus to four plusses, were adopted: ++++ to represent a strongly positive reaction, and + a very weakly positive one.

Before the results of these tests are considered, it may be said that, in general, a positive globulin precipitation test follows a

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*The test-tubes and pipettes used should be clean. Distilled water, if possible, should be quite fresh. When these precautions were not observed, we have frequently noticed the development of a fibrin-like precipitate at the bottom of the tube in negative cases, thus causing confusion with positive tests.*
Globulin Precipitation Test in Kala-azar.

fairly definite course of changes. Fig. 2. illustrates diagrammatically these changes from the time when the blood is mixed with the distilled water until a definite sedimentation has occurred. In a positive test, there is at first a uniform haziness or turbidity (Fig. 2-a). Then a fine precipitate develops within a very short time, which is evenly distributed throughout the mixture (Fig. 2-b). As the tube is allowed to stand undisturbed, settling of the precipitate occurs. With the progress of sedimentation, a coarser precipitate collects at the lower portion of the fluid (Fig. 2-c), until finally practically all the precipitate will have settled at the bottom of the tube to form a definite sediment, leaving a fairly clear supernatant fluid with but a few fine particles of precipitate remaining in suspension (Fig. 2-d). The length of time that is required for this sediment to form depends upon the amount of precipitate present. The heavier the precipitate, the more rapid the rate of sedimentation.

The present classification of the different degrees of positive reaction depends upon the rate of sedimentation of the precipitate. Various time intervals have been tried, and it was found that 5, 15, 30 and 60 minutes as mentioned above were the most satisfactory periods. At the end of five minutes, a haziness or cloudiness should be present in all positive tests. And tests that show a definite settling (Fig. 2-c) or fairly complete sedimentation of the precipitate (Fig. 2-d) within fifteen minutes are considered strongly positive (++++); those in which this change does not occur until 15 to 30 minutes, moderately positive (+++); those between 30 and 60 minutes, weakly positive (++); and those that show only a haziness and a very fine precipitate but no sediment even after 1 hour, very weakly positive (+). Observations are done with the naked eye alone; no magnifying lens is employed.

Table I gives a series of cases with strongly positive (++++) tests. Observations after 15 minutes are not given, because after a sediment has already formed no further visible changes take place, at least not for several hours. The presence of cloudiness at the end of five minutes and a definite settling or a complete sedimentation of the precipitate in fifteen minutes are taken as evidences of a strongly positive reaction (++++), and no further observations after fifteen minutes would therefore be necessary.
Table I.—Strongly Positive Tests

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Date</th>
<th>Stage of Disease</th>
<th>15 minutes Precipitate</th>
<th>Observations at 5 minutes</th>
<th>Stage of Disease</th>
<th>Observations at 5 minutes</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Untreated</td>
<td>Treated</td>
<td></td>
<td>Slightly Improved</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hosp. No.</td>
<td></td>
<td>U</td>
<td>B</td>
<td></td>
<td>SI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3333</td>
<td>1/29/23</td>
<td>SL. I</td>
<td></td>
<td>+</td>
<td>+</td>
<td>C*</td>
<td>+++</td>
</tr>
<tr>
<td>4128</td>
<td>1/22/23</td>
<td>U</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>D*</td>
<td>+++</td>
</tr>
<tr>
<td>1757</td>
<td>1/30/23</td>
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<td></td>
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<td>D</td>
<td>+++</td>
</tr>
<tr>
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<td>B</td>
<td>+</td>
<td>+</td>
<td>D</td>
<td>+++</td>
</tr>
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<td></td>
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<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>1757</td>
<td>2/13/23</td>
<td>U</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>D</td>
<td>+++</td>
</tr>
<tr>
<td>4332</td>
<td>2/19/23</td>
<td>U</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
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<td>B</td>
<td>+</td>
<td>+</td>
<td>D</td>
<td>+++</td>
</tr>
<tr>
<td>4534</td>
<td>3/29/23</td>
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<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>4443</td>
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<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>4740</td>
<td>4/12/23</td>
<td>U</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
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<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>4654</td>
<td>4/24/23</td>
<td>U</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>4849</td>
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<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>4954</td>
<td>4/26/23</td>
<td>U</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>4913</td>
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<td>U</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>4945</td>
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<td>U</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>4740</td>
<td>5/5/23</td>
<td>U</td>
<td>B</td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
<tr>
<td>1757</td>
<td>5/10/23</td>
<td>SL. I</td>
<td></td>
<td>+</td>
<td>+</td>
<td>C</td>
<td>+++</td>
</tr>
</tbody>
</table>

*See Fig. 2-c. and Fig. 2-d.

From the column under "Stage of Disease," it should be noted also that the cases showing ++++ reactions are either untreated cases, cases in which treatment has just begun, or those that have improved only slightly under treatment.

Table II shows the moderately positive (++) tests. A haziness or cloudiness is also present at 5 minutes. But settling or sedimentation of the precipitate occurs later than those shown in Table I, that is, between 15 and 30 minutes.

Table III represents a weaker positive reaction than the two previous groups. Sedimentation does not take place until thirty to sixty minutes, although a haziness could be seen also at the end of five minutes' standing. So far, only those patients that have shown moderate improvement give a two-plus reaction.
**Globulin Precipitation Test in Kala-azar.**

### Table II.—Moderately Positive Tests

<table>
<thead>
<tr>
<th>Case</th>
<th>Date</th>
<th>Stage of Disease*</th>
<th>Observations at</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Precipitate</td>
</tr>
<tr>
<td>Hosp. No.</td>
<td>1923</td>
<td></td>
<td>Clear</td>
</tr>
<tr>
<td>2882</td>
<td>1/13</td>
<td>Sl. I</td>
<td>+</td>
</tr>
<tr>
<td>4109</td>
<td>1/19</td>
<td>U</td>
<td>++</td>
</tr>
<tr>
<td>4109</td>
<td>2/3</td>
<td>B</td>
<td>++</td>
</tr>
<tr>
<td>4097</td>
<td>2/8</td>
<td>Sl. I</td>
<td>++</td>
</tr>
<tr>
<td>1671</td>
<td>2/8</td>
<td>Sl. I</td>
<td>++</td>
</tr>
<tr>
<td>3333</td>
<td>3/8</td>
<td>Sl. I</td>
<td>++</td>
</tr>
<tr>
<td>4332</td>
<td>3/29</td>
<td>B</td>
<td>++</td>
</tr>
<tr>
<td>3333</td>
<td>4/3</td>
<td>I</td>
<td>++</td>
</tr>
<tr>
<td>4929</td>
<td>5/5</td>
<td>U</td>
<td>++</td>
</tr>
<tr>
<td>4735</td>
<td>5/12</td>
<td>B</td>
<td>++</td>
</tr>
<tr>
<td>OPD No.</td>
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<td></td>
</tr>
<tr>
<td>22031</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hosp. No.</td>
<td>5/17</td>
<td>Sl. I</td>
<td>++</td>
</tr>
<tr>
<td>4430</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*See abbreviations used in Table I.

### Table III.—Weakly Positive Tests

<table>
<thead>
<tr>
<th>Case</th>
<th>Date</th>
<th>Stage of Disease*</th>
<th>Observations at</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>5 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Precipitate</td>
</tr>
<tr>
<td>Hosp. No.</td>
<td>1923</td>
<td></td>
<td>Clear</td>
</tr>
<tr>
<td>2312</td>
<td>1/23</td>
<td>I</td>
<td>+</td>
</tr>
<tr>
<td>2312</td>
<td>2/19</td>
<td>I</td>
<td>+</td>
</tr>
<tr>
<td>4097</td>
<td>3/6</td>
<td>I</td>
<td>+</td>
</tr>
<tr>
<td>3333</td>
<td>5/8</td>
<td>I</td>
<td>+</td>
</tr>
</tbody>
</table>

*See Table I.
There have been a few cases (Table IV) in which the test began with a haziness, and a slowly developing precipitate which was very very fine and did not show any sign of settling or sedimentation even after one hour's standing. Such tests were found in kala-azar patients that have shown marked clinical improvement, and are considered as a very weakly positive (+) test.

Table IV.—Very Weakly Positive Tests.

<table>
<thead>
<tr>
<th>Case</th>
<th>Date</th>
<th>Stage of Disease</th>
<th>Observations at 5 minutes</th>
<th>Observations at 15 minutes</th>
<th>Observations at 30 minutes</th>
<th>Observations at 1 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hosp. No.</td>
<td>1923</td>
<td>Disease</td>
<td>Precipitate</td>
<td>Precipitate</td>
<td>Precipitate</td>
<td>Precipitate</td>
</tr>
<tr>
<td>2882</td>
<td>1/23</td>
<td>I</td>
<td>+</td>
<td>+</td>
<td>O</td>
<td>+</td>
</tr>
<tr>
<td>1671</td>
<td>3/15</td>
<td>I</td>
<td>+</td>
<td>+</td>
<td>O</td>
<td>+</td>
</tr>
<tr>
<td>1671</td>
<td>4/5</td>
<td>I</td>
<td>+</td>
<td>+</td>
<td>O</td>
<td>+</td>
</tr>
<tr>
<td>4097</td>
<td>5/12</td>
<td>I</td>
<td>+</td>
<td>+</td>
<td>O</td>
<td>+</td>
</tr>
</tbody>
</table>

*See Table I.

Occasionally, there follow in patients that are practically well from kala-azar, tests in which only a haziness is present and no precipitate develops (at least not visibly to the naked eye) even after one hour's standing. These are examples of a doubtful positive (±) reaction.

Table V shows results of tests in clinically cured cases. Here the test was found to be negative, that is, there was neither turbidity nor any precipitate present. All of these cases were proved kala-azar and had given a strong positive test before treatment.
Globulin Precipitation Test in Kala-azar.

TABLE V.—GLOBULIN PRECIPITATION TEST IN CURED CASES OF KALA-AZAR

<table>
<thead>
<tr>
<th>Case</th>
<th>Stage of Disease</th>
<th>Observations at</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5 minutes</td>
<td>15 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Precipitate</td>
<td>Precipitate</td>
</tr>
<tr>
<td>Clear=O</td>
<td>Absent=0</td>
<td>No sediment=O</td>
<td>Absent=0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>O.P.D. No.</th>
<th>Hosp. No.</th>
<th>Well</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>10059</td>
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<td>Well</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<tr>
<td>2984</td>
<td></td>
<td>Well</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2680</td>
<td></td>
<td>Well</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2688</td>
<td></td>
<td>Well</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2137</td>
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<td>Well</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
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<td>0</td>
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</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4997</td>
<td></td>
<td>Well</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2882</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

In general, therefore, we may state that an untreated case of kala-azar usually gives a four-plus or three-plus globulin precipitation test. As the patient improves under treatment, there is a parallel diminution in the degree of positiveness, and when the patient is cured, the test will have become negative. To illustrate this point further, Table VI is given. It represents a few of the cases that have been under treatment at the kala-azar clinic of this hospital for some time. For rough comparison with the globulin precipitation test, the size of the spleen is taken to indicate the degree of improvement of the patient at the time of observation.

Finally, it is hoped that with as simple a method for estimating quantitative differences in the globulin precipitation test as this is, the test will prove to be more useful and specific, both as a guide in the treatment and also as an aid in the diagnosis of this disease.
SUMMARY.

The observation that all kala-azar patients do not give the same degree of a positive globulin precipitation test has led to the development of a method for judging quantitative differences between tests. For this purpose, the original technique previously employed has been slightly modified. Twenty ccm. of blood from a skin puncture is quickly mixed with 0.6 c.c. distilled water in a small test-tube and allowed to stand without further agitation. Positive tests are shown by the presence of a haziness or cloudiness at the end of five minutes, and tests that show a settling or sedimentation of the precipitate at the end of fifteen minutes are considered as strongly positive (+++); those at thirty minutes, moderately positive (+++); those at sixty minutes, weakly positive (++); those that show presence of a fine precipitate and no sedimentation even after 1 hour, a very weakly positive (+); and those occasional ones that give a haziness but no precipitate even after 1 hour, a doubtful positive (±) reaction.

It is further shown that in cases of kala-azar that have improved under treatment, there is also a parallel decrease in the degree of positiveness of the test, so that when the patient is discharged cured, the test will have become negative.

REFERENCES

PITUITRIN IN THE TREATMENT OF ASPHYXIA PALLIDA NEONATORUM.


Having recently had two very striking results from the use of pituitrin injection in treatment of asphyxia pallida in newly-born children, I think they are worth recording in the hope that others may try its use in similar cases that do not respond to the usual methods of resuscitation.

In the first case the mother, a Chinese, had been in labour for two and a half days; when I was called to her, the head of the child was presenting and was delivered by low forceps operation. The child was exceedingly pale and limp and made no attempt to breathe beyond one slight retraction of the abdomen. I used the
### Table VI.—The Globulin Precipitation Test and The Improvement of Kala-azar Patients.

#### Case 1.—Hosp. No. 1071

<table>
<thead>
<tr>
<th>Date</th>
<th>2/8/23</th>
<th>3/15/23</th>
<th>5/5/23</th>
<th>5/15/23</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. P. T.</td>
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<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

#### Case 2.—Hosp. No. 2312

<table>
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<tr>
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<th>1/18/23</th>
<th>2/22/23</th>
<th>3/22/23</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. P. T.</td>
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<td>++</td>
<td>+</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Case 3.—Hosp. No. 4997

<table>
<thead>
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<th>2/8/23</th>
<th>5/12/23</th>
<th>5/17/23</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. P. T.</td>
<td>+++</td>
<td>++</td>
<td>+</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Case 4.—Hosp. No. 2751

<table>
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<th>9/26/22</th>
<th>12/12/22</th>
<th>5/3/23</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. P. T.</td>
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<td>++</td>
<td>+</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Case 5.—Hosp. No. 2882

<table>
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<th>1/9/23</th>
<th>3/13/23</th>
<th>5/17/23</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. P. T.</td>
<td>++++</td>
<td>++</td>
<td>+</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Case 6.—Hosp. No. 2984

<table>
<thead>
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<th>10/24/22</th>
<th>12/5/22</th>
<th>1/25/23</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. P. T.</td>
<td>+++</td>
<td>++</td>
<td>+</td>
<td>0</td>
</tr>
</tbody>
</table>

* G. P. T. = Globulin Precipitation Test.
various methods of artificial respiration with the child bathed in hot water, and also tried breathing into its mouth through two layers of gauze, but without any result. These measures had occupied about fifteen or twenty minutes, and the friends regarded the child as quite dead and advised me not to trouble further. However, as I could just detect a little heart flutter, I determined to give a small injection of pituitrin. I injected about 0.3 c.c. into the muscle of the buttock, and within less than a minute the child gave a deep sigh, the colour began to flush its skin, and before five minutes it was crying and breathing quite normally. The friends almost regarded the case as one of raising the dead.

The second baby was also a Chinese; the mother had a perfectly normal labour without aid of any kind. The cord was round the neck rather tightly when the head was born, but it was immediately released. The babe gave a few gasps, but it was quite evident that no expansion of the lung had taken place, for with the retraction of the abdomen the intercostal muscles seemed also to be drawn in, and the whole body was pale, flaccid and lifeless. I performed the usual methods of artificial respiration, and kept the child in warm water while doing so, until the placenta was expelled, before I cut the cord, and continued these efforts for quite quarter of an hour. As I felt the heart was still beating, I thought I would try, as in the former case, the effect of pituitrin, giving about 0.3 c.c. The result was most striking. The child gave a deep sigh, the lungs expanded, and in a minute or so the body, which had been so pale, became deeply flushed, while the stump of cord which a moment before was lying limp, flat and bloodless on the abdomen of the child, began to expand and throb quite strongly with the force of the blood that filled it.

The explanation that occurred to me at the moment was that the pale asphyxia was due probably to something of the nature of "shock," and the action of the pituitrin in contracting the arteries and raising the blood pressure forced a bigger supply to the lungs and at the same time stimulated the intercostal and abdominal muscles to contract. I should be glad, however, if others who have had any similar experiences would venture an explanation.

I confess that when I first used pituitrin in this manner it was largely in the hope that something might come from a stimulant that could act quickly that led me to make the attempt, and I intend to repeat this method again in like circumstances.
A part of the great work which now lies before the medical profession in China, of even greater importance than the relief or cure of the diseases and injuries of individuals, is the dissemination everywhere among the people of the principles and application of scientific medicine, particularly as this is concerned with the prevention of disease. Probably few missionary physicians will dissent from this statement, but it may be well to state briefly a few of the reasons for making it.

(1) Epidemic and other preventable diseases with an appalling mortality are very common in China. Besides the sickness and death which these diseases cause, there is also impairment of the physical and mental vigor of multitudes suffering from parasitic and other chronic forms of preventable disease. In consequence, the efficiency and welfare of the people as a whole are lowered and national progress is impeded. For the prevention and eradication of these diseases it is necessary to obtain the intelligent co-operation of the people, and this cannot be given unless they are instructed.

(2) Until the Chinese people have some understanding of the causation of disease and are willing to co-operate intelligently in all measures to prevent or cure it, and cease to regard scientifically trained practitioners as being on exactly the same professional level as the ignorant native doctors, comparatively few well-educated young men and women of China will care to enter the medical profession. Public Health education is necessary to prepare the field for the successful practice of scientific medicine.

(3) Foreign physicians can never reach more than a fraction, a comparatively small fraction, of the sick and injured in China; the interests of public health demand that the Chinese must become independent in this respect by learning to take medical care of themselves.

(4) With infectious diseases rampant in China there is danger to the welfare of other countries."
Preventive Medicine

(5) Preventive medicine is closely related to missionary work. As long as there is ignorance of the laws of physiological and sanitary righteousness and it is commonly believed that all forms of disease are traceable to the action or influence of innumerable malignant spirits and demons over whom there can be no permanent human influence or control, there will be little real progress in public health, and the fear of what these spirits may do if offended by religious changes is an obstacle to Christian progress. To banish this fear, whether by medical science or Christianity, is intellectual and spiritual liberation. As a well-known medical missionary has said: "Christianity is the light that shines amid the darkness of man's fears; it assures him that he is not in the power of nature-spirits, ancestral spirits, or fetishes, and that no human being has any sinister power over another, since the will of God controls everything that goes on in the world." For these and other reasons it is consonant with the work of the medical missionary to support Public Health work, particularly by spreading knowledge concerning the true nature of disease and how to combat it.

Further, in the presence of an epidemic with a sudden and appalling mortality, of young and old, of the kind and good, it is often hard for sorrowing survivors to believe in the love, power, and wisdom of God and in His gracious purposes for mankind. The history of such epidemics as that of the Black Death, which swept over Europe in the fourteenth century, shows that the spiritual and moral results of stupendous calamities may be disastrous. On the other hand, when medical missionaries try to save the lives of those smitten by plague or pestilence at the risk of their own, it makes a profound spiritual appeal and helps non-Christians to understand the meaning of the Cross. During the winter months of 1910-1911, a virulent epidemic of pneumonic plague prevailed in the north of China and Manchuria. About fifty thousand people perished; not one of the sick recovered. Dr. Arthur Jackson, of the Free Church of Scotland Mission, who had arrived in China only a few months before, in association with Dr. Dugald Christie, Dr. Young and others, toiled with all his
strength to prevent the spread of the disease and to minister to the sick. In his contact with patients and suspected cases he was consistently careful both of himself and others. Nevertheless, he was smitten by the plague and died almost within twenty-four hours. The Chinese were deeply moved. In the words of the Viceroy of Manchuria, their sorrow was beyond all measure, their grief was too deep for words. At the burial service, this great official, not of the Christian faith, and who had formerly been credited with anti-foreign prejudices, offered a prayer which stirred strangely the hearts of those who listened: "O spirit of Dr. Jackson, we pray you intercede for the twenty million people of Manchuria and ask the Lord of Heaven to take away this pestilence, so that we may once more lay our heads in peace upon our pillows. In life you were brave; now you are an exalted spirit. Noble spirit, who sacrificed your life for us, help us still, and look down in kindness upon us all".*

"Help us still." In 1921 there was another visitation of the same pestilence. It was as virulent as before, but owing to the labors of a devoted band of workers, Chinese and foreign, among them medical missionaries, the plague was stayed with a mortality all told of 8,500, as compared with the 50,000 deaths of the previous plague epidemic. But there are infective diseases which year by year exact a far heavier toll of human lives without attracting much public notice, removing not only the old and infirm but also a large proportion of the young of both sexes, often the most bright and promising. Against these diseases an incessant warfare must be waged, and in this warfare it is difficult, if not impossible, for medical missionaries to stand aside. Because of the great importance of preventive medicine we can surely appeal with confidence to the churches at home to support, as far as lies in their power, Christian organisations which are working to promote the public health of China, as a part of, or ancillary to, the main evangelical purpose of missionary work.

The value of preventive medicine has been presented in a very instructive and interesting manner by Sir George Newman, in his recent paper published in the *British Medical Journal* (September,

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*The whole story is touchingly narrated by Mrs. Dugald Christie in her recently published book, "Jackson of Moukden".*
International Health Board of Rockefeller Foundation

1, 1923). In accordance with request, it is reprinted in its entirety elsewhere in this number of the Journal. It is also being translated into Chinese. Much good Public Health work has already been done in China, and it is gratifying to know that recently the organization and enterprises of the Council on Health Education have been greatly strengthened and extended and that it will shortly publish a journal of its own, entitled "Health."

INTERNATIONAL HEALTH BOARD OF ROCKEFELLER FOUNDATION.

Sections of the report of the International Health Board of the Rockefeller Foundation for 1922, made public on October 17, 1923, in advance of the general distribution of the volume, show that during the year the Board worked in co-operation with the governments of seventy states and countries throughout the world. The activities reported include a review of the history and objects of the International Health Board; the campaign against yellow fever in Mexico and South America; surveys, field experiments, and demonstrations in malaria control at home and abroad; world-wide efforts in the control of hookworm disease; the extension of country health work in the United States and Brazil; the development of public health laboratory services, and schools of hygiene in various countries; co-operation with the health section of the League of Nations; and the extension of training through fellowships. In connection with next to the last topic, the report says:—

"While the political implications of co-operation with the League of Nations may be a subject of controversy, its bitterest opponents acknowledge that it has a legitimate function in the co-ordination of effort against disease. An invitation from the Health Organization of the League to the International Health Board has developed into a programme whereby the Board will make funds available for putting the Epidemiological Intelligence Service on a broader and more effective basis during a period of five years. Funds have also been voted by the Board for the international exchange of public health personnel. It is anticipated that in a fixed number of years the value of these two services will be recognized by the states represented in the League of Nations, and that with improved financial conditions they will be able to assume severally the cost of these services."
"At the fifth session of the Health Committee of the League, held at Geneva during the second week of January, 1923, reference was made to the co-operation of the Board with the League of Nations, and special mention was made by the Medical Director of certain principles of relationship which the International Health Board has emphasized. 'It is a fundamental matter of policy,' he said, 'that the Board should have no views in determining the Health Organization's policy or programmes or any details of its administration. The Board is interested in keeping in close touch with our service with a view to ascertaining how the Board may be serviceable and with a view to keeping advised as to all the expenditures made by the Board. It is refraining from giving any views on such details as the appointment of personnel.' And in another connection the Medical Director added: 'I believe that the attitude of the International Health Board may be rightly summed up by stating that they would not like anyone to think that they are assuming the right to participate in the discussions of the Health Committee because they have made a contribution to its work.' These restatements show an understanding of the principles of action which the Board has always considered fundamental in every aspect of its programme of assistance and co-operation, at home or abroad."

NATIONAL MEDICAL ASSOCIATION OF CHINA

The Fifth Biennial Conference of the National Medical Association of China will be held this year in Nanking, February 7th-12th inclusive. An excellent programme has been prepared, and it may be said that all the medical papers which will be discussed are of great practical interest. A cordial invitation is extended to all foreign physicians in China, especially those familiar with the Chinese language, to be present at the Conference.

C.M.M.A. EXECUTIVE COMMITTEE MEETING.

SHANGHAI, OCTOBER 19th, 1923.

Several questions of great importance were considered, but owing to their complexity or wide range were held over for further discussion. The following extracts from the minutes refer to matters which were decided:—

Kuling Hospital.—Dr. Kirk reported that he had interviewed a trustee of the Matilda Hospital and that by the terms of the bequest to it the trustees were unable to help the Kuling Hospital.
C.M.M.A. Executive Committee Meeting.

The following resolution was proposed and carried:

"That the Executive Secretary be instructed to write to the Kuling Council informing them of the steps which the C.M.M.A. has taken, in response to Dr. Venable's letter, relative to the establishing of a Hospital in Kuling for foreigners with moderate means, and further to urge the Council to promote the project in the terms of the following resolution:

"We, the Executive Committee, acting on behalf of the C.M.M.A., realize the need of a hospital in Kuling, in which missionaries and other foreigners with moderate means can be treated, and seeing that it is impossible to secure help towards its establishment from the Matilda Hospital, Hongkong, would urge the Kuling Council to develop such an institution, and when the scheme is on a substantial and proper footing with a Constitution, we shall be prepared to recommend its support to the various Mission Boards for their sympathetic consideration."

Physical Examinations in Missionary Institutions.—A recommendation from the Council on Hospital Administration was read as follows:

"Resolved.—That the Council on Hospital Administration respectfully submits to the Executive the opinion that the examination of the students should be by qualified physicians, where possible, and that if any part of this has to be delegated to non-professional persons, their training for this work should be in the hands of physicians."

Upon motion, the above resolution was adopted.

It was moved and seconded that the resolution be transmitted to the Council on Health Education for the carrying out of this plan. This was carried.

Handbook on Mission Hospitals.—The following resolution on this subject was presented:

"That the Council on Hospital Administration recommend to the Executive that in the opinion of the Council the end to be served by the publication of the Handbook could be equally well served by the publication in the China Medical Journal of such individual papers as might be found acceptable."

This was adopted with the following phrase added:

"Reprints of which could be obtained for distribution or binding by any member desiring them."

Further, it was resolved:

"That this action does not prejudice the subsequent publication of a Hospital Handbook for China."

General Hospitals and Medical Education.—A letter from the British Advisory Board of Medical Missions to the Executive
Committee and the Council on Hospital Administration, asking for an opinion on the subject of common operating rooms, laboratories, offices, etc., for both men and women patients, and also on the question of the teaching of gynecology and obstetrics to men students in women's hospitals, was then considered, and the two following resolutions were proposed and carried:

"Resolved,—First, that as a general principle in the building of new hospitals to care for men and women patients, or in the remodelling of old ones, it should be recognized that the time has now arrived when duplication of operating rooms, laboratories, store-rooms, kitchens, and administrative offices, is unnecessary, and from the point of view of expense and management is undesirable.

"Secondly, that, inasmuch as the training of male medical students is at present confined to large cities and treaty ports, we are of opinion that, with adequate safeguards, it is both possible and desirable in Women's Hospitals in such centres to offer instruction in gynecology and obstetrics to male students"

Institutional Reports.

ENGLISH BAPTIST MISSION HOSPITALS,
TAI YUAN FU, SHANSI, 1922.

Hospital Staff: Drs. R. K. Ford, F. M. Edwards, C. I. Stockley and two Chinese doctors. Nurses: Miss Rossiter, Miss Jaques, Miss Cropley and 4 Chinese nurses.

This is a well-written and interesting report, issued before the recent disastrous fire which wholly destroyed the Men's Hospital and other buildings. With the limited funds in hand and in expectation of the insurance money, the Mission is already planning to make a practical beginning in the erection of a new hospital, so that the sick and injured of the district may not be left unrelieved.

We must all hope that generous gifts will be forthcoming to enable the Mission to erect buildings and provide equipment fully adequate to the medical and surgical needs of a hospital in a populous district.

The work during the year covered by the report has been large and very successful. Several instructive clinical notes and records of cases are given. The Nursing School continues to grow in usefulness. But there is the constantly recurring difficulty of all
medical missionary work. "As a culmination of more than two years of increasing failure of health, Mrs. Ford was urged to go home for treatment. To our great regret we learned that she was not allowed to return to China. Dr. Ford had no other course open to him but to return also, and left us in December. We can ill spare one of our number, and shall miss Dr. and Mrs. Ford very much indeed." Sometimes difficulties seem to come in battalions.

The more urgent the call to faith and courage.

INSTITUTION FOR THE CHINESE BLIND, SHANGHAI.

Mr. Geo. B. Fryer, Superintendent and Secretary. Honorary Physicians: Dr. Ruth Leonard, Dr. Way Sung New.

Strictly speaking this is not a medical report, but it must often happen that physicians in the interior of China come across blind Chinese children whom they would like to place in an institution where they would be surrounded by Christian influences, educated, and taught some useful occupation.

This need can be met by the Shanghai Institution, which aims to train and educate Chinese blind boys (and later, girls also) so that they may become useful men and women, able to earn their own living and to be respected members of the community. The course of instruction embraces all the subjects usually taught in public or missionary schools in China and several that are not taught there, such as typewriting, domestic and industrial pursuits, organ and vocal music. There are now in the school 52 pupils representing thirteen provinces. So far, about ten have been taught to earn their own living. The most successful pupil is now dictaphone typist in the office of the Council on Health Education. The general health of the boys is excellent. On entrance, beriberi seems to be the chief disease, but this disappears after a year or two of regular food and exercise. All the boys are fond of music, both instrumental and vocal. Industrially, the boys are employed in the making of rattan and cane baskets and furniture. The positions which are open to the sightless in China are very few. This is a great difficulty, for unless a blind person can obtain a position that is more lucrative than fortune-telling or begging, his education is regarded as a failure by many Chinese. The institution deserves the hearty support of all who can feel pity for one of the greatest of physical misfortunes.
A BOILABLE, INSULATED, ELECTRIC CAUTERY.*

ADRIAN S. TAYLOR, M.D., F.A.C.S., Peking.

Modern surgical technic is requiring the electric cautery in an increasing variety of conditions, and the difficulty experienced with cauteries furnished by the various surgical instrument makers has directed attention to possible improvement in design and manufacture.

The efficiency of an electric cautery depends upon perfect insulation between the two halves of the instrument. A short circuit heats the handle and interferes with the proper heating of the cutting point. Many of the cauteries upon the market become short circuited when wet, and are not boilable, and it is necessary to protect the non-sterile instrument with a sterile cover held in the hand. It seems desirable to eliminate this possibility of a break in technic.

The cautery here described is easily made in any hospital work shop, is perfectly insulated, and is sterilizable by boiling without diminution of efficiency. Pyrex glass tubing is used to carry heavy, copper feed wires which are thus thoroughly insulated. The points are made of high resistance ni-chrome wire in various sizes and shapes. Small holes are drilled into the ends of the copper feed wires, and the various sized, interchangeable points are

*From the Department of Surgery, Peking Union Medical College.
simply thrust into these holes as needed. Should a wire burn out in use, another is immediately substituted from the nurse's clean table.

The instrument made of the double barrelled tube is light and is conveniently held by the surgeon. A heavier handle, bolted across the two glass tubes is easily made of any boilable material. The handle (Fig. 1) is made of hard fibre, and is insulated from the feed wires by the glass tubes so that there is no danger of short circuiting.

Pyrex glass is heat resistant and does not crack in use. The tubes are smooth and are easily sterilized. Short circuiting has been eliminated, the points are effectively heated, and the handle remains cold. The cost of the materials used is slight, and the general satisfaction derived from the use of these cauteries justifies this note.

I wish to express my thanks to Mr. C. H. Bovell, the electrical engineer of the Peking Union Medical College, for his co-operation in making a model of the instrument.

HOT AND COLD WATER SYSTEM FOR HOSPITALS

Andrew Graham, F.R.C.S., Ichang.

The hot and cold water system I am about to describe has been in use in the Rankine Memorial Hospital, I'Chang for three years and has given every satisfaction. It is very simple, and the initial cost of installing it, if carried out by native fitters, is, I fancy, well within the reach of most inland mission hospitals. It is unnecessary for me to point out how great is the advantage of having an abundant supply of water throughout our hospitals, and I trust that what follows in this paper will result in many adopting the economical system we have found so satisfactory. I shall divide what I have to say into the following heads: (1) Source of water; (2) material required; (3) Source of heat for the hot water.

* Read at meeting of Kuling Branch of C.M.M.A., August, 1923.
Source of water.—At a distance of about 10 feet from the main building a well 65 feet deep was dug, and the water is drawn up by bucket and windlass, and is poured into a small reservoir just by the side of the well.

Material required.—For pumping the water a height of about 45 feet to the water tanks in the attic, a 2-inch semi-rotary pump is used. This is embedded in one of the pillars which bear the roof covering the well. This pillar was specially strengthened by cement for the purpose and the pump, which has to bear considerable strain, is bolted through the cement pillar. The pump is worked by one man and the water passes up a pipe two inches in diameter to the tanks in the attic.

The cisterns, two for cold water and one for hot, are simply wooden tubs each holding about 200 gallons, and are lined with galvanized iron sheeting. The two cold water tubs are connected together by a pipe so that the water through flowing into one rises equally in the other. The tubs all stand in shallow trays, which are also lined with galvanized iron, and from each tray a narrow pipe leads out on to the roof to carry off any water that may collect in the trays. There is also a ½-inch pipe which leads from one of the cold water tubs to the roof, and leaves the tub about 6 inches from the top; this is to prevent overflow, and the water appearing down the nearest rain-pipe indicates to the man at the pump that the tubs are full.

From the cold water tubs the water is led off through ¾-inch pipes to the various bathrooms, kitchen and operating theatre. All the material used in the cold water system is of galvanized iron to avoid rusting. What length of piping, how many joints, nipples, T-shaped pieces and so forth are needed depends on the size and shape of the building into which the system is being installed.

We come now to describe the more difficult hot water system. All the material for this is ordinary black iron-piping. The system is the thermo-syphon such as is commonly used in our home houses. The hot water cistern in our system is in the attic on the same level as the cold water, but at the opposite side of the hospital. The water for this hot water cistern is drawn by a ½-inch pipe from one of the cold water pipes which happen to pass near to where the cistern is placed. The water flows into the cistern through this ½-inch pipe which pierces the cistern about 6 inches
FACIOLD WOODF. N TIBS

If valve. ½ pipe.

CAST IRON BOILER

DETAIL OF VALVE for RIXED to HOT TUB.

Scale 1 in. = 1 ft.

WATER RESERVOIR

DIAGRAM ELEVATION.

Scale 1 in. = 1 ft.

THE "WOOLLEY" APPARATUS FOR HOT WATER

PATENT UNNECESSARY

Scales as stated.

Hot Water System for Hospitals. (Graham.)
Hot and Cold Water System for Hospitals.

from the bottom and after it enters there is a right angled bend on it, and to the end there is a brass cap attached in which is fitted a brass ball thus making a ball valve. There is a pin inserted above the ball to prevent it being driven out by the inrush of water. This ball valve, then, permits the cold water to flow in, but effectively prevents its flowing backwards as the ball falls down as soon as the inflow ceases, and blocks the mouth of the pipe. The water is heated in a boiler, and this is the only part of the outfit which is difficult to make. This boiler consists of two iron cylinders made of 6-inch piping closed at each end with an iron plate. These two cylinders are connected by 6½-inch pipes which lie in the fire. The water as it comes down from the cistern in its 1¼-inch pipe passes into the first cylinder and is distributed though the six pipes, and in passing on is re-collected in the up-going 1¼-inch pipe and ascends to the cistern. The ascending pipe is carried about halfway into the cistern to allow of the hotter water rising to the surface more freely, while that carrying the cooler water downwards arises flush from the sides of the cistern. We get all the hot water we need from the ordinary cooking fire and this is a point in economy worth considering. The pipes as they lie in the fire are not level but slope upwards to join the upper cylinder which is situated about 18 inches above the level of its fellow.

The difficulty in making the boiler lies in getting it watertight. One side of each cylinder is flattened out to about four inches to receive the six tubes, and very careful joints have to be made where the nuts screw home the tubes into the sides of the cylinders. An asbestos joint is needed between the end iron plates and the pipe which forms the cylinders. The hot water is drawn off in the usual ½-inch pipes to the theatre and kitchen. It has not been carried to the bathrooms as our outfit would hardly cope with the demands that the Chinese make on hot water; but given a larger heating surface, the same system will supply all that is needed for any size of hospital.

The pipes outside the building are covered with straw rope and plaster, which in the case of the cold water system prevent freezing, and in the hot water system loss of heat, during the winter.

The total cost of material and installing was about $500 Mex. The material can be bought from any of the Chinese firms in Shanghai dealing in iron ware.
PERMEATION OF THE MEDICAL CURRICULUM BY PREVENTION TEACHING

SIR GEORGE NEWMAN, K.C.B., M.D., D.C.L., F.R.C.P.,
Chief Medical Officer, Board of Education and Ministry of Health.

Preventive Medicine.—A new epoch opens this year before the students of medicine. In 1922 the medical curriculum in Great Britain was completely revised and reconstructed in such a way as to make it more preventive in purpose. The changes introduced had, of course, other collateral objects, but this was one of the special aims, and it was sealed by a resolution of the General Medical Council “that throughout the whole period of study the attention of the student should be directed by his teachers to the importance of the preventive aspects of Medicine.”

The medical schools are devising, or have already made, arrangements to carry out the new recommendations of the Council. These arrangements will no doubt be subject to the periodical visitation of the Council’s inspectors. It is anticipated that examiners also will look for and require substantial evidence of the student’s appreciation of the importance of dealing with disease in the “preventive” way, of not only knowing how to diagnose and cure immediate maladies, but of being in a position to advise the patient how to order his life in such a mode as to direct his personal and environmental tendencies towards health. It is a new outlook.

There were two fundamental reasons for this new attitude. First, it had come to be recognized that as compared with the twenty-three centuries since Hippocrates we are living in a Golden Age of Medicine, the chief glory of which has been the advance of prevention; and secondly, it is now generally acknowledged that the ultimate purpose of the science and art of medicine is not to cure the individual patient only, but to seek out the laws or principles which govern health or ill health for the human family. The nobility of the profession of medicine reaches its highest plane in compassion towards; and the relief of suffering of, the individual on the one hand, and, on the other, the finding and establishment of scientific truth which shall advance the evolution of man.

The Victories of Preventive Medicine.

Let me name four recent examples of the victories of preventive medicine in its communal sphere, which will illustrate the methods to which we must have regard. We need go no further back than thirty years. In 1893 there were in England and Wales 6,801 deaths from Typhoid fever, or 229 per million persons living; in 1903 this disease caused less than half that number of deaths (3,347 persons); in 1913 the death rate had fallen to 41 per million; and in 1922 it had come down to 12 per million, which meant only 443 deaths from a disease which formerly made an annual toll of eight or ten thousand lives. The case fatality remains about the same (15 to 20 per cent.) and the type of disease has not materially changed. But the disease
Preventive Medicine.

is disappearing. Why? Because the public water supply is improved; because drainage, sewerage, and refuse disposal have been reformed, and the food supply, including shell fish, has been controlled. There is no mystery about it, nor any doubt. Inoculation is available, and has been used in exceptional circumstances, though not widely, in the civil community. Its value, in conjunction with general and special sanitation, in the European war, 1914-18, is unquestioned. In the South African war the British Army strength was 208,000; there were 58,000 cases of typhoid, and 8,000 men died of it. In the European war the British Army on the western front had a strength exceeding a million men, but there were less than 7,500 cases of typhoid and only 266 deaths. In the army or the civil community the result is the same: the disease is conquered.

A second example is small-pox. In London from 1660 to 1780 Farr estimated from the bills of mortality that small-pox caused upwards of 4,000 deaths per million living. In England and Wales in 1838-42 the rate was 575 and in 1886-90 it had fallen to 14 per million. Why? Because of vaccination. It has been proved beyond doubt that vaccination was the specific agent in this decline, the specific protection against this disease. The malady was all but a universal scourge, and it is now entirely controllable. The vaccination laws may or may not be wise, ineffective vaccine and inefficient vaccination may or may not occur, the protection afforded may not be of indefinite duration; but in all countries the experience has been the same—vaccination prevents small-pox. It is not a disease which is dying out like black death or leprosy. When reintroduced into an unvaccinated community it returns, whatever be the sanitation. We have control if we choose to exercise it, but because of prejudice or ignorance we have not yet reached the stage of stamping it out for ever.

Tuberculosis is a third example. In 1847 the death rate per million from phthisis in England and Wales was 3,189. It has steadily declined for seventy years and in 1921 it was 554. Non-pulmonary tuberculosis is likewise declining. If the disease be as widely distributed as is generally supposed, it must indeed be one of the most curable of the great scourges. What is the explanation of its decline? The answer is prevention. An improved milk supply, institutional treatment of the disease, better nutrition, sanitation of the home and the workplace, the reduction in the habit of promiscuous spitting, and an immense advance in social well-being are, in spite of voluble and inconstant declarations to the contrary, steadily gaining ground over tuberculosis.

The last example I need cite is the prevention of a high infant mortality. At the end of the nineteenth century there died every year in England and Wales 150 infants per 1,000 born. In many industrial districts the figure was 300. In 1922 it had fallen for the whole country to 77. What has happened here? No doubt many factors have contributed, but the most potent have been more enlightened motherhood and infant nurture.
Now here we have four examples of the effect of preventive medicine applied to the community through the operations of the State or the municipality. They have effected a postponement of death and an enormous betterment of man's physical condition and capacity. But it was Medicine, medical science and medical art, which first determined the causes or conditions of these diseases, and then conceived the means of their prevention. Many and complex have been the factors at work, but in the four examples quoted (a) improved sanitary environment, (b) vaccine, (c) personal and social hygiene, and (d) enlightened motherhood, emerge as dominant.

Some Undefeated Enemies.

We must now take a further step in the argument, and ask ourselves if preventive medicine can be applied to other morbid conditions, which, though not national or racial scourges, do, in fact, prove themselves to be the most formidable enemies we have to face. What are they? There are two bodies of data immediately at hand. There were 486,780 deaths in 1922. The chief cause was respiratory disease (non-tuberculous), responsible for 18 per cent.; next came diseases of the heart and circulation, 16 per cent.; then nervous diseases and cancer, 10 per cent. each; then tuberculosis 9 per cent. So that 63 per cent. of the total number of deaths was due to five great groups of disease. What has preventive medicine to say to these? There is another body of data which illuminates the situation—namely, the causes which take upwards of seven million patients to their insurance doctors every year. A survey was made in 1921 of 31,000 cases in 226 practices in 110 towns, and it was found that 22 per cent. went to the doctor with respiratory disease (mainly bronchitis), 15 per cent. with digestive disease, and 45 per cent. with influenza, anaemia, skin disease, minor injuries and accidents, septic conditions, lumbago and rheumatism, and debility. Thus we know approximately 80 per cent. of the early morbid conditions met with in average insurance practice. What has preventive medicine to say to this group? Clearly, it should have more to do with them than with the ultimate causes of death. But taking both groups together, with the exception of cancer, they constitute the chief current burden of preventable mortality, sickness, incapacity, and "lost time" from the industrial point of view. This is now the unconquered territory. Preventive medicine has proved itself efficacious in the realm of infection; it must turn its attention to this larger issue, for it possesses the potentiality to deal with it also.

The problem before us at the moment is not the action the State should take in regard to these diseases, nor even the work of the medical practitioner, essential as they both are. It is the narrower engagement. How can the medical curriculum be permeated with the spirit and methods of prevention? I think the answer is twofold. First, by the teachers of medicine conducting the studies of their pupils in the direction of prevention (a) by a special course in hygiene and preventive medicine, and (b) by addressing themselves to the preventive aspects of clinical work; secondly, by the student bending himself to preventive study.


Preventive Medicine.

A Course in Physiological Hygiene and Preventive Medicine.

The celebrated medical school in the University of Salerno possessed, as early as the twelfth century, a department of instruction in the basic subject of the Conservation of Health, and its sanitary precepts and principles have been handed down to us in the records and poems of the Schola Salernitana. Every British Medical School has had something of this kind. But we do not make enough of it. It calls rather urgently for reform and amplification, partly as a definite and prescribed course in hygiene, and partly by the introduction into physiology and the clinical subjects of the preventive view. There should be a living and comprehensive short course in hygiene—not "drains" and nuisances, but the vital principles and means of health and the widest understanding of the physical effect of his environment and habits on man. We make the student, by special courses, familiar with anatomy and physiology that he may have the normal in his mind, and on that we build up his conception of disease. Why not start all his clinical work on a similar basis by providing a course in Hygiene of the normal body in action, and the factors which affect it? Again, Medicine proper should always and invariably include instruction in the prevention of disease to the respiratory, alimentary, circulatory, and nervous systems. There is a cause for all these morbid conditions, and Pasteur urged that the cause should be continuously sought and explored. Surgery likewise includes, and in some ways embodies in its most graphic form, the means of prevention; the removal of enlarged tonsils and adenoids, the correction of deformities, antisepsis, much abdominal and thoracic surgery, surgical reconstruction and re-education are examples which leap to the eye, but there are many others. Obstetrics should place in the foreground (and not in the background) the whole question of pre-natal supervision, puerperal fever, the prevention of congenital syphilis, ophthalmia, and the care of the infant, as well as the improved management of labour. What is really the scientific use and educational value of sending an inexperienced student to attend the confinement of a woman whom he has never seen before, and of whose physical history he knows nothing? Is it only that he may count the case in the necessary twenty he must attend?

Even more important than the spirit of prevention pervading all instruction is the whole attitude of the student to his clinical work. I want him to ask himself, every time: "Why is this patient here? What is the physical or social complex that has made his body depart from the normal? To what stresses and exhaustion has he been subjected? How did he get this thing that troubles him and me?" Certainly, it is not chance, caprice, or fate. It is our business and our science to worry out the causes, and discover the way to escape or remove them. If every student became thus an investigator and discoverer, the science and art of medicine would be saved from perfunctory workmanship, and from explanations which are no explanations, what Cullen used to call "the most, absolute languor" leading to "exclusive attachment to one system." We ought to
welcome light from any source, orthodox or heterodox, frequently question all our methods, and even receive cheerfully "the noise and bustling of Paracelsus." As Henry Ford of motor-car fame says, "Everything can always be done better than it is being done."

The Philosophy of Prevention.

The preventive attitude of the student cannot merely be left to opportunity. It must be provided for. In the first place, he should get a clear and fair "scratch line." He must know the physiological standard of health and capacity from which he starts. The preventive purpose of the course in anatomy and physiology is to teach him the range and capability of the human body, what Nature can and cannot do. "Our natures," said Hippocrates, "are the physicians of our diseases;" and, following him, in the Introduction of his Medical Observations, Thomas Sydenham, our grand exemplar in the seventeenth century, repeated the axiom: "Nature by herself determines diseases, and is of herself sufficient in all things against all of them." The study of biology, chemistry, and physics and the intermediate subjects, is to give an apprehension and standard of Nature which we may bring to the bedside. Without it we are lost, and prevention has no meaning. The natural history of disease is the crucial requirement. "When it is thoroughly grasped," says Sir Thomas Lewis, "that infection has more to do with heart failure than has strain or a mechanical defect in the heart itself at all stages of the disease, in its initiation, in its development and in its progress, then and only then is the natural history of heart disease understood."

In the second place, the student must become really keen on the search for the etiology, the primary and secondary causes, of the morbid condition he is investigating. One frequently hears it said that the clinical student learns best by seeing a great number of cases, and that London with its immense population therefore affords fullest opportunity for clinical study. I am afraid I do not agree. Of course, the wider the experience the better, but it is not the superficial survey of many cases but the understanding investigation of a few which really educates the student. Comprehension and not repetition is the strength of memory; and it is obtained as the mind really explores and observes, and discovers for itself the causation of the condition. Nowadays we look for guidance (a) to bacteriology and pathology, (b) to clinical character and symptomatology, (c) to laboratory confirmation, and (d) to social factors. There is much new knowledge available, but 150 years ago at Edinburgh, William Cullen was proclaiming all the enduring principles, and his plan of studying each case has not been greatly improved upon by some modern prophets. Nevertheless, of course, he taught before the industrial revolution. The people had not swarmed into the towns (where four-fifths of them now live), the factory system was not dominant, industrial fatigue—a fertile source of physical and psychical impairment—was not appreciated, and the general stress and strain of modern life was less than now. Mr. G. M. Treveryan tells us
that the second half of the nineteenth century is "the story of the building
up of the new world, of a wholly new type of society, infinitely more
complicated and interdependent in its parts, more full of potentials for
progress or disaster, than anything the world has before seen," and this
must be taken into account. Moreover, the growth of knowledge was
awaiting Darwin, Pasteur, Lister, Ehrlich, and Einstein. Hence, the actual
and relative causes of disease were not evident. But now every inquisitive
student can search with hopefulness, and be as Cromwell said, "happy
seeker, happy finder."

Lastly, the student should habituate himself to think widely and
resourcefully of the means of prevention in their whole range. Poverty,
industry, personal habits, social conditions, channels of infection, must be
considered as well as the grand category of the therapeutics which prevent
—drugs, vaccines, serums, organic substances, sunlight, electricity, radium,
massage, psychology—and the still wider factors of environment. He is to
learn by ingenuity to apply and adapt all knowledge to the harnessing of
disease as a whole. The patient is to be cured; yes, but out of the patient
is to be wrought an understanding of, and an attack upon, and the prevention
of, the particular disease from which he suffers. It may well be
that the student cannot practice prevention as he learns to practise the
cure, for the issues raised are beyond his immediate control. But when he
enters upon his life's work as a medical practitioner he will find that it is
required of him that he shall take an essential part in the vast national
and international machinery now in being for the conquest of disease. There
are not less than a score of Acts of Parliament which impose public
preventive duties upon him as a medical practitioner. He must know how
to comport himself in relation to those laws. But more than that, his
private patient is concerned not only with the alleviation of his malady, he
is anxious about the future and his capacity to work, and he asks, "What
can I do to prevent this?" Surely, that is a very cogent and penetrating
question for the medical practitioner to answer. His answer, and its wide
promulgation and proper interpretation, is the fulfilment of his splendid
part as the missionary of Preventive Medicine. For his comfort he may
remember that to prolong human life and make it fuller, better, and more
effective, is the "master task of mankind."

Progress of Hygiene.—The science of medicine as a whole has made
unprecedented advance during the last couple of decades, most notably in
the direction of preventive medicine, and, finally, the same progress which
has stimulated our modern industry and our modern medical science has
also, on the moral side, stimulated our public conscience to the ideal that
not only some fortunate members of the community but each member should
"live a healthful life at the top of his capacity of body and mind, avoiding
or removing external and internal conditions unfavorable to such a standard,
able to work to the highest power, able to rest to the fullest, growing in
strength and in joie de vivre."—Fitzgerald, Preventive Medicine.
During an outbreak of relapsing fever in the Accra district, Gold Coast, Africa, the authors made a careful study of the disease.

Incidence.—The large majority of the patients were males, the age varying from 10 to 55 years.

Mode of Transmission.—Feed experiments were carried out with bed-bugs, mosquitoes and lice. The results appear to agree with the conclusions of the French observers in Tunis and Algeria, Ch. Nicolle, L. Blaziot et E. Conseil (1912), and Edm. Sergeant et H. Foley (1922), namely, that the disease is not conveyed by the bites of lice or by their droppings being rubbed into excoriations of the skin, but that it is conveyed by the inoculation of crushed lice into wounds of the skin; further, that lice must be kept alive for about one week after feeding on a case of relapsing fever before they are capable of conveying the infection.

Morphological Characters of the Spirocheta.—The spirocheta found in the blood of cases met with in the present epidemic differed in no way from the descriptions given of the spirocheta causing relapsing fevers in other parts of the world.

Animal Experiments.—The following animals were inoculated with blood obtained from cases of relapsing fever: white rats, black rats, Cricetomys gambianus (the pouched rat), guinea-pigs, monkeys and one rabbit. Monkeys and black and white rats became infected with the strain, but did not relapse; guinea-pigs and rabbits were refractory, while the pouched rat became infected and had a relapse.

Clinical Manifestations.—These are fully described.

Relapses.—In untreated cases relapses occurred with an apyrexial period varying from two to ten days, while in treated or partially treated cases the apyrexial period varied from two to fourteen days.

Treatment.—Apart from intravenous medication with novarsenobillon given intravenously in 10 c. c. of warm, sterile, distilled water in doses varying from 0.3 gm. in the early cases to 0.6 and 0.9 or 1.2 gm. (divided into two or three doses) in the later cases, the treatment administered to patients was symptomatic. Patients were washed, shaved and disinfested on admission, and put to bed with a sleeping mat and two warm blankets. They received their injection of novarsenobillon as far as possible on a fasting stomach. If they wished, they were given two biscuits and a drink.
of milk a short time after the injection. Cold sponging was resorted to where the temperature was 105° F. or higher; but otherwise, apart from being given as much water in small quantities as they wished, the patients were left to sleep quietly until the following morning, care being taken to avoid chills in cases where the temperature fell by crisis. The following morning a saline purge was administered, and if conditions were satisfactory and no vomiting was present a light diet was given. As a rule the attack left the patients somewhat weak, and vomiting immediately occurred if the patients were allowed to satisfy their ravenous hunger.

Preventive Measures.—Careful house-to-house visits were made in affected areas and throughout the town. During these inspections personal, domestic and general cleanliness was preached.

It is noteworthy that [in a tropical climate] the following method of disinfecting and disinfesting clothes and blankets appeared to give the best results. The articles to be disinfested were first soaked for forty-eight hours in barrels containing 5 per cent. solution of izal. They were then washed and placed in the sun during the middle of the day on sheets of corrugated iron. This resulted in most efficient disinfestation, for the heat generated was at least 150° F. Neither lice nor eggs capable of hatching survived this treatment. Purses and amulets, the latter carried in great numbers by Hausas and Northern Territory tribesmen, required special treatment.

Conclusions.

This first recorded outbreak of relapsing fever in British West Africa is due to a spironema conveyed by lice.

The vectors of the organism in the present epidemic and the inoculation experiments suggest that the parasite is not the *Sp. durtoni*, but corresponds more closely to *Sp. recurrentis* vel *obermeieri*) or a related strain.

Novarsenobillon is a specific in the treatment of the disease. Immunity does not appear to be lasting or complete in cases treated with novarsenobillon.

NOTES ON ASCARICIDES.


Relative Efficiency of Various Drugs in Expelling Roundworms.—Microscopic examination of 19,251 inhabitants of the rural areas of the Madras Presidency has shown 55 per cent. of them to be infected with round-worms. Usually not more than two worms are present in the intestine; the largest number so far recorded from among the male population of the Trichinopoly Jail is 27.

Because of the high price of santonin during the war a comparative study was made of it and other ascaricides. Note was
taken of the cases infected with *Ascaris*, and the worm removal observed during the three days which followed the treatment. The faeces were then examined microscopically for round-worm ova on the tenth and eleventh days after treatment. Absence of ova was considered a sign of cure. Fifty different drugs were tested. Taking as a standard the percentage of cases cured with one test treatment, the results show that santonin is the most efficient drug against the round-worm (66.5 %). Other drugs show the following percentages: oil of chenopodium, 48 minims, 52.1 %; betanaphthoi, 50 grains, with purges, 49.6 %; thymol, 50 grains with magnesium carbonate, 43.4 %; carbon tetrachloride, 5 c.c without purges, 25 %; carvacrol, 45 minims, 14.3 %.

Of the Indian anthelmintics only one, *Butea frondosa*, removes round-worms, and its efficiency does not compare favourably with any of the above-mentioned drugs.

SANTONIN AS AN ASCARICIDE.

Dosage.—The first concern was to ascertain, as definitely as possible, the maximum ascaricidal dose of santonin to be administered in cases of round-worm infection among adult males. A one-grain dosage was accordingly fixed upon as the starting sub-maximal dose and batches of prisoners were treated with increasing doses of the drug. The limit of tolerance was reached with 6 grains, as noted from such toxic symptoms as xanthopsia, giddiness and headache. Five grains may therefore be taken as the dose.

Toxicity to the Host.—In doses of 5 grains santonin is a perfectly safe drug for adult males and produces no after-effects.

Mode of Treatment.—The drug was administered differently to three batches of infected patients:—

1. One batch took the drug in the morning fasting, and were given a purge two hours after;

2. The second batch were given a light evening meal, took the drug three hours after, and purgation followed early in the morning;

3. The third batch took the drug at 3 P.M., had a light meal in the evening, and received a purge early in the morning.

All cases of the second and third batches passed worms, and showed 80 per cent. cures. Seven only of the nine cases of the first batch passed worms, and the percentage of cures was only 66.6. Thus the efficiency of the treatment is increased by delaying purgation till 12 or more hours after the ingestion of the drug.

Toxicity to the Worms.—Santonin is a weak vermicide, but acts as a powerful narcotic on the worms, which are nearly all expelled in a senseless condition.
Purgative.—Since santonin is a weak vermicide and has no vermifugal properties, purgation is necessary. Castor oil and magnesium sulphate are equally good vermifuges, but castor oil has a late binding effect, and more than one dose is required.

Elimination.—Santonin gives a red color with alcoholic potash, and methods based on the color produced with alkalies are the most satisfactory for the detection of santonin in urine. The tests showed that santonin is eliminated from the system within 24 hours.

Conclusions.—1. Five grains is the optimum dose of santonin for male adults.
2. The optimum dose is perfectly safe.
3. Santonin has no vermifugal action and is a poor vermicide.
4. The optimum treatment consists in the administration of the drug at night, followed by purgation with Epsom salts in the morning.

ACCLIMATISATION.

Balfour, The Lancet, July 14th, 1923.

Dr. Balfour quotes Schilling as saying that Huntingdon showed that great climatic changes have taken place in India, China and other places, in consequence of which the peoples of these countries have suffered in vigour. The chief change consists in the absence of cold spells, which are regarded as being of great importance in maintaining a high degree of vitality. It is the prolonged conditions of heat and moisture that are most trying to the health. Leonard Hill points out that the maintenance of the body temperature within normal limits in the tropics imposes a harmful strain on the heat regulating centre mechanism. Aron in Manila showed that the brown skin is more suitable in the tropics than the white; it absorbs heat more readily, and so leads to prompt stimulation of the sweat glands, and also it gives off heat more rapidly. Balfour also points out that the white skin allows the heat rays to penetrate further into the tissues, and hence they reach the blood to a greater extent than in the case of the brown skin, where they are absorbed by the superficial pigment layers. Some observers have found a tendency to hyperglycaemia in Europeans in the tropics, and this is believed to conduce to neuritis and to susceptibility to bacterial invasion, especially by the tubercle bacillus. Balfour points out that this hyperglycaemia is of a different origin from that which McCay found to exist in Bengalis as a result of excessive carbohydrate in the diet.

The bulk of the evidence regarding changes in the circulatory system in the tropics points to this being due to diet rather than to climate. Balfour points to the necessity of employing the services of expert biochemists for the solution of many of the problems of
metabolism in the tropics, and it is obvious that there is still much need of further research into the whole question of the suitability of the tropics for the prolonged residence of Europeans.

Much fragmentary work has been done on this point, but the problem as a whole must be regarded as being unsolved.

It is generally agreed that the chief danger to life in the tropics comes from the greater prevalence of preventible diseases, but there still remain grounds for the suspicion that the highest degree of vitality and energy cannot be maintained for indefinite periods in tropical climates, especially in those in which uniform high temperatures, combined with atmospheric moisture, persist for the whole or the greater part of the year. This question is of importance not merely to Europeans; it affects the indigenous population, though possibly to a lesser extent.

NON-OPE RATIVE TREATMENT OF FRACTURES.

The main object to be kept in view in the treatment of fractures is union with exact apposition of the fragments. The importance of this cannot be exaggerated, for, although one cannot even then say that perfect function will be restored, and although every surgeon has seen cases in which good function is associated with defective alignment, yet statistics prove undeniably that good functional results will follow in direct proportion to the success which has been attained in the endeavour to restore a broken bone to its original natural form. The finding of the British Medical Association Fracture Committee in 1912 was that 90 per cent. of good anatomical results were followed by good functional results, and personal experience entirely supports that finding.

Each new fracture is a fresh problem, and its diagnosis and treatment cannot be controlled by a set of rules which were formulated, and did excellent service, at a time when the surgeon’s vision had to be projected through his finger-tips. X-rays must be used at every stage if one is to be certain of obtaining the best results.

When the surgeon has to deal with a complete fracture he knows that the fragments can be displaced in any of the three dimensions of space. Unless he selects a splint which will permit of these fragments being replaced through these dimensions he cannot expect a good result from his treatment. This requirement alone disposes of such splints as Liston’s, McIntire’s, Cline’s, internal right-angled splints for the arm, and plaster-of-Paris. These and similar forms of apparatus ought not to be used, and should be discarded from our equipment for treating fractures, because imperfect results can only be expected to follow their employment.
As has been already said, Thomas's splints fulfil all requirements, with such modifications in minor details for the arm and the leg as are necessitated by the anatomical differences in the limbs. These splints will permit of the indispensable extension; they correct the main displacement, and their side-bars allow the surgeon free access to the site of fracture, so that he is able, with the aid of X-rays, to complete any replacement of the fragments which the splint itself has not already accomplished. Thus, if after extension has been applied the X-ray photographs reveal the presence of lateral deformity, he can move either fragment in the required direction by passing a loop of bandage round the limb at the level of the displaced piece of bone and gently applying traction until the lateral error is corrected. To maintain the correct position the bandage can then be fastened to the side-bar. Antero-posterior displacement can be corrected by a transverse band passing from side-bar to side-bar either in front of or behind the limb, according to the direction in which it is necessary to move the fragment. No other splint will give the surgeon such absolute control over the fragments.

**ACUTE LUMBAGO TREATED BY THE INJECTION OF QUININE AND UREA.**


Of common minor ailments there is none which may be more completely paralysing than acute lumbago. In an instant an individual in the full vigour of health may find himself unable to make the slightest movement of the trunk without the most exquisite pain, and he may remain confined to bed for weeks as an absolute cripple. Even in the slightest cases, though the acute symptoms may pass off in a few days, it will be ten days at least before he can stoop with freedom and comfort.

A close examination will show that the source of these symptoms is even more narrowly localized than the patient imagines and that the pain spreads from a very small focus, characterized by exquisite tenderness to deep pressure. This focus may be situated anywhere in the lumbar muscle, and in addition to its excessive sensitiveness may be marked by a slight local swelling, with an oedema which pits on pressure.

The precise localization of the focus of pain naturally suggests some local form of treatment, and a large number of methods have been recommended. Radiant heat, dry cupping, heavy massage, the insertion of long needles, and the actual cautery, all have their advocates, but the more lenient methods are tedious, whilst the more drastic are somewhat Oriental. It occurred to the writer that the injection of a local anaesthetic would be a rational method
to employ, and could at least do no harm. He was scarcely prepared, however, for the instantaneous cures which he has observed, and still less for their permanence.

The anaesthetic chosen was quinine and urea hydrochloride in one per cent solution; this was selected because of the length of time, up to several days, the anaesthesia may last. It was thought at first that the action might be purely mechanical. Normal saline solution was therefore tried, but the effect proved to be only transitory. Five c.c.m. of the solution is injected through a long fine needle into the centre of the tender spot; within ten minutes the acute pain has entirely disappeared and the patient can move freely; a sense of stiffness remains, and a curious feature is that the patient may complain of a general malaise. It seems probable that some constitutional disturbance is a regular feature of the condition, but that it is masked by the severity of the local pain.

ANTE-PARTUM HAEMORRHAGE.


Of recent years the treatment of ante-partum haemorrhage has followed much more conservative lines than formerly. First, it is important to find out whether the bleeding is accidental or whether it results from placenta praevia. If the placenta cannot be felt by the finger passed through the cervical canal into the uterus the case should be treated as one of accidental haemorrhage and an expectant policy adopted for at least twenty-four hours. The patient is put to bed—in a hospital or nursing home if possible—and a hypodermic injection of morphine is given. Plenty of fluid may be taken by the mouth, and in severe cases rectal saline may be given. The essentials are rest and warmth, so that the patient may recover from the shock and the tone of the uterus may be restored. In many cases labour starts within twenty-four hours, and spontaneous delivery takes place. If labour does not come on and fresh bleeding occurs, the best treatment is to rupture the membranes or to give an injection of pituitary extract. Either method will generally be followed by the onset of labour within a few hours. The advantage of rupture of the membranes is that labour is pretty certain to come on without delay; the disadvantage of pituitary extract is that its effect may wear off after a few hours and the uterus may again become atonic. If rupture of the membranes is followed by pains which are weak and infrequent there is no objection to giving an injection of pituitrin as well. This method of treatment may be followed in some cases of placenta praevia, but more often the bleeding is severe and recurrent, if not continuous, so that steps must be taken to stop the bleeding by inserting a Champetier de Ribes's bag or by performing version and bringing down a leg. But here again there are many cases
which do very well if the membranes are ruptured and a tight binder applied. The treatment of placenta praevia by Caesarean section is but rarely indicated, and should be reserved for special cases, as follows: (1) When the patient is a primigravida with a rigid undilated os and central placenta praevia, and the foetus is known to be alive. (2) When the patient is a multipara who has lost a lot of blood and can ill afford to lose any more.

One point which may be emphasized in the treatment of ante-partum haemorrhage is, that the condition is one in which the advantages of treatment in a hospital or nursing home are very great.

**ETIOLOGY OF RICKETS.**


In the experiments reported a limitation of the supply of calcium proved to be of more importance in determining the onset of rickets than the limitation of vitamin A. A very restricted supply of calcium, although leading to changes in the bones, chemically and structurally resembling those found in rickets, did not materially reduce the calcium of the blood and muscles, or the inorganic phosphorus content of the blood. The retention of phosphorus appeared to be determined by the retention of the calcium. The percentage of the calcium retained did not vary very markedly with the amount in the food, within the limits investigated from 0.02 to 0.198 gm. calcium oxid per kilogram. The very high percentage retention of lime in the calcium poor diet makes it difficult to explain the favorable action of cod-liver oil on the retention. A comparison of the condition of puppies exposed to sunlight through glass with those from which direct sunlight was excluded showed that the latter condition favored the onset of rickets, but whether it was associated with the lethargy manifested by these puppies is not indicated. The addition of olive oil to a diet which was adequate to prevent rickets actually favored its onset. Cod-liver oil exercised a marked effect in favoring the cure of rickets in puppies. The addition of feces from cases of infantile rickets to the diets of puppies, whether on a diet of full cream, milk and bread, or on a diet of separated milk and bread, was not followed by a development of rickets. The injection of blood from cases of active infantile rickets did not produce the condition in puppies on a diet of full cream, milk and bread. While these experiments give no support to the theory that rickets is an infective disease, they do not disprove the possibility that a particular condition of the intestinal flora which might be propagated by fecal infection may so modify the absorption of calcium and phosphorus as to lead to rachitic changes.
X-RAY PHOTOGRAPHS OF FRACTURES.

SINCLAIR, British Medical Journal, November 17, 1923.

1. Antero-posterior and lateral views should always be taken whenever possible, and stereoscopic pictures should only be relied upon in those situations which are inaccessible from two planes—for example, where the limbs join the trunk.

2. If a fractured limb be properly splinted, either externally by the approved method, or internally by plating, it can be X-rayed without the slightest alteration taking place in the position of the fragments. If the proceeding causes the patient any pain it is evidence of inefficient splinting.

3. In operation cases no more dressing than is consistent with aseptic safety should be in the neighbourhood of the injury at the time it is photographed, as the more material the rays have to penetrate the less clear the detail of the picture will be. On this account the sectional dressings are very suitable as, by their use, a minimal amount of dressing is placed between the limb and the supporting flannel bands.

4. When the limb is X-rayed it is also advisable to replace the metal clips which secure the supporting flannel bands by sterile safety pins, otherwise the shadow thrown by the clips in the lateral view may obscure important features of the picture.

5. By noting the position of these safety-pins and by placing some parallel to and others at right angles to the side bars of the splint it is possible to localize on the surface of the limb the position of the particular displacement, foreign body, or fragment of bone, information which will help considerably in deciding how to deal with it.

6. Whenever possible the photograph should include a view of one or more standard bony features, such as the trochanters, patella, etc.

7. The most convenient and economical size of photographic plate for the long bones of the lower limb is one measuring 15 by 7½ inches.

8. In the early stages of the treatment of a fractured limb it is essential to have a mobile X-ray plant which is capable of taking photographs with the patient in his bed and without interfering in any way with the extension.

EMETINE PERIODID IN AMEBIC DYSENTERY.


One hundred and fifty cases of amebic dysentery were given various forms of treatment and subsequently kept under observation for from one to six months or longer. Of these 150 cases, 101 (66 per cent.) relapsed. Among all the cases treated only 6 patients
(4 per cent.) were observed to be passing *E. histolytica* cysts after treatment. Sixteen were given emetine periodid, 6 grains daily. Eight of these (50 per cent.) relapsed within one month. Giving this drug in gelatin capsules was found to be unsatisfactory, as they frequently passed through the intestine without dissolving. When mixed with a little milk and given by the mouth the periodid did not produce vomiting.

**MORTALITY FROM CANCER.**


**Table 1.—Mortality from Cancer in Japan, 1911-1921**

<table>
<thead>
<tr>
<th>Year</th>
<th>Population of Japan</th>
<th>Cancer and Other Malignant Tumors</th>
<th>Death Rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>50,682,600</td>
<td>33,888</td>
<td>66.9</td>
</tr>
<tr>
<td>1912</td>
<td>52,167,000</td>
<td>34,186</td>
<td>65.5</td>
</tr>
<tr>
<td>1913</td>
<td>52,917,000</td>
<td>36,845</td>
<td>69.3</td>
</tr>
<tr>
<td>1914</td>
<td>55,675,700</td>
<td>36,652</td>
<td>68.2</td>
</tr>
<tr>
<td>1915</td>
<td>54,448,200</td>
<td>37,494</td>
<td>68.9</td>
</tr>
<tr>
<td>1916</td>
<td>55,135,000</td>
<td>39,059</td>
<td>70.7</td>
</tr>
<tr>
<td>1917</td>
<td>56,035,100</td>
<td>38,714</td>
<td>69.1</td>
</tr>
<tr>
<td>1918</td>
<td>55,662,900</td>
<td>40,257</td>
<td>72.3</td>
</tr>
<tr>
<td>1919</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1920</td>
<td>55,963,053</td>
<td>42,994</td>
<td>76.6</td>
</tr>
<tr>
<td>1921</td>
<td>56,787,300</td>
<td>43,234</td>
<td>76.1</td>
</tr>
</tbody>
</table>

According to the table, the cancer death rate of Japan during the present decade has increased from 66.9 to 76.1 per hundred thousand of population. The Japanese cancer death rate, therefore, approaches the corresponding death rate for the U.S. registration area.

Table No. 2 shows the mortality from cancer of the breast in Japan, with the rates based on the female population only.

**Table 2.—Mortality from Cancer of the Breast in the Female Population of Japan, 1911-1921**

<table>
<thead>
<tr>
<th>Year</th>
<th>Female Population</th>
<th>Deaths from Cancer of Breast</th>
<th>Death Rate Per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>25,538,000</td>
<td>481</td>
<td>1.8</td>
</tr>
<tr>
<td>1912</td>
<td>25,888,400</td>
<td>511</td>
<td>1.8</td>
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<tr>
<td>1913</td>
<td>26,257,400</td>
<td>504</td>
<td>1.9</td>
</tr>
<tr>
<td>1914</td>
<td>26,530,900</td>
<td>507</td>
<td>2.0</td>
</tr>
<tr>
<td>1915</td>
<td>27,011,600</td>
<td>549</td>
<td>1.9</td>
</tr>
<tr>
<td>1916</td>
<td>27,398,600</td>
<td>537</td>
<td>1.9</td>
</tr>
<tr>
<td>1917</td>
<td>27,585,300</td>
<td>606</td>
<td>2.2</td>
</tr>
<tr>
<td>1918</td>
<td>27,678,600</td>
<td>552</td>
<td>1.9</td>
</tr>
<tr>
<td>1919</td>
<td></td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>1920</td>
<td>27,918,145</td>
<td>592</td>
<td>2.1</td>
</tr>
<tr>
<td>1921</td>
<td>28,332,800</td>
<td>542</td>
<td>1.9</td>
</tr>
</tbody>
</table>

This table reveals a surprisingly low death rate from cancer of the breast, which has probably remained stationary during the decade under observation.
SCHISTOSOMIASIS AND CANCER OF THE LIVER.


Reference was made in last year's report to the frequent association, in the native, of primary carcinoma of the liver with schistosomiasis, and to the possible etiological relationship between the two conditions. During the present year 19 further cases of primary carcinoma of the liver have come under notice. In seven of these, sufficient evidence was not forthcoming to determine whether schistosomiasis was present or not; ova were found in six, and in the remaining six there were no indications of either present or past infestation. It would appear, therefore, that although schistosomiasis may be one factor in accounting for the striking relative frequency of primary cancer of the liver amongst South African natives, it is by no means the only one. It is noteworthy, however, that in two of the six cases which were negative for schistosomiasis other helminthic infestations were found—in one instance, that of a Chinese, Clonorchis sinensis was present (see Porter and Pirie, Medical Journal of South Africa, Vol. XVII., July, 1922, p. 240), in the other, Cysticercus cellulosae. "Toxins" from these various parasites would afford a plausible explanation of the cirrhosis of the liver which appears invariably to precede the development of carcinoma.

PROTRACTED SLIGHT FEVER.


The author remarks that it is humiliating when we are unable to explain the cause of slight fever that persists tenaciously in spite of treatment, but this sometimes happens, especially in children and women. Sometimes this fever is observed after convalescence from an acute infectious disease, but the probability is that it had preceded the infection. Tuberculosis may usually be excluded when the temperature does not rise after physical exertion. In some cases the slight hyperthermia may subside for a few days or weeks, and then return as tenaciously as before. The patient may feel in perfect health throughout, but generally there is a slight malaise, especially in periods of exacerbation during the menses or after physical exercise or emotional stress. He is convinced that temperatures of 37.1° C. or 37.2° C. in the axilla, 37.3° C. in the mouth, and 37.6° C. in the rectum, may be regarded as physiologic, either congenital or acquired, in certain persons.
Book Reviews.


The term “cleft lip” is used instead of “hare lip,” because the latter term is a misnomer, as cleft lip does not resemble the lip of a hare. The author has had an experience of over forty years as a specialist in oral surgery, he has visited the principal surgical centres of America and Europe to deepen his knowledge and practical experience, and his work in two volumes on “Oral Surgery” was distributed in England during the war, and used for reference in all war hospitals. His surgical opinions are therefore entitled to the utmost respect. Many advances, major and minor, have been made in this branch of surgery in the last five years. In cleft lip operations the author has abandoned all previously employed devices to relieve tension on the coaptation sutures, and now uses the Logan Traction Bow. As to cleft palate, among the improvements which will bring to those operated on the great power of clear enunciation of speech is the surgical technic which prevents the spreading of the arch. Correct surgery of the bone is essential to the proper cure of the defect. Simply bringing together the soft parts anteriorly makes the cleft of the bones posteriorly still wider. To the objection that when the bones are approximated by means of lead plates there is danger of necrosis, the author replies that he has operated upon 693 infants under six years of age during the past six years, and necrosis has never occurred. As to the etiology of cleft plate, he believes that to some extent the defect is hereditary, and the influence of environment must also be considered. There is no proof that the defect is ever due to maternal impressions. As a rule, the supposed fright comes long after the lips and features are developed; the lips are completely formed by the ninth week. The volume should be in the possession of all surgeons who operate upon cases of cleft lip and cleft palate, defects which seem to be not uncommon in China. The illustrations are numerous and good.


This work consists of lectures given as a preliminary or introductory course to third-year students as a preparation for the actual clinical teaching of psychiatry during the fourth year of the medical course. Therefore its range is limited, as the aim has not been to write a complete treatise on psychiatry, but simply to give the fundamentals of the subject with as little encumbrance of unnecessary details as possible. Nevertheless, the ground is fairly well covered, and not only medical students, but also social workers, those concerned with the problems presented by the workers in industrial organizations, and those interested in vocational guidance, will find the volume very useful. The references at the end of each chapter will enable readers to pursue their way to deeper study of all the subjects discussed.


The author writes leisurely and comprehensively on his subject. There is an historical introduction beginning with the Code of Hammurabi (about 2200 B.C.), and nearly every subsequent chapter is prefaced by a
A Manual of Proctology.—By T. Chittenden Hill, Ph. B., M.B., F.R.C.S.

It is the opinion of the author of this Manual that encyclopaedic treatises on proctology weary the reader with excessive details. On the other hand, the space devoted to the subject in general text-books and in the larger systems of surgery is entirely inadequate. So he has attempted to effect a useful compromise. By the omission of controversial matter, irrelevant details, repetitions, references, and operations and methods which have not been proved of permanent value, he has saved much space without the loss of anything essential; the only operations described are those now practised. The text is written with admirable clearness and brevity, the operations described have behind them the long experience of a specialist and teacher, and the illustrations are good. We think the author has admirably fulfilled his purpose of writing a small volume that will guide the general practitioner and surgeon in the recognition and treatment of rectal diseases.

Handbook of Anaesthetics.—By J. Stuart Ross, M.B., Ch.B., F.R.C.S.E.
Book Reviews.

The first edition of this book was reviewed very favorably in this journal when it appeared. In preparing the second edition the whole work has been revised and much new material added. Free use has been made of the information supplied by Dr. J. S. Haldane in his recently published lectures on "Respiration," which have brought into due prospective a vast amount of work in a branch of physiology of peculiar interest to anaesthetists. The treatment of shock among the casualties of the Great War, preliminary hypodermic medication, and Gwathm'y's synergistic analgesia are briefly but well described, and there is a reference to the theoretical value of insulin in post-operative acidosis. The author's "stock" method of inducing anaesthesia is to use ether as the main inducing agent, but he assists its action by the intermittent and most guarded addition of small quantities of \( C_2E_3 \) mixture, that is, two parts chloroform and three parts ether. The whole subject of general and local anaesthesia, including spinal and sacral anaesthesia, is presented clearly and adequately. The illustrations, mostly of different forms of apparatus, are numerous. The volume, although not very large, is sincerely commended to all surgeons and anaesthetists.


Apparently, there are few surgeons who care to explore fully the possibilities and advantages of local anesthesia in serious operations, instead of inducing general anesthesia. Probably their experiences so far of the local method have not been very encouraging. As stated in the foreword to this volume, with the announcement of the discovery of the first drug (cocaïn) possessing local anaesthetic properties, came a wave of enthusiastic adoption by surgeons of a long-sought ideal. In its wake, as promptly, came disasters and disappointments. Seeking still further, innumerable substitutes were found and lauded—still with similar results. "Failure was inevitable because the induction of local anesthesia in any given area involves anatomical, surgical and psychic factors which in the past were ignored, overlooked or unthought of." The problem has been studied from every conceivable angle by the author, and his success in performing difficult and prolonged operations under local anesthesia is said to be phenomenal and most gratifying. In this handsome, well-illustrated volume of five hundred pages, his aim is to present to the medical profession the advantages of local anesthesia to patient and to surgeon, and to describe the practical details of methods of administration and of operative technique.

For the sake of convenience the book is divided into three parts. In Part I. certain problems are considered in connection with anesthesia, including equipment, technic, and a description of the sensory nervous system. In Part II. the subject has been considered regionally, all portions of the body, aside from the abdomen, being treated. In Part III. the surgery of the abdomen is considered.

Compared with general anesthesia, local anesthesia has many advantages, but there is no short and easy road to success in its use. A thorough knowledge of the anatomy of the nervous system, attention to psychological details, careful selection of the drugs to be employed, and a special armamentarium are all necessary in addition to the surgical skill and well-trained assistants required at every serious operation. The author has devoted twenty years to the study of this subject, and unquestionably during this period a very great advance has been made in the science and art of local anesthesia. The volume is well worth the study.
of all surgeons who would use local anesthesia whenever possible if convinced of its advantages, especially when obliged to operate without the assistance of professional colleagues.


As the author says, there is a close analogy between clinical medicine and music. One may know harmony, counterpoint, and all that makes up the science of music, but unless by dint of practice he has mastered technique there will be no music. Technique in music produces beauty of tone; in medicine it secures accuracy of data. There are many sources of error in diagnosis, such as errors of judgment, errors in analysis, errors in data, but the commonest of all are errors of technique. So the author's aim is to present as clearly and concisely as possible methods of determining the facts on which accurate diagnosis rests. The matter is well up-to-date. The chapters on diseases of the cardio-vascular system, with its numerous electrocardiograms, and on neurological examination are very good. The work is well illustrated, and to add to its interest and to stimulate thought there are scattered throughout the volume records of cases in which the diagnosis was obscure or difficult. For instance, "about ten years ago I was entrusted with the care of a patient who was believed to have carcinoma of the liver. On first impression one would concur in the probability, the patient was so emaciated, deeply jaundiced and utterly hopeless. Curiosity to feel dictated aspiration. The patient began to improve as by magic. Nothing was felt in the abdomen, and the man is apparently in perfect health to-day." What was the correct diagnosis? The volume is intended to furnish an intermediary between the classical description of the text-book of medicine and the treatise on the latest methods of treatment. To students and young practitioners of medicine it should be particularly useful.


The author has prepared this small volume for medical students, hospital interns and physicians who have only a limited amount of time to give to laboratory work. It has reached a fourth edition, so it is evidently meeting a professional need, and meeting it satisfactorily. "Every possible care has been used to incorporate in this guide only the up-to-date and absolutely reliable laboratory tests, and if one is able to perform these tests accurately and at the same time place the proper interpretation on the results, he will be very materially assisted in coming to an accurate diagnosis". The physician who is within easy reach of a good laboratory where all the difficult and unusual tests can be performed for him whenever necessary, but who wishes to do some of the more common tests himself, will find the volume very handy.

**P. U. M. C. Publications:**

**CHEMICAL AND DRUG STOCK LIST.**—Compiled for the use of the staff of the P. U. M. C., this list may be of service to all in charge of hospitals in China as a guide to the drugs which should be kept in stock, their quality, price, and the business firms from whom the drugs should be purchased. A list of stains, indicators and test papers is also given.

**DEPARTMENT OF MEDICINE: DUTIES OF STAFF.**—With such a very large staff as that of the P. U. M. C., it is necessary in order to obtain the highest efficiency and smooth working of the organization that the duties of each
Book Reviews.

member of the staff and his relations to his colleagues should be clearly defined. The printed form received outlines these duties and relations very clearly, and it may well serve as a model or guide to other large hospitals.


This number consists of a very interesting article by G. G. MacCurdy, Ph.D., on ancient Human Skeletal Remains from the Highlands of Peru. Of special interest to medical men are the sections describing the types of intentional deformation exhibited by the skulls, and the evidences of trepanation. The ancient Peruvian highlanders were brave and pugnacious, and battles were frequent. The common weapon was a stone club. Consequently, fractures of the skull were common, usually on the left side because the combatants were right-handed. Trephining seems to have been performed by scraping or cauterization. One man underwent as many as five trephining operations at various times, all of which penetrated to the cerebral membranes, and only once did infection occur. The whole number should be read by those interested in anthropology and ancient history.

The Tsinan Medical Review.—Vol IV. No. 1. January, 1924. Subscription $1.50 for one year. Published by the Medical Department of the Shantung Christian University, Tsinanfu.

This valuable medical journal, printed almost wholly in the Chinese language, should be subscribed to by every hospital which has Chinese medical assistants with little or no knowledge of the English language. The following instructive articles appear in the present number: Chronic Gastric Ulcer; The Therapeutic Use of Digitalis; The Diagnosis of Leprosy; The Indications for Tonsillectomy; Pyelitis, its Guises and Disguises; Notes on Helminthology; Psoriasis; Mistakes in Abdominal Diagnosis; Quartan Malaria, and Tubal Pregnancy with Rupture.


The purpose of this new magazine is to bring together the large amount of interesting but widely scattered information concerning the practical side of endocrinology. The following are the principal articles in the first number: The Adrenal Glands in Dementia Praecox; Prospects from Parathyroid Therapy; Iodin Therapy; Pluriglandular Involvement in Disorders of the Pituitary; Endocrine Personality Types; Endocrine Inter-relationships; The Vitamins and Growth; The Adrenals and the Blood Picture.


A preliminary report of the use of various forms of rubber and gutta percha subcutaneously for the purpose of raising the depressed nasal bridge and filling in various tissue deficiencies, with illustrations and descriptions of the types of material used, the manner of preparation, and special syringes used by the writer.
WITH THE EXECUTIVE SECRETARY.

The Shanghai Municipal Council has recently changed all the numbers in Dixwell Road. The private address of the Secretary is now 700 Dixwell Road, and that of the Editor of the Journal, 710 Dixwell Road.

The Secretary would like to call the attention of the members to the new form of receipt that is being issued for membership dues this year. The Executive Committee has decided to issue the receipt in the form of a certificate of membership for the current year, somewhat after the form used by the American Medical Association. There are two reasons for this:

1. The desire to call the attention of members to the fact that their dues are paid not merely to defray the cost of printing and publishing the *Journal*—though we venture to consider that the *Journal* is more than worth the amount paid—but are the contributions of members to meet the general expenses of an Association which strives to unite together all medical missionaries and those with similar aims in a common bond of service. Members are thus not single units, but parts of a whole; and it is important that we realize that the Association stands or falls with the strength of this bond.

2. American members wishing to join the American Medical Association as Associate Members can use the certificate of membership in the China Medical Missionary Association for this purpose.

Membership dues for 1924 should now be sent to the Treasurer, and members will then have the opportunity of seeing for themselves these new certificates.

THE TONSILS AND TUBERCULOSIS.


Fischer examined the tonsils in 173 cadavers. Death had been from tuberculosis in 161. Only in one case did the data indicate with great probability that the infection had started in the tonsil, but even this one case he considers important. In 73.2 per cent. of the cases of ulcerative processes of the lung, the tonsils presented tuberculous changes. Even minute lesions in the lungs not ulcerative were sometimes accompanied by contagious tuberculous foci in the tonsils.
Correspondence.

Correspondents are requested to write on one side of the paper only, and always to send their real names and addresses. The Journal does not hold itself responsible for the opinions or assertions of correspondents.

American Missionary Physicians and the American Medical Association

To the Editor, C. M. J.

Dear Sir,—The following is taken from a letter recently received from Dr. Olin West, Secretary of the American Medical Association, with address at 535, North Dearborn Street, Chicago, Ill.:—

"I take pleasure in submitting the following information concerning Associate Fellowship for the benefit of American medical missionaries with whom you may be associated.

"Under the provisions of the By-Laws of the American Medical Association, all American physicians engaged in missionary work in foreign countries are eligible for Associate Fellowship, providing their applications are favorably passed upon by the Judicial Council of the Association. Of course it is necessary that evidence shall accompany the application, which will show applicants to be actually engaged in medical missionary work. Application should therefore be accompanied by credentials from the proper officers of the organizations represented by the applicants.

"The usual subscription to the Journal of the American Medical Association is included in the annual Fellowship dues. In other words, the annual Fellowship dues and subscription to the Journal are all included in the one payment, which is the same in amount as the regular subscription to the Journal.

"I shall be very glad to have your application and applications from your Associates in time to be acted upon for presentation to the House of Delegates at the next annual meeting."

Yours sincerely,

W. W. Cadbury.

Canton.

November 27, 1923

A Case of Osteo-Aneurism of The Femur?

To the Editor, C. M. J.,

Dear Sir,—The following case seems to be worthy of recording owing to its comparative rarity.

A countryman, named Lu, aged 37, attended at the hospital here on September 31st, 1923, complaining of pain in his leg when he walked. He was somewhat anaemic. He gave the history that one year and three months previously, while returning from work in the fields, he had been tripped up by something on the ground and had fallen. He is quite clear that he had pain in the injured leg for at least six months before the accident. Following his fall he could not walk and was in bed for one month. After that he got up and returned to work for a whole month. At the end of this period he again had to stay at home, unable to work because of the pain in his leg. Fifteen months after the accident he presented himself at our hospital for treatment. His condition was such that he could just manage to hobble around the ward, but even such effort gave him pain in the left femur.

On inspection, the left femur was obviously deformed; there was shortening of about two inches and the leg could not be laid flat on the bed; 10-20 degrees of permanent flexion at the hip. Otherwise the hip joints were both freely movable. There was a smooth bony mass, of considerable size, around and just below the whole of the upper third of the shaft of the femur. The mass was prominent anteriorly at the junction of the upper and middle thirds, as though the upper fragment of a fracture at that point had been brought forward by ilio-psoas traction and fixed in that position.
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for lack of treatment. The bony mass extended laterally, where it was somewhat superficial, under skin, fascia and muscle, and it also extended upwards above the level of the great trochanter in Nelaton's line. It was thought possible that the bony overgrowth might merely be callus produced in excess owing to malposition, re-fracture, etc. The mass did not give the sensation of "eggshell cracking."

Operation.—Owing to the patient's desire for something to be done, and because it was thought that the case might possibly be a simple mal-united fracture (too little importance was attached to the extension above Nelaton's line), an exploratory operation was undertaken.

An incision was made from the side direct, through skin, fascia, and muscle, into the shaft of the femur. The periosteum being exposed, the knife at once penetrated into the substance of the mass of callus, through what was obviously a mere eggshell of bone, and bleeding commenced. An attempt to examine the tumour further and to stop the bleeding only gave rise to a more profuse flow of blood, mixed arterial and venous in colour. On introducing a finger into the tumour a large cavity was revealed; spicules of bone seemed to exist here and there floating in a lake or semi-fluid mass of blood. As the wound was too high for the use of a tourniquet, the only method of stopping the bleeding was to pack the wound. This was done without delay. The gauze used was cut in ample squares about four inches square, rolled round one another and well impregnated with Rutherford Morrison's Ripp (bismuth, iodoform, and paraffin paste). The gauze was pushed in so as to be very tight, the rest of the wound sewn up and the patient returned to bed.

Progress was uneventful. For four days the gauze packing was not touched, after which it was very gradually removed; the inner layers (like the tobacco from a cigarette) were taken out first with the idea of gradually releasing pressure and allowing the wound to fill up from below without disturbing the granulations which it was feared would be so likely to bleed. Eventually, within two weeks the whole packing was safely removed, bleeding did not recur, and the wound closed normally. Patient would not consent to amputation.

It is now possible, when one examines particularly for it, to detect distinct arterial pulsation over the whole tumour through its "eggshell" wall, though there still is no crackling. Unfortunately we have no X-ray equipment; nor was any microscopic specimen obtained. There are no infected glands, nor signs of metastases elsewhere, and taken with the long duration of the disease, nearly two years, this is of interest in view of the statement by Sir Robert Jones and Lovett in their recent book on Orthopedic Surgery that this type of growth, when it occurs, as it more usually does, in the bones of the skull, is "a type of sarcomata arising from the vessels of the cortex and consisting of widely irregular dilated sinuses, which may pulsate . . . highly malignant and metastasizes early."

Could the tumour in the case above described have been merely a degenerated myeloid sarcoma?

Yours sincerely,

George H. Pearson.

Poaking, Hunan.

December, 1923.

Note on Above Case by Dr. James L. Maxwell.

The case here described is undoubtedly one of myeloma. Such tumours occur usually in the long bones, and most commonly in the lower end of the femur and upper end of tibia.

"It was formerly customary to include the myelomas among the sarcomas as the giant-celled variety or myeloid sarcoma. The course of the disease, however, fully justifies
the view that a myeloma is a benign growth, showing no tendency to cause deposits in the lymphatic glands or metastases." (Choice, System of Surgery, Vol. i, p. 400.)

"On account of the great vascularity of the tumour, pulsation can often be detected at any spot at which the bony envelope of the growth is wanting, and is a physical sign of great value in the differential diagnosis" (Id.)

If it doubtful whether the treatment described will be sufficient to eradicate the disease. In small tumours thorough curettage with cautereization of the inside of the cavity has been known to effect a cure. In more extensive disease, such as this, more radical measures are required. Considerable success has, to my knowledge, attended the excision of the affected area of bone with grafting, say from the fibula, to fill in the deficiency. Of course this is much easier to do when one of the arm bones is affected.—J.I..M.

Appeal from University of Toronto for Parasitic Material

Dr. W.W. Peter,
Chairman, China Council Public Health.

Dear Dr. Peter,—The suggestion has been made to me that we may be able to appeal through you to members of the medical profession in China for parasitic material for our laboratory. We are most anxious to build up a representative collection of parasitic material and, as you know, in Canada the opportunity to obtain specimens is rather rare. We shall welcome anything sent to us,—specimens of lice, fleas, tape-worms, round-worms, also malarial blood films and other types of films which can be obtained. May we hope that you will be able to help us with any material which you may see fit to send? We shall be glad to assume any expense which may be incurred for packing, preserving or mailing.

I hope this request will not occasion you too much trouble.

Gratefully yours,

Marion Maitland.

Toronto, Canada.

November, 1923.

Locum Tenency.—Urgently required for an important city in the South of China, a fully qualified missionary physician as locum tenens for a few months. For particulars, apply to Executive Secretary, C.M.M.A., Box 1121, Shanghai.

EYESIGHT OF CHINESE ROYALTIES.—

On December 21, 1923, Drs. Fuchs and Ling paid a professional visit to the Ex-Emperor Hsuan Tung. A thorough examination was made and it is gratifying to know that the ex-Emperor's eyes have not changed since he began wearing the glasses prescribed by Dr. Howard more than a year ago. Dr. Fuchs examined also a brother and a brother-in-law of the ex-Emperor, and prescribed glasses for them. On December 23rd, Drs. Fuchs, Li and Pi visited the palace and refracted the eyes of the ex-Empress. Subsequently they were shown about the grounds by the ex-Emperor and Mr. Johnston. The latter made the observation that this visit of foreign physicians was the first instance of attendance of foreign doctors upon an Empress of China in the palace.

RELEASE OF DR. SCHMALZRIED.—

The American missionary, Dr. Schmalzried, who was captured by brigands on November 13, 1923, near the Kueichow-Hunan border
was released on January 17th, 1924. Local Chinese paid 18,000 strings of cash for his ransom.

A WELCOME RECRUIT.—Handley George Stockley, M.B., Ch.B. (Edin.), recently appointed by the English Baptist Mission, is the bearer of an honoured name in our Baptist annals, being a son of the Rev. T. L. Stockley and a brother of Dr. Clement Stockley, already one of our medical missionaries at Taiyuan Fu. He was accepted by the Edinburgh Medical Missionary Society, and graduated at Edinburgh University in 1922. His course was interrupted by two years' war service in India and Mesopotamia, in the course of which he gained valuable insight into life in the East. Subsequent to graduation, Dr. Stockley held resident appointments at the Cowgate Dispensary, Edinburgh, and at Leith Infirmary. In addition he took a course of study in Tropical Medicine in London.—Missionary Herald, December, 1923.

PEKING UNION MEDICAL COLLEGE.—Since the opening of the Premedical School in 1917 and of the Medical College in 1919, 208 institutions in China have sent their students to seek for admission here, and students of 93 schools have successfully passed the examinations and have been admitted. The present undergraduate enrollment of 113 medical and premedical students includes representatives of 60 schools in China and 6 foreign institutions, a total school representation of 75.

UNIVERSITY OF HONGKONG.—It is understood that the University of Hongkong has offered the Vice-Chancellorship to Mr. W. W. Hornell, Director of Public Instruction, Bengal. The post has practically been vacant since the appointment of Sir Charles Eliot in 1912, then Vice-Chancellor, as the British Ambassador to Japan. Mr. Hornell has not so far replied to the cable, but it is understood that he is likely to accept.

Dr. Edward H. Hume left Peking on January 2, 1924, after a week's visit. His address in the Auditorium on Sunday, December 30, 1923, was an inspiring appeal for a deeper appreciation of the spiritual contribution of Eastern religions and for a diligent search after a new approach to the religious needs of this part of the world.

STOUT MEMORIAL HOSPITAL, WUCHOW.—A hospital chapel having been built recently, the dedicatory service was held on Sunday, December 23, 1923.

NURSES' ASSOCIATION OF CHINA.—The next national conference of this Association will be held in Canton, January 31 to February 6, 1924. The programme is interesting and instructive, and it is expected that the attendance will be large.

PLAN TO ESTABLISH A ROCKFELLER ORIENTAL LABORATORY.—As a sequel to the offer of the Rockefeller Institute to make a present of some scientific institution which Japan may choose to ask, Viscount Goto, the Home Minister, is reported to have sent a reply to the Institute some time ago to the effect that Japan would be very grateful for a hygiene and sanitation laboratory to cost Y. 5,000,000. It is reported further that the Institute has written back to the Viscount that Japan would before long send a mission to establish the desired laboratory, and an arrangement has already been agreed upon whereby a committee for the establishment of the Rockefeller Oriental Hygiene and Sanitation Laboratory will be formed on the arrival of the mission, the committee to consist of Dr. Teusler, of St. Luke's Hospital, Tokyo, and other prominent medical men of the country, with Viscount Goto as its chairman. On completion of the laboratory, St. Luke's Hospital will become
affiliated with it, and the Government will be asked to bear the expense of maintaining both institutions. The laboratory would, when completed, become a world institution, with Japan, China and India as its principal fields of operation, and be sure to render invaluable service.—Japan Medical World, December, 1923.

**Record Seizure of Narcotics.—** A record seizure of contraband narcotics was made at San Francisco recently, when more than 1,000 tons of opium were found aboard the Pacific Mailliner "President Wilson," upon its arrival from the Orient, the narcotics being valued at more than $100,000. This seizure increases the dilemma of the Government in the matter of penalties, the vessel being owned by the United States Board. It has been ruled that one department cannot assess fines against another department and collect, and Customs officials have been holding vessel commanders responsible along with operating companies. Following this large seizure, Collector of Customs William B. Hamilton assessed a fine of $185,000 against Captain Henry Nelson, commander of the "President Wilson." An appeal will be taken by the Pacific Mail Steamship Company.—Drug and Chemical Markets.

**Patent Medicines in China.—** Foreign exploiters of patent medicines have found China a rich field when extensively and attractively advertised. One of the mistakes of foreign manufacturers is to expect too much of this country of 300 millions, forgetting that only a small part of the population is able to pay for foreign medicines. There are many Chinese medicines. In a report published in 1904 on the Province of Szechwan, a list is given of 189 vegetable and 31 animal medicines made and used by the Chinese of Szechwan from time immemorial. The great Materia Medica compiled in the sixteenth century is composed of 52 volumes and contains 1,892 remedies. The internal trade in Chinese medicines is enormous, and the export alone is more than $2,500,000 annually.”—Drug and Chemical Markets.

**Lepers in U. S. A.—** There are now 174 lepers at Carville, Louisiana, every bed being filled, the inmates including men and women from nearly every State in the Union. The new buildings authorized will add 204 additional beds which will be immediately utilized, since there is a waiting list of more than 100 who wish to enter the institution, and many other lepers in the United States aggregating, it is believed, more than 1,000, whom it is desired to segregate as soon as facilities can be provided. One-fourth of the inmates at Carville are totally blind from the disease, and the mutilations, especially of hands and feet, resulting from the disease are such as to remind one forcibly of Biblical descriptions.

**The Blood that has been Shed.—** Wars, no doubt, in our day are fewer in number; but the number of victims remains fairly constant. A thoughtful French inquirer, De Lapouge, came to the conclusion that the stream of blood shed throughout the ages remains unaffected. Almost twenty years ago he attempted to estimate the victims of war for each civilized country during half a century, and ascertained that the total amounted to nine and a half millions. By including the Napoleonic and other wars of the beginning of the nineteenth century, he considered that the total would have been doubled. De Lapouge puts this in another form, by stating that the wars of a century spill 120,000,000 gallons of blood, enough to create a perpetual fountain sending up a jet of 150 gallons per hour. The horrible matter is that the fountain has been flowing unceasingly ever since the dawn of history.—Times Lit. Suppl., Oct., 11, 1923.
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EDITOR—Edward M. Merrins, M.D., St John's University. Office address, 4 Quinsan Gardens, Shanghai. Medical papers and other literary communications for the Journal, books for review, and exchange medical journals, should be sent to the Editor.

EDITORIAL BOARD.—Drs. R. C. Beebe, Shanghai; W. W. Cadbury, Canton; E. D. Congdon, Peking; C. L. Davenport, Shanghai; H. E. Earle, Hongkong; H. J. Howard, Peking; J. L. Maxwell, Shanghai; A. W. Tucker, Shanghai; Way Sung New, Shanghai.

TREASURER.—The Executive Secretary, Dr. James L. Maxwell, is also Treasurer of the Association. Office address, 4 Quinsan Gardens, Shanghai. All payments, whether subscriptions to the Journal, payments for advertisements, or Association dues, should be sent to him. Checks should be made payable to the China Medical Missionary Association and the amount stated in dollars, Shanghai currency.

RECORDING SECRETARY.—H. H. Morris, M.D., 24 Minghong Road, Shanghai. Members of the Association should inform him of change of address and state whether change is temporary or permanent.

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REPORT ON THE CONTROL AND TREATMENT OF VENEREAL DISEASE IN SHANGHAI.

The Committee appointed by the Shanghai Medical Society to consider and report on the question of the control and treatment of venereal diseases in Shanghai from a Public Health point of view have the honour to present the following data with suggestions for the consideration of the Council of the Medical Society, and the Commissioner of Public Health.

The Committee included Dr. E. L. Marsh (Chairman), Dr. A. C. Bryson, Dr. E. Lagrange and Dr. Lovett Cumming, and meetings were held on April 27th, May 4th, June 11th and July 13th, 1923, at the General Hospital, Shanghai.

HISTORICAL

1869.—Definite public action in connection with the problem of venereal diseases and prostitution in Shanghai dates from 1869, when Dr. Edward Henderson, Surgeon to the Municipality and Officer of Health, recorded in a letter addressed to the Chairman of Works that the alleged remarkable prevalence in the Settlement of syphilis and prostitution was fully borne out by a reference to hospital reports no less than by the individual experience of medical men. "Nor is such prevalence to be wondered at when we consider the number of Chinese prostitutes who infest the back streets of the Settlement, the number of sailors from all parts of the world who visit the Port, and the absence hitherto of all legislation in the matter. The number of foreign prostitutes is very limited, and their price will, I presume, limit the visits of any save those possessed of considerable means."

Immoral Houses in Shanghai.—A census of Chinese houses known as frequented by foreigners taken in January, 1869, for the Anglo-American Settlement gave 97 houses and 311 girls, exclusive of the brothel keepers. The total of houses frequented by both foreigners and natives was 463 for the Anglo-American Settlement, and the total number of prostitutes was 1,612. The houses fre-
quented by natives alone were largely in excess of those visited by foreigners, and this difference was important, for it meant that the women living in the former could in no way affect the health of the foreign community, and did not need therefore to form an item in the calculations of any supervision scheme which had for its object the protection of foreigners only.

Dr. Massais, the French municipal medical officer, estimated the total number of such houses in the French Concession in 1869 at about 250, and the total number of prostitutes at about 2,600. Of these houses, however, 24 only were known to be frequented by foreigners; these houses contained 90 girls, viz., 54 Cantonese and 36 girls from Soochow, Ningpo and Shanghai.

**Brothel Inspection.**—The Municipal Council having decided that a regular system of Chinese brothel inspection should be inaugurated, Dr. Henderson made the first tour of inspection in Hongkew on the 16th August, 1869. The result he embodied in a letter addressed to the Chairman of the Committee of Works. He found that the Chinese brothels, known as frequented by foreigners, were for the most part aggregated in back streets, each house containing 3 or 4 inhabitants, 2 or 3 young girls and an older woman acting as superintendent (brothel house-keeper). These houses were for the most part dark, dirty and unfurnished, and all that were visited were alike destitute of appliances necessary for those ablutions which, according to many, form the best preventative against disease.

Among the girls inspected, some 30 or 40, none exhibited any outward sign of specific skin eruptions or other manifest indication of venereal disease. Thorough inspection on the part of any foreign medical man would be impossible in such houses from the prejudices of the women, the absence in many cases of the necessary light, and in all of the necessary privacy.

**Lock Hospital opened.**—On the 26th August, 1869, Mr. Penfold, police superintendent, submitted to Dr. Henderson a scheme which appeared to meet all requirements; with a trifling alteration in detail, this was eventually approved by the Council.

It recommended the establishment of a hospital, to be termed a Home, placed under the superintendence of the Municipal medical officer, to which all suffering from disease were to be sent by a
native doctor who, at a salary of $30.00 per month, should be engaged to visit the houses and inspect the inmates.

It contained a clause providing for the prosecution of any brothel-keeper found having or harbouring any girl suffering from venereal disease, and proposed that the necessary expenses should be defrayed by a subscription of 50 cents per girl per month to be collected from the keepers of such houses. It stated further that the women were themselves willing to submit to such regulations.

Dr. Massais, municipal medical officer to the French Concession, also drew up a report on this subject, which he entitled "Notes intended to serve as the basis of a plan for the establishment of a 'Service Sanitaire' for brothels in the French Concession". He advocated a complete system of registration modelled on the plan adopted in large French towns. At this date (October 2nd, 1869) the French Council had come to no decision on this matter.

Following the course suggested above, a house (Chinese Lock Hospital) was opened in the Honan Road in 1869; the furniture—a stove, three beds, etc.—being alone supplied at the Municipal expense (Tls.56.71). Up till the end of the year only one patient had been treated, a change in the Chinese inspecting doctor failing to increase the number of applicants.

1870.—The "Home," or Lock Hospital, was not a success and was subsequently closed.

1871.—In a "Report on Prostitution in Shanghai", drawn up at this time by Dr. Edward Henderson for the Council for the foreign community of Shanghai, it stated that the question of the supervision of public women is one which had engaged the attention of former Councils, and which, at present, no less than formerly, demands the serious consideration of those whose duty it is to guard the interests and care for the health of the foreign community of Shanghai.

According to Dr. Henderson, there were at least three good reasons which might be given to show that the residents in the Settlement were specially interested in the discussion of the subject; he advanced them as the preliminary considerations which induced him to enter upon a careful investigation of the whole subject:—
1. Shanghai, a busy mercantile port visited by ships from all parts of the world, like all similarly situated towns is peculiarly exposed to the invasion of venereal disease and has attracted a large number of prostitutes within its limits.

2. The native women who infest the Settlement, and who are the chief source of danger to foreigners, place themselves almost exclusively under the care of Chinese doctors, whose notions with regard to contagion are utterly vague, and whose detection or treatment of disease cannot in the least be relied on.

3. The inhabitants of Shanghai, consisting mainly of young unmarried men, are peculiarly liable to suffer from those evils, the limitation or eradication of which it is hoped may be attained by properly directed legislation.

Dr. Henderson's own experience in practice in the Settlement led him to the conclusion that venereal disease is neither excessively or unusually prevalent among the foreign residents. The number of native women in the position of mistresses indicated, no doubt, the principal cause of this immunity. This statement did not apply to the foreign police force, in which venereal affections had been unusually prevalent during the preceding year. Dr. Henderson had seen nothing as yet to lead one to the conclusion that syphilis bears an undue proportion in Shanghai to other forms of venereal disease.

From 1865 to 1870 inclusive, 2,791 patients had been treated for various complaints in the wards of the General Hospital; among these, cases of venereal disease occurred in the proportion of about 16 in every hundred.

According to statements made by the Chinese and by the native doctors, patients with venereal disease were more common in Shanghai during the summer and autumn months, possibly following the arrival of many foreign ships which yearly made their appearance in the river in the end of May or beginning of June, to await the opening of the tea market.

*"The somewhat unsatisfactory arrangement adopted in several of the hospital reports permits of a stronger case being made out against venereal disease, but of this I have taken no advantage."—E. Henderson, M.D., Report on Prostitution, p. 22.
Dr. Henderson concludes his report by saying: "If it be considered that the medical evidence adduced fails to prove the excessive prevalence of venereal diseases among foreigners residing in, or visiting Shanghai, it still cannot be denied enough has been brought forward to show that these are sufficiently widely spread to demand the serious consideration of the sanitary guardians of the Settlement. The excessive prevalence of venereal disease among the natives who surround us is an incontestable fact. The large number of brothels existing within foreign limits is in the highest degree objectionable, as affecting the good name of the Settlement. By far the greater number exist for the use of natives only, and such ought to find no place in the Foreign Settlement. The foundation of a properly appointed Lock Hospital should be the first step taken. Compulsory periodical examination of the native women, enforced detention in hospital of all found suffering from venereal disease, are, in my opinion, the only measures the adoption of which is likely to yield any notably good results."

1873.—The fourth Annual Report of the Health Officer (Dr. Henderson) places the opening of an efficient Lock Hospital as one of the important necessities which concern health.

1874.—The Memorandum of the Watch Committee addressed to the Council mentions, with reference to a Lock Hospital, that the French Municipality would not be in a position to co-operate with the Council during the year, and for this reason and also the probable opposition on the part of the Chinese authorities which would interfere with the successful working of the Institution, no appropriation would be asked for. At the same time every endeavour should be made to initiate an undertaking so needed and so beneficial in its results.

1875.—The Watch Committee called for a report from the Health Officer as to the suitability of a building at the head of Foochow Road in which to commence the work of a Lock Hospital. The exhaustive memorandum sent in by Dr. Henderson (Municipal Report, 1875, p.58) showed that if the idea of a Lock Hospital was to be entertained, there must be no half measures, and that the ratepayers must make up their minds to spend the sum asked for at the outset, and to put aside every year say Tls. 2,000.00 to work the institution on a proper basis. The Committee must
consider whether they will go to this expense, bearing in mind that without the support of the Chinese authorities the success of the hospital is highly doubtful.

The neighbouring French Municipality expressed a desire to act in common as the most economical manner of proceeding at first.

After deliberation the Watch Committee were of opinion that the scheme at present was not feasible.

The British Naval Commander-in-Chief now made a request for a Lock Hospital and some compulsory system of inspection of public women, and in reply the Council stated "that the establishment of a Lock Hospital has occupied the attention of successive Councils, but in face of the difficulties and opposition that are certain to be met with in working it successfully, they have come to the conclusion that it is quite impracticable at present."

The Admiral collected from the various surgeons of H.M. ships on the China Station evidence as to the effect on the frequency of venereal diseases and the virulence of the diseases, in "protected" and "unprotected" ports, and found that it is most conclusively in favour of protection.

Subsequently the Council decided to put in force a tentative scheme, being actuated thereto by further urgent representations by the British Admiral in consequence of the ships under his command having frequently a large number of men under treatment for venereal disease and in very grave forms contracted in Shanghai (Municipal Report, 1876, p.22).

1876.—In the Health Officer's Report for this year the following general résumé of the question of venereal disease and prostitution in Shanghai is from the pen of Dr. Henderson:—

Value of Lock Hospital:—"The necessity for establishing some system of medical supervision over the public women in Shanghai has long been acknowledged, but the difficulties—financial, political and social—which have stood in the way of the various schemes proposed by successive administrations, have hitherto proved sufficient to prevent any very decided action from being taken, either by the community or its representatives.

"In August of 1869 the Police Superintendent proposed to the Council to open a small hospital in the Settlement, where the native women might be examined, and, when necessary, admitted and treated; attendance was to be optional on the part of the women, but such provision as was possible
was made for the prosecution of any brothel-keeper found concealing a case of venereal disease in her house. Neither Mr. Penfold nor I hoped for much from this undertaking, but the Council was anxious that something should be done, and apparently at the same time unable or unwilling to take the matter seriously in hand. This experiment proved a failure; the women would not attend, and, while we had reason to know that disease continued to prevail extensively in the brothels, the hospital was for many months without a single patient. Before acknowledging defeat, an effort was made to induce attendance by means of house-to-house visitations by paid native assistants, but this also failed in its object, and the hospital was finally closed in the beginning of 1870.

"In the end of 1870 I drew up for the Council a special report, which was printed and privately circulated in 1871. In this I discussed the whole subject very fully. I defined the various classes of houses which the Settlement contained, giving their situation, distinctive characters, their number, and the number of their inmates; I drew attention to the iniquitous bargains by which in too many cases the brothel-keepers became the actual possessors of the young women who lived in their houses; I pointed out the folly of placing any dependence on the native women themselves, or on their treatment by the native doctors, and showed how the native hospitals under foreign supervision failed at all adequately to provide for their wants; from the statistics of the General Hospital, the native hospitals and the foreign police force, together with such figures as I was able to obtain from the men-of-war stationed at the port during the year, I proved the widespread prevalence of venereal disease; finally, I urged upon the Council the necessity for the introduction of some efficient scheme of medical supervision, and declared it to be my opinion that nothing short of compulsory periodical examinations and enforced detentions in Hospital could be depended on to yield any notably good results.

"My report attracted some notice at the time of its publication, but other matters of public importance diverting attention, and some difficulty in the way of co-operation with the French Council being anticipated, the subject was allowed to drop, and no action was taken till December of 1874. In that month I was requested by the Secretary to frame a special memorandum from which the Watch Committee might calculate the probable expenses attendant on the establishment of a Lock Hospital for the native women; I was at the same time officially informed that the co-operation of the French Council had been definitely promised. In the Health Officer’s report for 1874 I gave a short sketch of the memorandum which I addressed to the Watch Committee, and full details of this document were at the same time published by the Secretary. Nothing further was done in 1875, but in 1876 Vice-Admiral Ryder being on the station and taking an active interest in the matter, the Lock Hospital was once more discussed by the Council. The arguments employed by Admiral Ryder were cogent—for, besides demonstrating anew the serious injury inflicted on the Navy by venereal diseases contracted in Shanghai, he was able to show
clearly the great improvement in this respect which had been effected in Hongkong and in Japan, where well-devised systems of examination and seclusion were thoroughly carried out by a competent staff.

"Under instructions from the Council, and after consultation with the Health Officer for the French Concession and the Police Superintendents, I now drew up the details of a scheme by which, without much outlay, the Council might fairly test its ability to control the brothels, and compel the attendance of the native prostitutes for examination by a foreign surgeon. This scheme was substantially a plan of procedure recommended to the French Council by Dr. Massais in 1864, but it differed from the original proposal, and fell short of my own views, in so far as it failed to make provision for the detention in Hospital of the women found to be diseased. I advanced it, however, as tentative only, and it was so regarded by the two Municipalities; it would obviously have been unwise to incur the expense of furnishing a hospital, while as yet the power to procure patients was a matter of uncertainty. On the 24th of July, at a Council meeting attended by representatives of the French Municipality, by the English Admiral, and by the Health Officer for the French Concession, my memorandum was read and fully discussed; at a later date I was informed that plans of action advised had been approved of, and that, along with Dr. Pichon, I might proceed to open the new Dispensary on the 1st of January, 1877. Writing now on the 1st of February I have little to add. The Dispensary has been open since the beginning of the year, but the houses have all been closed by their proprietors, and the women as yet obstinately refuse to come for examination. This is, however, no more than might have been expected; I anticipated it in my special report when I said: 'It cannot be denied that the initiation of an effective supervision scheme may result in the closing of some of the native brothels and the emigration of the women,' etc. Success will now depend on the perseverance with which the two Municipalities refuse to allow native brothels to exist in the Settlements, the inmates of which fail to appear regularly before the examining surgeon."

The Memorandum mentioned in the preceding paragraph is entitled The Medical and Police Supervision of Native Prostitutes, dated June 12th, 1876, and is as follows:—

"1. It is unnecessary now to recapitulate the facts which have been accumulated to prove the necessity of subjecting the native prostitutes in Shanghai to foreign medical supervision. During the past year the subject has again been brought prominently forward by Vice-Admiral Ryder, who urges the Council to take immediate action, by arguments founded on the experience of ships of war stationed at the port, and by detailed reference to the good results obtained in Japan from the systematic inspection of the women and the establishment of Lock Hospitals. In addition to the letters of the English Admiral, I beg now also to enclose a letter from Fleet-Surgeon Thomas J. Turner, of the U.S. Flagship.
"Tennessee," in which the writer expresses strongly his conviction that a Lock Hospital is needed in Shanghai, and adds his experience to that of other Naval Surgeons to prove the prevalence of venereal disease at the port. I am also further informed by the Health Officer of the French Council that during the past six months the Captain of a French man-of-war lying in the harbour refused altogether to grant his men shore-going leave, on account of the risk which he believed they ran of contracting venereal disease in the brothels.

2. I have recently pointed out (in my last report as Health Officer) that efficient control of the native prostitutes will be obtained with greater difficulty in Shanghai than either in Hongkong or Japan in virtue of the facts that Hongkong is a British Colony and that in Japan the Native Government concerns itself directly in the establishment and maintenance of Lock Hospitals. In view of the difficulties which may be anticipated, the following points seem to me deserving of special consideration:

(a) The Superintendent of Police is of opinion that the number of the native prostitutes in Shanghai has undergone little alteration during the past few years, and that the figures published in my special report in 1871 may be taken as substantially correct. At that date 1,612 women were known by the Police as prostitutes in the Settlement north of the Yang-King-Pang Creek. Of these women, 1,385 received the visits of natives only, and in no case permitted foreigners to enter their houses. It would be as impossible, as it would be impolitic, to attempt the medical inspection of women who specially reserve themselves, and they may be altogether beyond our power. The cost of the visits of 223 women will doubtless sufficiently tax the resources of the staff which the Council can command, but the number is scarcely so great as to be seriously embarrassing. These 223 women are distributed over Hongkew and the English Settlement in 62 houses.

(b) It has been definitely ascertained that neither in the French Concession nor in the Settlement north of Yang-king-pang Creek will the women voluntarily, or even readily, submit to the visits of inspectors. This, however, will, I believe, be found scarcely a serious obstacle. The native authorities may be counted upon to support the police in closing any native brothel simply proceeded against as such; and the keepers of the houses will compel the women to appear before the surgeon when they find that the only alternative is the shutting up of the brothel. To prevent emigration from one Settlement to another, it is essential that the two Municipalities act simultaneously; and this co-operation should be definitely secured before the work is begun.

(c) I have ascertained personally from the Commissioner of Customs and the Harbour Master that the Council may depend upon their support, and if in any way possible, their assistance. This is a matter of no small importance, as, so far as sailors are concerned, the most dangerous women appear to be those who, under the guise of needlewomen,
The official registration of the houses and their inhabitants is the first step. This done, the women practising prostitution are furnished with tickets to which their photographs are attached. The weekly inspections are then begun in a convenient apartment hired for the purpose; the building at the head of Foochow Road would suit perfectly. The women, on presenting themselves before the surgeon, hand in their tickets, and upon these the surgeon, or his assistant, inscribes the date of the examination and the condition of the women examined. Should any of the inhabitants of a registered house fail to appear, the proprietor is at once communicated with by the police, and if the reasons assigned for the non-appearance are unsatisfactory, the house is closed and struck off the register. By the more active promoters of this scheme it is believed that it will for some time to come prove a sufficient check on the spread of venereal disease in Shanghai, but I can myself only support it as an advisable preliminary step to the establishment of a hospital, at which the women will not only be periodically examined, but, when found diseased, will be detained till cured.

"I think, and the Superintendent of Police agrees with me, that the expense of the tickets and photographs should be borne by the women themselves."

The following rules and regulations were to be observed by the keepers and inmates of brothels:

1. Any person wishing to keep a brothel, to which foreigners may be admitted, to apply at the Central Police Station when the name of such person, the house she intends to occupy, with the females she proposes to keep, will be registered; she shall bring two photographs of each female, and will be instructed when and where to attend with the females for the purpose of being there examined by the medical officer.

2. Each inmate of a brothel to present herself for examination at such place and at such days as may be appointed by the Council, taking her photograph and card for identification and signature.
Venereal Disease in Shanghai.

3. If found healthy the card to be dated and signed by the medical officer, and the person so examined may return to her home.

4. If found unhealthy the photograph and card to be detained until again examined and found healthy by the medical officer.

5. If any female who has not been examined by the medical officer, or who has been examined by him and found unhealthy, and who has not since been examined and had her card and photograph returned to her by the medical officer, shall be found in any brothel, the proprietor of such house to be proceeded against either for a breach of these regulations, or for keeping a disorderly house.

6. The photograph and card to be at all times exposed in the brothel in which the person designated may reside, as may be directed by the Council.

7. The proprietor of a brothel shall at all times admit any person authorized by the Council to enter such house for the purpose of ascertaining that the regulations are strictly complied with.

8. No female shall remove from one brothel to another unless information shall have previously been given at the Central Police Station and the fact noted on the card of such female.

1877.—The Council in conjunction with the French Council agreed to put in force from the 1st of January the following tentative scheme:—

(a) The licensing of public women

(b) The registration of brothels and women*

(c) Weekly examination of Chinese brothels receiving visits from foreigners.

(d) Treatment of infected women who will voluntarily submit.

(e) The closing of native brothels under order from Mixed Court where one or more inmates object to treatment.

*The moral point of view of this matter of registering brothels and receiving fees from prostitutes formed the subject of a lengthy discussion at the meeting of Ratepayers on the 6th March, 1877.

Speaking to a motion of amendment the proposer, in his moral earnestness, said: "There was always one test for a Christian man by which he could tell whether he ought to support an undertaking, and that was, Could he ask the blessing of God on it? And he asked, Could any one ask that blessing on a scheme countenancing and protecting fornication, in fact, making provision for the flesh to fulfil the lusts thereof? He would not take up any more time, but would now move as an amendment to the original motion—'Provided that nothing contained therein shall be construed into authorizing the Council to grant licences to or receive fees from any brothel or public prostitute.'" The amendment was not carried.
As regards foreign prostitutes, the Council did not propose to compel submission to inspection, as they avail themselves readily of medical advice but if it appears necessary hereafter, the Council intended to take steps in this direction.

"As was anticipated, the women at first refused to attend, preferring rather to close their houses and even, in a few instances, to leave the Settlement. Later, so far as the prejudices of the women against the system were concerned, these were satisfactorily overcome, if indeed they ever constituted a real difficulty." (Health Officer's Report, 1877, p. 35.)

1878.—In this year the Health Officer reported as follows:

"The expectations connected with this institution (Lock Hospital), and expressed in the Report for the year 1877, have been completely fulfilled. As regards the prejudices of the women against the system which the last Report said were satisfactorily overcome, they have been scarcely felt the last year. The best evidence of this is the constant increase shown by the list of women on the roll. Whilst according to the last report there were only 68 women distributed amongst 17 houses, there are now 106 women for 21 houses; and, as has been formerly the case, many more have been from time to time examined and rejected.

"The institution has also done good in a sanitary point of view. This is especially the case in consequence of the women giving greater attention to their persons and clothing after once being examined and knowing their examination is to be repeated weekly. Although the number of women examined has increased to almost double that of last year, there have been, nevertheless, absolutely fewer cases of disease. The report for December last gives as a maximum 12 sick women, all cases being of a light nature. Another consequence of the regular surveillance, which is not to be undervalued, is the fact that women affected with secondary syphilis, who in consequence would be subjected to prolonged treatment, generally leave the Settlements for their homes.

"It is a most satisfactory result that according to reports obtained from surgeons of men-of-war of various nationalities stationed at Shanghai, cases of syphilis have greatly decreased in number and are rare in comparison with the sick list at other ports where there is no surveillance of prostitutes." (Health Officer's Report, 1878, p. 47.)

1879.—Dr. Jamieson moved at the annual meeting of rate-payers that the appropriation for the Lock Hospital be struck out of the Budget for 1879, on the ground that the result of his experience during the past year was that venereal disease had
Venereal Disease in Shanghai.

largely increased instead of diminished since the inspection was brought into operation, and further expressed himself in very strong terms regarding the working of this institution.

In reply to this criticism, Dr. Zachariae, Acting Surgeon to the Lock Hospital, stated that the Annual Report of the General Hospital for the past year showed a considerable decrease in syphilis when compared with previous years. A similar favourable report had also been noticed by Dr. Johnston at the Sailors' Home during 1878, and by ship surgeons during the stay of their vessels in port, and that finally Dr. Galle, the other medical attendant of the Lock Hospital, agreed that the system worked well and that there was a definite diminution in the number of cases of venereal disease during 1878 as a result of this work.

1886.—At the beginning of this year the Health Officer (Dr. Henderson) considered the Lock Hospital as at present constituted a failure, and as he could see no prospect of effecting that extension and improvement which he believed to be essential to secure efficiency, he felt it his duty to recommend the Council to discontinue the work.

The Council did not consider it advisable to agree to this, as they were of opinion that the present system, however imperfect, had to a considerable extent prevented venereal disease amongst the sailors visiting the port. Subsequently, the French Council intimated that they intended to continue their usual contribution towards the support of the institution.

The British Admiral strongly protested against the closing of the Hospital. Dr. Henderson gave as further reasons for his attitude: "Our failure to make any approach to the establishment of a Hospital properly so-called and our weekly examinations are as limited as they were five years ago, while the number of native prostitutes frequented by foreigners—chiefly by the addition of Japanese—has considerably increased. The treatment of disease, when detected, is as unsatisfactory as ever."

The views of the Health Officer to the French Council (Dr. L. Pichon) were that improvement of the working of the Lock Hospital, and not its suppression, was what was needful, and that while admitting that the previously existing clandestine native prostitution had been dangerously supplemented by the Japanese
element, he thought an understanding could be arrived at with the Japanese authorities, and that no official opposition would be offered to the enforcement upon Japanese women of a sanitary measure to which they have to submit in their own country, namely, subjection to the same medical examination which Chinese women undergo. "It is the existing inequalities in the treatment of Japanese and Chinese prostitutes which is chiefly put forward by the latter to justify their neglect of municipal regulations, and their avoidance of examination." (Municipal Council Report 1886, p.77 et seq.)

Impracticability of Surveillance of Prostitutes.—The above facts of an experience extending over 10 years show that any justification of faith in measures of surveillance of prostitutes for the control of venereal disease was found wanting in practice in the early days of the Settlement, even when the total foreign population, according to the census of 1885 for the Settlement (north of the Yang-king-pang) gave only 1,775 men, 1,011 women and 887 children; these figures, added to the last census returns for the Shipping (including the men of ships of war lying in the river) and the French Concession made in 1870, gave a total of 5,090 foreigners.

1896.—A Committee appointed by the Ratepayers recommended the licensing of Brothels as part of Bye-law No. XXXIV.

1898.—A reference to the Lock Hospital appears in the Annual Report for this year, in which it is stated that it is an important factor in the preventive medicine of the Settlement, by reason of the detention and cure of infected native prostitutes. As the class who are protected subject themselves voluntarily to the risk of contracting disease, it is only right that they should pay for the protection gained. At present there is a tax of one dollar a month on these native prostitutes. This does not pay the expenses of the hospital; consequently the excess devolves upon the public. This would be avoided by increasing the tax to, say, two dollars a month, a sum which they are quite able to pay.

1900.—"The Lock Hospital in Foochow Road has been vacated, the accommodation of these patients forming an essential part of the new Isolation Hospital. The number of in-patients admitted during the year was 271 while 10,100 medical examinations were made." (Annual Report, 1900).
1905.—Another committee of lay members sat to consider the question of prostitution in the Settlement and unanimously reported in favour of the strict carrying out of Bye-law XXXIV, and therefore of licensing brothels. The recommendation was, however, turned down by the then Watch Committee as being, from a police point of view, impracticable, and in some directions not wholly desirable.

Owing to official prejudice, Bye-law XXXIV was never exacted against brothels, and no control by this means was ever exercised over brothels. Registration and inspection of certain native prostitutes continued as a system up to 1920.

1920.—A third Committee authorised by the Municipal Council, and composed entirely of lay members, issued a Report on Vice Conditions in Shanghai, in which the following summary of recommendations appears:

1. That brothels be eliminated.
2. That brothels be licensed.
3. That special notification be given to all registered owners of brothel property in order to endeavour to get their co-operation.
4. That no brothel license be granted in any event for premises near schools.
5. That as this cause necessitates more extended work for prostitutes it should be done by means of increased grants to the Door of Hope and kindred institutions.
6. That the law against street soliciting be strictly enforced, including proceedings against the brothel-keeper.
7. That the law prohibiting indecent advertisements by way of posters or in newspapers be strictly enforced.
8. That the law against the sale of intoxicating liquors in unlicensed premises be strictly enforced.
9. That convictions for offences relating to prostitution recorded against holders of any license render the holder incapable of holding any license again.
10. That no "brothel wine license" be issued in future.
11. That parks and other open spaces be well lighted and policed in the summer months.
12. That the examination of prostitutes by the Health Department cease.

13. That future provision for the treatment of venereal disease be undertaken by the Health Department.

14. That propaganda be undertaken by the Health Department relating to the evils of promiscuous intercourse and the dangers arising therefrom.

15. That the Health Department keep such returns as it can relating to venereal disease, and hospitals receiving public moneys be compelled to treat venereal disease and keep returns in such form as the Health Department may require; failure to do this to form ground for refusing any further grant.

16. That a Conference of all educational authorities in Shanghai and neighbourhood be called to investigate thoroughly the advisability and methods of teaching social hygiene in schools.

1922.—In pursuance of the scheme for the gradual elimination of brothels from the Settlement, adopted as a result of the Vice Commission's Report published in the Municipal Gazette of March 19, 1920, the third drawing took place at the Town Hall on December 5, 1922, when one-third of the existing brothels were selected by lot and the license in respect thereto to be withdrawn on April 1, 1923. On December 31, 1922, there were 343 brothels on the register. The license fees collected under this heading for the year amounted to Tls. 634. (Annual Health Report, 1922, p. 36c).

1923.—On 15th of February the Shanghai Medical Society met to discuss "The Control and Treatment of Venereal Diseases from a Public Health point of view." The following is a résumé of some of the opinions expressed, none of which, however, formed the subject of a resolution.

"Venereal disease is a terrible peril"; "should be placed on the list of contagious diseases"; "reduction to be looked for in advances in medical treatment"; "procedures both of regulation and of prohibition have failed, and the present system requires revision."

"Sailors who have contracted venereal disease should be confined on board their ships if not under treatment in hospital."
"The British Merchant Shipping Act discriminates unfairly against sailors suffering from venereal diseases and encourages men to hide disease."

"Public notices about venereal diseases should notify free treatment and free Wassermann tests, and free facilities for patients to sterilize themselves against infection, and this without compulsion." "Special free clinics should be formed furnished with necessary equipment." "Facilities should be provided for treatment after office hours." "Free treatment should be extended to native population."

"The medical profession and not the administration authorities should be in charge of general prophylaxis."

"Treatment by chemists or quacks, or other unqualified persons, should be prohibited"; "advertising of nostrums should be prohibited." "Segregated and regulated districts are better than indiscriminate promiscuity, where there can be no possibility of control." "Independent prostitutes are a greater menace than those in houses of prostitution." "Statistics prove that less disease emanates from brothels than elsewhere." "Need for the education of the public, and of children in schools."

1923.—"The Public Health Department has, at present, no power to regulate, restrict or control Venereal Disease in Shanghai."
Letter of Commissioner of Public Health to Chairman of present Committee.

DISCUSSION.

It seems expedient to the Committee to quote these past records at length for the reasons that they are not easily available for reference, and their study is necessary for the formation of opinion on the problem as represented by the past experience of Shanghai. A little thought about the meaning of its own experience of past administrative procedures which had for their object simply action against native prostitutes and brothels solely for the protection of foreigners shows, even provided such action could be effectual, a limited view of the problem and one likely to produce limited results especially as the social evil in Shanghai is merely a vice and not a crime forbidden and punishable by law.

The records of like procedures in other civil communities give similar and greater affirmation of this failure of results from their sanitary superintendence of prostitution.
It is interesting to note in the above records that, with the exception of Dr. Henderson's work as Health Officer, the initiative in attempts to improve vice conditions in Shanghai has come from the laity. This shows how much the question of the suppression of venereal diseases is one of common interest to all classes of society, and one which must exercise the activity of the Community at large still more in future.

The Committee appreciate the importance of the public opinion and sentiment behind the desire for enlightenment on this important subject, and they believe that the effectiveness of efforts to combat venereal diseases includes:

1. The value of efforts to raise the standard of a general conviction in the community that the evil is a serious one and must be dealt with.

2. Preventive and rescue work; the need of measures to safeguard girls and women who might be led into prostitution by temptation, fraud, or force.

3. The value of efforts to diminish the publicity and profits of the business of prostitution.

4. The fact that the moral issues involved in the problem demand mention of the part played in causing prostitution by such factors as unemployment, low wages, indifference, want of preventive measures against prostitution, and absence of efforts to work upon the individual men and women who are concerned by pure and kindly human contact.

Statistics of Venereal Disease in Shanghai.

Venereal diseases are diffused by prostitutes. The common habitat of the causal micro-organisms is personal to the infectress and her client. Of any given number of prostitutes, always about one-third may be assumed to be diseased. In the spread of venereal diseases one case tends to become two, the two to become four; or it may be the one tends to become three, the three to become nine, and so on. In all cases there is a tendency to geometrical progression, with the ratio varying according to the opportunities for infectivity.
Some measure of the morbidity of promiscuous fornication in Shanghai is afforded by the statistics of the General Hospital. The hospital was originally founded as a private institution under the management of trustees for the foreign sailors who required treatment, and in the early years nearly all the patients treated within its walls were derived from the ships in port. It is important to remember this in reading the Hospital Statistics relating to venereal diseases.

In 1875 the Hospital became a public institution under the management of a Board of Governors.

The following table gives the incidence of venereal diseases among the cases admitted to the General Hospital during the quinquennial periods covering the years 1865 to 1919, and for the period of the three years 1920 to 1922.

**Table 1. Incidence of Venereal Diseases in Shanghai.**

<table>
<thead>
<tr>
<th>Period</th>
<th>Total Number of Patients Admitted</th>
<th>Cases of V. D. including venereal affections (bubo, venereal orchitis and stricture)</th>
<th>Percentage of V. D's to Total Admissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1865-1869</td>
<td>2336</td>
<td>450</td>
<td>19.4%</td>
</tr>
<tr>
<td>1870-1874*</td>
<td>1743</td>
<td>289</td>
<td>16.5%</td>
</tr>
<tr>
<td>1875-1879</td>
<td>1651</td>
<td>252</td>
<td>14.1%</td>
</tr>
<tr>
<td>1880-1884</td>
<td>2128</td>
<td>214</td>
<td>10.0%</td>
</tr>
<tr>
<td>1885-1889</td>
<td>2325</td>
<td>203</td>
<td>8.7%</td>
</tr>
<tr>
<td>1890-1894</td>
<td>2917</td>
<td>242</td>
<td>8.3%</td>
</tr>
<tr>
<td>1895-1899</td>
<td>4322</td>
<td>402</td>
<td>9.3%</td>
</tr>
<tr>
<td>1900-1904</td>
<td>6610</td>
<td>616</td>
<td>9.3%</td>
</tr>
<tr>
<td>1905-1909</td>
<td>7615</td>
<td>602</td>
<td>7.0%</td>
</tr>
<tr>
<td>1910-1914</td>
<td>7927</td>
<td>599</td>
<td>7.5%</td>
</tr>
<tr>
<td>1915-1919</td>
<td>7595</td>
<td>597</td>
<td>6.6%</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>47149</strong></td>
<td><strong>4366</strong></td>
<td><strong>9.2%</strong></td>
</tr>
<tr>
<td>1920-1922</td>
<td>7128</td>
<td>591</td>
<td>8.2%</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>54277</strong></td>
<td><strong>4947</strong></td>
<td><strong>9.1%</strong></td>
</tr>
</tbody>
</table>

*A A change in the commerce of the port from sailing vessels to steamers occurred at this time. Not only are there fewer seamen now visiting Shanghai, but their stay is shorter (Reports of the General Hospital, 1870-1874).*
The average length of residence in hospital under treatment was 21 days.

Of the above total of 4,947 cases of venereal disease, 1,979 were cases of syphilis, giving the unusually large proportion of 40 per cent. as against the common experience elsewhere of 25 per cent., only one-fourth part of all cases of venereal disease being due to syphilis.

It has to be noted, however, that the above figures do not cover all the simpler forms of venereal disease admitted to the Hospital, for the reason that in some of the medical reports, particularly those in the earlier periods, the statement is made that "the returns deal only with the severer forms of the disease," and that "venereal disease was the cause of many admissions to the Hospital not entered under Venereal Disease in the Catalogue of Diseases." Moreover, prior to 1901 venereal bubo was not tabulated as such, but as "disease of lymphatic glands, including venereal bubo." For statistical purposes only one-half of these cases had been considered as venereal, although a truer proportion probably would be two-thirds. In addition, there were numbers of cases catalogued as urethritis, vaginitis, endometritis, salpingitis, obviously of venereal origin: also a number of diseases due to syphilis which do not come under review in the above statistical statement.

Allowing for omissions and irregularities of nomenclature in considering the above statistics, the fact is elicited that about 1 in every 10 patients admitted into the Hospital suffers from venereal disease. In 1922, in the out-patient department of the Hospital, or Free Dispensary, of 3,227 patients 230 were treated for venereal diseases—a proportion of 7.1 per cent. Each of these 230 patients was subsequently seen at the dispensary on an average about five times. In London the number of cases of venereal disease seen in free dispensaries is about 7 per cent of the total bodily diseases.

Venereal Diseases in Hospitals for Chinese.

Shantung Road Hospital.—The medical reports of the Shantung Road Hospital prior to 1870 contain no definite information regarding venereal diseases. The Report for 1863 mentions that "venereal diseases of all kinds have been unusually
Venereal Disease in Shanghai.

common both among men and women. It is no uncommon thing for a woman to come in charge of 6, 8 or 10 others, suffering from the disease."

The following table gives the incidence of venereal diseases among the patients admitted to the Shantung Road Hospital, including those treated as out-patients, from 1870 to 1922. It should be noted that from 1896 to 1904 the statistical records were altered, "no difference being made between old and new patients, all being reckoned together" in the out-patient department. From 1905 onward no medical records for out-patients are available.

Table II.—Shantung Road Hospital: Incidence of Venereal Disease, 1870-1922.

<table>
<thead>
<tr>
<th>Period</th>
<th>Total Number treated</th>
<th>Total V.D. s treated</th>
<th>Percentage of V.D. to total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1870-1874</td>
<td>62,856</td>
<td>3,329</td>
<td>5.3%</td>
</tr>
<tr>
<td>1875-1879</td>
<td>74,596</td>
<td>3,869</td>
<td>5.2%</td>
</tr>
<tr>
<td>1880-1884 a</td>
<td>79,093</td>
<td>4,511</td>
<td>5.9%</td>
</tr>
<tr>
<td>1885-1889 b</td>
<td>93,154</td>
<td>5,310</td>
<td>5.7%</td>
</tr>
<tr>
<td>1890-1894 c</td>
<td>95,121</td>
<td>5,627</td>
<td>5.9%</td>
</tr>
<tr>
<td>1895-1899 d</td>
<td>359,886 d</td>
<td>24,004</td>
<td>6.6%</td>
</tr>
<tr>
<td>1900-1904 d</td>
<td>460,929 d</td>
<td>35,251</td>
<td>7.6%</td>
</tr>
<tr>
<td>1905-1909 e</td>
<td>6,295 e</td>
<td>345</td>
<td>5.4%</td>
</tr>
<tr>
<td>1910-1914</td>
<td>8,002</td>
<td>458</td>
<td>5.7%</td>
</tr>
<tr>
<td>1915-1919 f</td>
<td>9,074</td>
<td>385</td>
<td>4.2%</td>
</tr>
<tr>
<td>1920-1922 g</td>
<td>5,321</td>
<td>262</td>
<td>4.9%</td>
</tr>
<tr>
<td>Totals</td>
<td>1,251,027</td>
<td>83,351</td>
<td>6.6%</td>
</tr>
</tbody>
</table>

a. No medical statistics available for 1883.
b. " " " " " " " " 1885.
c. " " " " " " " " 1893.
d. These figures represent old and new patients reckoned together. The average number of visits of old patients being three.
e. There are no medical statistics for out-patients from this date.
f. No medical statistics available for 1916.
g. " " " " " " " " 1920.

St. Luke's Hospital.—The only medical statistics available for the last four years issued by St. Luke's Hospital are those for 1919, when 2,304 patients were admitted, of whom 195 suffered from venereal diseases—a proportion of 8.4 per cent.
HOSPITALS AND VENEREAL DISEASE.

It is a matter calling for special remark that the medical records of these two important hospitals for the treatment of Chinese are not as complete nor as accurate as they should be for purposes of reference. Hospital medical records are an important index of the Public Health, and as such they should be beyond questioning.

The Committee think it would be to the public interest to have a uniform system of medical records carefully kept by the important hospitals in Shanghai, particularly by those receiving public grants in aid.

These statistics give some idea of the actual proportion of venereal diseases in Shanghai. The current figures do not show any exceptional incidence in the community, and they probably illustrate the utmost dimensions the evil can attain in this city. The figures of admission for venereal diseases give a notion of the quantity of hospital accommodation which is requisite to satisfy this need.

The Committee are satisfied that hospital accommodation is sufficiently provided in Shanghai for the treatment of venereal diseases. They think, however, that special accommodation should be set aside for both men and women, and proper equipment provided for the treatment of these cases in those hospitals receiving grants from public monies.

Dr. Henderson makes a statement in a footnote on the first page of his report on prostitution in Shanghai in 1871, which is applicable almost in similar terms at the present day.

"Women who seek the aid of foreign medical men at the Chinese Hospital present, with few exceptions, examples of advanced disease which have resisted nature and the efforts of the native doctors. These patients are generally very irregular in their attendance, seldom or never continuing their visits until a complete cure is effected. There is not at present in Shanghai any hospital, or any part of a hospital, set apart for the reception of women suffering from venereal disease. In connection with the General Hospital such an arrangement may perhaps be considered unnecessary, the number of foreign prostitutes being so inconsiderable, but if the erection of a separate Lock Hospital be not contemplated, something should be done to enable the native establishments to supply the wants. At present, with scarcely a single exception, native women suffering from venereal disease are treated at the Chinese hospitals as out-patients; in neither of the two
Venereal Disease in Shanghai.

institutions (Shantung Road Hospital and St. Luke's Hospital) is there the necessary accommodations for the indoor treatment of such cases, and the proper appliances are entirely wanting in both."

THE INTERNATIONAL SETTLEMENT AND THE CONTROL OF VENEREAL DISEASES.

Social Problems.—Shanghai has the distinction of being one of the few cities where municipal function is not directly subordinate to a larger administrative unit. It is able to meet each situation as it arises in the light of local conditions, guided by local opinion. The "local conditions" in relation to the public control and treatment of Venereal Disease are undoubtedly of a very complex nature.

For one thing, the territorial unity of the community is destroyed for administrative purposes by the large populations surrounding the Settlement boundaries, under separate jurisdictions.

Another local problem is that of the mixed population, estimated according to the Commissioner of Public Health at 840,000 on December 31st, 1922, of which number only 26,000 were foreigners. The latter figure includes non-Chinese Asians, who comprise, roughly, 50 per cent. of the total. The term "non-Chinese Asiatic" includes Japanese, Indians, Malays, Koreans, etc. The Chinese total of 814,000 fluctuates considerably. Males are in excess of females in the proportion of three to two.

The Community is housed in 69,195 houses, of which 4,750 are foreign. The area of the Settlement is 8.72 sq. miles.

There are 32 police (foreign, Sikh and Chinese) per 10,000 of the population, and 306 police per square mile.

The density of the population within International limits is, roughly, 150 persons per acre. In certain congested areas (the Northern and Eastern Districts) this figure reaches over 400 per acre.

The total population of Shanghai, including Chapei, French Concession and the native city, has been conservatively estimated at two millions. Of this number, roughly, 35,000 are foreigners, including non-Chinese Asians. Japanese account for about 45 per cent. of the total. There are approximately 3,000 Russian refugees resident in the combined areas.
Seafaring Population.—The large seafaring population is another factor in local conditions. According to the Commissioner of Customs, a conservative average number of vessels in port daily, excluding men-of-war, is 70. Allowing 90 as the average number of crew, the total number of seamen (foreign and native) in port daily amounts to 6,300. During 1922, of British merchant ships alone, 677 entered from, and 596 cleared for, foreign ports. The average stay of these vessels in port was 5 days. This large seafaring population constitutes an entirely exceptional problem in connection with venereal diseases and the Public Health—quite different from the case of the civil population. The mode of life is an essential determining cause of prostitution. It was under the strong compulsion of this circumstance, and also considerations connected with the serious quantity of temporary disablement from venereal disease among their sailors, that the British Admiral and other Naval Commanders urgently requested that the Contagious Diseases Act should be administered on a small scale in Shanghai in 1875.

Sailors peculiarly need the humanising effect of being cared for while on shore. Unfortunately there is no proper Seamen’s Institute in Shanghai for the social life of sailors. The Hanbury Institute, the Wayport Rooms, the Union Jack Club and the Navy Y.M.C.A. do excellent work so far as they go, but the beachcomber element—nomads who are hardly ever a day ahead of their wants—spoil the two former Institutions for many mercantile seamen who might otherwise find them useful.

Something better is required for sailors in Shanghai. The incidental advantage to Shanghai of a well-founded Seamen’s Institute would appear in the moral and physical elevation of the inmates above the less desirable attractions of back streets. Similarly a Home or Lodging House for native seamen under voluntary or Municipal management is a desideratum. Moreover, the lot of the seaman, at any rate of British seamen, sick from venereal disease, is made more difficult than need be by those clauses of the Merchant Shipping Act, 1894, which provide that where a seaman is discharged and left behind at a foreign port suffering from venereal disease he loses his wages during such time as he is unfit for duty, and that his medical and hospital expenses can be deducted from such wages as are due to him.
Such provisions seem altogether unfair and form blots on a succession of Acts which were passed in order to improve the lot of those who serve before the mast. The afflicted seaman naturally does all he can to hide the contagion from authority so hostile to his interests, and incidentally supplies a menace to shipping ports.

**General Considerations.**

While the Committee recognise that the terms of their reference have to do chiefly with the public control and treatment of the clinical manifestations of venereal diseases, their professional experience has impressed them with the fact that they would only misapprehend the problem if they did not recognise that promiscuous sexuality is inseparable from human society in large communities. The past records of the difficulties in dealing with this primeval and ever-active sexual impulse is strikingly summarised in an article on "Prostitution" in the *Encyclopaedia Britannica* (11th edition, 1910-1911), in the following words:—"In different countries and ages it has in turn been patronized and prohibited, ignored, recognised, tolerated and condemned, regulated and let alone, flaunted and concealed. Christianity, the greatest moral force in the history of mankind, has repeatedly and systematically attacked it with a scourge in one hand and balm in the other; but the effect has been trifling or transient. Nor have all the social and administrative resources of modern civilization availed to exercise an effective control. The elementary laws on which prostitutes rest are stronger than the artificial codes imposed by moral teaching, conventional standards or legislatures; and attempts at repression only lead to a change of form, not of substance."

As against any feeling that the problem is hopeless of solution or improvement, we have to remember that it is only within the last century that public health activities have been developed as an important and continuous branch of city administration with special attention to the preventive side. And it is only within much more recent times that an awakening to a new social consciousness among citizens has developed.

On the medical side it is only within the last fifty years that a beginning was made of a truly scientific study of this medical and social problem.
The gonococcus, the specific cause of gonorrhoea, was only discovered in 1879; the bacillus of chancre in 1889; and the protozoon of syphilis in 1903. The first International Congress for the study of the prophylaxis of syphilis and other venereal diseases was held in Brussels as recently as 1899. At the conclusion of the conference there was founded the first International Society for the sanitary and moral prophylaxis of syphilis and other venereal diseases. It has its seat in Brussels and meets at periodical intervals for international conference.

Nations are only now learning that organization is necessary to limit and resist the inroads of communicable diseases.

CONCLUSIONS.

This investigation of records and statistics relating to venereal diseases in Shanghai contributes some of the elements necessary for judging what measures are expedient to have in this city against the evil.

The Committee agree that there are no valid local reasons for protection and control of prostitution, and consider that public policy best which is decidedly in favour of not fostering such an order of things.

The past experience in Shanghai shows that the good which can be got through the spending of public funds in the matter are not such as to reasonably compensate for the cost and trouble at which it was attained. We believe that no appreciable good would be got by a superintendence of prostitution even with a much larger and more expensive organization than heretofore, particularly as the local circumstances are entirely unfavourable for success.*

The Committee are of opinion that the object of measures dealing with the control and treatment of venereal diseases from a public health point of view should be active in:

(a) The protection of health by early and efficient treatment of diseased individuals among the poor at the public expense.

(b) Preventive and rescue work.

*English Public Health Law has not hitherto taken any special cognisance of venereal diseases of the civil population. This neutral official attitude commonly exists throughout the world among English-speaking civil communities.
In regard to (a) the Committee recommend the organization of a Venereal Disease Department under the Commissioner of Public Health. This Department should have a special medical officer to supervise the Venereal Disease Clinics and the work of the Department generally. They also suggest the addition of women inspectors as a promising step in the direction of practical results.

In regard to (b) the Committee think that close relations should exist between the Health Department and those institutions engaged in preventive and rescue work, and that sufficient financial aid should be given to them to carry on their work efficiently.

The work done by these institutions and by kindred associations should represent the social side of an organization against vice and the control of venereal diseases which is supplemental to and completed by the work of the Public Health Department. Such an organization would help to relieve the regular police of the undesirable function of enforcing standards of moral conduct in a highly cosmopolitan community not altogether in sympathy with such ideals.

In connection with the question of efficient treatment the Committee call attention to the harm done by attempts to treat venereal diseases by quacks and unqualified persons. The thorough treatment of syphilis is a matter of several years, and gonorrhoea is a disease which, even more than syphilis, demands the most precise knowledge of complicated technique and morbid anatomy alone possessed by the scientifically trained medical man.

Summary of Recommendations.

1. That in the interest of the Public Health the best public policy in Shanghai is not to foster any official system of supervision of prostitutes.

2. That prostitution and venereal diseases should be deemed matters of official concern only in the interests of the Public Health, and in the preservation of orderliness and decency.

3. That the Municipal Council organise a Venereal Diseases Department under the Commissioner of Public Health.

† "In matters medical the ordinary citizen of to-day has not one whit more sense than the old Romans, whom Lucian scourged for a credulity which made them fall easy victims to the quacks of the time."—Sir William Osler, M.D., in Acquainimitas, p. 6.
4. That the Municipal Council require of hospitals receiving grants in aid satisfactory accommodation and equipment for the care and treatment of venereal diseases for both men and women, including clinics for out-patients.

5. That the Council require of hospitals receiving grants in aid accurate medical records catalogued on a uniform system, including statistics relating to venereal diseases.

6. That the Council should organise additional clinics for the treatment of venereal diseases among the poor where necessary.

7. That all clinics for venereal diseases should show a prominent sign or coloured light (the Service blue light); that all clinics should be available for sterilization treatment before and after ordinary working hours; that all clinics should keep a register detailing as accurately as possible particulars as to the source of infection in an infectee, occupation, length of residence in Shanghai, etc. Registers should be available for inspection by a medical officer of the Health Department.

8. That action against any notorious source of infection should be the concern of the Commissioner of Public Health.

9. That the Commissioner of Health should be empowered to engage women sanitary inspectors if he considers them necessary to assist in this work.

10. That the Commissioner of Public Health should exhibit public notices about venereal diseases in each of the sub-stations of his Department, which notices should notify free treatment, free Wassermann tests, and free facilities for sterilization.

11. That special hoardings with public notices relating to venereal diseases and their free treatment should be placed in a prominent position on public landing stages along the river front.

12. That similar public notices should be placed in public markets, public latrines, and wherever advantageous.
13. That the Commissioner of Public Health should publish and circulate leaflets stating the official position in regard to venereal disease in Shanghai; the incidence of disease in Shanghai according to hospital statistics; the risk of promiscuous sexual intercourse; the need for immediate sterilization; where public facilities for sterilization and treatment of the infected are provided; how the untreated or ineffectively treated perpetuate and spread the infections suffered by them.

14. That the advantage, if any, of the earlier closing of public bars and licensed places of entertainment in relation to the diffusion of venereal diseases be investigated by the Commissioner of Public Health.

15. That the Commissioner of Public Health should investigate and report on the facilities for proper lodging accommodation in Institutes for foreign and native seamen in Shanghai.

16. That shipowners and masters of ships be notified of the necessity of giving facilities for the treatment of cases of venereal disease among crews of vessels visiting the port.

17. That washerwomen and needlewomen should not be allowed to visit ships unless provided with special permits from the Missions to Seamen or other authorization.

18. That public advertisement of quack cures and remedies should be prohibited, and attempted treatment by unqualified persons should be a punishable offence.

19. That co-operation for purposes of public control of vice and venereal diseases should exist between the Public Health Department and neighbouring municipalities, and also between the Health Department and social institutions and societies engaged in this work.

20. That the Public Health Department become associated by membership with International Societies for the control and investigation of venereal diseases from a public health point of view.